

**Specifications**

**For**

**Houstonfirst**<sup>SM</sup>

**GRBCC LIGHTING CONTROLS UPGRADE**

ISSUE FOR PROCUREMENT

**Divisions 01, 07, 26**

March 3, 2021

**Jacobs**

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Jacobs Project Number: WHXK6604

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Division	Section Title
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## SPECIFICATIONS GROUP

### *General Requirements Subgroup*

#### **DIVISION 01 - GENERAL REQUIREMENTS**

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### *Facility Construction Subgroup*

#### **DIVISION 07 - THERMAL AND MOISTURE PROTECTION**

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## SECTION 01 10 00 - SUMMARY

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section Includes:
  - 1. Project information.
  - 2. Work covered by Contract Documents.
  - 3. Access to site.
  - 4. Coordination with occupants.
  - 5. Work restrictions.
  - 6. Specification and drawing conventions.
- B. Related Requirements:
  - 1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

## 1.3 PROJECT INFORMATION

- A. Project Identification: George R Brown Convention Center: Lighting Controls Upgrade.
  - 1. Project Location: 1001 Avenida De Las Americas, Houston, TX 77010.
- B. Owner: Houston First Corporation, George R Brown Convention Center.
- C. Engineer: Jacobs.

## 1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and consists of the following:
  - 1. The Contractor shall replace or upgrade all existing relay panels with new panels or panel insides due to age and failures. Reusing existing tubs and covers is acceptable, if that is possible while still have entirely new relays and electronics.
  - 2. The Contractor shall carefully label and document all existing relay panel schedules and provide updated schedules as part of the new system documentation. All circuits to be tested and verified by the electrical contractor as part of the replacement process.
  - 3. Contractor shall install new network components as required to support new relay system and front end controls.
  - 4. Contractor shall pull new interconnection wire panel to panel, per manufacturer plans and instructions. Reusing existing conduit, where in good shape, is permissible. However it may be necessary to run new conduit if topology does not match existing conduit layout.

5. Contractor shall provide and install new front end software with graphics on computer provided by manufacturer
6. Graphics screens shall be floor plan based, with an overall home screen and zoomed in detail screens of individual exhibit halls. Design shall be similar to graphics of existing system, with input from owner/operators as to changes they would like in how it operates.
7. The manufacturer shall be able to remotely support the system, by means of a cell modem. The manufacturer remote operation center shall, when called by an authorized user, login to the system to troubleshoot issues and make changes. This support shall be provided for a full 5 years as part of a service contract
8. Contractor shall coordinate work schedule with GRBCC/Houston First to ensure no events are interrupted.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

### 1.5 ACCESS TO SITE

- A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. Use of Site: Limit use of Project site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
1. Driveways, Walkways and Entrances: Keep driveways loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
    - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
    - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

### 1.6 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner will occupy site and existing building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.
1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
  2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

## 1.7 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
  - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
  - 1. Notify Owner not less than two days in advance of proposed utility interruptions.
  - 2. Obtain Owner's written permission before proceeding with utility interruptions.
- C. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
  - 1. Notify Owner not less than two days in advance of proposed disruptive operations.
  - 2. Obtain Owner's written permission before proceeding with disruptive operations.
- D. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor-air intakes.
- E. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.

## 1.8 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
  - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
  - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
  - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
  - 2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings.
  - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000



## SECTION 01 25 00 - SUBSTITUTION PROCEDURES

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
  - 1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

## 1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
  - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
  - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

## 1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
  - 1. Substitution Request Form: Use facsimile of form provided in Project Manual.
  - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product or fabrication, or installation cannot be provided, if applicable.
    - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific

- features and requirements indicated. Indicate deviations, if any, from the Work specified.
- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
  - e. Samples, where applicable or requested.
  - f. Certificates and qualification data, where applicable or requested.
  - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
  - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
  - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
  - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
  - k. Cost information, including a proposal of change, if any, in the Contract Sum.
  - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
  - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 14 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
  - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

## 1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

## 1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

## PART 2 - PRODUCTS

## 2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
    - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    - b. Substitution request is fully documented and properly submitted.
    - c. Requested substitution will not adversely affect Contractor's construction schedule.
    - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
    - e. Requested substitution is compatible with other portions of the Work.
    - f. Requested substitution has been coordinated with other portions of the Work.
    - g. Requested substitution provides specified warranty.
    - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Architect will consider requests for substitution if received within 60 days after commencement of the Work. Requests received after that time may be considered or rejected at discretion of Architect.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
    - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
    - b. Requested substitution does not require extensive revisions to the Contract Documents.
    - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    - d. Substitution request is fully documented and properly submitted.
    - e. Requested substitution will not adversely affect Contractor's construction schedule.
    - f. Requested substitution has received necessary approvals of authorities having jurisdiction.
    - g. Requested substitution is compatible with other portions of the Work.
    - h. Requested substitution has been coordinated with other portions of the Work.
    - i. Requested substitution provides specified warranty.
    - j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

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PART 3 - EXECUTION (Not Used)

END OF SECTION 01 25 00

# SUBSTITUTION REQUEST

Project Name: \_\_\_\_\_ Project Number: \_\_\_\_\_

## SUBSTITUTION REQUEST

We request that the following substitution be approved:

- Product specified: \_\_\_\_\_  
Specification section: \_\_\_\_\_  
Related Drawing/Detail No. (if applicable): \_\_\_\_\_
- Product substitute: \_\_\_\_\_  
Manufacturer: \_\_\_\_\_
- Differences in specified product: \_\_\_\_\_  
\_\_\_\_\_

Reason for requesting substitution: \_\_\_\_\_

Check those that apply:

- After in-depth investigation, we conclude that the quality of the substitution is equal to or better than the specified product.
- All cost data is complete and includes no other additional cost.
- Does the substitution affect schedules, dimensions on drawings, or work of other sections.  
If so, explain: \_\_\_\_\_
- All necessary changes related to the proposed substitution will be coordinated and any changes necessary for complete installation will be included at no additional cost to the owner.

Submit product data for **both** the specified and proposed substituted product that accurately defines comparisons between the products and as described in Division 01.

The undersigned acknowledges that the information completed above is correct and accurately defines the manufacturers product data for the substitution and accepts responsibility for coordination of the proposed substitution and all additional costs resulting from the incorporation of the proposed substitution.

\_\_\_\_\_ Submitted By      \_\_\_\_\_ Signature      \_\_\_\_\_ Date

## ARCHITECT'S REVIEW

Check those that apply:

Substitution: Accepted  Not Accepted  Submission: Submittals Incomplete  Too Late

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ Architect      \_\_\_\_\_ Signature      \_\_\_\_\_ Date

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## SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
  - 1. Section 01 25 00 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

## 1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

## 1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
  - 2. Within time specified in Proposal Request or 20 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Include costs of labor and supervision directly attributable to the change.
    - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and

finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

- e. Quotation Form: Use forms acceptable to Architect.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
  2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
  3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
  4. Include costs of labor and supervision directly attributable to the change.
  5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
  6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
  7. Proposal Request Form: Use form acceptable to Architect.

#### 1.5 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

#### 1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.



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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 26 00

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## SECTION 01 29 00 - PAYMENT PROCEDURES

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
  - 1. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
  - 2. Section 01 32 00 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

## 1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

## 1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
  - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
    - a. Application for Payment forms with continuation sheets.
    - b. Submittal schedule.
    - c. Items required to be indicated as separate activities in Contractor's construction schedule.
  - 2. Submit the schedule of values to Construction Manager at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
  - 3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.
  - 4. Subschedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide subschedules showing values coordinated with each element.

- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
1. Identification: Include the following Project identification on the schedule of values:
    - a. Project name and location.
    - b. Name of Architect.
    - c. Architect's project number.
    - d. Contractor's name and address.
    - e. Date of submittal.
  2. Arrange schedule of values consistent with format of AIA Document G703.
  3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
    - a. Related Specification Section or Division.
    - b. Description of the Work.
    - c. Name of subcontractor.
    - d. Name of manufacturer or fabricator.
    - e. Name of supplier.
    - f. Change Orders (numbers) that affect value.
    - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
      - 1) Labor.
      - 2) Materials.
      - 3) Equipment.
  4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
  5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
  6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
    - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
  7. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
  8. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
  9. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.
  10. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
    - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
  11. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

## 1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Construction Manager and paid for by Owner.
1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Application for Payment Forms: Use forms acceptable to Owner for Applications for Payment. Submit forms for approval with initial submittal of schedule of values.
- C. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Construction Manager will return incomplete applications without action.
1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
  2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
  3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
  4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- D. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
  2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
  3. Provide summary documentation for stored materials indicating the following:
    - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
    - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
    - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- E. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Construction Manager by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.

2. When an application shows completion of an item, submit conditional final or full waivers.
  3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
  4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
  2. Schedule of values.
  3. Contractor's construction schedule (preliminary if not final).
  4. Combined Contractor's construction schedule (preliminary if not final) incorporating Work of multiple contracts, with indication of acceptance of schedule by each Contractor.
  5. Products list (preliminary if not final).
  6. Schedule of unit prices.
  7. Submittal schedule (preliminary if not final).
  8. List of Contractor's staff assignments.
  9. List of Contractor's principal consultants.
  10. Copies of building permits.
  11. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
  12. Initial progress report.
  13. Report of preconstruction conference.
  14. Certificates of insurance and insurance policies.
  15. Performance and payment bonds.
  16. Data needed to acquire Owner's insurance.
- H. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
  2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- I. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
  2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
  3. Updated final statement, accounting for final changes to the Contract Sum.
  4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
  5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
  6. AIA Document G707, "Consent of Surety to Final Payment."
  7. Evidence that claims have been settled.
  8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
  9. Final liquidated damages settlement statement.

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HFC GRBCC LIGHTING CONTROLS UPGRADE

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

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## SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. General coordination procedures.
  - 2. Coordination drawings.
  - 3. Requests for Information (RFIs).
  - 4. Project Web site.
  - 5. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
  - 1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
  - 2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
  - 3. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.
  - 4. Section 019113 "General Commissioning Requirements" for coordinating the Work with Owner's Commissioning Authority.

## 1.3 DEFINITIONS

- A. RFI: Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

## 1.4 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.

2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
  3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
  3. Make adequate provisions to accommodate items scheduled for later installation.
- C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's construction schedule.
  2. Installation and removal of temporary facilities and controls.
  3. Delivery and processing of submittals.
  4. Progress meetings.
  5. Preinstallation meetings.
  6. Project closeout activities.
  7. Startup and adjustment of systems.

## 1.5 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
    - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
    - b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.

- c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
  - d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
  - e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
  - f. Indicate required installation sequences.
  - g. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
  2. Plenum Space: Indicate sub framing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
  3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
  4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
  5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
  6. Mechanical and Plumbing Work: Show the following:
    - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
    - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
    - c. Fire-rated enclosures around ductwork.
  7. Electrical Work: Show the following:
    - a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
    - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
    - c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
    - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
  8. Fire-Protection System: Show the following:
    - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
  9. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 013300 "Submittal Procedures."

- C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:
  - 1. File Submittal Format: Submit or post coordination drawing files using format same as file preparation format or Portable Data File (PDF) format.

#### 1.6 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
  - 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
  - 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
  - 1. Project name.
  - 2. Project number.
  - 3. Date.
  - 4. Name of Contractor.
  - 5. Name of Architect.
  - 6. RFI number, numbered sequentially.
  - 7. RFI subject.
  - 8. Specification Section number and title and related paragraphs, as appropriate.
  - 9. Drawing number and detail references, as appropriate.
  - 10. Field dimensions and conditions, as appropriate.
  - 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  - 12. Contractor's signature.
  - 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
    - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Architect.
  - 1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow five working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
  - 1. The following Contractor-generated RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for approval of Contractor's means and methods.
    - d. Requests for coordination information already indicated in the Contract Documents.
    - e. Requests for adjustments in the Contract Time or the Contract Sum.

- f. Requests for interpretation of Architect's actions on submittals.
      - g. Incomplete RFIs or inaccurately prepared RFIs.
    2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
    3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
      - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
  - E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Software log with not less than the following:
    1. Project name.
    2. Name and address of Contractor.
    3. Name and address of Architect.
    4. RFI number including RFIs that were returned without action or withdrawn.
    5. RFI description.
    6. Date the RFI was submitted.
    7. Date Architect's response was received.
  - F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
    1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
    2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

## 1.7 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
  1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
  2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.
- B. Preconstruction Kickoff Meeting: a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
  1. Conduct the conference to review responsibilities and personnel assignments.
  2. Attendees: Authorized representatives of Owner Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing and long-lead items.
    - d. Designation of key personnel and their duties.
    - e. Lines of communications.
    - f. Procedures for processing field decisions and Change Orders.
    - g. Procedures for RFIs.
    - h. Procedures for testing and inspecting.
    - i. Procedures for processing Applications for Payment.
    - j. Distribution of the Contract Documents.
    - k. Submittal procedures.
    - l. Sustainable design requirements.
    - m. Preparation of record documents.
    - n. Use of the premises.
    - o. Work restrictions.
    - p. Working hours.
    - q. Owner's occupancy requirements.
    - r. Responsibility for temporary facilities and controls.
    - s. Procedures for moisture and mold control.
    - t. Procedures for disruptions and shutdowns.
    - u. Construction waste management and recycling.
    - v. Parking availability.
    - w. Office, work, and storage areas.
    - x. Equipment deliveries and priorities.
    - y. First aid.
    - z. Security.
    - aa. Progress cleaning.
  4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Meetings: Conduct a preinstallation meeting at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect, and Owner's Commissioning Authority of scheduled meeting dates.
  2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - a. Contract Documents.
    - b. Options.
    - c. Related RFIs.
    - d. Related Change Orders.
    - e. Purchases.
    - f. Deliveries.
    - g. Submittals.
    - h. Possible conflicts.
    - i. Compatibility requirements.
    - j. Time schedules.
    - k. Manufacturer's written instructions.

- l. Warranty requirements.
  - m. Compatibility of materials.
  - n. Acceptability of substrates.
  - o. Temporary facilities and controls.
  - p. Space and access limitations.
  - q. Regulations of authorities having jurisdiction.
  - r. Testing and inspecting requirements.
  - s. Installation procedures.
  - t. Coordination with other work.
  - u. Required performance results.
  - v. Protection of adjacent work.
  - w. Protection of construction and personnel.
3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
  4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
  5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Project Closeout Meeting: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 30 days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.
  2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
    - a. Preparation of record documents.
    - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
    - c. Submittal of written warranties.
    - d. Requirements for preparing operations and maintenance data.
    - e. Requirements for delivery of material samples, attic stock, and spare parts.
    - f. Requirements for demonstration and training.
    - g. Preparation of Contractor's punch list.
    - h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
    - i. Submittal procedures.
    - j. Coordination of separate contracts.
    - k. Owner's partial occupancy requirements.
    - l. Installation of Owner's furniture, fixtures, and equipment.
    - m. Responsibility for removing temporary facilities and controls.
  4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

- E. Progress Meetings: Conduct progress meetings at a minimum monthly intervals.
1. Coordinate dates of meetings with preparation of payment requests.
  2. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      - 1) Review schedule for next period.
    - b. Review present and future needs of each entity present, including the following:
      - 1) Interface requirements.
      - 2) Sequence of operations.
      - 3) Status of submittals.
      - 4) Status of sustainable design documentation.
      - 5) Deliveries.
      - 6) Off-site fabrication.
      - 7) Access.
      - 8) Site utilization.
      - 9) Temporary facilities and controls.
      - 10) Progress cleaning.
      - 11) Quality and work standards.
      - 12) Status of correction of deficient items.
      - 13) Field observations.
      - 14) Status of RFIs.
      - 15) Status of proposal requests.
      - 16) Pending changes.
      - 17) Status of Change Orders.
      - 18) Pending claims and disputes.
      - 19) Documentation of information for payment requests.
  4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
    - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.



- F. Coordination Meetings: Conduct Project coordination meetings at regular intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
1. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
    - b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
    - c. Review present and future needs of each contractor present, including the following:
      - 1) Interface requirements.
      - 2) Sequence of operations.
      - 3) Status of submittals.
      - 4) Deliveries.
      - 5) Off-site fabrication.
      - 6) Access.
      - 7) Site utilization.
      - 8) Temporary facilities and controls.
      - 9) Work hours.
      - 10) Hazards and risks.
      - 11) Progress cleaning.
      - 12) Quality and work standards.
      - 13) Change Orders.
  3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

## SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
  - 1. Startup construction schedule.
  - 2. Contractor's construction schedule.
  - 3. Construction schedule updating reports.
  - 4. Daily construction reports.
  - 5. Material location reports.
  - 6. Special reports.
- B. Related Requirements:
  - 1. Section 013300 "Submittal Procedures" for submitting schedules and reports.
  - 2. Section 014000 "Quality Requirements" for submitting a schedule of tests and inspections.

## 1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
  - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
  - 2. Predecessor Activity: An activity that precedes another activity in the network.
  - 3. Successor Activity: An activity that follows another activity in the network.
- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- D. Event: The starting or ending point of an activity.

- E. Float: The measure of leeway in starting and completing an activity.
  - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
  - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
  - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- F. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
  - 1. Working electronic copy of schedule file, where indicated.
  - 2. PDF electronic file.
  - 3. Two paper copies.
- B. Startup construction schedule.
  - 1. Startup construction schedule and updates as requested by Owner.
- C. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- D. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
  - 1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.
- E. Construction Schedule Updates: As specified by Owner.

#### 1.5 QUALITY ASSURANCE

- A. Preconstruction Kick-off Meeting: Conduct meeting at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's construction schedule, including, but not limited to, the following:
  - 1. Review format for schedules and updates.
  - 2. Verify availability of qualified personnel needed to develop and update schedule.
  - 3. Discuss constraints, including but not limited to phasing, area separations, interim milestones, and partial Owner occupancy.
  - 4. Review submittal requirements and procedures.
  - 5. Review time required for review of submittals and resubmittals.
  - 6. Review requirements for tests and inspections by independent testing and inspecting agencies.

7. Review time required for Project closeout and Owner startup procedures, including commissioning activities.
8. Review and finalize list of construction activities to be included in schedule.
9. Review procedures for updating schedule.

## 1.6 COORDINATION

- A. Coordinate Contractor's construction schedule with the list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
  1. Secure time commitments for performing critical elements of the Work from entities involved.
  2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

## PART 2 - PRODUCTS

### 2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for commencement of the Work to date of Substantial Completion.
  1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
  1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
  2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
  3. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
  4. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
  5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
  6. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
  1. Phasing: Arrange list of activities on schedule by phase.
  2. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.

3. Work Restrictions: Show the effect of the following items on the schedule:
    - a. Coordination with existing construction.
    - b. Limitations of continued occupancies.
    - c. Uninterruptible services.
    - d. Partial occupancy before Substantial Completion.
    - e. Use of premises restrictions.
    - f. Provisions for future construction.
    - g. Seasonal variations.
    - h. Environmental control.
  4. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
    - a. Subcontract awards.
    - b. Submittals.
    - c. Purchases.
    - d. Mockups.
    - e. Fabrication.
    - f. Sample testing.
    - g. Deliveries.
    - h. Installation.
    - i. Tests and inspections.
    - j. Adjusting.
    - k. Curing.
    - l. Startup and placement into final use and operation.
  5. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
    - a. Structural completion.
    - b. Temporary enclosure and space conditioning.
    - c. Permanent space enclosure.
    - d. Completion of mechanical installation.
    - e. Completion of electrical installation.
    - f. Substantial Completion.
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.
1. Temporary enclosure and space conditioning.
- E. Upcoming Work Summary (Look-Aheads as requested by Owner): Prepare look-aheads indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
1. Unresolved issues.
  2. Unanswered Requests for Information.
  3. Rejected or unreturned submittals.
  4. Notations on returned submittals.
  5. Pending modifications affecting the Work and Contract Time.
- F. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.

- G. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

## 2.2 STARTUP CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit startup, horizontal, bar-chart-type construction schedule within seven days of date established for commencement of the Work.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

## 2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's construction schedule within 30 days of date established for commencement of the Work or as specified by Owner. Base schedule on the startup construction schedule and additional information received since the start of Project.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
  - 1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

## 2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- 1. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
- 2. Format: Mark the critical path.
- B. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis to demonstrate the effect of the proposed change on the overall project schedule.
- C. Schedule Updating: Concurrent with making revisions to schedule, prepare updates that show the following:
  - 1. Identification of activities that have changed.
  - 2. Changes in early and late start dates.
  - 3. Changes in early and late finish dates.
  - 4. Changes in activity durations in workdays.
  - 5. Changes in the critical path.
  - 6. Changes in total float or slack time.
  - 7. Changes in the Contract Time.

## 2.5 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
1. List of subcontractors at Project site.
  2. List of separate contractors at Project site.
  3. Approximate count of personnel at Project site.
  4. Equipment at Project site.
  5. Material deliveries.
  6. High and low temperatures and general weather conditions, including presence of rain or snow.
  7. Accidents.
  8. Meetings and significant decisions.
  9. Unusual events (see special reports).
  10. Stoppages, delays, shortages, and losses.
  11. Meter readings and similar recordings.
  12. Emergency procedures.
  13. Orders and requests of authorities having jurisdiction.
  14. Change Orders received and implemented.
  15. Construction Change Directives received and implemented.
  16. Services connected and disconnected.
  17. Equipment or system tests and startups.
  18. Partial completions and occupancies.
  19. Substantial Completions authorized.
- B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:
1. Material stored prior to previous report and remaining in storage.
  2. Material stored prior to previous report and since removed from storage and installed.
  3. Material stored following previous report and remaining in storage.
- C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

## 2.6 SPECIAL REPORTS

- A. General: Submit special reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

## PART 3 - EXECUTION

## 3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At two-week intervals or as directed by the Owner, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
  2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
  3. As the Work progresses, indicate final completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Architect Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.
  2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01 32 00



## SECTION 01 33 00 - SUBMITTAL PROCEDURES

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
  - 1. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
  - 2. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
  - 3. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
  - 4. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

## 1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

#### 1.4 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
  2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
  3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
    - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
  4. Format: Arrange the following information in a tabular format:
    - a. Scheduled date for first submittal.
    - b. Specification Section number and title.
    - c. Submittal category: Action; informational.
    - d. Name of subcontractor.
    - e. Description of the Work covered.
    - f. Scheduled date for Architect's final release or approval.
    - g. Scheduled date of fabrication.
    - h. Scheduled dates for purchasing.
    - i. Scheduled dates for installation.
    - j. Activity or event number.

#### 1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
  3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
  4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 10 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
  2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  3. Resubmittal Review: Allow 7 days for review of each resubmittal.
  4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
  5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.
- D. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
  2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
  3. Include the following information for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name of Architect.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Name of subcontractor.
    - g. Name of supplier.
    - h. Name of manufacturer.
    - i. Submittal number or other unique identifier, including revision identifier.
      - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
    - j. Number and title of appropriate Specification Section.
    - k. Drawing number and detail references, as appropriate.
    - l. Location(s) where product is to be installed, as appropriate.
    - m. Other necessary identification.
  4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
    - a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.

5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return without review submittals received from sources other than Contractor.
  - a. Transmittal Form for Paper Submittals: Provide locations on form for the following information:
    - 1) Project name.
    - 2) Date.
    - 3) Destination (To:).
    - 4) Source (From:).
    - 5) Name and address of Architect.
    - 6) Name of Construction Manager.
    - 7) Name of Contractor.
    - 8) Name of firm or entity that prepared submittal.
    - 9) Names of subcontractor, manufacturer, and supplier.
    - 10) Category and type of submittal.
    - 11) Submittal purpose and description.
    - 12) Specification Section number and title.
    - 13) Specification paragraph number or drawing designation and generic name for each of multiple items.
    - 14) Drawing number and detail references, as appropriate.
    - 15) Indication of full or partial submittal.
    - 16) Transmittal number, numbered consecutively.
    - 17) Submittal and transmittal distribution record.
    - 18) Remarks.
    - 19) Signature of transmitter.
- E. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
  1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
  2. Name file with submittal number or other unique identifier, including revision identifier.
  3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
  4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner, containing the following information:
    - a. Project name.
    - b. Date.
    - c. Name and address of Architect.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Name of firm or entity that prepared submittal.
    - g. Names of subcontractor, manufacturer, and supplier.
    - h. Category and type of submittal.
    - i. Submittal purpose and description.
    - j. Specification Section number and title.
    - k. Specification paragraph number or drawing designation and generic name for each of multiple items.
    - l. Drawing number and detail references, as appropriate.
    - m. Location(s) where product is to be installed, as appropriate.

- n. Related physical samples submitted directly.
  - o. Indication of full or partial submittal.
  - p. Transmittal number, numbered consecutively.
  - q. Submittal and transmittal distribution record.
  - r. Other necessary identification.
  - s. Remarks.
5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
- a. Project name.
  - b. Number and title of appropriate Specification Section.
  - c. Manufacturer name.
  - d. Product name.
- F. Options: Identify options requiring selection by Architect.
- G. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
  2. Note date and content of revision in label or title block and clearly indicate extent of revision.
  3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- J. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

## PART 2 - PRODUCTS

### 2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
1. Post electronic submittals as PDF electronic files directly to the Architect.
    - a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
  2. Submit electronic submittals via email as PDF electronic files.
    - a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

3. Action Submittals: Submit electronic files or three paper copies of each submittal unless otherwise indicated. Architect will return two copies.
  4. Informational Submittals: Submit electronic files or two paper copies of each submittal unless otherwise indicated. Architect will not return copies.
  5. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
    - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
    - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
  2. Mark each copy of each submittal to show which products and options are applicable.
  3. Include the following information, as applicable:
    - a. Manufacturer's catalog cuts.
    - b. Manufacturer's product specifications.
    - c. Standard color charts.
    - d. Statement of compliance with specified referenced standards.
    - e. Testing by recognized testing agency.
    - f. Application of testing agency labels and seals.
    - g. Notation of coordination requirements.
    - h. Availability and delivery time information.
  4. For equipment, include the following in addition to the above, as applicable:
    - a. Wiring diagrams showing factory-installed wiring.
    - b. Printed performance curves.
    - c. Operational range diagrams.
    - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
  5. Submit Product Data before or concurrent with Samples.
  6. Submit Product Data in the following format:
    - a. PDF electronic file or three paper copies of Product Data unless otherwise indicated. Architect will return two copies.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Identification of products.
    - b. Schedules.
    - c. Compliance with specified standards.
    - d. Notation of coordination requirements.
    - e. Notation of dimensions established by field measurement.
    - f. Relationship and attachment to adjoining construction clearly indicated.
    - g. Seal and signature of professional engineer if specified.
  2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches.

3. Submit Shop Drawings in the following format:
  - a. PDF electronic file.
  - b. Two opaque (bond) copies of each submittal. Architect will return one copy(ies).
  
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
  1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
  2. Identification: Attach label on unexposed side of Samples that includes the following:
    - a. Generic description of Sample.
    - b. Product name and name of manufacturer.
    - c. Sample source.
    - d. Number and title of applicable Specification Section.
    - e. Specification paragraph number and generic name of each item.
  3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
  4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
    - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
  5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
    - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
  6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
    - a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.
      - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
      - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
  - 1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
  - 2. Manufacturer and product name, and model number if applicable.
  - 3. Number and name of room or space.
  - 4. Location within room or space.
  - 5. Submit product schedule in the following format:
    - a. PDF electronic file or three paper copies of product schedule or list unless otherwise indicated. Architect will return two copies.
- F. Coordination Drawing Submittals: Comply with requirements specified in Section 013100 "Project Management and Coordination."
- G. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."
- H. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."
- I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 014000 "Quality Requirements."
- J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."
- K. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."
- L. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- M. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- N. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- O. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- P. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.



- Q. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- R. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- S. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- T. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
1. Name of evaluation organization.
  2. Date of evaluation.
  3. Time period when report is in effect.
  4. Product and manufacturers' names.
  5. Description of product.
  6. Test procedures and results.
  7. Limitations of use.
- U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- V. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- W. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- X. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

## 2.2 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file and three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
  - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

### PART 3 - EXECUTION

#### 3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

#### 3.2 ARCHITECT'S ACTION

- A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 01 33 00

## SECTION 01 40 00 - QUALITY REQUIREMENTS

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
  - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
  - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.
  - 4. Specific test and inspection requirements are not specified in this Section.

## 1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

1. Laboratory Mockups: Full-size physical assemblies constructed at testing facility to verify performance characteristics.
- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
  1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

#### 1.4 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

## 1.5 ACTION SUBMITTALS

- A. Shop Drawings: For mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.
  - 1. Indicate manufacturer and model number of individual components.
  - 2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

## 1.6 INFORMATIONAL SUBMITTALS

- A. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
  - 1. Specification Section number and title.
  - 2. Entity responsible for performing tests and inspections.
  - 3. Description of test and inspection.
  - 4. Identification of applicable standards.
  - 5. Identification of test and inspection methods.
  - 6. Number of tests and inspections required.
  - 7. Time schedule or time span for tests and inspections.
  - 8. Requirements for obtaining samples.
  - 9. Unique characteristics of each quality-control service.

## 1.7 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
  - 1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
  - 2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
- B. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- C. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

## 1.8 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
  - 1. Date of issue.
  - 2. Project title and number.
  - 3. Name, address, and telephone number of testing agency.

4. Dates and locations of samples and tests or inspections.
  5. Names of individuals making tests and inspections.
  6. Description of the Work and test and inspection method.
  7. Identification of product and Specification Section.
  8. Complete test or inspection data.
  9. Test and inspection results and an interpretation of test results.
  10. Report data of a retest or re-inspection shall be notated as such and shall reference the original test or inspection.
  11. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
  12. Recommendations on acceptable methods to correct Work that does not comply with requirements.
  13. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  14. Name and signature of laboratory inspector.
  15. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of technical representative making report.
  2. Statement on condition of substrates and their acceptability for installation of product.
  3. Statement that products at Project site comply with requirements.
  4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  6. Statement whether conditions, products, and installation will affect warranty.
  7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of factory-authorized service representative making report.
  2. Statement that equipment complies with requirements.
  3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  4. Statement whether conditions, products, and installation will affect warranty.
  5. Other required items indicated in individual Specification Sections.
- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

## 1.9 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
  - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
  - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
  - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

- J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
1. Contractor responsibilities include the following:
    - a. Provide test specimens representative of proposed products and construction.
    - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
    - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
    - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
    - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
    - f. When testing is complete, remove test specimens, assemblies, and mockups, and laboratory mockups; do not reuse products on Project.
  2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect and Commissioning Authority, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- K. Laboratory Mockups: Comply with requirements of preconstruction testing and those specified in individual Specification Sections.

#### 1.10 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
  2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
  3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
  2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
    - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
  3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.



4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
  6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. **Manufacturer's Field Services:** Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."
- D. **Manufacturer's Technical Services:** Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- E. **Retesting/Reinspecting:** Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- F. **Testing Agency Responsibilities:** Cooperate with Architect, Commissioning Authority and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect, Commissioning Authority, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
  3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  6. Do not perform any duties of Contractor.
- G. **Associated Services:** Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  4. Facilities for storage and field curing of test samples.
  5. Delivery of samples to testing agencies.
  6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  7. Security and protection for samples and for testing and inspecting equipment at Project site.

- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
  - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.
  - 1. Distribution: Distribute schedule to Owner, Architect, Commissioning Authority, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

#### 1.11 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:
- B. Special Tests and Inspections: Conducted by a qualified testing agency as required by authorities having jurisdiction, as indicated in individual Specification Sections, and as follows:
  - 1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
  - 2. Notifying Architect, Commissioning Authority, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
  - 3. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
  - 4. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
  - 5. Retesting and reinspecting corrected work.

#### PART 2 - PRODUCTS (Not Used)

#### PART 3 - EXECUTION

##### 3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
  - 1. Date test or inspection was conducted.
  - 2. Description of the Work tested or inspected.
  - 3. Date test or inspection results were transmitted to Architect.
  - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's, Commissioning Authority's, reference during normal working hours.

## 3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
  - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 00

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## SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
  - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

## 1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, testing agencies, and authorities having jurisdiction.

## 1.4 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- C. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
  - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
  - 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
- D. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
  - 1. Locations of dust-control partitions at each phase of work.
  - 2. HVAC system isolation schematic drawing.

3. Location of proposed air-filtration system discharge.
4. Waste handling procedures.
5. Other dust-control measures.

## 1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
  1. Electrical Contractor shall provide and maintain service locations throughout the building such that any point in the building may be reached with a 200 foot extension cord.
  2. Electrical Contractor shall provide and maintain lighting throughout the building at a minimum of 5 foot-candles throughout each room as required per OSHA Standards.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

## 1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.
- B. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches.

### 2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
  1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.

2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 017700 "Closeout Procedures".

### PART 3 - EXECUTION

#### 3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
  1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

#### 3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
  1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
  1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.
- C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
  1. Toilets: Use of Owner's existing toilet facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

- F. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
  - 1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to coordination drawings.
    - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
    - b. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
  - 2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
  - 3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- G. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
  - 1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.
- H. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
  - 1. Connect temporary service to Owner's existing power source, as directed by Owner.
- I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
  - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
  - 2. Install lighting for Project identification sign.

### 3.3 SUPPORT FACILITIES INSTALLATION

- A. Traffic Controls: Comply with requirements of authorities having jurisdiction.
  - 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
  - 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- B. Parking: Provide temporary parking areas for construction personnel.
- C. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
  - 1. Identification Signs: Provide Project identification signs.
  - 2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
    - a. Provide temporary, directional signs for construction personnel and visitors.
  - 3. Maintain and touchup signs so they are legible at all times.



- D. Waste Disposal Facilities: Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."
- F. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
  - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- G. Existing Elevator Use: Use of Owner's existing elevators will be permitted, provided elevators are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore elevators to condition existing before initial use, including replacing worn cables, guide shoes, and similar items of limited life.
  - 1. Do not load elevators beyond their rated weight capacity.
  - 2. Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required.
- H. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
  - 1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.

### 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- C. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- D. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
  - 1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.

- E. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise.
1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant-treated plywood on construction operations side.
  2. Construct dustproof partitions with two layers of 6-mil polyethylene sheet on each side. Cover floor with two layers of 6-mil polyethylene sheet, extending sheets 18 inches up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant-treated plywood.
    - a. Construct vestibule and airlock at each entrance through temporary partition with not less than 48 inches between doors. Maintain water-dampened foot mats in vestibule.
  3. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
  4. Insulate partitions to control noise transmission to occupied areas.
  5. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
  6. Protect air-handling equipment.
  7. Provide walk-off mats at each entrance through temporary partition.
- F. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
1. Prohibit smoking in construction areas.
  2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
  3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
  4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

### 3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

END OF SECTION 01 50 00

## SECTION 01 60 00 - PRODUCT REQUIREMENTS

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
  - 1. Section 012500 "Substitution Procedures" for requests for substitutions.
  - 2. Section 014200 "References" for applicable industry standards for products specified.

## 1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
  - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
  - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
  - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

#### 1.4 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
  - 1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
  - 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 14 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
    - a. Form of Approval: As specified in Section 013300 "Submittal Procedures."
    - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

#### 1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
  - 1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
  - 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

#### 1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
  - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
  - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
  - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
  - 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

## C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

## 1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
1. **Manufacturer's Warranty:** Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
  2. **Special Warranty:** Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. **Special Warranties:** Prepare a written document that contains appropriate terms and identification, ready for execution.
1. **Manufacturer's Standard Form:** Modified to include Project-specific information and properly executed.
  2. **Specified Form:** When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
  3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. **Submittal Time:** Comply with requirements in Section 017700 "Closeout Procedures."

## PART 2 - PRODUCTS

## 2.1 PRODUCT SELECTION PROCEDURES

- A. **General Product Requirements:** Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
  2. **Standard Products:** If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.

3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
  4. Where products are accompanied by the term "as selected," Architect will make selection.
  5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
  6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures:
1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
  2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
  3. Products:
    - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
    - b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
  4. Manufacturers:
    - a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
    - b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
  5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.

- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

## 2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
  2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
  3. Evidence that proposed product provides specified warranty.
  4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
  5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

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## SECTION 01 73 00 - EXECUTION

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Installation of the Work.
  - 2. Cutting and patching.
  - 3. Progress cleaning.
  - 4. Starting and adjusting.
  - 5. Protection of installed construction.
- B. Related Requirements:
  - 1. Section 011000 "Summary" for limits on use of Project site.
  - 2. Section 013300 "Submittal Procedures" for submitting surveys.
  - 3. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

## 1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

## 1.4 INFORMATIONAL SUBMITTALS

- A. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
  - 1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
  - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
  - 3. Products: List products to be used for patching and firms or entities that will perform patching work.
  - 4. Dates: Indicate when cutting and patching will be performed.

5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
  - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.

## 1.5 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
  1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
  2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
    - a. Primary operational systems and equipment.
    - b. Fire separation assemblies.
    - c. Air or smoke barriers.
    - d. Fire-suppression systems.
    - e. Mechanical systems piping and ducts.
    - f. Control systems.
    - g. Communication systems.
    - h. Fire-detection and -alarm systems.
    - i. Conveying systems.
    - j. Electrical wiring systems.
    - k. Operating systems of special construction.
  3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
  4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- B. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

## PART 2 - PRODUCTS

## 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
  - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
  - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
  - 1. Description of the Work.
  - 2. List of detrimental conditions, including substrates.
  - 3. List of unacceptable installation tolerances.
  - 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

### 3.3 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and make horizontal work level.
  - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
  - 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
  - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
  - 2. Allow for building movement, including thermal expansion and contraction.
  - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

#### 3.4 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  5. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
  2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
    - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    - b. Restore damaged pipe covering to its original condition.
  3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
    - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
  4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

### 3.5 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.

3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
    - a. Use containers intended for holding waste materials of type to be stored.
  4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  1. Remove liquid spills promptly.
  2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.
- 3.6 STARTING AND ADJUSTING
- A. Coordinate startup and adjusting of equipment and operating components with requirements in Section 019113 "General Commissioning Requirements."
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 01 73 00



## SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
  - 1. Disposing of nonhazardous demolition and construction waste.

## 1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

## 1.4 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 30 days of date established for commencement of the Work.

### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For waste management coordinator and refrigerant recovery technician.
- B. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

### 1.6 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:
  - 1. Review and discuss waste management plan including responsibilities of waste management coordinator.
  - 2. Review requirements for documenting quantities of each type of waste and its disposition.
  - 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
  - 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
  - 5. Review waste management requirements for each trade.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### 3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan to include disposal of all material and equipment associated with the existing generator. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
  - 1. Comply with operation, termination, and removal requirements in Section 015000 "Temporary Facilities and Controls."

- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
  - 1. Distribute waste management plan to everyone concerned within three days of submittal return.
  - 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
  - 2. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

### 3.2 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
  - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
  - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION 01 74 19

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## SECTION 01 77 00 - CLOSEOUT PROCEDURES

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Substantial Completion procedures.
  - 2. Final completion procedures.
  - 3. Warranties.
  - 4. Final cleaning.
  - 5. Repair of the Work.
- B. Related Requirements:
  - 1. Section 017300 "Execution" for progress cleaning of Project site.
  - 2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
  - 3. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
  - 4. Section 017900 "Demonstration and Training" for requirements for instructing Owner's personnel.

## 1.3 ACTION SUBMITTALS

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

## 1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest control inspection.

## 1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

## 1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
  - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
  - 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  - 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.
    - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.
  - 5. Submit test/adjust/balance records.
  - 6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
  - 1. Complete startup and testing of systems and equipment.
  - 2. Perform preventive maintenance on equipment used prior to Substantial Completion.
  - 3. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
  - 4. Advise Owner of changeover in heat and other utilities.
  - 5. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
  - 6. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  - 7. Complete final cleaning requirements, including touchup painting.

8. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
  2. Results of completed inspection will form the basis of requirements for final completion.

### 1.7 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
1. List of Incomplete Items: Submit inspection list of items to be completed or corrected (punch list) to the Owner and Architect. The list shall state that each item has been completed or otherwise resolved for acceptance.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

### 1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
  2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
  3. Include the following information at the top of each page:
    - a. Project name.
    - b. Date.
    - c. Name of Architect.
    - d. Name of Contractor.
    - e. Page number.
  4. Submit list of incomplete items in the following format:
    - a. PDF electronic file. Architect will return annotated file.

## 1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
  - 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
  - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
  - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
  - 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned and consistent with approved usage by Operations in facilities. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

## PART 3 - EXECUTION

### 3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.



- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Remove tools, construction equipment, machinery, and surplus material from Project site.
    - d. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    - e. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    - f. Sweep concrete floors broom clean in unoccupied spaces.
    - g. Remove labels that are not permanent.
    - h. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
    - i. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
    - j. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
      - 1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.
    - k. Clean light fixtures, globes, and reflectors to function with full efficiency. Provide new lamps for all light fixtures at the time of Substantial Completion.
    - l. Leave Project clean and ready for occupancy.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal."

### 3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.

2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
  - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 01 77 00

## SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
  - 1. Operation and maintenance documentation directory.
  - 2. Emergency manuals.
  - 3. Operation manuals for systems, subsystems, and equipment.
  - 4. Product maintenance manuals.
  - 5. Systems and equipment maintenance manuals.
- B. Related Requirements:
  - 1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
  - 2. Section 019113 "General Commissioning Requirements" for verification and compilation of data into operation and maintenance manuals.

## 1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

## 1.4 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
  - 1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
  - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

- B. Format: Submit operations and maintenance manuals in the following format:
  - 1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on media acceptable to owner.
    - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
    - b. Enable inserted reviewer comments on draft submittals.
  - 2. Paper copies. Submit as directed by owner.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect and Commissioning Authority will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect and Commissioning Authority will return copy with comments.
  - 1. Correct or revise each manual to comply with Architect's and Commissioning Authority's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's and Commissioning Authority's comments and prior to commencing demonstration and training.

## PART 2 - PRODUCTS

### 2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
  - 1. List of documents.
  - 2. List of systems.
  - 3. List of equipment.
  - 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

## 2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
1. Title page.
  2. Table of contents.
  3. Manual contents.
- B. Title Page: Include the following information:
1. Subject matter included in manual.
  2. Name and address of Project.
  3. Name and address of Owner.
  4. Date of submittal.
  5. Name and contact information for Contractor.
  6. Name and contact information for Construction Manager.
  7. Name and contact information for Architect.
  8. Name and contact information for Commissioning Authority.
  9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
  10. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
  2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
1. Binders: Heavy-duty, three-ring, vinyl-covered, post-type binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

- a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
  - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
  3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
  4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
  5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
    - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
    - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

## 2.3 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for each of the following:
  1. Type of emergency.
  2. Emergency instructions.
  3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
  1. Power failure.
  2. Water outage.
  3. System, subsystem, or equipment failure.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
  1. Instructions on stopping.
  2. Shutdown instructions for each type of emergency.
  3. Operating instructions for conditions outside normal operating limits.
  4. Required sequences for electric or electronic systems.
  5. Special operating instructions and procedures.

## 2.4 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
  2. Performance and design criteria if Contractor has delegated design responsibility.
  3. Operating standards.
  4. Operating procedures.
  5. Operating logs.
  6. Wiring diagrams.
  7. Control diagrams.
  8. Piped system diagrams.
  9. Precautions against improper use.
  10. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
1. Product name and model number. Use designations for products indicated on Contract Documents.
  2. Manufacturer's name.
  3. Equipment identification with serial number of each component.
  4. Equipment function.
  5. Operating characteristics.
  6. Limiting conditions.
  7. Performance curves.
  8. Engineering data and tests.
  9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
  2. Equipment or system break-in procedures.
  3. Routine and normal operating instructions.
  4. Regulation and control procedures.
  5. Instructions on stopping.
  6. Normal shutdown instructions.
  7. Seasonal and weekend operating instructions.
  8. Required sequences for electric or electronic systems.
  9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

## 2.5 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:
  - 1. Product name and model number.
  - 2. Manufacturer's name.
  - 3. Color, pattern, and texture.
  - 4. Material and chemical composition.
  - 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
  - 1. Inspection procedures.
  - 2. Types of cleaning agents to be used and methods of cleaning.
  - 3. List of cleaning agents and methods of cleaning detrimental to product.
  - 4. Schedule for routine cleaning and maintenance.
  - 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
  - 1. Include procedures to follow and required notifications for warranty claims.

## 2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
  - 1. Standard maintenance instructions and bulletins.
  - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
  - 3. Identification and nomenclature of parts and components.
  - 4. List of items recommended to be stocked as spare parts.



- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
  - 1. Test and inspection instructions.
  - 2. Troubleshooting guide.
  - 3. Precautions against improper maintenance.
  - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  - 5. Aligning, adjusting, and checking instructions.
  - 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
  - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
  - 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
  - 1. Include procedures to follow and required notifications for warranty claims.

### PART 3 - EXECUTION

#### 3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
  - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.

2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
1. Do not use original project record documents as part of operation and maintenance manuals.
  2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."
- G. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

## SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
  - 3. Record Product Data.
  - 4. Miscellaneous record submittals.
- B. Related Requirements:
  - 1. Section 017300 "Execution" for final property survey.
  - 2. Section 017700 "Closeout Procedures" for general closeout procedures.
  - 3. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

## 1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit copies of record Drawings as follows:
    - a. Initial Submittal:
      - 1) Submit electronic and hardcopy set(s) of marked-up record prints as directed by Owner and Architect.
    - b. Final Submittal:
      - 1) Submit electronic and hardcopy set(s) of marked-up record prints as directed by Owner and Architect.
- B. Record Specifications: As directed by Owner, submit hardcopy and electronic files Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: As directed by Owner, submit paper copy and electronic files and directories of each submittal.
  - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit paper copy and electronic files as directed by Owner.

## PART 2 - PRODUCTS

## 2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
    - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Accurately record information in an acceptable drawing technique.
    - c. Record data as soon as possible after obtaining it.
    - d. Record and check the markup before enclosing concealed installations.
    - e. Cross-reference record prints to corresponding archive photographic documentation.
  2. Content: Types of items requiring marking include, but are not limited to, the following:
    - a. Dimensional changes to Drawings.
    - b. Revisions to details shown on Drawings.
    - c. Locations and depths of underground utilities.
    - d. Revisions to routing of piping and conduits.
    - e. Revisions to electrical circuitry.
    - f. Actual equipment locations.
    - g. Locations of concealed internal utilities.
    - h. Changes made by Change Order or Construction Change Directive.
    - i. Changes made following Architect's written orders.
    - j. Details not on the original Contract Drawings.
    - k. Field records for variable and concealed conditions.
    - l. Record information on the Work that is shown only schematically.
  3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
  4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  5. Mark important additional information that was either shown schematically or omitted from original Drawings.
  6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
  2. Consult Architect for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.

- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
  - 1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
  - 2. Format: Annotated PDF electronic file with comment function enabled.
  - 3. Identification: As follows:
    - a. Project name.
    - b. Date.
    - c. Designation "PROJECT RECORD DRAWINGS."
    - d. Name of Architect.
    - e. Name of Contractor.

## 2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
  - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
  - 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
  - 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
  - 5. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as annotated PDF electronic file and paper copy.

## 2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
  - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
  - 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as annotated PDF electronic file and paper copy.
  - 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

## 2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as PDF electronic file and an paper copy.
  - 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

## PART 3 - EXECUTION

### 3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION 01 78 39

## SECTION 01 79 00 - DEMONSTRATION AND TRAINING

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
  - 1. Demonstration of operation of systems, subsystems, and equipment.
  - 2. Training in operation and maintenance of systems, subsystems, and equipment.

## 1.3 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
- B. Qualification Data: For facilitator.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.
- D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

## 1.4 CLOSEOUT SUBMITTALS

## 1.5 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.

- C. Preinstruction Meeting: Conduct meeting at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:
  - 1. Inspect and discuss locations and other facilities required for instruction.
  - 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
  - 3. Review required content of instruction.
  - 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

## 1.6 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

## PART 2 - PRODUCTS

### 2.1 INSTRUCTION PROGRAM

- A. Training Modules: With input from Owner Operations and Maintenance, develop training for each major system installed on the project. Include a description of specific skills and knowledge that participant is expected to master. Training shall include the following, as applicable ,to the system, equipment, or component:
  - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
    - a. System, subsystem, and equipment descriptions.
    - b. Performance and design criteria if Contractor is delegated design responsibility.
    - c. Operating standards.
    - d. Regulatory requirements.
    - e. Equipment function.
    - f. Operating characteristics.
    - g. Limiting conditions.
    - h. Performance curves.
  - 2. Documentation: Review the following items in detail:
    - a. Emergency manuals.
    - b. Operations manuals.
    - c. Maintenance manuals.
    - d. Project record documents.
    - e. Identification systems.
    - f. Warranties and bonds.
    - g. Maintenance service agreements and similar continuing commitments.



3. Emergencies: Include the following, as applicable:
  - a. Instructions on meaning of warnings, trouble indications, and error messages.
  - b. Instructions on stopping.
  - c. Shutdown instructions for each type of emergency.
  - d. Operating instructions for conditions outside of normal operating limits.
  - e. Sequences for electric or electronic systems.
  - f. Special operating instructions and procedures.
4. Operations: Include the following, as applicable:
  - a. Startup procedures.
  - b. Equipment or system break-in procedures.
  - c. Routine and normal operating instructions.
  - d. Regulation and control procedures.
  - e. Control sequences.
  - f. Safety procedures.
  - g. Instructions on stopping.
  - h. Normal shutdown instructions.
  - i. Operating procedures for emergencies.
  - j. Operating procedures for system, subsystem, or equipment failure.
  - k. Seasonal and weekend operating instructions.
  - l. Required sequences for electric or electronic systems.
  - m. Special operating instructions and procedures.
5. Adjustments: Include the following:
  - a. Alignments.
  - b. Checking adjustments.
  - c. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
  - a. Diagnostic instructions.
  - b. Test and inspection procedures.
7. Maintenance: Include the following:
  - a. Inspection procedures.
  - b. Types of cleaning agents to be used and methods of cleaning.
  - c. List of cleaning agents and methods of cleaning detrimental to product.
  - d. Procedures for preventive maintenance.
  - e. Procedures for routine maintenance.
  - f. Instruction on use of special tools.
8. Repairs: Include the following:
  - a. Diagnosis instructions.
  - b. Repair instructions.
  - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  - d. Instructions for identifying parts and components.
  - e. Review of spare parts needed for operation and maintenance.

## PART 3 - EXECUTION

## 3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

## 3.2 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
  - 1. Schedule training with Owner with at least seven days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a written or a demonstration performance-based test.
- F. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

END OF SECTION 01 79 00

## SECTION 01 91 13 – GENERAL COMMISSIONING REQUIREMENTS

## PART 1 – GENERAL

## 1.1 DEFINITIONS

- A. CxA: The Commissioning Authority for Building Commissioning services is Cogent Commissioning LLC.
- B. Systems, Subsystems, and Equipment: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, and equipment.

## 1.2 COMMISSIONING TEAM

- A. The Commissioning team includes but is not limited to; the Owner, Members of the Design Team, The General Contractor, Mechanical subcontractors, Electrical subcontractors, BMCS subcontractors, suppliers, and specialists deemed appropriate by the CA. Representatives will be appointed by each of these groups to lead the commissioning effort on the part of their respective organization. These individuals shall have the authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated actions.

## 1.3 CONTRACTOR'S RESPONSIBILITIES

- A. Provide utility services required for the commissioning process.
- B. Contractor shall assign representatives with expertise and authority to act on behalf of the Contractor and schedule them to participate in and perform commissioning team activities including, but not limited to, the following:
  - 1. Participate in construction phase coordination meetings.
  - 2. Participate in maintenance orientation and inspection.
  - 3. Participate in operation and maintenance training sessions.
  - 4. Participate in final review at acceptance meeting.
  - 5. Certify that Work is complete and systems are operational.
  - 6. Complete all Pre-Functional Checklists provided by the CxA.
    - a. Pre-Functional Checklists are used to verify the installation of the systems to be commissioned is complete.
    - b. The Commissioning process will not proceed until the contractors have returned the completed checklists to the CxA for review.
    - c. The CxA will spot check these checklists to confirm accuracy before proceeding with Functional Testing.
  - 7. Demonstrate operation of installed systems and equipment as detailed in the Functional Performance Tests, or as otherwise required to demonstrate the compliance of the installation with the Contract Documents.
    - a. To provide a more efficient use of the Commissioning Team's time, it is highly recommended that the installing contractors perform these Functional Test prior to certifying the systems and equipment are ready for testing.

- b. Functional testing is a time-consuming process and involves multiple team members, not simply the installing contractors and the CxA. The owner and design team may wish to witness the demonstration of the Functional Performance Tests as well.
    - c. The contractors are responsible for the additional costs incurred by the commissioning team for repeating failed tests.
  8. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
  9. Review and approve final commissioning documentation.
- C. Subcontractors shall assign representatives with expertise and authority to act on behalf of subcontractors and schedule them to participate in and perform commissioning team activities including, but not limited to, the following:
  1. Participate in construction phase coordination meetings.
  2. Participate in maintenance orientation and inspection.
  3. Participate in procedures meeting for testing.
  4. Participate in final review at acceptance meeting.
  5. Provide schedule for operation and maintenance data submittals, equipment startup, and testing to CA for incorporation into the commissioning plan. Update schedule throughout the construction period.
  6. Provide information to the CA for developing construction phase commissioning plan.
  7. Certify that Work is complete and systems are operational.
  8. Complete all Pre-Functional Checklists provided by the CxA.
    - a. Pre-Functional Checklists are used to verify the installation of the systems to be commissioned is complete.
    - b. The Commissioning process will not proceed until the contractors have returned the completed checklists to the CxA for review.
    - c. The CxA will spot check these checklists to confirm accuracy before proceeding with Functional Testing.
  9. Demonstrate operation of installed systems and equipment as detailed in the Functional Performance Tests, or as otherwise required to demonstrate the compliance of the installation with the Contract Documents.
    - a. To provide a more efficient use of the Commissioning Team's time, it is highly recommended that the installing contractors perform these Functional Test prior to certifying the systems and equipment are ready for testing.
    - b. Functional testing is a time-consuming process and involves multiple team members, not simply the installing contractors and the CxA. The owner and design team may wish to witness the demonstration of the Functional Performance Tests as well.
    - c. The contractors are responsible for the additional costs incurred by the commissioning team for repeating failed tests.
  10. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
  11. Review and approve final commissioning documentation.
  12. Participate in training sessions for Owner's operation and maintenance personnel.
  13. Provide updated Project Record Documents to the CA.
  14. Gather and submit operation and maintenance data for systems, subsystems, and equipment to the CA.
  15. Provide technicians who are familiar with the construction and operation of installed systems and who shall develop specific test procedures and participate in testing of installed systems, subsystems, and equipment.

#### 1.4 DESIGN TEAM RESPONSIBILITIES

- A. Support to the Commissioning Process.
- B. Provide detailed written sequences of operation for development of Functional Performance Tests by the CxA.
- C. Provide information such as schematic drawings, floor plans, etc. for compilation of the systems manual by the CxA.

#### 1.5 COMMISSIONING DOCUMENTATION

- A. Owners Project Requirements (OPR): A document, prepared by the Owner, that details the owners operational, sustainable, aesthetic, budgetary, schedule or other needs. In the commissioning process this document need only address the systems to be commissioned but may address other issues such as the building envelope, structural systems, or other issues that may be of particular concern to the owner.
- B. Basis of Design Document (BOD): A document, prepared by the Engineer, that records concepts, calculations, decisions, and product selections used to meet the project requirements and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.
- C. Commissioning Plan: A document, prepared by CA, that outlines the schedule, allocation of resources, and documentation requirements of the commissioning process, and shall include, but is not limited to the following:
  - 1. Plan for delivery and review of submittals, systems manuals, and other documents and reports. Identification of the relationship of these documents to other functions and a detailed description of submittals that are required to support the commissioning processes. Submittal dates shall include the latest date approved submittals must be received without adversely affecting commissioning plan.
  - 2. Description of the organization, layout, and content of commissioning documentation (including systems manual) and a detailed description of documents to be provided along with identification of responsible parties.
  - 3. Identification of systems and equipment to be commissioned.
  - 4. Description of schedules for testing procedures along with identification of parties involved in performing and verifying tests.
  - 5. Identification of items that must be completed before the next operation can proceed.
  - 6. Description of responsibilities of commissioning team members.
  - 7. Description of observations to be made.
  - 8. Description of requirements for operation and maintenance training, including required training materials.
  - 9. Description of expected performance for systems, subsystems, equipment, and controls.
  - 10. Schedule for commissioning activities with specific dates coordinated with overall construction schedule.
  - 11. Identification of installed systems, subsystems, and equipment, including design changes that occurred during the construction phase.
  - 12. Process and schedule for documenting changes on a continuous basis to appear in Project Record Documents.

13. Process and schedule for completing prestart and startup checklists for systems, subsystems, and equipment to be verified and tested.
  14. Step-by-step procedures for testing systems, subsystems, and equipment with descriptions for methods of verifying relevant data, recording the results obtained, and listing parties involved in performing and verifying tests.
- D. Test Checklists: CA shall develop test checklists for each system, subsystem, or equipment including interfaces and interlocks, and include a separate entry, with space for comments, for each item to be tested. Prepare separate checklists for each mode of operation and provide space to indicate whether the mode under test responded as required. Provide space for testing personnel to sign off on each checklist. Specific checklist content requirements are specified in Division 23, and 26. Each checklist, regardless of system, subsystem, or equipment being tested, shall include, but not be limited to, the following:
1. Name and identification code of tested item.
  2. Test number.
  3. Time and date of test.
  4. Indication of whether the record is for a first test or retest following correction of a problem or issue.
  5. Dated signatures of the persons performing test and of the witness, if applicable.
  6. Individuals present for test.
  7. Deficiencies.
  8. Issue number, if any, generated as the result of test.
- E. Certificate of Readiness: Certificate of Readiness shall be signed by the General Contractor, Subcontractor(s) certifying that systems, subsystems, equipment, and associated controls are ready for testing. Completed test checklists signed by the responsible parties shall accompany this certificate.
- F. Test and Inspection Reports: Subcontractors shall perform Pre-Functional Tests and shall complete the Pre-Functional Test documentation. Subcontractors shall perform Functional Testing, which shall be witnessed by the CA. The CA shall complete the Functional Testing Forms with assistance from the appropriate subcontractor.
- G. Corrective Action Documents: CA shall document corrective action taken for systems and equipment that fail tests. Include required modifications to systems and equipment and revisions to test procedures, if any. Retest systems and equipment requiring corrective action and document retest results.
- H. Commissioning Report: CA shall document results of the commissioning process including unresolved issues and performance of systems, subsystems, and equipment. The commissioning report shall indicate whether systems, subsystems, and equipment have been completed and are performing according to the OPR, BOD, and Contract Documents. The commissioning report shall include, but is not limited to, the following:
1. Lists and explanations of substitutions; compromises; variances in the Basis of Design, and Contract Documents; record of conditions; and, if appropriate, recommendations for resolution. This report shall be used to evaluate systems, subsystems, and equipment and shall serve as a future reference document during Owner occupancy and operation.
  2. Commissioning plan.
  3. Testing plans and reports.
  4. Completed test checklists.

5. Listing of off-season test(s) not performed and a schedule for their completion.
- I. Systems Manual: CA shall gather required information and compile systems manual. Systems manual shall include, but is not limited to, the following:
    1. Basis of Design, including system narratives, schematics, and changes made throughout the Project. Provided by the Design Team.
    2. Project Record Documents as specified in Division 1 Section "Project Record Documents". Provided by the Installing Contractors.
    3. Final commissioning plan. As developed by the CxA.
    4. Commissioning report. As compiled by the CxA.
    5. Operation and maintenance data as specified in Division 1 Section "Operation and Maintenance Data." Provided by the Installing Contractors.

#### 1.6 QUALITY ASSURANCE

- A. Training Instructor Qualifications: Factory-authorized service representatives experienced in training, operation, and maintenance procedures for installed systems, subsystems, and equipment.
- B. Test Equipment Calibration: Comply with test equipment manufacturer's calibration procedures and intervals. Recalibrate test instruments immediately whenever instruments have been repaired following damage or dropping. Affix calibration tags to test instruments. Instruments shall have been calibrated within six months prior to use.

#### 1.7 COORDINATION

- A. Coordinating Meetings: CA shall conduct coordination meetings of the commissioning team to review progress on the commissioning plan, to discuss scheduling conflicts, and to discuss commissioning process activities.
- B. Testing Coordination: CA shall coordinate sequence of testing activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

## SECTION 07 81 00 - APPLIED FIREPROOFING

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section includes sprayed fire-resistive materials.

## 1.2 DEFINITIONS

- A. SFRM: Sprayed fire-resistive materials.

## 1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

## 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

## 1.5 INFORMATIONAL SUBMITTALS

- A. Product certificates.
- B. Evaluation reports.
- C. Field quality-control reports.

## 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by fireproofing manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to specified requirements.

## PART 2 - PRODUCTS

## 2.1 PERFORMANCE REQUIREMENTS

- A. Assemblies: Provide fireproofing, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.



- B. Fire-Resistance Design: Indicated on Drawings, tested according to ASTM E 119 or UL 263 testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Steel members are to be considered unrestrained unless specifically noted otherwise.
- C. Asbestos: Provide products containing no detectable asbestos.

## 2.2 SPRAYED FIRE-RESISTIVE MATERIALS

- A. Sprayed Fire-Resistive Material UL-Design No. X829 – 3 Hr.
- B. SFRM: Manufacturer's standard, factory-mixed, lightweight, dry formulation, complying with indicated fire-resistance design and mixed with water at Project site to form a slurry or mortar before conveyance and application or conveyed in a dry state and mixed with atomized water at place of application.
- C. Products: Subject to compliance with requirements, provide one of the following:
  - 1. Concealed/Commercial SFRMs:
    - a. Physical Properties:
      - 1) Bond Strength: Minimum 150-lbf/sq. ft. (7.18-kPa) cohesive and adhesive strength based on field testing according to ASTM E 736.
      - 2) Density: Not less than 15 lb/cu. ft. (240 kg/cu. m) as specified in the approved fire-resistance design, according to ASTM E 605.
      - 3) Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design.
      - 4) Combustion Characteristics: When tested in accordance with ASTM E 136 shall be noncombustible.
      - 5) Surface-Burning Characteristics: When tested in accordance with ASTM E84 or CAN4-S102, the material shall exhibit the following surface burning characteristics:
        - a) Flame Spread Index 10 or less
        - b) Smoke Developed 10 or less
      - 6) Compressive Strength: When tested in accordance with ASTM E761, the material shall not deform more than 10 percent when subjected to a crushing force of 1,440 psf (68.9 kPa).
      - 7) Corrosion Resistance: No evidence of corrosion according to ASTM E 937.
      - 8) Deflection: No cracking, spalling, or delamination according to ASTM E 759.
      - 9) Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E 760.
      - 10) Air Erosion: Maximum weight loss of 0.025 g/sq. ft. (0.270 g/sq. m) in 24 hours according to ASTM E 859.
      - 11) Fungal Resistance: When tested in accordance with ASTM G21, the material shall show resistance to mold growth for a minimum period of 28

### 2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that are compatible with fireproofing and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.
- B. Substrate Primers: Primers approved by fireproofing manufacturer for the required fire-resistance design.
- C. Bonding Agent: Product approved by fireproofing manufacturer.
- D. Topcoat: Suitable for application over applied fireproofing; of type recommended in writing by fireproofing manufacturer for each fire-resistance design.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrates and other conditions affecting performance of the Work and according to each fire-resistance design.

### 3.2 PREPARATION

- A. Cover other work subject to damage from fallout or overspray of fireproofing materials during application.
- B. Prime substrates where included in fire-resistance design and where recommended in writing by fireproofing manufacturer unless compatible shop primer has been applied and is in satisfactory condition to receive fireproofing.

### 3.3 APPLICATION

- A. Construct fireproofing assemblies that are identical to fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, sealers, topcoats, finishing, and other materials and procedures affecting fireproofing work.
- B. Comply with fireproofing manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fireproofing; as applicable to conditions of installation and as required to achieve fire-resistance ratings indicated.
- C. Spray apply fireproofing to maximum extent possible. After the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by fireproofing manufacturer.
- D. Do not install enclosing or concealing construction until after fireproofing has been applied, inspected, and tested and corrections have been made to deficient applications.

### 3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
  - 1. Test and inspect as required by the IBC, Subsection 1705.13, "Sprayed Fire-Resistant Materials."
- B. Fireproofing will be considered defective if it does not pass tests and inspections.
  - 1. Remove and replace fireproofing that does not pass tests and inspections, and retest.
  - 2. Apply additional fireproofing, per manufacturer's written instructions, where test results indicate insufficient thickness, and retest.
- C. Prepare test and inspection reports.

### 3.5 CLEANING, PROTECTING, AND REPAIRING

- A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.
- B. Repair fireproofing damaged by other work before concealing it with other construction.
- C. Repair fireproofing by reapplying it using same method as original installation or using manufacturer's recommended trowel-applied product.

END OF SECTION 07 81 00

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## SECTION 07 84 13 - PENETRATION FIRESTOPPING

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Penetrations in fire-resistance-rated walls.

## 1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site

## 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Product Schedule: For each penetration firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing and inspecting agency.
  - 1. Engineering Judgments: Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping system, submit illustration, with modifications marked, approved by penetration firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly. Obtain approval of authorities having jurisdiction prior to submittal.

## 1.4 INFORMATIONAL SUBMITTALS

- A. Product test reports.

## 1.5 CLOSEOUT SUBMITTALS

- A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

## 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."

## PART 2 - PRODUCTS

## 2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics:
1. Perform penetration firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
  2. Test per testing standards referenced in "Penetration Firestopping Systems" Article. Provide rated systems complying with the following requirements:
    - a. Penetration firestopping systems shall bear classification marking of a qualified testing agency.
      - 1) UL in its "Fire Resistance Directory."
      - 2) Intertek Group in its "Directory of Listed Building Products."
      - 3) FM Global in its "Building Materials Approval Guide."

## 2.2 PENETRATION FIRESTOPPING SYSTEMS

- A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
1. 3M Fire Protection Products
  2. RectorSeal
  3. Tremco, Inc.
  4. Hilti
- B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
1. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
- C. Exposed Penetration Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, per ASTM E 84.
- D. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.

## PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.

- B. General: Install penetration firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications.
- C. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings.
  - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.
- D. Install fill materials by proven techniques to produce the following results:
  - 1. Fill voids and cavities formed by openings, forming materials, accessories and penetrating items to achieve required fire-resistance ratings.
  - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
  - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

### 3.2 IDENTIFICATION

- A. Wall Identification: Permanently label walls containing penetration firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than 3 inches (76 mm) high and with minimum 0.375-inch (9.5-mm) strokes.
  - 1. Locate in accessible concealed floor, floor-ceiling, or attic space at 5 feet (4.57 m) from end of wall and at intervals not exceeding 10 feet (9.14 m).
- B. Penetration Identification: Identify each penetration firestopping system with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of penetration firestopping system edge so labels are visible to anyone seeking to remove penetrating items or firestopping systems. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
  - 1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
  - 2. Contractor's name, address, and phone number.
  - 3. Designation of applicable testing and inspecting agency.
  - 4. Date of installation.
  - 5. Manufacturer's name.
  - 6. Installer's name.

### 3.3 FIELD QUALITY CONTROL

- A. Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E 2174.
- B. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.

- C. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

END OF SECTION 07 84 13



## SECTION 26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

## 1.1 WORK INCLUDED

- A. Scope: Extent of electrical work covered by this Section is specified in all other sections of Division 26, the drawings, schedules and by requirements of this Section.
- B. Division 01: Refer to Division 01 sections for additional electrical requirements including:
  - 1. Section 01 33 00: Submittal Procedures.
  - 2. Section 01 60 00: Product Requirements.
  - 3. Section 01 77 00: Closeout Procedures.
- C. Refer to Division 23 specification sections and Division 26 drawings for work furnished under Division 23 and installed, connected and tested under Division 26.

## 1.2 RELATED WORK

- A. Field painting, except such painting as is required to maintain shop coat painting and factory finish painting.
- B. Electrical control systems and interlock wiring as required by the electrical and mechanical drawings, specifications or manufacturer's schematics.
- C. Flashing of conduits into roofing and outside walls.
- D. Heating, ventilating, and air conditioning equipment.
- E. Plumbing equipment.
- F. Fire alarm and detection system.
- G. Telecommunication system equipment.
- H. Security system.

## 1.3 QUALITY ASSURANCE

- A. Comply with applicable local, state and federal codes.
- B. Labels and Listings: Refer to Section 01 60 00, "Product Requirements," for requirements that materials, appliances and equipment provided meet the requirements of the Underwriters Laboratories, Inc. (UL), Electrical Testing Laboratories (ETL) and other standards organizations.

- C. National Fire Protection Association (NFPA): All work provided under this Contract shall meet the requirements of NFPA 70, "National Electrical Code, 2011 Edition.
- D. Current Models:
  - 1. Manufactured items furnished shall be the current, cataloged product of the manufacturer.
  - 2. Replacement parts shall be available.
  - 3. There shall be a permanent service organization maintained or trained by the manufacturer to provide satisfactory service.
- E. Experience: Manufactured items shall have been installed and used, without modification, renovation or repair, on other projects for not less than three years prior to the date of bid opening for this project.

#### 1.4 DEFINITIONS

- A. Where the word "furnish" or "provide" appears in the specifications, it shall be construed to mean furnish and install complete and ready for safe and regular use. Each exception to this definition shall be specifically defined.

#### 1.5 APPLICABLE STANDARDS

- A. Refer to Division 01: General Requirements.

#### 1.6 CODES, RULES AND REGULATIONS

- A. Comply with the most recently revised versions of rules, regulations, and ordinances of the local authority, whether so indicated or not. Where alterations to and/or deviations from the contract documents are required by the authority, report the requirements to the Owner and secure his approval before starting work.
- B. Comply with rules and regulations of the State Fire Insurance Regulatory Code, and Underwriters' Laboratories, whether so indicated on the contract documents or not. Comply with all Federal, State and municipal building and safety laws, ordinances and regulations relating to buildings and public safety. Comply with the Owner's insurance underwriters requirements.
- C. Should any design work shown on the bid documents be construed as being contrary to or not conforming to aforementioned codes, such alleged confliction to be brought to attention of the Owner in writing ten (10) days prior to bid date for review so that such point in question may be resolved. All work to be installed in strict conformity with applicable codes without additional cost to the Owner.
- D. Contractor to submit and/or file with proper authorities all necessary specifications and drawings as required by governing authorities.

#### 1.7 SHOP DRAWINGS AND BROCHURES

- A. Conform to the requirements of Division 01, Section 01 33 00, "Submittal Procedures."

- B. The requirements in this Section shall be in addition to the requirements of Section 01 33 00 and the individual specification sections.
- C. Submit detailed shop drawings and brochures for approval of all equipment and all material proposed for use on this project. Furnish the number of copies required by Section 01 33 00.
- D. Shop drawings shall be prepared by the manufacturer at the point of manufacture; these drawings shall reflect the proposed construction and intention of those individuals actually responsible for the manufacture of the equipment. Shop drawings shall indicate where the shop drawings were prepared and by whom and the date.
- E. Documents submitted shall show the following:
  - 1. Principal dimensions and details of construction.
  - 2. Code, operating and maintenance clearances.
  - 3. Weights of principal parts and total weights with information required for the design of supports.
  - 4. Sizes and location of connections.
  - 5. Performance data.
  - 6. Notation that equipment does have a UL label. If equipment does not have a UL label, an explanation must be provided and approved by the Owner.
- F. Sequentially number submittal sheets with the format-sheet number of number total. For example, 1 of 3.
- G. Submit brochures that contain only that information which is relative to the particular equipment or materials to be furnished. Do not submit catalogs that describe several different items other than those items to be used, unless all irrelevant information is marked out and relevant material is clearly marked.
- H. Response to Specifications:
  - 1. Submit a point by point statement of compliance with the specifications.
  - 2. The statement of compliance shall consist of a list of numbered paragraphs. Each specification paragraph shall be cross referenced to the page/drawing in the submittal on which the compliance is confirmed; the confirming data on the page/drawing shall be highlighted for ready identification.
  - 3. Where the proposed system complies fully, such shall be indicated by placing the word “comply” opposite the paragraph number.
  - 4. Where the proposed system does not comply, or accomplishes the stated function in a manner different from that described, provide a full description of the deviation.
  - 5. Where a full description of the deviation is not provided, it shall be assumed that the proposed system does not comply with the paragraph in question.
  - 6. A submittal which does not include a point by point statement of compliance as specified shall be rejected.

## 1.8 DRAWINGS AND SPECIFICATIONS

- A. The drawings and specifications are cooperative. Work or materials called for in one and not mentioned in the other, shall be furnished and installed as though treated in both.

- B. The specifications, drawings and referenced standards indicate minimum requirements. Where the specifications and/or drawings are different or contradict the reference standards, the more stringent shall apply. The Contractor will be held liable for satisfying the more stringent of either the specification, drawings, or reference standard at no additional cost to the Owner. When conflicts occur, consult the Owner for direction, before proceeding. Submission of bid constitutes ratification of this requirement.
- C. The drawings are diagrammatic and indicate the arrangements of the principal equipment conduit and controls, and shall be followed as closely as possible. Where headroom and space conditions appear inadequate, propose solutions to the Owner for review before proceeding with the work.
- D. Perform the work to provide the best possible arrangement to ensure head room throughout and access to equipment. Carefully investigate the structural and finished conditions affecting all the work and arrange equipment and conduits accordingly.
- E. The drawings and specifications do not include exact equipment dimensions and locations and exact and complete accessory items and control wiring devices required for each manufacturer's equipment. However, the intent of the general design and the design of component parts is to provide complete and properly functioning systems which meet performance requirements and test requirements.
- F. Dimensionally located equipment, boxes and conduits shown on the drawings is for information only. The elevations and dimensions have been provided to assist the Contractor in establishing final locations. The Owner is not responsible for dimensionally locating equipment, boxes and conduits. Dimensionally locate equipment, boxes and conduits after coordinating with other building trades. Coordination with other building trades shall be the responsibility of the Contractor. Make modifications to the location of the equipment boxes and conduits to avoid interferences at no additional cost.
- G. If directed by the Owner make reasonable modifications in the layout without extra charge as needed to prevent conflict with other trades or for proper execution of the work.

#### 1.9 BASIS OF DESIGN

- A. The first manufacturer listed in each of the following Sections identifies the manufacturer used as the basis of design and quality level expected from the other manufacturers listed.
- B. The Owner and the Engineer of Record will determine compliance with the requirements of the specifications.

#### 1.10 RECORD DRAWINGS

- A. Maintain red-marked copy on file of record drawings in accordance with the requirements of Division 01.
- B. Provide scan copy to Owner.
- C. Provide updated CADD files to Owner.

## 1.11 EQUIPMENT AND SERVICE LOCATIONS

- A. Locations of electrical equipment indicated on the drawings are approximate only. Do not scale drawings for locations. Coordinate locations with other drawings and with other trades. Changes in the contract sum will not be approved for changes from approximate location when installed without fully coordinating locations.

## 1.12 SPACE LIMITATIONS

- A. Equipment has been chosen to fit into the physical space provided, while allowing room for access, servicing, removal and replacement of parts.
- B. Since space requirements and equipment arrangements vary according to manufacturer, the responsibility for space requirements, initial access and proper fit rests with the Contractor.
- C. Provide space for equipment clearances in accordance with code requirements, the requirements of the local inspection department, and the recommendations of the equipment manufacturers.
- D. Use care in selection of equipment to ascertain the equipment will meet the size and weight limitations of the space in which it is to be installed and that doors or other building openings made available are of adequate size to permit the entry of the equipment without alterations to the building. The cost of alterations caused by failure to comply with the above instructions shall be borne by the Contractor.

## 1.13 SLEEVES, INSERTS, SUPPORTS, CUTTING AND PATCHING

- A. Furnish to other trades sleeves, inserts, anchors or other required items which are to be built in by those trades for the securing of hangers or other supports to be installed by this trade.
- B. Supervise the placing of sleeves, inserts, etc., or give explicit instructions therefore and assume responsibility for the proper location and size. Furnish to the other trades full and explicit information on supports on walls, roofs, and floors and assume full responsibility for their proper location and size.
- C. Furnish and install, where shown on the drawings or as required utilized component steel channel racks for supports of indoor raceways, cable, motor controls, lighting fixtures, etc.
- D. Furnish and install the structural steel hangers and supports required for electrical equipment.
- E. If holes and/or sleeves are not properly installed and cutting and patching becomes necessary, it shall be done at no additional expense. No cutting or patching shall be done without first securing the Owner's approval.

## 1.14 MATERIALS

- A. The fact that materials and equipment are provided in accordance with the contract documents does not relieve the Contractor of the responsibility for having such materials and equipment function properly and satisfactorily and in accordance with the intent of the contract documents.

- B. Since manufacturing methods vary, reasonable minor equipment variations are expected. However, performance and material requirements indicated in the contract documents are the minimum acceptable. The Owner retains the right to judge equality of equipment and installation that deviates from the specifications.
- C. When two or more units of the same class of equipment and products are installed, provide the products from a single manufacturer, unless otherwise indicated in the contract documents.

#### 1.15 PROTECTION OF MATERIALS AND PRODUCTS

- A. Do not damage the building. Cover finished floors, step treads and finished surfaces to prevent any damage by workmen of their tools and equipment during construction.
- B. Protect products from damage. This shall include the erection of temporary shelters, to adequately protect products stored in the open on the site, and cribbing any products above the floor of the construction, and the covering of products in the incompleting building with tarpaulins or other protective coverings. Failure to comply with the above shall result in the rejection of the products damaged.

#### 1.16 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Refer to Division 01 for the requirements of material and products to be delivered to the project site.
- B. Storage: Materials stored at the project site which become soiled with construction dirt, concrete or earthwork shall be washed, cleaned and dried or removed from the project site and replaced with new. Do not install soiled material.
- C. Cleaning: Clean and wipe the interior of conduit, pullboxes and panelboard backboxes, soiled by masonry trades, before proceeding with wiring.
- D. Do not install damaged, broken or marred material or products, replace with new. On long delivery items which are damaged in shipping or storage, field repair may be authorized instead of replacement. Repair authorization shall be requested in writing from the Owner. Approval of the Owner shall be secured before proceeding with any field repair work.
- E. All damaged painted surfaces of equipment to be touched up to match original paint.

#### 1.17 IDENTIFICATION OF EQUIPMENT

- A. Refer to Section 26 05 53, "Identification for Electrical Systems" for requirements.

#### 1.18 OPERATING AND MAINTENANCE MANUALS

- A. Prepare and submit to the Owner for review by the Owner and for delivery to the Owner 3 bound and indexed manuals with complete technical data for every piece of equipment provided under the work of Division 26.
  - 1. Complete MEP submittals as approved by the Owner.

2. Manufacturer's installation instruction brochures.
  3. Manufacturer's local representative and/or distributor's name and address.
  4. Manufacturer's operating and maintenance brochures.
  5. Manufacturer's internal wiring diagrams.
  6. Contractor's installation wiring diagrams.
  7. Replacement part number listings and/or descriptions.
  8. Manufacturer's warranties.
  9. Equipment serial numbers.
- B. This manual shall include the listed data bound into a permanent hard-back binder identified on the cover as "Operating and Maintenance Manual" with additional cover display of the name and location of building, the names of the Owner, the Architect/Engineer, the Contractor and the subcontractors.
- C. Contents of the manual shall be grouped in sections according to type of equipment, and shall be listed in a table of contents, preceded by a copy of these pages of the specifications. Sections shall be organized as follows:
1. Each tab in the brochure shall identify the grouping of all literature required for a single class of equipment. For example, provide a tab for overcurrent protection devices, lighting fixtures, etc. Use the specification sections as a starting point for identifying the number of tabs and for grouping similar equipment.
  2. Arrange contents under each tab in the following sequence: First, the approved engineering submittals with complete performance and technical data; second, the manufacturer's installation brochure; third, the manufacturer's operating and maintenance brochure; fourth, the manufacturer's installation wiring diagram; fifth, the Contractor's field wiring diagram; sixth, the control diagram for the particular item; and seventh, the manufacturer's brochure listing replacement part numbers.

#### 1.19 COORDINATION WITH OTHER TRADES

- A. Cooperate with other trades and furnish in writing to the Owner, information necessary to permit the work of trades to be installed with the least possible interference or delay. Information shall include, but not be limited to such items as construction schedules, critical dates, equipment requirements, conduits, boxes and equipment support requirements.
- B. Where the work will be installed in close proximity to, or will interfere with the work of other trades, assist in the working out of space conditions to make satisfactory adjustment. Where necessary, prepare composite working drawings and sections, clearly showing the work to be installed in relation to work of other trades.
- C. Furnish other trades, templates, patterns, setting plans, and shop details for the proper installation of the work and for the purpose of coordinating adjacent work.
- D. Provide to the trade performing the work, a dimensioned drawing of each opening required in the construction of floors, walls and ceilings.
1. Indicate the clear opening dimension required with an outline of the Division 26 products shown in relationship to the opening.
  2. The drawing shall be at least 3/8 inch to 1 foot scale.
  3. Dimensionally locate the openings from fixed elements, such as column grid lines and floor slabs.
  4. Identify the sleeve requirements for each opening on the drawing.

- E. Coordinate electrical work with that of other trades so that:
  - 1. Interference between general construction, mechanical, electrical, structural and other specialty trades is avoided.
  - 2. Maintain clearances and advise other trades of clearance requirements for operation, repair, removal and testing of electrical equipment.
  - 3. Indicate aisleways and accessways required on coordinated shop drawings.
  - 4. All electrical materials and equipment shall be kept as close as possible to ceiling, walls and columns to occupy the minimum amount of space.
  - 5. Furnish and install all offsets, fittings and similar items necessary to accomplish the requirements of coordination, without additional expense.
  
- F. Prepare coordination drawings in accordance with Division 01, to a scale of 1/4"=1'-0" or larger; detailing major elements, components, and systems of electrical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including, (but not necessarily limited to) the following:
  - 1. Indicate the proposed locations of major raceway systems, equipment and materials. Include the following:
    - a. Fire-rated wall and floor penetrations.
    - b. Equipment connections and support details.
  - 2. Prepare reflected ceiling plans to coordinate and integrate installations of air outlets and inlets, light fixtures, communications systems components, fire alarm and detection system components, sprinklers, and other ceiling-mounted devices.
  - 3. Prepare under raised floor plans to coordinate and integrate installations of mechanical pipes and air outlets, plumbing pipes, power distribution system components, communication systems components, fire alarm and detection system components and any other under raised floor installed devices.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS (Not Applicable)

### 2.2 DIVISION 26 SECTIONS

- A. Conform to the requirements of Division 26 sections for all products furnished under this Contract.

## PART 3 - EXECUTION

### 3.1 COORDINATION

- A. Intent:
  - 1. These sections of specifications and drawings form a complete set of documents for the electrical work of this project. Neither is complete without the other. Any item mentioned in one shall be as binding as though mentioned in both.



2. The intent of these specifications and drawings is to form a guide for a complete electrical installation. Where an item is reasonably necessary for a complete system but not specifically mentioned, such as pull boxes, fittings, expansion fittings, support hangers, etc. provide same without additional cost to the Owner.

B. Deviations:

1. No deviations from specifications and drawings to be made without approval by the Owner.
2. Should Contractor find during progress of work that existing conditions make desirable a modification of the requirements of any particular item, report such item promptly to the Owner for decision and instructions.

### 3.2 ROUGH-IN

- A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.
- B. Refer to equipment specifications in Divisions 02 through 26 for rough-in requirements.

### 3.3 ELECTRICAL INSTALLATIONS

- A. General: Sequence, coordinate, and integrate the various elements of the electrical systems, materials and equipment. Comply with the following requirements.
  1. Coordinate electrical systems, equipment, and materials installation with building components.
  2. Verify all dimensions by field measurements.
  3. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for electrical installations.
  4. Coordinate the installation of required supporting devices and sleeves as they are constructed.
  5. Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the Work.
  6. Install systems, materials, and equipment to conform with approved submittal data, and coordination drawings. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Owner.
  7. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components.
  8. Install electrical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. Connect equipment for ease of disconnecting, with minimum of interference with other installations.
  9. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.

### 3.4 CERTIFICATION

- A. General: Provide Certification that the installation meets NFPA 70 and manufacturer's recommendations as indicated in the respective sections.

### 3.5 CUTTING AND PATCHING

- A. Repair or replace routine damage caused by cutting in performance of this contract.
- B. Repairs to be performed with materials which match existing materials and to be installed in accordance with appropriate sections of these specifications.
- C. Cutting: Provide cutting, channeling, chasing and drilling of floors, walls, partitions, ceilings and other surfaces necessary for installation of electrical work. All cutting shall be performed by skilled mechanics of the trades involved. This shall include, but not limited to:
  - 1. Uncover work to provide for installation of ill-timed work.
  - 2. Remove and replace defective Work.
  - 3. Remove and replace Work not conforming to requirements of the Contract Documents.
  - 4. Remove samples of installed Work as specified for testing.
  - 5. Upon written instructions from the Owner, uncover and restore work to provide for Owner's observation of concealed Work.
- D. Protection of Installed Work: During cutting and patching operations, protect adjacent installation.
- E. Patching: Repair cut surfaces to match adjacent surfaces.

### 3.6 CLOSING OF OPENINGS

- A. Unused slots, sleeves and other penetrations in floors, walls or other general construction shall be closed and sealed with an approved material. Fire stopping material shall be used where fire walls are specified.
- B. Fire stopping material shall be UL listed and tested silicone elastomer specifically formulated for use in horizontal and vertical applications. The material shall possess intumescent characteristics and upon exposure to heat above 250 degrees F. shall expand to not less than five times its original volume to form a fireproof envelope, UL rated for 2- and 3-hour protection, when applied in accordance with the manufacturer's recommendation.
- C. Openings in walls shall be closed with 16 gauge galvanized steel sheet securely attached at the midpoint of the wall thickness and fire stopped on both sides of the steel sheet with not less than 1/2-inch thick layer of non-sagging silicone elastomer to fully cover the opening.
- D. Single or multiple conduits passing through walls and floors shall have the annulus space between conduits or between conduits and structure filled with silicone elastomer to provide required rating for floors and walls.
- E. All conduit penetrations through walls and floors shall be properly sealed.

3.7 FIELD TESTING AND TEST EQUIPMENT

- A. All Field testing specified in Divisions 26 electrical specification shall be made with test equipment specially designed and calibrated for the purpose. Test equipment used shall be calibrated and certified by an approved testing laboratory. Date of last calibration and certification shall not be more than 90 days old at the time of field testing.

END OF SECTION 26 05 00

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## SECTION 26 05 23 - CONTROL-VOLTAGE ELECTRICAL POWER CABLES

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Low-voltage control cabling.
  - 2. Control-circuit conductors.

## 1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.3 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control and signaling power-limited circuits.
- C. Plenum: A space forming part of the air distribution system to which one or more air ducts are connected. An air duct is a passageway, other than a plenum, for transporting air to or from heating, ventilating, or air-conditioning equipment.

## 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

## 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified layout technician, installation supervisor, and field inspector.
- B. Source quality-control reports.
- C. Field quality-control reports.

## PART 2 - PRODUCTS

### 2.1 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Flame Travel and Smoke Density in Plenums: As determined by testing identical products according to NFPA 262 by a qualified testing agency. Identify products for installation in plenums with appropriate markings of applicable testing agency.
  - 1. Flame Travel Distance: 60 inches or less.
  - 2. Peak Optical Smoke Density: 0.5 or less.
  - 3. Average Optical Smoke Density: 0.15 or less.

### 2.3 CONTROL-CIRCUIT CONDUCTORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Southwire Company.
  - 2. General Cable Technologies Corporation.
  - 3. Encore Wire Corporation.
- B. Class 1 Control Circuits: Stranded copper, Type THHN-2-THWN-2, in raceway, complying with UL 83.
- C. Class 2 Control Circuits: Stranded copper, Type THHN-2-THWN-2, in raceway, complying with UL 83.
- D. Class 3 Remote-Control and Signal Circuits: Stranded copper, Type THHN-2-THWN-2, in raceway, complying with UL 83.
- E. Class 2 Control Circuits and Class 3 Remote-Control and Signal Circuits That Supply Critical Circuits: Circuit Integrity (CI) cable.
  - 1. Smoke control signaling and control circuits.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine cables on receipt at Project site.

### 3.2 INSTALLATION OF RACEWAYS AND BOXES

- A. Comply with requirements in Section 26 05 33 "Raceways and Boxes for Electrical Systems" for raceway selection and installation requirements for boxes, conduits, and wireways as supplemented or modified in this Section.
  - 1. Outlet boxes shall be no smaller than 2 inches wide, 3 inches high and 2-1/2 inches deep.
  - 2. Flexible metal conduit shall not be used.

### 3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Comply with NECA 1 and NFPA 70.
- B. Installation of Control-Circuit Conductors:
  - 1. Install wiring in raceways. Comply with requirements specified in Section 26 05 33 "Raceways and Boxes for Electrical Systems."
- C. Installation of Cable Routed Exposed under Raised Floors:
  - 1. Install plenum-rated cable only.
  - 2. Install cabling after the flooring system has been installed in raised floor areas.

### 3.4 CONTROL-CIRCUIT CONDUCTORS

- A. Minimum Conductor Sizes:
  - 1. Class 1 remote-control and signal circuits; No 14 AWG.
  - 2. Class 2 low-energy, remote-control, and signal circuits; No. 16 AWG.
  - 3. Class 3 low-energy, remote-control, alarm, and signal circuits; No 12 AWG.

### 3.5 FIRESTOPPING

- A. Comply with requirements in Section 07 84 13 "Penetration Firestopping."

### 3.6 GROUNDING

- A. For low-voltage control wiring and cabling, comply with requirements in Section 26 05 26 "Grounding and Bonding for Electrical Systems."

### 3.7 IDENTIFICATION

- A. Comply with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."

END OF SECTION 26 05 23

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## SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section Includes:

1. Copper building wire rated 600 V or less.
2. Connectors, splices, and terminations rated 600 V and less.

## 1.3 SUBMITTALS

- A. Product Data: For each type of product.

- B. Product Schedule: Indicate type, use, location, and termination locations.

- C. Response:

1. The manufacturer shall submit a point by point statement of compliance with specifications.
2. The statement of compliance shall consist of numbered paragraphs. Each specification paragraph shall be cross referenced to the page/drawing in the submittal on which the compliance is confirmed. The confirming data on the page/drawing shall be highlighted for ready identification
3. Where the proposed system complies fully, indicate by placing the word "comply" next to the subparagraph
4. Where the proposed system does not comply or accomplishes the stated function in a manner different from that described, provide a full description of the deviation.
5. A submittal which does not include a point by point statement of compliance as specified shall be rejected.

- D. Qualification Data: For manufacturer's authorized service representative.

- E. Field quality-control reports.

## 1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA.

1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

## PART 2 - PRODUCTS

## 2.1 COPPER BUILDING WIRE

- A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.
- B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. General Cable Technologies Corporation.
  - 2. Okonite Company (The).
  - 3. Southwire Company.
- C. Standards:
  - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
  - 2. RoHS compliant.
  - 3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
- D. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 for stranded conductors.
- E. Conductor Insulation:
  - 1. Type THHN and Type THWN-2: Comply with UL 83.
  - 2. Type XHHW-2: Comply with UL 44.

## 2.2 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors, pre-assembled type MC cable, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. 3M Electrical Products.
  - 2. Ideal Industries, Inc.
  - 3. ILSCO.
  - 4. O-Z/Gedney; a brand of Emerson Industrial Automation.
  - 5. Thomas & Betts Corporation; A Member of the ABB Group.
  - 6. Hubbell Power Systems, Inc.
- C. Type MC cable: For use as lighting fixture whips.
- D. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.

1. Material: Copper.
2. Type: Two hole with long barrels.
3. Termination: Compression.

### PART 3 - EXECUTION

#### 3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.
- C. Power-Limited Fire Alarm and Control: Solid for No. 12 AWG and smaller.

#### 3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: Type XHHW-2, single conductors in raceway.
- B. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway.
- C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.
- E. Feeders Installed below Raised Flooring: Type THHN/THWN-2, single conductors in raceway.
- F. Exposed Branch Circuits, Including in Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- G. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway.
- H. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.
- I. Branch Circuits Installed below Raised Flooring: Type THHN/THWN-2, single conductors in raceway.
- J. Type MC cable for lighting fixture whips. Length not to exceed 6'-0".
- K. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.

- L. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- M. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

### 3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 26 05 33 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

### 3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
  - 1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.

### 3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor. Identify as spare conductor.

### 3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

### 3.7 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 078413 "Penetration Firestopping." The General Contractor or Designated sub-contractor to install firestop for all trades.

### 3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Perform tests and inspections.
  - 1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
  - 2. Perform each of the following visual and electrical tests:
    - a. Inspect exposed sections of conductor and cable for physical damage and correct connection according to the single-line diagram.
    - b. Test bolted connections for high resistance using one of the following:
      - 1) A low-resistance ohmmeter.
      - 2) Calibrated torque wrench.
      - 3) Thermographic survey.
    - c. Inspect compression-applied connectors for correct cable match and indentation.
    - d. Inspect for correct identification.
    - e. Inspect cable jacket and condition.
    - f. Insulation-resistance test on each conductor for ground and adjacent conductors. Apply a potential of 500-V dc for 300-V rated cable and 1000-V dc for 600-V rated cable for a one-minute duration.
    - g. Continuity test on each conductor and cable.
    - h. Uniform resistance of parallel conductors.
  - 3. Initial Infrared Scanning: After Substantial Completion, but before Final Acceptance, perform an infrared scan of each splice in conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner. Correct deficiencies determined during the scan.
    - a. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

- b. Record of Infrared Scanning: Prepare a certified report that identifies switches checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.
- 4. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan 11 months after date of Substantial Completion.
- C. Cables will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports to record the following:
  - 1. Procedures used.
  - 2. Results that comply with requirements.
  - 3. Results that do not comply with requirements, and corrective action taken to achieve compliance with requirements.

END OF SECTION 260519

## SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section includes grounding and bonding systems and equipment.
- B. Section includes grounding and bonding systems and equipment, plus the following special applications:
  - 1. Underground distribution grounding.
  - 2. Ground bonding common with lightning protection system.
  - 3. Foundation steel electrodes.

## 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

## 1.3 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Plans showing dimensioned locations of grounding features specified in "Field Quality Control" Article, including the following:
  - 1. Test wells.
  - 2. Ground rods.
  - 3. Ground rings.
  - 4. Grounding arrangements and connections for separately derived systems.
- B. Qualification Data: For testing agency and testing agency's field supervisor.
- C. Field quality-control reports.

## 1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For grounding to include in emergency, operation, and maintenance manuals.
  - 1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
    - a. Plans showing as-built, dimensioned locations of system described in "Field Quality Control" Article, including the following:
      - 1) Test wells.
      - 2) Ground rods.

- 3) Ground rings.
  - 4) Grounding arrangements and connections for separately derived systems.
- b. Instructions for periodic testing and inspection of grounding features at test wells, ground rings, grounding connections for separately derived systems based on NETA MTS.
- 1) Tests shall determine if ground-resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if values do not.
  - 2) Include recommended testing intervals.

## 1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Certified by NETA.

## PART 2 - PRODUCTS

### 2.1 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

### 2.2 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Advanced Lightning Technology, Ltd.
  2. Burndy; Part of Hubbell Electrical Systems.
  3. ERICO; a brand of nVent.
  4. Harger Lightning & Grounding.
  5. ILSCO.
  6. O-Z/Gedney; a brand of Emerson Industrial Automation.
  7. Robbins Lightning, Inc.
  8. Thomas & Betts Corporation; A Member of the ABB Group.

### 2.3 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
1. Solid Conductors: ASTM B3.
  2. Stranded Conductors: ASTM B8.



3. Tinned Conductors: ASTM B33.
  4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
  5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
  6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
  7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
- C. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 4 inches in cross section, with 9/32-inch holes spaced 1-1/8 inches apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V and shall be Lexan or PVC, impulse tested at 5000 V.
- CONNECTORS
- D. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- E. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- F. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.
- G. Beam Clamps: Mechanical type, terminal, ground wire access from four directions, with dual, tin-plated or silicon bronze bolts.
- H. Cable-to-Cable Connectors: Compression type, copper or copper alloy.
- I. Cable Tray Ground Clamp: Mechanical type, zinc-plated malleable iron.
- J. Conduit Hubs: Mechanical type, terminal with threaded hub.
- K. Ground Rod Clamps: Mechanical type, copper or copper alloy, terminal with hex head bolt.
- L. Ground Rod Clamps: Mechanical type, copper or copper alloy, terminal with hex head bolt. nbm
- M. Lay-in Lug Connector: Mechanical type, aluminum or copper rated for direct burial terminal with set screw.
- N. Service Post Connectors: Mechanical type, bronze alloy terminal, in short- and long-stud lengths, capable of single and double conductor connections.
- O. Signal Reference Grid Clamp: Mechanical type, stamped-steel terminal with hex head screw.
- P. Straps: Braided copper, cast-bronze clamp. Rated for 600 A.
- Q. Tower Ground Clamps: Mechanical type, copper or copper alloy, terminal one-piece clamp.
- R. U-Bolt Clamps: Mechanical type, copper or copper alloy, terminal listed for direct burial.
- S. Water Pipe Clamps:

1. Mechanical type, two pieces with zinc-plated bolts.
  - a. Material: Die-cast zinc alloy.
  - b. Listed for direct burial.
2. U-bolt type with malleable-iron clamp and copper ground connector.

## 2.4 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel, sectional type; 3/4 inch by 10 feet.
- B. Ground Plates: 1/4 inch thick, hot-dip galvanized.

## PART 3 - EXECUTION

### 3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 10 AWG and smaller, and stranded conductors for No. 8 AWG and larger unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare copper conductor, No. 2/0 AWG minimum.
  1. Bury at least 30 inches below grade.
  2. Duct-Bank Grounding Conductor: Bury 12 inches above duct bank when indicated as part of duct-bank installation.
- C. Grounding Conductors: Green-colored insulation with continuous yellow stripe.
- D. Isolated Grounding Conductors: Green-colored insulation with more than one continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.
- E. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
  1. Install bus horizontally, on insulated spacers 2 inches minimum from wall, 60 inches above finished floor unless otherwise indicated.
  2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.
- F. Conductor Terminations and Connections:
  1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
  2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
  3. Connections to Ground Rods at Test Wells: Bolted connectors.
  4. Connections to Structural Steel: Welded connectors.

### 3.2 GROUNDING AT THE SERVICE

- A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

### 3.3 GROUNDING SEPARATELY DERIVED SYSTEMS

- A. Generator: Install grounding electrode(s) at the generator location. The electrode shall be connected to the equipment grounding conductor and to the frame of the generator.

### 3.4 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

- A. Comply with IEEE C2 grounding requirements.
- B. Grounding Manholes and Handholes: Install a driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 4 inches will extend above finished floor. If necessary, install ground rod before manhole is placed and provide No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inches above to 6 inches below concrete. Seal floor opening with waterproof, nonshrink grout.
- C. Grounding Connections to Manhole Components: Bond exposed-metal parts such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, stranded, hard-drawn copper bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields according to written instructions by manufacturer of splicing and termination kits.
- D. Pad-Mounted Transformers and Switches: Install two ground rods and ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Install tinned-copper conductor not less than No. 2 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than 6 inches from the foundation.

### 3.5 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
  - 1. Feeders and branch circuits.
  - 2. Lighting circuits.
  - 3. Receptacle circuits.
  - 4. Single-phase motor and appliance branch circuits.
  - 5. Three-phase motor and appliance branch circuits.
  - 6. Flexible raceway runs.

7. Armored and metal-clad cable runs.
  8. Busway Supply Circuits: Install insulated equipment grounding conductor from grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.
  9. X-Ray Equipment Circuits: Install insulated equipment grounding conductor in circuits supplying x-ray equipment.
- C. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.
- D. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.
- E. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.
- F. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply circuit raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure, and install a separate insulated equipment grounding conductor. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.
- G. Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.
- H. Metallic Fences: Comply with requirements of IEEE C2.
1. Grounding Conductor: Bare copper, not less than No. 8 AWG.
  2. Gates: Shall be bonded to the grounding conductor with a flexible bonding jumper.
  3. Barbed Wire: Strands shall be bonded to the grounding conductor.

### 3.6 FENCE GROUNDING

- A. Fence Grounding: Install at maximum intervals of 1500 feet except as follows:
1. Fences within 100 Feet (30 m) of Buildings, Structures, Walkways, and Roadways: Ground at maximum intervals of 750 feet.
    - a. Gates and Other Fence Openings: Ground fence on each side of opening.
      - 1) Bond metal gates to gate posts.

- 2) Bond across openings, with and without gates, except at openings indicated as intentional fence discontinuities. Use No. 2 AWG wire and bury it at least 18 inches below finished grade.
- B. Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing and at a maximum distance of 150 feet on each side of crossing.
- C. Fences Enclosing Electrical Power Distribution Equipment: Ground as required by IEEE C2 unless otherwise indicated.
- D. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at grounding location.
- E. Bonding Method for Gates: Connect bonding jumper between gate post and gate frame.
- F. Bonding to Lightning-Protection System: If fence terminates at lightning-protected building or structure, ground the fence and bond the fence grounding conductor to lightning-protection down conductor or lightning-protection grounding conductor, complying with NFPA 780.

### 3.7 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.
- C. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
  1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
  2. Use exothermic welds for all below-grade connections.
  3. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- D. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes are specified in Section 260543 "Underground Ducts and Raceways for Electrical Systems," and shall be at least 12 inches deep, with cover.
  1. Install at least one test well for each service unless otherwise indicated. Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.

- E. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
  - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
  - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
  - 3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.
  
- F. Grounding and Bonding for Piping:
  - 1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
  - 2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
  - 3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.
  
- G. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install bonding jumper to bond across flexible duct connections to achieve continuity.
  
- H. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet apart.
  
- I. Ground Ring: Install a grounding conductor, electrically connected to each building structure ground rod and to each steel column indicated, extending around the perimeter of building or area or item indicated.
  - 1. Install tinned-copper conductor not less than No. 4/0 AWG for ground ring and for taps to building steel.
  - 2. Bury ground ring not less than 24 inches from building's foundation.
  
- J. Concrete-Encased Grounding Electrode (Ufer Ground): Fabricate according to NFPA 70; use a minimum of 20 feet of bare copper conductor not smaller than No. 4 AWG.
  - 1. If concrete foundation is less than 20 feet long, coil excess conductor within base of foundation.
  - 2. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building's grounding grid or to grounding electrode external to concrete.
  
- K. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.
2. Make connections with clean, bare metal at points of contact.
3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
4. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

### 3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.
- D. Tests and Inspections:
  1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
  2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
  3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, at ground test wells. Make tests at ground rods before any conductors are connected.
    - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
    - b. Perform tests by fall-of-potential method according to IEEE 81.
  4. Prepare dimensioned Drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
- E. Grounding system will be considered defective if it does not pass tests and inspections.
- F. Prepare test and inspection reports.
- G. Report measured ground resistances that exceed the following values:
  1. Power and Lighting Equipment or System with Capacity to 1000 kVA: 5 ohms.
  2. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.

- H. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 260526



## SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

## A. Section Includes:

1. Steel slotted support systems.
2. Aluminum slotted support systems.
3. Nonmetallic slotted support systems.
4. Conduit and cable support devices.
5. Support for conductors in vertical conduit.
6. Structural steel for fabricated supports and restraints.
7. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.
8. Fabricated metal equipment support assemblies.

## 1.3 DEFINITIONS

- A. EMT: Electrical metallic tubing.

## 1.4 ACTION SUBMITTALS

## A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
  - a. Slotted support systems, hardware, and accessories.
  - b. Clamps.
  - c. Hangers.
  - d. Sockets.
  - e. Eye nuts.
  - f. Fasteners.
  - g. Anchors.
  - h. Saddles.
  - i. Brackets.

2. Include rated capacities and furnished specialties and accessories.
- B. Shop Drawings: For fabrication and installation details for electrical hangers and support systems.
1. Hangers. Include product data for components.
  2. Slotted support systems.
  3. Equipment supports.
  4. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame Rating: Class 1.
  2. Self-extinguishing according to ASTM D635.

### 2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch-diameter holes at a maximum of 8 inches o.c. in at least one surface.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. B-line, an Eaton business.
    - b. CADDY; a brand of nVent.
    - c. Thomas & Betts Corporation; A Member of the ABB Group.
    - d. Super Strut
    - e. Unistrut; Part of Atkore International.
    - f. Cooper B-Line, Inc.; a division of Cooper Industries.
    - g. ERICO International Corporation.
    - h. GS Metals Corp.
    - i. OZ Gedney.
  2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
  3. Material for Channel, Fittings, and Accessories: Galvanized steel
  4. Channel Width: Selected for applicable load criteria
  5. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
  6. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
  7. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.

8. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Aluminum Slotted Support Systems: Extruded-aluminum channels and angles with minimum 13/32-inch- diameter holes at a maximum of 8 inches o.c. in at least one surface.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Cooper Industries, Inc.
    - b. Thomas & Betts Corporation; A Member of the ABB Group.
    - c. Unistrut; Part of Atkore International.
  2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
  3. Channel Material: 6063-T5 aluminum alloy.
  4. Fittings and Accessories Material: 5052-H32 aluminum alloy.
  5. Channel Width: Selected for applicable load criteria.
  6. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
  7. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
  8. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Nonmetallic Slotted Support Systems: Structural-grade, factory-formed, glass-fiber-resin channels and angles with minimum 13/32-inch- diameter holes at a maximum of 8 inches o.c., in at least one surface.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. B-line, an Eaton business.
    - b. G-Strut.
  2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
  3. Channel Width: Selected for applicable load criteria.
  4. Fittings and Accessories: Products provided by channel and angle manufacturer and designed for use with those items.
  5. Fitting and Accessory Materials: Same as those for channels and angles, except metal items may be stainless steel.
  6. Rated Strength: Selected to suit applicable load criteria.
  7. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- D. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- E. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be made of malleable iron.

- F. Structural Steel for Fabricated Supports and Restraints: ASTM A36/A36M steel plates, shapes, and bars; black and galvanized.
- G. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
  - 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
    - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      - 1) Hilti, Inc.
      - 2) ITW Ramset/Red Head; Illinois Tool Works, Inc.
      - 3) Red Head
  - 2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
    - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      - 1) B-line, an Eaton business.
      - 2) Hilti, Inc.
      - 3) ITW Ramset/Red Head; Illinois Tool Works, Inc.
      - 4) Red Head
  - 3. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
  - 4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
  - 5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM F3125/F3125.
  - 6. Toggle Bolts: All steel springhead type.
  - 7. Hanger Rods: Threaded steel.

### 2.3 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in Section 055000 "Metal Fabrications" for steel shapes and plates.

## PART 3 - EXECUTION

## 3.1 APPLICATION

- A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:
  - 1. NECA 1.
  - 2. NECA 101
  - 3. NECA 102.
  - 4. NECA 105.
  - 5. NECA 111.
- B. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping materials and installation for penetrations through fire-rated walls, ceilings, and assemblies.
- C. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."
- D. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
- E. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
  - 1. Secure raceways and cables to these supports with two-bolt conduit clamps.
- F. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings, and for fastening raceways to trapeze supports.

## 3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT and] RMC may be supported by openings through structure members, according to NFPA 70.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
  - 1. To Wood: Fasten with lag screws or through bolts.

2. To New Concrete: Bolt to concrete inserts.
  3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
  4. To Existing Concrete: Expansion anchor fasteners.
  5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
  6. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts.
  7. To Light Steel: Sheet metal screws.
  8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.
- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

### 3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Comply with installation requirements in Section 055000 "Metal Fabrications" for site-fabricated metal supports.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- C. Field Welding: Comply with AWS D1.1/D1.1M.

### 3.4 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
  1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A780.

END OF SECTION 260529

## SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

## A. Section Includes:

1. Metal conduits and fittings.
2. Nonmetallic conduits and fittings.
3. Metal wireways and auxiliary gutters.
4. Surface raceways.
5. Boxes, enclosures, and cabinets.

## B. Related Requirements:

1. Section 078413 "Penetration Firestopping" for firestopping at conduit and box entrances.
2. Section 270528 "Pathways for Communications Systems" for conduits, wireways, surface pathways, innerduct, boxes, faceplate adapters, enclosures, cabinets, and handholes serving communications systems.

## 1.3 DEFINITIONS

- A. ARC: Aluminum rigid conduit.
- B. GRC: Galvanized rigid steel conduit.

## 1.4 ACTION SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

## PART 2 - PRODUCTS

## 2.1 METAL CONDUITS AND FITTINGS

## A. Metal Conduit:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. AFC Cable Systems; a part of Atkore International.
  - b. Allied Tube & Conduit; a part of Atkore International.
  - c. Electri-Flex Company.
  - d. O-Z/Gedney; a brand of Emerson Industrial Automation.
  - e. Perma-Cote.
2. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. GRC: Comply with ANSI C80.1 and UL 6.
4. ARC: Comply with ANSI C80.5 and UL 6A.
5. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
  - a. Comply with NEMA RN 1.
  - b. Coating Thickness: 0.040 inch , minimum.
6. EMT: Comply with ANSI C80.3 and UL 797.
7. FMC: Comply with UL 1; zinc-coated steel.
8. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

## B. Metal Fittings:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. AFC Cable Systems; a part of Atkore International.
  - b. Allied Tube & Conduit; a part of Atkore International.
  - c. Anamet Electrical, Inc.
  - d. Electri-Flex Company.
  - e. O-Z/Gedney; a brand of Emerson Industrial Automation.
2. Comply with NEMA FB 1 and UL 514B.
3. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
4. Fittings, General: Listed and labeled for type of conduit, location, and use.
5. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 1203 and NFPA 70.
6. Fittings for EMT:
  - a. Material: Steel.



- b. Type: compression.
  - 7. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
  - 8. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.
- C. Joint Compound for GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

## 2.2 NONMETALLIC CONDUITS AND FITTINGS

### A. Nonmetallic Conduit:

- 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. CANTEX INC.
  - b. Carlon.
  - c. CertainTeed Corporation.
- 2. Listing and Labeling: Nonmetallic conduit shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- 3. ENT: Comply with NEMA TC 13 and UL 1653.
- 4. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
- 5. LFNC: Comply with UL 1660.
- 6. Rigid HDPE: Comply with UL 651A.
- 7. Continuous HDPE: Comply with UL 651A.
- 8. Coilable HDPE: Preassembled with conductors or cables, and complying with ASTM D3485.
- 9. RTRC: Comply with UL 2515A and NEMA TC 14.

### B. Nonmetallic Fittings:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. CANTEX INC.
  - b. Carlon.
  - c. CertainTeed Corporation.
- 2. Fittings, General: Listed and labeled for type of conduit, location, and use.
- 3. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.
  - a. Fittings for LFNC: Comply with UL 514B.

4. Solvents and Adhesives: As recommended by conduit manufacturer.

### 2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

- A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  1. B-line, an Eaton business.
  2. Hoffman; a brand of nVent.
  3. Square D.
- B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1, Type 3R, Type 4 unless otherwise indicated, and sized according to NFPA 70.
  1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- D. Wireway Covers: Hinged unless otherwise indicated.
- E. Finish: Manufacturer's standard enamel finish.

### 2.4 SURFACE RACEWAYS

- A. Listing and Labeling: Surface raceways and tele-power poles shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Surface Metal Raceways: Galvanized steel with snap-on covers complying with UL 5. Manufacturer's standard enamel finish in color selected by Architect.
  1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  2. Hubbell Incorporated; Wiring Device-Kellems.
    - a. MonoSystems, Inc.
    - b. Wiremold / Legrand.

### 2.5 BOXES, ENCLOSURES, AND CABINETS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  1. Crouse-Hinds, an Eaton business.
  2. EGS/Appleton Electric.
  3. FSR Inc.

4. Hoffman; a brand of nVent.
  5. Hubbell Incorporated.
- B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.
- E. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.
- F. Metal Floor Boxes:
1. Material: Cast metal or sheet metal.
  2. Type: Fully adjustable or Semi-adjustable.
  3. Shape: Rectangular.
  4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- G. Nonmetallic Floor Boxes: Nonadjustable, rectangular.
1. Listing and Labeling: Nonmetallic floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- H. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb . Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.
- I. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- J. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.
- K. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- L. Device Box Dimensions: 4 inches square by 2-1/8 inches deep or 4 inches by 2-1/8 inches by 2-1/8 inches deep.
- M. Gangable boxes are allowed.
- N. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1, Type 3R or Type 4 with continuous-hinge cover with flush latch unless otherwise indicated.
1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
  2. Nonmetallic Enclosures: Fiberglass.
  3. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.
- O. Cabinets:

1. NEMA 250, Type 1 or Type 3R galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.
6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

## PART 3 - EXECUTION

### 3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed Conduit: GRC, PVC coated.
2. Concealed Conduit, Aboveground: GRC.
3. Underground Conduit: RNC, Type EPC-40-PVC or Type EPC-80-PVC, direct buried or concrete encased.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R or Type 4.

B. Indoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
  - a. Loading dock.
  - b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
  - c. Mechanical rooms.
  - d. Gymnasiums.
3. Concealed in Ceilings and Interior Walls and Partitions: EMT.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
5. Damp or Wet Locations: GRC.
6. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.

C. Minimum Raceway Size: 3/4-inch trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.

2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
  3. EMT: Use compression, steel fittings. Comply with NEMA FB 2.10.
  4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.
- E. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.
- F. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.
- G. Install surface raceways only where indicated on Drawings.
- H. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

### 3.2 INSTALLATION

- A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.
- B. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- C. Do not install raceways or electrical items on any "explosion-relief" walls or rotating equipment.
- D. Do not fasten conduits onto the bottom side of a metal deck roof.
- E. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- F. Complete raceway installation before starting conductor installation.
- G. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- H. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
- I. Make bends in raceway using large-radius preformed ells. Field bending shall be according to NFPA 70 minimum radii requirements. Use only equipment specifically designed for material and size involved.
- J. Conceal conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- K. Support conduit within 12 inches of enclosures to which attached.

- L. Raceways Embedded in Slabs:
  - 1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
  - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
  - 3. Arrange raceways to keep a minimum of 1 inch of concrete cover in all directions.
  - 4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
  - 5. Change from ENT to GRC before rising above floor.
  
- M. Stub-Ups to Above Recessed Ceilings:
  - 1. Use EMT or RMC for raceways.
  - 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
  
- N. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
  
- O. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
  
- P. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
  
- Q. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch (35mm) trade size and insulated throat metal bushings on 1-1/2-inch (41-mm) trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
  
- R. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
  
- S. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
  
- T. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
  
- U. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
  
- V. Surface Raceways:
  - 1. Install surface raceway with a minimum 2-inch radius control at bend points.
  - 2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface

raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

- W. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.
- X. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
  - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
  - 2. Where an underground service raceway enters a building or structure.
  - 3. Conduit extending from interior to exterior of building.
  - 4. Conduit extending into pressurized duct and equipment.
  - 5. Conduit extending into pressurized zones that are automatically controlled to maintain different pressure set points.
  - 6. Where otherwise required by NFPA 70.
- Y. Comply with manufacturer's written instructions for solvent welding RNC and fittings.
- Z. Expansion-Joint Fittings:
  - 1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F and that has straight-run length that exceeds 25 feet. Install in each run of aboveground RMC and EMT conduit that is located where environmental temperature change may exceed 100 deg F and that has straight-run length that exceeds 100 feet.
  - 2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
    - a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
    - b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
    - c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.
    - d. Attics: 135 deg F temperature change.
  - 3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F of temperature change for metal conduits.
  - 4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
  - 5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

- AA. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
    - 1. Use LFMC in damp or wet locations subject to severe physical damage.
    - 2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.
  - BB. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
  - CC. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
  - DD. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
  - EE. Locate boxes so that cover or plate will not span different building finishes.
  - FF. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
  - GG. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
  - HH. Set metal floor boxes level and flush with finished floor surface.
  - II. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.
- 3.3 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS
- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."
- 3.4 FIRESTOPPING
- A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."
- 3.5 PROTECTION
- A. Protect coatings, finishes, and cabinets from damage and deterioration.
    - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
    - 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.



END OF SECTION 260533

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## SECTION 260544 - SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:

1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
2. Sleeve-seal systems.
3. Sleeve-seal fittings.
4. Grout.
5. Silicone sealants.

- B. Related Requirements:

1. Section 078413 "Penetration Firestopping" for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

### PART 2 - PRODUCTS

#### 2.1 SLEEVES

- A. Wall Sleeves:

1. Steel Pipe Sleeves: ASTM A53/A53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.

- B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

- C. PVC-Pipe Sleeves: ASTM D1785, Schedule 40.
- D. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.
- E. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.
- F. Sleeves for Rectangular Openings:
  - 1. Material: Galvanized sheet steel.
  - 2. Minimum Metal Thickness:
    - a. For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches, thickness shall be 0.052 inch.
    - b. For sleeve cross-section rectangle perimeter 50 inches or more and one or more sides larger than 16 inches, thickness shall be 0.138 inch.

## 2.2 SLEEVE-SEAL SYSTEMS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Advance Products & Systems, Inc.
    - b. Flexicraft Industries.
    - c. Metraflex Company (The).
    - d. Proco Products, Inc.
  - 2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
  - 3. Pressure Plates: Carbon steel.
  - 4. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

## 2.3 SLEEVE-SEAL FITTINGS

- A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    - a. HOLDRITE; Reliance Worldwide Company.

## 2.4 GROUT

- A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.
- B. Standard: ASTM C1107/C1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

## 2.5 SILICONE SEALANTS

- A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.
  - 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.
- B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

## PART 3 - EXECUTION

### 3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

- A. Comply with NECA 1.
- B. Comply with NEMA VE 2 for cable tray and cable penetrations.
- C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
  - 1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
    - a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 079200 "Joint Sealants."
    - b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.
  - 2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
  - 3. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed
  - 4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.

5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches above finished floor level. Install sleeves during erection of floors.
- D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:
1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
  2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.
- E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

### 3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.
- B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

### 3.3 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 260544

## SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section Includes:

1. Color and legend requirements for raceways, conductors, and warning labels and signs.
2. Labels.
3. Bands and tubes.
4. Tapes and stencils.
5. Tags.
6. Signs.
7. Cable ties.
8. Paint for identification.
9. Fasteners for labels and signs.

## 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for electrical identification products.
- B. Delegated-Design Submittal: For arc-flash hazard study.

## PART 2 - PRODUCTS

## 2.1 PERFORMANCE REQUIREMENTS

- A. Comply with ASME A13.1 and IEEE C2.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Comply with NFPA 70E requirements for arc-flash warning labels.

- F. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.
- G. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
  - 1. Temperature Change: 120 deg F , ambient; 180 deg F , material surfaces.

## 2.2 COLOR AND LEGEND REQUIREMENTS

- A. Raceways and Cables Carrying Circuits at 600 V or Less:
  - 1. Orange letters on a black background.
  - 2. Legend: Indicate voltage, system and service type.
  - 3. Example:
    - a. 480VAC/ 3PH
    - b. 60HZ
    - c. LIGHTING AND POWER
- B. Color-Coding for Phase- and Voltage-Level Identification, 600 V or Less: Use colors listed below for ungrounded service feeder and branch-circuit conductors.
  - 1. Color shall be factory applied or field applied for sizes larger than No. 8 AWG.
  - 2. Colors for 208/120-V Circuits:
    - a. Phase A: Black.
    - b. Phase B: Red.
    - c. Phase C: Blue.
  - 3. Colors for 240-V Circuits:
    - a. Phase A: Black.
    - b. Phase B: Red.
  - 4. Colors for 480/277-V Circuits:
    - a. Phase A: Brown.
    - b. Phase B: Purple.
    - c. Phase C: Yellow.
  - 5. Color for Neutral: White or gray.
  - 6. Color for Equipment Grounds: Green.
  - 7. Colors for Isolated Grounds: Green with two or more yellow stripes.
- C. Raceways and Cables Carrying Circuits at More Than 600 V:
  - 1. Black letters on an orange field.
  - 2. Legend: "DANGER - HIGH VOLTAGE WIRING."
- D. Warning Label Colors:



1. Identify system voltage with black letters on an orange background.
- E. Warning labels and signs shall include, but are not limited to, the following legends:
1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
- F. Equipment Identification Labels:
1. Black letters on a white background.
  2. Include equipment designation 1/4"H.
  3. Include source and circuit number 1/8"H.

### 2.3 LABELS

- A. Vinyl Wraparound Labels: Preprinted, flexible labels laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    - a. Brady Corporation.
    - b. Panduit Corp.
- B. Snap-around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameters sized to suit diameters and that stay in place by gripping action.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    - a. Brady Corporation.
    - b. Panduit Corp.
- C. Self-Adhesive Wraparound Labels: Preprinted, 3-mil-thick, vinyl flexible label with acrylic pressure-sensitive adhesive.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    - a. Brady Corporation.
    - b. Panduit Corp.
  2. Self-Lamination: Clear; UV-, weather- and chemical-resistant; self-laminating, protective shield over the legend. Labels sized such that the clear shield overlaps the entire printed legend.
  3. Marker for Labels: Machine-printed, permanent, waterproof, black ink recommended by printer manufacturer.

- D. Self-Adhesive Labels: Vinyl, thermal, transfer-printed, 3-mil- thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    - a. Brady Corporation.
    - b. Panduit Corp.
  2. Minimum Nominal Size:
    - a. 1-1/2 by 6 inches for raceway and conductors.
    - b. 3-1/2 by 5 inches for equipment.

## 2.4 BANDS AND TUBES

- A. Snap-around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches long, with diameters sized to suit diameters and that stay in place by gripping action.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    - a. Brady Corporation.
    - b. Panduit Corp.

## 2.5 TAPES AND STENCILS

- A. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    - a. Ideal Industries, Inc.
    - b. Panduit Corp.
- B. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils thick by 1 to 2 inches wide; compounded for outdoor use.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    - a. Brady Corporation.

## 2.6 TAGS

- A. Metal Tags for use in Vaults, Manholes and Handholes: Brass, stainless steel or aluminum, 2 by 2 by 0.05 inch with stamped legend, punched for use with self-locking cable tie fastener.

## 2.7 SIGNS

### A. Laminated Acrylic Signs:

- 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  - a. Brady Corporation.
- 2. Engraved legend.
- 3. Thickness:
  - a. For signs up to 20 sq. in., minimum 1/16 inch thick.
  - b. For signs larger than 20 sq. in., 1/8 inch thick.
  - c. Engraved legend with white letters on black background.
  - d. Punched or drilled for mechanical fasteners with 1/4-inch grommets in corners for mounting.
  - e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

## 2.8 CABLE TIES

- A. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.
  - 1. Minimum Width: 3/16 inch.
  - 2. Tensile Strength at 73 Deg F according to ASTM D638: 12,000 psi.
  - 3. Temperature Range: Minus 40 to plus 185 deg F.
  - 4. Color: Black, except where used for color-coding.
- B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.
  - 1. Minimum Width: 3/16 inch.
  - 2. Tensile Strength at 73 Deg F according to ASTM D638: 12,000 psi.
  - 3. Temperature Range: Minus 40 to plus 185 deg F.
  - 4. Color: Black.
- C. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, and self-locking.
  - 1. Minimum Width: 3/16 inch.
  - 2. Tensile Strength at 73 Deg F according to ASTM D638: 7000 psi.
  - 3. UL 94 Flame Rating: 94V-0.

4. Temperature Range: Minus 50 to plus 284 deg F.
5. Color: Black.

## 2.9 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

### 3.2 INSTALLATION

- A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.
- B. Install identifying devices before installing acoustical ceilings and similar concealment.
- C. Verify identity of each item before installing identification products.
- D. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.
- E. Apply identification devices to surfaces that require finish after completing finish work.
- F. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.
- G. System Identification for Raceways and Cables under 600 V: Identification shall completely encircle cable or conduit. Place identification of two-color markings in contact, side by side.
  1. Secure tight to surface of conductor, cable, or raceway.
- H. System Identification for Raceways and Cables over 600 V: Identification shall completely encircle cable or conduit. Place adjacent identification of two-color markings in contact, side by side.

1. Secure tight to surface of conductor, cable, or raceway.
- I. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
  - J. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch-high letters for emergency instructions at equipment used for power transfer.
  - K. Elevated Components: Increase sizes of labels, signs, and letters to those appropriate for viewing from the floor.
  - L. Accessible Fittings for Raceways: Paint the covers of each junction and pull box of the following systems as follows:
    1. Emergency – Yellow.
    2. Fire Alarm – Red.
  - M. Vinyl Wraparound Labels:
    1. Secure tight to surface of raceway or cable at a location with high visibility and accessibility.
    2. Attach labels that are not self-adhesive type with clear vinyl tape, with adhesive appropriate to the location and substrate.
  - N. Snap-around Labels: Secure tight to surface at a location with high visibility and accessibility.
  - O. Self-Adhesive Wraparound Labels: Secure tight to surface at a location with high visibility and accessibility.
  - P. Self-Adhesive Labels:
    1. On each item, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual.
    2. Unless otherwise indicated, provide a text with 1/2-inch-high letters on 1-1/2-inch- or 2-inch high label.
  - Q. Snap-around Color-Coding Bands: Secure tight to surface at a location with high visibility and accessibility.
  - R. Marker Tapes: Secure tight to surface at a location with high visibility and accessibility.
  - S. Self-Adhesive Vinyl Tape: Secure tight to surface at a location with high visibility and accessibility.
    1. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding.
  - T. Metal Tags:
    1. Place in a location with high visibility and accessibility.

2. Secure using general-purpose cable ties.

U. Laminated Acrylic Signs:

1. Attach signs that are not self-adhesive type with stainless steel or brass screws.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high sign; where two lines of text are required, use labels 2 inches high.

V. Cable Ties: General purpose, for attaching tags, except as listed below:

1. Outdoors: UV-stabilized nylon.
2. In Spaces Handling Environmental Air: Plenum rated.

### 3.3 IDENTIFICATION SCHEDULE

- A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.
- B. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility for both new and existing to be reused equipment. Identify by system and circuit designation.
- C. Concealed Raceways, Duct Banks, More Than 600 V, within Buildings: Tape and stencil. Stencil legend "DANGER - HIGH-VOLTAGE WIRING" with 3-inch-high, black letters on 20-inch centers.
1. Locate identification at changes in direction, at penetrations of walls and floors, and at 30-foot maximum intervals.
- D. Accessible Raceways, Armored and Metal-Clad Cables, More Than 600 V: Vinyl wraparound labels.
1. Locate identification at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- E. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits, More Than 30 A and 120 V to Ground: Identify with self-adhesive raceway labels.
1. Locate identification at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- F. Accessible Fittings for Raceways and Cables within Buildings: Identify the covers of each junction and pull box with panel and circuit number in indelible ink.
- G. Power-Circuit Conductor Identification, 600 V or Less: For conductors in pull and junction boxes, use vinyl self-adhesive wraparound labels to identify the phase and circuit designation.
1. Locate identification at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

- H. Power-Circuit Conductor Identification for conductors in vaults, manholes, and handholes, use metal tags to indicate phase, and circuit designation.
- I. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use self-adhesive labels with the conductor or cable designation, origin, and destination.
- J. Control-Circuit Conductor Termination Identification: For identification at terminations, provide self-adhesive labels with the conductor designation.
- K. Conductors to Be Extended in the Future: Attach write-on tags to conductors and list source.
- L. Auxiliary Electrical Systems Conductor Identification: Marker tape that is uniform and consistent with system used by manufacturer for factory-installed connections.
  - 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
- M. Instructional Signs: Self-adhesive labels, including the color code for grounded and ungrounded conductors.
- N. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive labels.
  - 1. Apply to exterior of door, cover, or other access.
  - 2. For equipment with multiple power or control sources, apply to door or cover of equipment, including, but not limited to, the following:
    - a. Power-transfer switches.
    - b. Controls with external control power connections.
- O. Arc Flash Warning Labeling: Self-adhesive labels.
- P. Operating Instruction Signs: Laminated acrylic signs.
- Q. Emergency Operating Instruction Signs: Laminated acrylic signs with white legend on a red background with minimum 3/8-inch- high letters for emergency instructions at equipment used for power transfer.
- R. Equipment Identification Labels:
  - 1. Indoor Equipment: Laminated acrylic nameplates.
  - 2. Outdoor Equipment: Laminated acrylic nameplates.
  - 3. Equipment to Be Labeled:
    - a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be in the form of a engraved laminated acrylic nameplate.
    - b. Enclosures and electrical cabinets.
    - c. Access doors and panels for concealed electrical items.
    - d. Switchgear.

- e. Switchboards.
- f. Transformers: Label that includes tag designation indicated on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
- g. Substations.
- h. Emergency system boxes and enclosures.
- i. Motor-control centers.
- j. Enclosed switches.
- k. Enclosed circuit breakers.
- l. Enclosed controllers.
- m. Variable-speed controllers.
- n. Push-button stations.
- o. Power-transfer equipment.
- p. Contactors.
- q. Remote-controlled switches, dimmer modules, and control devices.
- r. Battery-inverter units.
- s. Battery racks.
- t. Power-generating units.
- u. Monitoring and control equipment.
- v. UPS equipment.

END OF SECTION 260553



## SECTION 260943 – NETWORK LIGHTING CONTROLS

## PART 1 - GENERAL

## 1.1 SECTION INCLUDES

- A. Distributed Digital Lighting Control System: Systems includes
  1. Digital Lighting and Plug Load Controls
  2. Relay Panels

## 1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.3 SUMMARY

- A. Section includes network lighting control system comprised of the following components:
  1. System Compliance
  2. System Performance Requirements
  3. System Backbone and Integration Equipment
  4. Wired Networked Devices
  5. Wireless Networked Devices (For future fixture replacement)
  6. The contractor shall provide, install and verify proper operation of all equipment necessary for proper operation of the system as specified herein and as shown on applicable drawings.

## 1.4 DEFINITIONS

- A. BAS: Building automation system.
- B. Low Voltage: As defined in NFPA 70, term for circuits and equipment operating at less than 50 V or for remote-control, signaling, and power-limited circuits.
- C. Scene: The lighting effect created by adjusting several zones of lighting to the desired intensity.
- D. Zone: A luminaire or group of luminaires controlled simultaneously as a single entity. Also known as a "channel."

## 1.5 DESIGN/PERFORMANCE REQUIREMENTS

- A. Digital Relay System shall replace or upgrade existing system utilizing relay panels, controls, and accessories that suit the required lighting and electrical system parameters.
- B. System shall conform to requirements of NFPA 70.

- C. System shall comply with FCC emission standards specified in part 15, sub-part J for commercial and residential application.
- D. System shall be listed under UL sections 916 and/or 508.

#### 1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Catalog sheets and specifications.
  - 2. Ratings, configurations, standard wiring diagrams, dimensions, colors, service condition requirements, and installed features.
  - 3. Storage and handling requirements and recommendations.
  - 4. Installation instructions.
- B. Shop Drawings: Detail assemblies of standard components, custom assembled for specific application on Project. Indicate dimensions, weights, arrangement of components, and clearance and access requirements.
  - 1. Include elevation views of front panels of control and indicating devices and control stations.
  - 2. Include diagrams for power, signal, and control wiring.
  - 3. Address Drawing: Reflected ceiling plan and floor plans, showing connected luminaires, address for each luminaire, and luminaire groups. Base plans on construction plans, using the same legend, symbols, and schedules.
  - 4. Point List and Data Bus Load: Summary list of all control devices, sensors, ballasts, and other loads. Include percentage of rated connected load and device addresses.
  - 5. Wire Termination Diagrams and Schedules: Coordinate nomenclature and presentation with Drawings and block diagram. Differentiate between manufacturer-installed and field-installed wiring.
  - 6. Block Diagram: Show interconnections between components specified in this Section and devices furnished with power distribution system components. Indicate data communication paths and identify networks, data buses, data gateways, concentrators, and other devices used. Describe characteristics of network and other data communication lines.
- C. Samples for Initial Selection: For master-control stations, partitioned-space master-control stations, wall stations, dimmer cabinets, and faceplates with factory-applied color finishes and technical features.
- D. Samples for Verification: For each type of master-control station, partitioned-space master-control station, wall station, dimmer cabinet, and faceplate with factory-applied color finishes and technical features.

#### 1.7 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.
- B. Sample Warranty: For special warranty.

## 1.8 CLOSEOUT SUBMITTALS

## A. Operation and Maintenance Data

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
  - a. Include approved Shop Drawings and Product Data.
  - b. Include Sequence of Operation, identifying operation for each room or space.
  - c. Include manufacturer's maintenance information.
  - d. Operation and Maintenance Data: Include detailed information on device programming and setup.
  - e. Include startup and test reports.

## 1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

## 1.10 QUALITY ASSURANCE

- A. In addition to items specified in Section 014000 "Quality Requirements" include the following:
  1. Manufacturer Qualifications: Company specializing in manufacturing of centralized and distributed lighting control systems with a minimum of 10 years documented experience.
  2. Installer Qualifications: Company certified by the manufacturer and specializing in installation of networked lighting control products with minimum three years documented experience.
  3. System Components: Demonstrate that individual components have undergone quality control and testing prior to shipping. System electrical components shall be listed or recognized by a nationally recognized testing laboratory (e.g., UL, ETL, or CSA) and shall be labeled with required markings as applicable. All components and the manufacturing facility where product is manufactured must be RoHS compliant.
- B. Installation and Startup Qualifications
  1. System startup shall be performed by qualified personnel approved or certified by the manufacturer.
- C. Service and Support Requirements
  1. Phone Support: Toll free technical support shall be available.
  2. Remote Support: The bidder will offer 1yr of remote support.
  3. Onsite Support: The bidder shall offer onsite support that is billable at whole day rates.
  4. Service Contract: The bidder shall offer a Service Contract that packages phone, remote, and onsite support calls for the project. Response times for each type of support call shall be indicated in the terms of the service contract included in the bid package.
  5. The manufacturer shall make available to the owner new parts, upgrades, and/or replacements available for a minimum of 5 years following installation.

## 1.11 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Do not install equipment until following conditions can be maintained in spaces to receive equipment:
  - 1. Ambient temperature: 32 to 104 degrees F (0 to 40 degrees C).
  - 2. Relative humidity: Maximum 90 percent, non-condensing.
- C. Equipment shall not be subjected to dust, debris, moisture, or temperature and humidity conditions exceeding the requirements indicated above or as marked on the product, at any point prior to installation.
- D. Only properly rated equipment and enclosures, installed per the manufacturer's instructions, may be subjected to dust and moisture following installation.
- E. Store products in a clean, dry space in original manufacturer's packaging in accordance with manufacturer's written instructions until ready for installation.

## 1.12 PRE-CONSTRUCTION MEETINGS

- A. Convene minimum two weeks prior to commencing Work of this section. Meeting to be attended by Contractor, Architect, system installer, factory authorized manufacturer's representative, and representative of all trades related to the system installation.
- B. Review installation procedures and coordination required with related Work and the following:
  - 1. Confirm the location and mounting of all devices, with special attention to placement of switches, dimmers, and any sensors.
  - 2. Review the specifications for low voltage control wiring and termination.
  - 3. Discuss the functionality and configuration of all products, including sequences of operation, per design requirements.
  - 4. Discuss requirements for integration with other trades
- C. Inspect and make notes of job conditions prior to installation:
  - 1. Record minutes of the conference and provide copies to all parties present.
  - 2. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.
  - 3. Installation shall not begin until all outstanding issues are resolved to the satisfaction of the Architect.

## 1.13 MAINTENANCE AND OPERATIONAL SERVICES

- A. Remote Access and Enhanced Warranty for Networked Lighting Controls: Provide Manufacturer's Remote Access and Enhanced Warranty for Networked Lighting Controls as follows:
  - 1. Configure to allow the manufacturer remote access to the lighting control system. Configuration includes at a minimum: cellular modem, antenna for the modem, cellular

- service contract and any connections required to enable communication to the specified Network Lighting Control system
2. Remote Access program will automatically trigger a First Year Enhanced Warranty Agreement that will start once lighting control system startup is complete and accepted by the Owner. During this one year period, the Owners authorized site contact can request the manufacturer to check the system for proper operation, and make any programmable changes desired. Manufacturer shall provide a phone number dedicated to customer calls concerning Remote Accessible systems, and a support organization capable of enabling cellular communication to the system for troubleshooting and making requested changes to the system. Any user attempting to request remote support on the system shall be fully verified by the Remote Operations Center (ROC) before providing remote support or making any changes to the system. Systems that allow the modem to be always accessible will not be acceptable. Access must be by a secured VPN connection to the private lighting control network that is completely isolated from the Owner's internal network. Remote access that requires a connection through the Owner's internal network is not acceptable. Manufacturer to identify available response time for a technician to be on site should remote access not be able to resolve the issue.
  3. Remote Access Program may be continued by the Owner after the first year. However, If the Owner does not continue the enhanced warranty the cellular contract will lapse, and all hardware components, while still remaining property of the manufacturer, will remain in site so that they can be re-activated at a later time should the Owner desire.
- B. As a separate add-alternate line item - Provide a Technology-Enabled Service Contract: The manufacturer of the Lighting Control System shall provide a service contract for continued support of the system post installation that combines secure yet immediately accessible remote support with the backup assurance of onsite support when necessary. The coverage levels and features of the selected service contract would apply immediately upon completion of startup and supersede any enhanced remote support offered by the manufacturer during the first year after startup. Manufacturer shall provide an add-alternate line item price for enhanced support services such that client can call and request a technician to be on site within 2 hours for show/event days and within 24 hours for non-show/event days for a period of 5 years.
- 1.14 WARRANTY
- A. The manufacturer shall provide a minimum five-year warranty on all hardware devices supplied and installed.
  - B. The hardware warranty shall cover repair or replacement of one for one for any defective products within the warranty period. 100 percent replacement parts coverage, 100 percent manufacturer labor coverage to troubleshoot and diagnose a lighting issue.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Acuity Brands, Lutron, Wattstopper
- B. Substitutions: Not Permitted

## 2.2 SYSTEM COMPLIANCE

- A. System components shall comply with UL 916 and UL 924 standards where applicable.
- B. System components shall comply with CFR Title 47, Part 15 standards where applicable.
- C. System components shall comply with ISED Canada RSS-247 standards where applicable.
- D. All equipment shall be installed and connected in compliance with NFPA 70.

## 2.3 SYSTEM PERFORMANCE REQUIREMENTS

### A. System Architecture

- 1. System shall have an architecture that is based upon three main concepts: (1) networkable intelligent lighting control devices, (2) standalone lighting control zones using distributed intelligence, (3) optional system backbone for remote, time based and global operation.
- 2. (Future) Intelligent lighting control devices shall have individually addressable network communication capability and consist of one or more basic lighting control components: occupancy sensor, photocell sensor, relay, dimming output, contact closure input, analog 0-10V input, and manual wall station capable of indicating switching, dimming, and/or scene control. Combining one or more of these components into a single device enclosure shall be permissible so as to minimize overall device count of system.
- 3. System must be capable of interfacing directly with networked luminaires such that either low voltage network cabling or wireless RF communication is used to interconnect networked luminaires with control components such as sensors, switches and system backbone (see Control Zone Characteristics sections for each type of network connection, wired or wireless).
- 4. Networked luminaires and intelligent lighting control devices shall support individual (unique) configuration of device settings and properties, with such configuration residing within the networked luminaires and intelligent control devices.
- 5. Lighting control zones consisting of one or more networked luminaires and intelligent lighting control devices shall be capable of providing automatic control from sensors (occupancy and/or photocell) and manual control from local wall stations without requiring connection to a higher-level system backbone; this capability is referred to as “distributed intelligence.”
  - a. Lighting control zones (wired and wireless) of at least 128 devices per zone shall be supported.
- 6. Networked luminaires and intelligent lighting control devices shall have distributed intelligence programming stored in non-volatile memory, such that following any loss of power the lighting control zones shall operate according to their defined default settings and sequence of operations.
- 7. Lighting control zones shall be capable of being networked with a higher-level system backbone to provide time based control, remote control from inputs and/or systems external to the control zone, and remote configuration and monitoring through a software interface.
- 8. The system may include one or more system controllers that provide time-based control. The system controller also provides a means of connecting the lighting control system to a system software interface and building management systems via BACnet/IP or BACnet MS/TP protocol.
- 9. All system devices shall support firmware update, either remotely or from within the applications space, for purposes of upgrading functionality at a later date.

## B. Wired Network Control Zone Characteristics

1. Connections to relay/dimming panels and devices within a wired networked lighting control zone and to backbone components shall be with a single type of low voltage network cable, which shall be compliant with CAT5e specifications or higher. To prevent wiring errors and provide cost savings, the use of mixed types of low voltage network cables shall not be permitted.
2. Devices in an area shall be connected via a “daisy-chain” topology; requiring all individual networked devices to be connected back to a central component in a “hub-and-spoke” topology shall not be permitted, so as to reduce the total amount of network cable required for each control zone.
3. System shall provide the option of having pre-terminated plenum rated low voltage network cabling supplied with hardware so as to reduce the opportunity for improper wiring and communication errors during system installation.
4. Following proper installation and provision of power, all networked devices connected together with low voltage network cable shall automatically form a functional lighting control zone without requiring any type of programming, regardless of the programming mechanism (e.g. software application, handheld remote, pushbutton). The “out of box” default sequence of operation is intended to provide typical sequence of operation so as to minimize the system startup and programming requirements and to also have functional lighting control operation prior to system startup and programming.
5. Once software is installed, system shall be able to automatically discover all connected devices without requiring any provisioning of system or zone addresses.
6. All networked devices shall have the ability to detect improper communication wiring and blink its LED in a specific cadence as to alert installation/startup personnel.
7. Networked control devices intended for control of egress and/or emergency light sources shall not require the use of additional, externally mounted UL924 shunting and/or 0-10V disconnect devices, so as to provide a compliant sequence of operation while reducing the overall installation and wiring costs of the system. The following types of wired networked control devices shall be provided for egress and/or emergency light fixtures:
  - a. Low-Voltage power sensing: These devices shall automatically provide 100% light level upon detection of loss of power sensed via the low voltage network cable connection.
  - b. UL924 Listed Line-Voltage power sensing: These devices shall be listed as emergency relays under the UL924 standard, and shall automatically close the load control relay and provide 100% light output upon detection of loss of power sensed via line voltage connection to normal power.
8. Networked luminaires and intelligent lighting control devices located in different areas shall be able to transmit and track information within at least 128 system-wide control zones to support required sequences of operation that may span across multiple areas. Occupancy and photocell commands shall be available across a single controller, and switch commands shall be available across single or multiple controllers. These shall also be referred to as global control zones.
9. Wired networked Wall stations shall provide the follow Scene Control Capabilities:
  - a. Preset Scenes that can activate a specific combination of light levels across multiple local and global channels, as required.
  - b. Profile Scenes that can modify the sequence of operation for the devices in the area (group) in response to a button press. This capability is defined as supporting “Local Profiles” and is used to dynamically optimize the occupant experience and lighting energy usage. Wall stations shall be able to manually start and stop Local Profiles, or the local profile shall be capable of ending after a specific duration of time between 5 minutes and 12 hours. Parameters that shall be configurable and assigned

to a Local Profile shall include, but not be limited to, fixture light level, occupancy time delay, response to occupancy sensors (including enabling/disabling response), response to daylight sensors (including enabling/disabling response), and enabling/disabling of wall stations.

- c. 3-way / multi-way control: multiple wall stations shall be capable of controlling the same local and global control zones, so as to support “multi-way” preset scene and profile scene control.

C. Wireless Networked Control Zone Characteristics for Future additions

1. Lighting Control System shall support future planned fixture replacement using wireless communications. Relay system must provide native wireless capability to include future wireless fixtures, power packs, and wall controls retrofits in all areas. It is preferred that the future wireless not utilize the 2.4Ghz, 5Ghz bands or the 800 - 900 MHz communication bands. At this time, these bands are not specifically excluded.
2. Wireless network communication shall support uniform and instant response such that all luminaires in a lighting control zone respond immediately and synchronously in response to a sensor or wall station signal.
3. To support the system architecture requirement for distributed intelligence, wireless network communication shall support communication of control signals from sensors and wall stations to networked luminaires and wireless load control devices, without requiring any communication, interpretation, or translation of information through a backbone device such as a wireless access point, communication bridge or gateway.
4. All wireless communication between lighting control components shall support the following five tiers of security measures.
  - a. Data Encryption
  - b. Firmware Protection
  - c. Tamper-Proof Hardware
  - d. Authenticated User Access
  - e. Mutual Device Authentication
5. Accounting for typical environmental conditions and building construction materials encountered within commercial indoor lighting environments, wireless networked devices shall be capable of communicating to at least 150’ spacing between devices with embedded wireless transceivers under typical site conditions.
6. Wireless networked devices shall have a line-of-sight communication range of at least 1000’ under ideal environmental conditions.

D. System Integration Capabilities

1. The system shall be capable of interfacing with third party building management systems (BMS) to support two-way communication using the industry standard BACnet/IP or BACnet MS/TP protocols. The following system integration capabilities shall be available via BACnet/IP and BACnet MS/TP protocols:
  - a. The system shall support control of individual devices, including, but not limited to, control of relay and dimming output.
  - b. The system shall support reading of individual device status information. The available status will depend on the individual device type and capabilities, which may include but not be limited to, relay state, dimming output, power measurement, occupancy sensor status, and photocell sensor states or readings. All system devices shall be available for polling for devices status.
  - c. The system shall support activation of pre-defined system Global Profiles (see Supported Sequence of Operations for further definition of Global Profile capabilities).



2. The system shall support activation of Global Profiles from third party systems by receiving dry contact closure output signals or digital commands via RS-232/RS-485. (See Supported Sequence of Operations for further definition of Profile and Scene Preset capabilities.)
3. The system shall support activation of demand response levels from Demand Response Automation Servers (DRAS) via the OpenADR 2.0a protocol.

E. Supported Sequence of Operations

1. Control Zones
  - a. Networked luminaires and intelligent lighting control devices installed in an area (also referred to as a group of devices) shall be capable of transmitting and tracking occupancy sensor, photocell sensor, and manual switch information within at least 48 unique control zones to support different and reconfigurable sequences of operation within the area. These shall also be referred to as local control zones.
2. Wall station Capabilities
  - a. Wall stations shall be provided to support the following capabilities:
    - 1) On/Off of a local control zone.
    - 2) Continuous dimming control of light level of a local control zone.
  - b. 3-way / multi-way control: multiple wall stations shall be capable of controlling the same local control zones, so as to support “multi-way” switching and/or dimming control.
3. Occupancy Sensing Capabilities for Future Additions
  - a. Occupancy sensors shall be configurable to control a local zone.
  - b. Multiple occupancy sensors shall be capable of controlling the same local zones. This capability combines occupancy sensing coverage from multiple sensors without consuming multiple control zones.
  - c. System shall support the following types of occupancy sensing sequence of operations:
    - 1) On/Off Occupancy Sensing
    - 2) Partial-On Occupancy Sensing
    - 3) Partial-Off Occupancy Sensing
    - 4) Vacancy Sensing (Manual-On / Automatic-Off)
  - d. On/Off, Partial-On, and Partial-Off Occupancy Sensing modes shall function according to the following sequence of operation:
    - 1) Occupancy sensors shall automatically turn lights on to a designated level when occupancy is detected. To support fine tuning of Partial-On sequences the designated occupied light level shall support at least 100 dimming levels.
    - 2) Occupancy sensors shall automatically turn lights off or to a dimmed state (Partial-Off) when vacancy occurs or if sufficient daylight is detected. To support fine tuning of Partial-Off sequences the designated unoccupied dim level shall support at least 100 dimming levels.
    - 3) To provide additional energy savings the system shall also be capable of combining Partial-Off and Full-Off operation by dimming the lights to a designated level when vacant and then turning the lights off completely after an additional amount of time.
    - 4) Photocell readings, if enabled in the Occupancy Sensing control zone, shall be capable of automatically adjusting the light level during occupied or unoccupied conditions as necessary to further reduce energy usage. Additional requirements and details for photocell sensing capabilities are indicated under Photocell Sensing Capabilities.

- 5) The use of a wall station shall change the dimming level or turn lights off as selected by the occupant. The lights shall optionally remain in this manually-specified light level until the zone becomes vacant; upon vacancy the normal sequence of operation, as defined above, shall proceed.
  - e. Vacancy Sensing mode (also referred to as Manual-On / Automatic-Off) shall function according to the following sequence of operation:
    - 1) The use of a wall station is required turn lights on. The system shall be capable of programming the zone to turn on to either to a designated light level or the previous user light level. Initially occupying the space without using a wall station shall not result in lights turning on.
    - 2) Occupancy sensors shall automatically turn lights off or to a dimmed state (Partial-Off) when vacancy occurs or if sufficient daylight is detected. To support fine tuning of Partial-Off sequences the designated unoccupied dim level shall support at least 100 dimming levels.
    - 3) To provide additional energy savings and an enhanced occupant experience, the system shall also be capable of dimming the lights when vacant and then turning the lights off completely after an additional amount of time.
    - 4) To minimize occupant impact in case the area or zone is still physically occupied following dimming or shutoff of the lights due to detection of vacancy, the system shall support an “automatic grace period” immediately following detection of vacancy, during which time any detected occupancy shall result in the lights reverting to the previous level. After the grace period has expired, the use of a wall station is required to turn lights on.
    - 5) Photocell readings, if enabled in the Occupancy Sensing control zone, shall be capable of automatically adjusting the light level during occupied or unoccupied conditions as necessary to further reduce energy usage. Additional requirements and details for photocell sensing capabilities are indicated under Photocell Sensing Capabilities.
    - 6) At any time, the use of a wall station shall change the dimming level or turn lights off as selected by the occupant. The lights shall optionally remain in this manually-specified light level until the zone becomes vacant; upon vacancy the normal sequence of operation, as defined above, shall proceed.
  - f. To accommodate diverse types of environments, occupancy time delays before dimming or shutting off lights shall be specifiable for control zones between 15 seconds to 2 hours.
4. Photocell Sensing Capabilities (Automatic Daylight Sensing) for Future Additions
    - a. Photocell sensing devices shall be configurable to control a local zone.
    - b. The system shall support the following type of photocell-based control:
      - 1) Continuous Dimming: The control zone automatically adjusts its dimming output in response to photocell readings, such that a minimum light level consisting of both electric light and daylight sources is maintained at the task. The photocell response shall be configurable to adjust the photocell setpoint and dimming rates.
  5. Schedule Capabilities
    - a. System shall support the creation of time schedules for time-of-day override of devices including offsets from dusk and dawn.
    - b. System shall support blink warning and timed extension capabilities. At the end of a scheduled period, the system shall be capable of providing a visible “blink warning” 5 minutes prior to the end of the schedule. Wall stations may be programmed to provide timed overrides that turn the lights on for an additional period of time. Timed override duration shall be programmable for each individual

- device, zone of devices, or customized group of devices, ranging from 5 minutes to 12 hours.
6. Global Profile Capabilities
    - a. The system shall be capable of automatically modifying the sequence of operation for selected devices in response to any of the following: a time-of-day schedule, contact closure input state, manually triggered wired wall station input, RS-232/RS-485 command to wired input device, and BACnet input command. This capability is defined as supporting “Global Profiles” and is used to dynamically optimize the occupant experience and lighting energy usage.
    - b. Global profiles may be scheduled with the following capabilities:
      - 1) Global Profiles shall be stored within and executed from the system controller (via internal timeclock) such that a dedicated software host or server is not required to be online to support automatic scheduling and/or operation of Global Profiles.
      - 2) Global Profile time-of-day schedules shall be capable of being given the following recurrence settings: daily, specific days of week, every “n” number of days, weekly, monthly, and yearly. Lighting control profile schedules shall support definition of start date, end date, end after “n” recurrences, or never ending. Daylight savings time adjustments shall be capable of being performed automatically, if desired.
      - 3) Global Profile Holiday Schedules should follow recurrent settings for specific US holiday dates regardless if they always occur on a specific date or are determined by the day/week of the month.
      - 4) Global Profiles shall be capable of being scheduled to run according to timed offsets relative to sunrise or sunset. Sunrise/sunset times shall be automatically derived from location information using an astronomical clock.
      - 5) Software management interface shall be capable of displaying a graphic calendar view of profile schedules for each control zone.
    - c. System Global Profiles shall have the following additional capabilities:
      - 1) Global Profiles shall be capable of being manually activated directly from the system controller, specially programmed wired input devices, scene capable wired wall stations, and the software management interface.
      - 2) Global Profiles shall be selectable to apply to a single device, zone of devices, or customized group of devices.
      - 3) Parameters that shall be configurable and assigned to a Global Profile shall include, but not be limited to, fixture light level, occupancy time delay, response to occupancy sensors (including enabling/disabling response), response to daylight sensors (including enabling/disabling response), and enabling/disabling of wall stations.
    - d. A backup of Local and Global Profiles shall be stored on the software’s host server such that the Profile backup can be applied to a replacement system controller or wired wall station.
  7. System shall support automated demand response capabilities with automatic reduction of light level to at least three levels of demand response.

## 2.4 SYSTEM SOFTWARE INTERFACES

### A. Management Interface

1. System shall provide a web-based management interface that provides remote system control, live status monitoring, and configuration capabilities of lighting control settings and schedules.
2. Management interface must be compatible with industry-standard web browser clients, including, but not limited to, Microsoft Internet Explorer®, Apple Safari®, Google Chrome®, Mozilla Firefox®.
3. Management interface shall require all users to login with a User Name and Password, and shall support creation of at least 100 unique user accounts.
4. Management interface shall support at least three permission levels for users: read-only, read & change settings, and full administrative system access.
5. Management interface shall be capable of restricting access for user accounts to specific devices within the system.
6. All system devices shall be capable of being given user-defined names.
7. The following device identification information shall be displayed in the Management interface: model number, model description, serial number or network ID, manufacturing date code, custom label(s), and parent network device.
8. Management interface shall be able to read the live status of a networked luminaire or intelligent control device (relay/dimmer) and shall be capable of displaying luminaire on/off status, dim level, power measurement, device temperature, PIR occupancy sensor status, microphonic occupancy sensor status, remaining occupancy time delay, photocell reading, and active Profiles.
9. Management interface shall be able to read the current active settings of a networked luminaire or intelligent control device and shall be capable of displaying dimming trim levels, occupancy sensor and photocell enable/disable, occupancy sensor time delay and light level settings, occupancy sensor response (normal or vacancy), and photocell setpoints and transition time delays.
10. Management interface shall be able to change the current active settings and default settings for an individual networked luminaire or intelligent control device.
11. Management interface shall be capable of applying settings changes for a zone of devices or a group of selected devices using a single “save” action that does not require the user to save settings changes for each individual device.
12. A printable network inventory report shall be available via the management interface.
13. A printable report detailing all system profiles shall be available via the management interface.
14. All sensitive information stored by the software shall be encrypted.
15. All system software updates must be available for automatic download and installation via the internet.

## 2.5 VISUALIZATION AND PROGRAMMING INTERFACES

- A. System shall provide a web-based visualization interface that displays graphical floorplan.
- B. Graphical floorplan shall offer the following types of system visualization:
  1. A master graphic of the entire building, by area, showing each relay panel installed in the project. In addition to overall building plans by floor, Manufacturer to account for the following enlarged floor plans
    - a. Halls A-E with the option to zoom in to specific hall
    - b. Halls A3-B3 with the option to zoom in to specific hall
    - c. Meeting Rooms (310, 320, 322, 330, 332, 340, 342, 350, 351, 352, 360, 361, 362, 370, 371, 372, 380, 381, and 382) with Option to zoom in to specific meeting room

- d. Ballroom A-C with option to zoom in to specific Ballroom
- e. General Assembly
- 2. Graphics screens shall be floor plan based, with an overall home screen and zoomed in detail screens of individual exhibit halls. Design shall be similar to graphics of existing system, with input from owner/operators as to changes they would like in how it operates. Over-ride capability to match existing relay system.

This shall include, but not be limited to, the following:

- a. Controls embedded light fixtures
- b. Controls devices not embedded in light fixtures
- c. Daylight Sensors
- d. Occupancy Sensors
- e. Wall Switches and Dimmers
- f. Scene Controllers
- g. Networked Relays
- h. Wired Bridges
- i. System Controllers
- j. Wired Relay Panels
- k. Group outlines
- 3. Group Only Option - A master graphic of the entire building, by floor, showing only control groups outlined.
- 4. Allow for pan and zoom commands so smaller areas can be displayed on a larger scale simply by panning and zooming each floor's master graphic.
- 5. A mouse click on any control device shall display the following information (as applicable):
  - a. The device catalog number.
  - b. The device name and custom label.
  - c. Device diagnostic information.
  - d. Information about the device status or current configuration is available with an additional mouse click.

## 2.6 SYSTEM BACKBONE AND SYSTEM INTEGRATION EQUIPMENT

- A. System Controller
- B. System Controller shall be multi-tasking, real-time digital control processor consisting of modular hardware with plug-in enclosed processors, communication controllers, and power supplies.
- C. System Controller shall have 32-bit microprocessor operating at a minimum of 1 GHz.
- D. System Controller shall have minimum of 512MB memory, with a minimum of 4GB non-volatile flash, to support its own operating system and databases.
- E. System Controller shall perform the following functions:
  - 1. Time-based control of downstream wired and wireless network devices.
  - 2. Linking into an Ethernet network.
  - 3. Integration with Building Management Systems (BMS) and Heating, Ventilation and Air Conditioning (HVAC) equipment.
  - 4. Connection to various software interfaces, including management interface, historical database and analytics interface, and visualization interface.

- F. System Controller shall have an integral web server to support configuration, diagnostics and hosting of software interfaces.
- G. Device shall have option for a graphical touch screen to support configuration and diagnostics.
- H. Device shall have three RJ-45 networked lighting control ports for connection to any of the following:
  - 1. The graphical touch screen
  - 2. Wired communication bridges
  - 3. Direct connection to networked wired luminaires and intelligent lighting control devices (up to 128 total devices per port)
- I. Device shall automatically detect all networked devices connected to it.
- J. Device shall have an internal time clock used for astronomical and standard schedules.
- K. Device shall have 2 switched RJ-45 10/100 BaseT Ethernet ports for local area network (LAN) connection.
  - 1. Ethernet connection shall support daisy chain wiring to other lighting control system LAN devices.
  - 2. Ethernet connection shall support IPv4 and shall be capable of using a dedicated static or DHCP assigned IP address.
- L. Device shall have 2 x USB 2.0 Expansion ports for 802.11 Wi-Fi Adapter enabling wireless connectivity including:
  - 1. Hot Spot
  - 2. Access Point
  - 3. Client
- M. Each System Controller shall be capable of managing and operating at least 750 networked devices (wired or wireless).
  - 1. Multiple System Controllers may be networked together via LAN connection to scale the system up to 20,000 networked devices.
- N. System Controller shall support BACnet/IP and BACnet MS/TP protocols to directly interface with BMS and HVAC equipment without the need for additional protocol translation gateways.
  - 1. BACnet MS/TP shall support 9600 to 115200 baud rate.
  - 2. System Controller shall be BACnet Testing Laboratory (BTL listed) using Device Profile BACnet Building Controller (B-BC) with outlined enhanced features.
- O. System controller shall contain a “FIPS 140-2 Level 1 Inside” cryptographic module.
- P. System controller shall support RESTful API control of BACnet objects, user management, date and time, and file management.
- Q. System controller shall be available within a NEMA 1 enclosure with Class 1 and Class 2 separation
  - 1. Enclosure shall support power input power of 120-277VAC, or optional 347

## 2.7 WIRED NETWORKED DEVICES

### A. Wired Networked Digital Key Switches

1. Devices shall recess into single-gang switch box and fit a standard GFI opening.
2. Communication and low voltage power shall be delivered to each device via standard low voltage network cabling with RJ-45 connectors.
3. All switches shall have the ability to detect when it is not receiving valid communication and blink its LED in a pattern to visually indicate a potential wiring issue.
4. Devices shall have LED user feedback to provide indication of on/off status of the programmed lights or scene, as well as indication of device power.
5. Digital key switches shall support the following device options:
  - a. Control Types Supported:
    - 1) On/Off
    - 2) On/Off/Dimming
    - 3) Preset Level Scene Type
    - 4) Reprogramming of other devices within daisy-chained zone so as to implement user selected lighting scene. This shall support manual start/stop from the scene controller, or optionally programmed to automatically end after a user selectable duration between 5 minutes and 12 hours.
    - 5) Selecting a lighting profile to be run by the system's upstream controller so as to implement a selected lighting profile across multiple zones. This shall support manual start/stop from the scene controller, or optionally programmed to automatically end after a user selectable duration between 5 minutes and 12 hours.
  - b. Colors: Ivory, White, Light Almond, Stainless Steel

### B. Wired Networked Auxiliary Input / Output (I/O) Devices

1. Devices shall be plenum rated and be inline wired, screw mountable, or have an extended chase nipple for mounting to a 1/2" knockout.
2. Communication and low voltage power shall be delivered to each device via standard low voltage network cabling with RJ-45 connectors.
3. Auxiliary Input/Output Devices shall be specified as an input or output device with the following options:
  - a. Contact closure or Pull High input
    - 1) Input shall be programmable to support maintained or momentary inputs that can activate local or global scenes and profiles, activate lights at a preconfigured level, ramp light level up or down, or toggle lights on/off.
  - b. 0-10V analog input
    - 1) Input shall be programmable to function as a daylight sensor.
  - c. RS-232/RS-485 digital input
    - 1) Input supports activation of up to 4 local or global scenes and profiles, and on/off/dimming control of up to 16 local control zones.
  - d. 0-10V dimming control output, capable of sinking up to 20mA of current
    - 1) Output shall be programmable to support all standard sequence of operations supported by system.
  - e. Digital control output via EldoLED LEDcode communication
    - 1) Output shall be programmable to support light intensity control, as well as optional correlated color temperature (CCT) control, of the connected luminaire.

### C. Wired Networked Relay and Dimming Panel

1. Relay and dimming panel shall be available with 4, 8, 12, 16, 24, 32, 40 or 48 individual relays per panel, with an equal number of individual 0-10V dimming outputs.
  2. Optional Field Configurable Relays (FCR) used shall have the following required properties:
    - a. Configurable in the field to operate with single-, double-, or triple-pole relay groupings.
    - b. Configurable in the field to operate with normally closed or normally open behavior.
    - c. Provides visual status of current state and manual override control of each relay.
    - d. Listed for the following minimum ratings:
      - 1) 40A @ 120-480VAC Ballast
      - 2) 16A @ 120-277VAC Electronic
      - 3) 20A @ 120-277VAC Tungsten
      - 4) 20A @ 48VDC Resistive
      - 5) 2HP @ 120VAC
      - 6) 3HP @ 240-277VAC
      - 7) 65kA SCCR @ 480VAC
  3. 0-10 dimming outputs shall support a minimum of 100mA sink current per output.
  4. Relay and dimming outputs shall be individually programmable to support all standard sequence of operations as defined in this specification.
  5. Panel shall be UL924 listed for control of emergency lighting circuits.
  6. Panel shall power itself from an integrated 120-277 VAC or optional 347VAC supply.
  7. Panel shall provide a configurable low-voltage sensor input with the following properties:
    - a. Configurable to support any of the following input types:
      - 1) Indoor Photocell
      - 2) Outdoor Photocell
      - 3) Occupancy Sensor
      - 4) Contact Closure
    - b. Low voltage sensor input shall provide +24VDC power for the sensor so that additional auxiliary power supplies are not required.
    - c. Sensor input supports all standard sequence of operations as defined in this specification.
  8. Panel shall provide a contact closure input for each group of 8-relays that acts as a panel override to activate the normally configured state of all relays (i.e., normally open or normally closed) in the panel. This input is intended to provide an interface to alarm systems, fire panels, or BMS system to override the panel.
  9. Panel shall supply current limited low voltage power to other networked devices connected via low voltage network cable.
  10. Panel shall be available with NEMA 1 rated enclosure with the following mounting and cover options:
    - a. Surface-mounted for all panel sizes
    - b. Flush-mounted for up to 16 relay panel sizes
    - c. Screw-fastened for up to 16 relay panel sizes
    - d. Hinged cover with keyed lock for all panel sizes
  11. Surface-mounted screw cover options for 8 and 16 relay panel sizes shall be plenum rated
  12. Panel shall be rated from 0-50C for 8 and 16 enclosure sizes, and 0-45C for 32 and 48 enclosure sizes.
- D. Wired Networked Communication Bridge
1. Device shall surface mount to a standard 4" x 4" square junction box.
  2. Device shall have 8 RJ-45 ports for connection to lighting control zones (up to 128 devices per port), additional network bridges, and System Controller.



3. Device shall be capable of aggregating communication from multiple lighting control zones for purposes of minimizing backbone wiring requirements back to System Controller.
4. Device shall be powered with Class 2 low voltage supplied locally via a directly wired power supply, or powered via low voltage network connections from powered lighting control devices (e.g. power packs).
5. Wired Bridge shall be capable of redistributing power from its local supply and connected lighting control zones with excess power to lighting control zones with insufficient local power. This architecture also enables loss of power to a particular area to be less impactful on network lighting control system.

## 2.8 CONDUCTORS AND CABLES

- A. Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
- B. Classes 2 and 3 Control Cable: Multiconductor cable with stranded-copper conductors. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
- C. Class 1 Control Cable: Multiconductor cable with stranded-copper conductors. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Verify that required pre-construction meeting specified in Part 1 of this specification has been completed, recorded meeting minutes have been distributed and all outstanding issues noted have been resolved prior to the start of construction. Do not begin installation until measurements have been verified and work areas have been properly prepared.
- B. The successful bidder will perform an audit of the existing relay system to verify quantity of relays and panels and to verify wiring paths are suitable for new control cables. Screenshots of existing graphics to be taken as a template for new graphic interface.
  - 1.
- C. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.2 INSTALLATION

- A. Comply with NECA 1.
- B. Install system in accordance with the approved system shop drawings and manufacturer's instructions.

- C. The successful bidder shall install and connect the networked lighting control system components according to the manufacturer's installation instructions, wiring diagrams, the project submittals and plans specifications.
- D. The successful bidder is required to coordinate with the owner's representative to secure all required network connections to the owner's IT network infrastructure.
  - 1. The bidder shall provide to the owner's representative all network infrastructure requirements of the networked lighting control system.
  - 2. The bidder shall provide to the manufacturer's representative all necessary contacts pertaining to the owner's IT infrastructure, to ensure that the system is properly connected and started up.
- E. Wiring Method:
  - 1. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
  - 2. Install all room/area devices using manufacturer's factory-tested twisted pair cable with pre-terminated RJ-45 connectors.
    - a. If pre-terminated cable is not used for room/area wiring, each field-terminated cable shall be tested following installation and testing results submitted to the Manufacturer's Representative for approval prior to proceeding with the Work.
  - 3. Low voltage wiring topology must comply with manufacturer's specifications.
  - 4. Route network wiring as indicated on the Drawings as closely as possible. Document final wiring location, routing and topology on as built drawings.
  - 5. Minimum conduit size shall be 3/4 inch (18 mm).
- F. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.
- G. Size conductors according to lighting control device manufacturer's written instructions unless otherwise indicated.
- H. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.
- I. Install dimmer cabinets for each zone.

### 3.3 IDENTIFICATION

- A. Comply with requirements in Section 260553 "Identification for Electrical Systems" for identifying components and power and control wiring.
- B. Label each dimmer module with a unique designation.
- C. Label each scene control button with approved scene description.
- D. All line voltage connections shall be tagged to indicate circuit and switched legs.

### 3.4 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections. Notify Architect and Manufacturer in writing a minimum of 3 weeks prior to system start-up and testing.
- B. Tests and Inspections: Manufacturer's service representative shall perform the following inspections and prepare reports.
  - 1. Verify Class I and II wiring connections are terminated properly by validating system performance.
  - 2. Set IP addresses and other network settings of system front end hardware per facilities IT instructions.
  - 3. Verify / complete task programming for all switches, dimmers, time clocks, and sensors.
  - 4. Verify that the control of each space complies with the Sequence of Operation.
  - 5. Correct any system issues and retest.
- C. Test Labeling: After satisfactory completion of tests and inspections, apply a label to tested components indicating test results, date, and responsible agency and representative.
- D. Provide a report in table format with drawings, or using a software file that can be opened in the manufacturer's system software including each room or space that has lighting control installed. Indicate the following:
  - 1. Date of test or inspection.
  - 2. Loads per space, or Fixture Address identification.
  - 3. Quantity and Type of each device installed
  - 4. Reports providing each device's settings.
  - 5. Record defective materials and workmanship and unsatisfactory test results.
  - 6. Record repairs and adjustments.

### 3.5 TESTING

- A. The successful bidder shall be responsible for testing of all low voltage network cable included in the bid. Bidder is responsible for verification of the following minimum parameters:
  - 1. Wire Map (continuity, pin termination, shorts and open connections, etc.)
  - 2. Length
  - 3. Insertion Loss
- B. Test all devices to ensure proper communication.
- C. Calibrate all sensor time delays and sensitivity to guarantee proper detection of occupants and energy savings. Adjust time delay so that controlled area remains lighted while occupied.
- D. Post start-up tuning - Adjust sensor time delays and sensitivities to meet the Owner's requirements 30 days from beneficial occupancy. Provide a detailed report to the Architect / Owner of post start-up activity.
- E. Tighten all panel Class I conductors from both circuit breaker and to loads to torque ratings as marked on enclosure UL label.

### 3.6 DOCUMENTATION

- A. The installing contractor shall be responsible for documenting installed location of all networked devices, including networked luminaires. This includes responsibility to provide as-built plan drawing showing device address barcodes corresponding to locations of installed equipment.
- B. The installing contractor is also responsible for the following additional documentation to the manufacturer's representative if visualization / graphical floorplan software is provided as part of bid package:
  - 1. As-Built floor plan drawings showing device address locations required above. All documentation shall remain legible when reproducing\scanning drawing files for electronic submission.
  - 2. As-Built electrical lighting drawings (reflected ceiling plan) in PDF and CAD format. Architectural floor plans shall be based on as-built conditions.
- C. Provide written or computer-generated documentation on the configuration of the system including room by room description including:
  - 1. Sensor parameters, time delays, sensitivities, and daylighting setpoints.
  - 2. Sequence of operation, (e.g. manual ON, Auto OFF. etc.)
  - 3. Load Parameters (e.g. blink warning, etc.)

### 3.7 SOFTWARE SERVICE AGREEMENT

- A. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for two years.
- B. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.
  - 1. Upgrade Notice: At least 30 days to allow Owner to schedule and access the system and to upgrade computer equipment if necessary.

### 3.8 DEMONSTRATION AND TRAINING

- A. Before Substantial Completion, arrange and provide 8 hours of Owner instruction period to designated Owner personnel to be broken up in either a one day 8 hour session or two day 4 hour sessions. Set-up, starting of the lighting control system and Owner instruction includes:
  - 1. Confirmation of entire system operation and communication to each device.
  - 2. Confirmation of operation of individual relays, switches, and sensors.
  - 3. Confirmation of system Programming, photocell settings, override settings, etc.
  - 4. Provide training to cover installation, programming, operation, and troubleshooting of the lighting control system.

3.9 PRODUCT SUPPORT AND SERVICE

- A. Factory telephone support shall be available at no cost to the Owner following acceptance. Factory assistance shall consist of assistance in solving application issues pertaining to the control equipment.

END OF SECTION 260933

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## SECTION 262726 - WIRING DEVICES

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section Includes:
  1. Toggle switches, 120/277 V, 20 A.
  2. Decorator-style devices, 20 A.
  3. Occupancy sensors.
  4. Wall-box dimmers.
  5. Wall plates.
  6. Floor service fittings.

## 1.3 DEFINITIONS

- A. BAS: Building automation system.
- B. EMI: Electromagnetic interference.
- C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- D. RFI: Radio-frequency interference.

## 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

## 1.5 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

## 1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

## PART 2 - PRODUCTS

## 2.1 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Comply with NFPA 70.
- C. RoHS compliant.
- D. Comply with NEMA WD 1.
  - 1. Cord and Plug Sets: Match equipment requirements.
- E. Device Color:
  - 1. Wiring Devices Connected to Normal Power System: White unless otherwise indicated or required by NFPA 70 or device listing.
  - 2. Wiring Devices Connected to Essential Electrical System: Red.
- F. Wall Plate Color: For plastic covers, match device color.
- G. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.
  - 1.

## 2.2 TOGGLE SWITCHES, 120/277 V, 20 A

- A. Key-Operated, Single-Pole Switches, 120/277 V, 20 A:
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    - a. Hubbell Incorporated; Wiring Device-Kellems.
    - b. Leviton Manufacturing Co., Inc.
    - c. Pass & Seymour/Legrand (Pass & Seymour).
  - 2. Description: Factory-supplied key in lieu of switch handle.
  - 3. Standards: Comply with UL 20 and FS W-S-896.

## 2.3 DECORATOR-STYLE DEVICES, 20 A

- 1.
- B. Decorator Single-Pole Switches, 120/277 V, 20 A:
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:



- a. Hubbell Incorporated; Wiring Device-Kellems.
  - b. Leviton Manufacturing Co., Inc.
  - c. Pass & Seymour/Legrand (Pass & Seymour).
2. Comply with UL 20.

## 2.4 OCCUPANCY SENSORS

### A. Wall Switch Sensor Light Switch, Dual Technology:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Hubbell Incorporated; Wiring Device-Kellems.
  - b. Leviton Manufacturing Co., Inc.
  - c. Pass & Seymour/Legrand (Pass & Seymour).
  - d. Wattstopper.
  - e. Lutron Electronics Co., Inc.
2. Description: Switchbox-mounted, combination lighting-control sensor and conventional switch lighting-control unit using dual (ultrasonic and passive infrared) technology.
3. Standards: Comply with UL 20.
4. Rated 960 W at 120 V ac for tungsten lighting, 10 A at 120 V ac or 10 A at 277 V ac for fluorescent or LED lighting, and 1/4 hp at 120 V ac.
5. Adjustable time delay of 20 minutes.
6. Able to be locked to Automatic-On mode.
7. Connections: Provisions for connection to BAS.

## 2.5 DIMMERS

### A. Wall-Box Dimmers:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  - a. Hubbell Incorporated; Wiring Device-Kellems.
  - b. Leviton Manufacturing Co., Inc.
  - c. Lutron Electronics Co., Inc.
  - d. Pass & Seymour/Legrand (Pass & Seymour).
2. Description: Modular, full-wave, solid-state dimmer switch with integral, quiet on-off switches, with audible frequency and EMI/RFI suppression filters.
3. Control: Continuously adjustable slider; with single-pole or three-way switching.
4. Standards: Comply with UL 1472.
5. Fluorescent Lamp Dimmer Switches: Modular; compatible with dimmer ballasts; trim potentiometer to adjust low-end dimming; dimmer-ballast combination capable of consistent dimming with low end not greater than 20 percent of full brightness.

6. LED Lamp Dimmer Switches: Modular; compatible with LED lamps; trim potentiometer to adjust low-end dimming; capable of consistent dimming with low end not greater than 20 percent of full brightness.

## 2.6 WALL PLATES

- A. Single Source: Obtain wall plates from same manufacturer of wiring devices.
- B. Single and combination types shall match corresponding wiring devices.
  1. Plate-Securing Screws: Metal with head color to match plate finish.
  2. Material for Finished Spaces: Smooth, high-impact nylon, or satin-finished, Type 302 stainless steel 0.04-inch-thick for Essential Electrical System.
  3. Material for Unfinished Spaces: Galvanized steel.
- C. Wet-Location, Weatherproof While-In-Use Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover. Hubbell WP26E vertical, WP26EH horizontal.

## 2.7 FLOOR SERVICE FITTINGS

- A. Above-Floor Service Fittings:
  1. Description: Type: Modular, above-floor, dual-service units suitable for wiring method used.
  2. Compartments: Barrier separates power from voice and data communication cabling.
  3. Service Plate: Rectangular, die-cast aluminum with satin finish.
  4. Data Communication Outlet: Blank cover with bushed cable opening.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.
- B. Coordination with Other Trades:
  1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes, and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
  2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
  3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
  4. Install wiring devices after all wall preparation, including painting, is complete.
- C. Conductors:

1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall comply with NFPA 70, Article 300, without pigtails.
4. Existing Conductors:
  - a. Cut back and pigtail, or replace all damaged conductors.
  - b. Straighten conductors that remain and remove corrosion and foreign matter.
  - c. Pigtailling existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:

1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

F. Dimmers:

1. Install dimmers within terms of their listing.
2. Verify that dimmers used for fan-speed control are listed for that application.
3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device, listing conditions in the written instructions.

### 3.2 IDENTIFICATION

- A. Comply with Section 260553 "Identification for Electrical Systems."

### 3.3 FIELD QUALITY CONTROL

- A. Test Instruments: Use instruments that comply with UL 1436.

- B. Perform the following tests and inspections:
  - 1. Test Instruments: Use instruments that comply with UL 1436.
- C. Wiring device will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

END OF SECTION 262726

APPENDIX A      SCHEDULE DOCUMENTATION EXPORT FROM EXISTING LIGHTING  
CONTROLS FRONT END

Schedule Documentation									
George R. Brown Convention Center - George R. Brown Convention Center									
						Schedule	Description	Occupancy Time	
1						Sunset - Sunrise		03:01	
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Holiday 1	Holiday 2	Holiday 3
Sunrise +00:30	Sunrise +00:30	Off	Sunrise +00:30	Off	Sunrise +00:30	Off	Sunrise +00:30	Off	Sunrise +00:30
Sunset -00:30	Sunset -00:30	On	Sunset -00:30	On	Sunset -00:30	On	Sunset -00:30	On	Sunset -00:30
Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
On	On	On	On	On	On	On	On	On	On
Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
On	On	On	On	On	On	On	On	On	On
Normal	Alternate								
LCP 1: Panel PHA - Central Plant (Was MODs 2 & 3) Relay 1-1: Lot 5 Far South - E Hall (Old 2-1) Relay 1-2: Mod -2 relay 2 Relay 1-3: Mod -2 relay 3 Relay 1-4: HPD Pkg Lot Pole Lts (Old 2-4) {PHA} Relay 1-5: Lot 5 South (Old 2-5) {PHA} Relay 1-6: Lot 5 Far North/HPD (Old 2-6) Relay 1-7: North/South Drive Up Ramps (Old 2-7) Relay 1-8: 3rd Lvl Ramp High Lights - BR/GA (Old 2-8) Relay 1-9: 3rd Lvl Ramp High Lights - Hall G (Old 2-9) Relay 1-10: Mod -2 relay 10 Ramp (?) Relay 1-17: Mod -3 relay 1 {PHA #8} Relay 1-18: Lot 5 North - (Old 3-2) {PHA #1,3} Relay 1-19: Mod -3 relay 3 Relay 1-20: Mod -3 relay 4 Relay 1-21: Mod -3 relay 5 Relay 1-22: Mod -3 relay 6 Relay 1-23: Lots 3 & 4 - (Old 3-7) LCP 5: Panel TB1 - Ticket Booth D (Was MODs 10 & 11) Relay 5-1: Canopy D (Old 10/1) {TB1-3} Relay 5-2: Canopy D (Old 10/2) {TB1-5} Relay 5-5: Canopy D (Old 10/5) {TB1-11} Relay 5-6: Canopy D (Old 10/6) {TB1-13} Relay 5-7: Canopy D (Old 10/7) {TB1-15} Relay 5-8: Canopy D (Old 10/8) {TB1-17} Relay 5-9: Canopy D (Old 10/9) {TB1-19} Relay 5-10: Canopy D (Old 10/10) {TB1-21} Relay 5-11: Canopy D (Old 10/11) {TB1-23} Relay 5-12: Canopy D (Old 10/12) {TB1-25} Relay 5-14: Canopy D (Old 10/14) {TB1-27} Relay 5-15: Canopy D (Old 10/15) {TB1-28} Relay 5-17: Flagpole (Out of Svc){Old 11/1} {12HD-25} LCP 7: Panel TB3 - Ticket Booth B (Was MOD 14) Relay 7-1: Canopy B (Old 14/1) {TB3-3} Relay 7-2: Canopy B (Old 14/2) {TB3-5} Relay 7-3: Canopy B (Old 14/3) {TB3-7} Relay 7-4: Canopy B (Old 14/4) {TB3-11} Relay 7-5: Canopy B (Old 14/5) {TB3-13} Relay 7-6: Canopy B (Old 14/6) {TB3-15} Relay 7-7: Canopy B (Old 14/7) {TB3-17} Relay 7-8: Canopy B (Old 14/8) {TB3-19} Relay 7-9: Canopy B (Old 14/9) {TB3-21} Relay 7-10: Canopy B (Old 14/10) {TB3-23} Relay 7-13: Canopy B (Old 14/13) {TB3-27} Relay 7-15: Flagpole B (Old 14/15) {12HG-25} LCP 11: Panel 25HC - 2R Boiler Room (Was MODs 22 & 23) Relay 11-1: Dock D (Old 22/1) {25HC-2} Relay 11-2: Dock D (Old 22/2) {25HC-4} Relay 11-3: Dock D (Old 22/3) {25HC-6} Relay 11-4: Dock D (Old 22/4) {25HC-8} Relay 11-5: Dock D (Old 22/5) {25HC-10} Relay 11-6: Dock C (Old 22/6) {25HC-12} Relay 11-7: Dock C (Old 22/7) {25HC-14} Relay 11-8: Dock C (Old 22/8) {25HC-16} Relay 11-9: Dock C (Old 22/9) {25HC-18} Relay 11-10: Dock C (Old 22/10) {25HC-20}									

Relay 11-16: C Dock Soffit Lts (Old 22/16) {25LC-26}  
 Relay 11-24: D Dock Nt Lts (Old 23/8) {25HC-43}  
 Relay 11-25: C Dock Nt Lts (Old 23/9) {25HC-45}  
 Relay 11-26: D Dock ??? Soffit Lts (Old 23/10) {25LC-24}  
 Relay 11-27: D Dock Spot Lts (Old 23/11) {25LC-1}  
 Relay 11-28: D Dock Spot Lts (Old 23/12) {25LC-3}  
 Relay 11-29: D Dock Spot Lts (Old 23/13) {25LC-5}  
 Relay 11-30: C Dock Spot Lts (Old 23/14) {25LC-7}  
 Relay 11-31: C Dock Spot Lts (Old 23/15) {25LC-9}  
 Relay 11-32: C Dock Spot Lts (Old 23/16) {25LC-11}  
 LCP 12: Panel 25HD - 2R Kitchen Warehouse (Was MOD 24)  
 Relay 12-6: Dock B (Old 24/6) {25HD-11}  
 Relay 12-7: Dock B (Old 24/7) {25HD-13}  
 Relay 12-8: Dock B (Old 24/8) {25HD-15}  
 Relay 12-9: Dock B (Old 24/9) {25HD-17}  
 Relay 12-10: Dock B (Old 24/10) {25HD-19}  
 Relay 12-13: B Dock Nt Lts (Old 24/13) {25HD-22}  
 Relay 12-14: B Dock Spot Lts (Old 24/14) {25LD-2}  
 Relay 12-15: B Dock Spot Lts (Old 24/15) {25LD-4}  
 Relay 12-16: B Dock Spot Lts (Old 24/16) {25LD-6}  
 LCP 14: Panel 35HA - Front Hall D (Was MOD 28)  
 Relay 14-2: D Stairwells E/W (Old 28/2) {35HA-34}  
 Relay 14-3: D Stairwells E/W (Old 28/3) {35HA-36}  
 LCP 15: Panel 35HB - Front Hall C (Was MODs 30 & 31)  
 Relay 15-30: C Stairwells E/W (Old 31/14) {35HB-32}  
 Relay 15-31: C Stairwells E/W (Old 31/15) {35HB-34}  
 LCP 16: Panel 35HC - Front Hall B (Was MODs 32 & 33)  
 Relay 16-30: B Stairwells E/W (Old 33/14) {35HC-32}  
 Relay 16-31: B Stairwells E/W (Old 33/15) {35HC-34}  
 LCP 27: Panel 83HD - Rear Gen Assy (Was MOD 54)  
 Relay 27-8: GA Dock (Old 54/8) {83HD-2}  
 Relay 27-9: GA Dock (Old 54/9) {83HD-4}  
 Relay 27-15: Mod -54 relay 15  
 LCP 28: Panel 83HF - Rear Ballrooms (Was MOD 56)  
 Relay 28-9: BR Dock (Old 56/9) {83HF-1}  
 Relay 28-10: BR Dock (Old 56/10) {83HF-3}  
 Relay 28-11: BR Dock (Old 56/11) {83HF-15}  
 Relay 28-12: BR Dock (Old 56/12) {83HF-17}  
 LCP 30: Panel 83HG - Rear Hall B3 (Was MOD 60)  
 Relay 30-1: Dock G (Old 60/1) {83HG-31}  
 Relay 30-2: Dock G (Old 60/2) {83HG-33}  
 Relay 30-3: Dock G (Old 60/3) {83HG-35}  
 Relay 30-4: Dock G (Old 60/4) {83HG-37}  
 Relay 30-5: Dock G (Old 60/5) {83HG-39}  
 Relay 30-6: Dock G (Old 60/6) {83HG-41}  
 LCP 203: LCP-35RPA-2 - Rear Hall A  
 Relay 203-5: LOADING DOCK LIGHTING (EMERG) NE +0 {35EH2A-9}  
 Relay 203-6: LOADING DOCK LIGHTING NE +0 {35H2AA-1}  
 Relay 203-7: LOADING DOCK LIGHTING NE +0 {35H2AA-3}  
 Relay 203-8: LOADING DOCK LIGHTING NE +0 {35H2AA-5}  
 Relay 203-9: LOADING DOCK LIGHTING NE +0 {35H2AA-2}  
 Relay 203-10: LOADING DOCK LIGHTING NE +0 {35H2AA-4}  
 LCP 205: LCP-35RPB - Front Hall A  
 Relay 205-45: CANOPY LIGHTING +0 NW {35H2BB-5}  
 LCP 208: LCP-83RPA-2 - Rear Hall A3  
 Relay 208-1: LOADING DOCK LIGHTING (EMERG) NE +51 {83EH2A-7}  
 Relay 208-2: LOADING DOCK LIGHTING NE +51 {83H2AA-4}  
 Relay 208-3: LOADING DOCK LIGHTING NE +51 {83H2AA-6}  
 Relay 208-4: LOADING DOCK LIGHTING NE +51 {83H2AA-8}

Relay 208-5: LOADING DOCK LIGHTING NE +51 {83H2AA-10}  
 Relay 208-7: ROOF TOP LIGHT VIA CONTACTOR {83L2A-23}  
 LCP 211: LCP-35RPD - Front Hall E  
 Relay 211-46: ENTRANCE CANOPY +0 SW {35H2DB-1}  
 Relay 211-47: ENTRANCE CANOPY +0 SW {35H2DB-5}  
 LCP 213: LCP-35RPC-2 - Rear Hall E  
 Relay 213-5: LOADING DOCK LIGHTING (EMERG) +0 SE {35EH2C-9}  
 Relay 213-6: LOADING DOCK LIGHTING +0 SE {35H2CA-1}  
 Relay 213-7: LOADING DOCK LIGHTING +0 SE {35H2CA-3}  
 LCP 214: LCP-83RPC - Mtg. Rms Rear  
 Relay 214-5: DOCK LIGHTING LVL 51 SE {83H2C-9}

Schedule								Description	Occupancy Time
2								Sunset on only	03:01
<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>					<b>Friday</b>	
Sunset -00:30	On	Sunset -00:30	On	Sunset -00:30	On	Sunset -00:30	On	Sunset -00:30	On
<b>Saturday</b>	<b>Sunday</b>	<b>Holiday 1</b>	<b>Holiday 2</b>					<b>Holiday 3</b>	
Sunset -00:30	On	Sunset -00:30	On	Sunset -00:30	On	Sunset -00:30	On	Sunset -00:30	On
<b>Normal</b>	<b>Alternate</b>								

Schedule								Description	Occupancy Time
3								GENERAL SCHEDULES	03:01
<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>					<b>Friday</b>	
07:00	On	07:00	On	07:00	On	07:00	On	07:00	On
19:00	Off	19:00	Off	19:00	Off	19:00	Off	19:00	Off
<b>Saturday</b>	<b>Sunday</b>	<b>Holiday 1</b>	<b>Holiday 2</b>					<b>Holiday 3</b>	
<b>Normal</b>	<b>Alternate</b>								

Schedule								Description	Occupancy Time
4								Admintistration, Sales offices 2nd level	03:01
<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>					<b>Friday</b>	
06:00	On	06:00	On	06:00	On	06:00	On	06:00	On
19:00	Off	19:00	Off	19:00	Off	19:00	Off	19:00	Off
<b>Saturday</b>	<b>Sunday</b>	<b>Holiday 1</b>	<b>Holiday 2</b>					<b>Holiday 3</b>	
<b>Normal</b>	<b>Alternate</b>								
	LCP 209: LCP-35RPDA - Reg. E Relay 209-15: LIGHTING +25 SW {35H2DA-16}								

Schedule								Description	Occupancy Time
5								Water Heaters	03:01
<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>					<b>Friday</b>	
06:00	On	06:00	On	06:00	On	06:00	On	06:00	On
19:00	Off	19:00	Off	19:00	Off	19:00	Off	19:00	Off
<b>Saturday</b>	<b>Sunday</b>	<b>Holiday 1</b>	<b>Holiday 2</b>					<b>Holiday 3</b>	
06:00	On	06:00	On						
19:00	Off	19:00	Off						
<b>Normal</b>	<b>Alternate</b>								

LCP 201: LCP-12RPA - Tunnel A



Relay 201-6: WATER HEATER +0 NORTHEAST {12H2A-23}

LCP 203: LCP-35RPA-2 - Rear Hall A  
 Relay 203-11: WATER HEATER {35H2AA-6}

LCP 204: LCP-35RPBA - Reg. A  
 Relay 204-1: WATER HEATER LEVEL +25 {35H2BA-1}  
 Relay 204-2: WATER HEATER LEVEL +0 {35H2BA-3}  
 Relay 204-23: WATER HEATER TICKET BOOTH {35H2BA-23}

LCP 205: LCP-35RPB - Front Hall A  
 Relay 205-44: WATER HEATER +51 {35H2B-41}

LCP 209: LCP-35RPDA - Reg. E  
 Relay 209-1: WATER HEATER LEVEL +25 {35H2DA-1}  
 Relay 209-2: WATER HEATER LEVEL +0 {35H2DA-3}  
 Relay 209-17: WATER HEATER TICKET BOOTH {35H2DA-13}

LCP 210: LCP-12RPC - Tunnel E  
 Relay 210-6: WATER HEATER LVL 0 SOUTHEAST {12H2C-23}

LCP 211: LCP-35RPD - Front Hall E  
 Relay 211-44: WATER HEATER {35H2D-41}

LCP 213: LCP-35RPC-2 - Rear Hall E  
 Relay 213-11: WATER HEATER {35H2CA-10}

Schedule		Description	Occupancy Time
6		Gilbane Office	
<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>
06:00 On	06:00 On	06:00 On	06:00 On
23:00 Off	23:00 Off	23:00 Off	23:00 Off
<b>Saturday</b>	<b>Sunday</b>	<b>Holiday 1</b>	<b>Holiday 2</b>
07:00 On	07:00 On		
23:00 Off	23:00 Off		
<b>Normal</b>	<b>Alternate</b>		
LCP 18: Panel 35HD - Rear Hall D (Was MOD 36) Relay 18-10: Exhaust fan D-Hall rear Restrooms {control voltage of F-1SE35}			

Schedule		Description	Occupancy Time
7		Truss Lights (morning)	
<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>
08:00 Off	08:00 Off	08:00 Off	08:00 Off
<b>Saturday</b>	<b>Sunday</b>	<b>Holiday 1</b>	<b>Holiday 2</b>
08:00 Off	08:00 Off		
<b>Normal</b>	<b>Alternate</b>		
LCP 8: Panel 25HA - Reg. D (Was MODs 16 & 17) Relay 8-23: Lobby D (Old 17/7) {25HA-28} <p>LCP 9: Panel 25HA - Reg. D (Was MOD 18)                  Relay 9-7: Lobby C (Old 18/7) {25HA-56}</p> <p>LCP 10: Panel 25HB - Reg. B (Was MODs 20 &amp; 21)                  Relay 10-23: Lobby B (Old 21/7) {25HB-32}</p> <p>LCP 23: Panel 83HA - Front GA (Was MODs 46 &amp; 47)                  Relay 23-17: Truss D - Balcony D (Old 47/1) {83HA-2}                  Relay 23-18: Truss D - Balcony D (Old 47/2) {83HA-4}                  Relay 23-19: Truss D - Balcony D (Old 47/3) {83HA-6}                  Relay 23-20: Truss D - Balcony D (Old 47/4) {83HA-8}                  Relay 23-21: Truss D - Escalators D (Old 47/5) {83HA-10}                  Relay 23-22: Truss D - Escalators D (Old 47/6) {83HA-12}                  Relay 23-23: Truss D - Escalators D (Old 47/7) {83HA-14}                  Relay 23-24: Truss D - Escalators D (Old 47/8) {83HA-16}</p> <p>LCP 24: Panel 83HB - Front Ballrooms (Was MODs 48 &amp; 49)                  Relay 24-17: Truss C - Balcony C (Old 49/1) {83HB-2}</p>			

Relay 24-18: Truss C - Balcony C (Old 49/2) {83HB-4}  
 Relay 24-19: Truss C - Balcony C (Old 49/3) {83HB-6}  
 Relay 24-20: Truss C - Balcony C (Old 49/4) {83HB-8}  
 Relay 24-21: Truss C - Escalators C (Old 49/5) {83HB-10}  
 Relay 24-22: Truss C - Escalators C (Old 49/6) {83HB-12}  
 Relay 24-23: Truss C - Escalators C (Old 49/7) {83HB-14}  
 Relay 24-24: Truss C - Escalators C (Old 49/8) {83HB-16}  
 Relay 24-25: Truss C - Balcony B (Old 49/9) {83HB-18}  
 Relay 24-26: Truss C - Balcony B (Old 49/10) {83HB-20}  
 Relay 24-27: Truss C - Balcony B (Old 49/11) {83HB-22}  
 Relay 24-28: Truss C - Balcony B (Old 49/12) {83HB-24}  
 LCP 26: Panel 83HC - Front Hall B3 (Was MOD 52)  
 Relay 26-5: Truss B - Balcony A (Old 52/5) {83HC-50}  
 Relay 26-6: Truss B - Balcony A (Old 52/6) {83HC-4}  
 Relay 26-7: Truss B - Balcony A (Old 52/7) {83HC-6}  
 Relay 26-8: Truss B - Balcony A (Old 52/8) {83HC-8}  
 Relay 26-9: Truss B - Escalators B (Old 52/9) {83HC-10}  
 Relay 26-10: Truss B - Escalators B (Old 52/10) {83HC-12}  
 Relay 26-11: Truss B - Escalators B (Old 52/11) {83HC-14}  
 Relay 26-12: Truss B - Escalators B (Old 52/12) {83HC-16}  
 LCP 205: LCP-35RPB - Front Hall A  
 Relay 205-38: ENTRANCE +0 NW {35H2B-33}  
 LCP 206: LCP-83RPB - Front Hall A3  
 Relay 206-33: Truss Lights A/F {83H2B-27}  
 Relay 206-34: Truss Lights A/F {83H2B-26}  
 Relay 206-35: Truss Lights A/F {83H2B-28}  
 Relay 206-36: Truss Lights A/F {83H2B-30}  
 LCP 211: LCP-35RPD - Front Hall E  
 Relay 211-38: ENTRANCE +0 SW {35H2D-33}  
 LCP 215: LCP-83RPD - Mtg. Rms. Front  
 Relay 215-8: TRUSS E LIGHTING LVL 51 SW {83H2D-8}  
 Relay 215-9: TRUSS E LIGHTING LVL 51 SW {83H2D-10}  
 Relay 215-10: TRUSS E LIGHTING LVL 51 SW {83H2D-12}  
 Relay 215-11: TRUSS E LIGHTING LVL 51 SW-over Skybridge {83H2D-14}

		Schedule		Description		Occupancy Time			
8		24Hour special							
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Holiday 1	Holiday 2	Holiday 3
04:59	04:59	04:59	04:59	04:59	04:59	04:59	04:59	04:59	04:59
05:00	05:00	05:00	05:00	05:00	05:00	05:00	05:00	05:00	05:00
Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
On	On	On	On	On	On	On	On	On	On
Normal	Alternate								
LCP 204: LCP-35RPBA - Reg. A Relay 204-17: LIGHTING Senior Games 2.5 offices {35H2BA-24}									

		Schedule		Description		Occupancy Time			
9		Sunrise off only							
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Holiday 1	Holiday 2	Holiday 3
Sunrise +00:30	Sunrise +00:30	Sunrise +00:30	Sunrise +00:30	Sunrise +00:30	Sunrise +00:30	Sunrise +00:30	Sunrise +00:30	Sunrise +00:30	Sunrise +00:30
Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
On	On	On	On	On	On	On	On	On	On
Normal	Alternate								
LCP 5: Panel TB1 - Ticket Booth D (Was MODs 10 & 11) Relay 5-3: Plaza D (Old 10/3) {TB1-7} Relay 5-4: Plaza D (Old 10/4) {TB1-9} Relay 5-13: Plaza C (Old 10/13) {TB1-26} Relay 5-16: Plaza C (Old 10/16) {TB1-29}									

Relay 5-28: Plaza D Floods (Old 11/12) (TB1-?)  
 Relay 5-29: Plaza C Floods (Old 11/13) (TB1-?)  
 Relay 5-30: Plaza D (Old 11/14) (TB1-?)  
 Relay 5-32: Plaza C (Old 11/16) (TB1-?)  
 LCP 7: Panel TB3 - Ticket Booth B (Was MOD 14)  
 Relay 7-11: Plaza A (Old 14/11) (TB3-25)  
 Relay 7-12: Plaza A (Old 14/12) (TB3-26)  
 Relay 7-14: Plaza A (Old 14/14) (TB3-28)  
 Relay 7-16: Plaza A Floods (Old 14/16) (TB3-?)  
 LCP 205: LCP-35RPB - Front Hall A  
 Relay 205-46: CANOPY LIGHTING +0 NW {35H2BB-2}

Schedule										Description	Occupancy Time
10										Sunset on - Midnight off	03:01
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Holiday 1	Holiday 2	Holiday 3		
00:00	Off	00:00	Off	00:00	Off	00:00	Off	00:00	Off	00:00	Off
Sunset -00:30	On	Sunset -00:30	On	Sunset -00:30	On	Sunset -00:30	On	Sunset -00:30	On	Sunset -00:30	On
Normal	Alternate										
LCP 205: LCP-35RPB - Front Hall A Relay 205-48: SIGN LIGHTING +0 NW {35H2BB-4} LCP 211: LCP-35RPD - Front Hall E Relay 211-48: SIGN LIGHTING +0 SW {35H2DB-2}											

Schedule										Description	Occupancy Time
11										Tunnels	
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Holiday 1	Holiday 2	Holiday 3		
06:00	On	06:00	On	06:00	On	06:00	On	06:00	On	06:00	On
18:00	Off	18:00	Off	18:00	Off	18:00	Off	18:00	Off	18:00	Off
Normal	Alternate										

Schedule										Description	Occupancy Time
12										Building Signs	03:01
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Holiday 1	Holiday 2	Holiday 3		
05:00	On	05:00	On	05:00	On	05:00	On	05:00	On	05:00	On
23:00	Off	23:00	Off	23:00	Off	23:00	Off	23:00	Off	23:00	Off
Sunrise +00:30	Off	Sunrise +00:30	Off	Sunrise +00:30	Off	Sunrise +00:30	Off	Sunrise +00:30	Off	Sunrise +00:30	Off
Sunset -00:30	On	Sunset -00:30	On	Sunset -00:30	On	Sunset -00:30	On	Sunset -00:30	On	Sunset -00:30	On
Normal	Alternate										
LCP 208: LCP-83RPA-2 - Rear Hall A3 Relay 208-9: GRBCC NEON SIGN LIGHTS North End {83L2A-23} LCP 214: LCP-83RPC - Mtg. Rms Rear Relay 214-8: GRBCC NEON SIGN LIGHTS South End {83L2C-37}											

Schedule										Description	Occupancy Time
13										Ballroom Foyer Lighting	03:01
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Holiday 1	Holiday 2	Holiday 3		
04:00	On	04:00	On	04:00	On	04:00	On	04:00	On	04:00	On
07:00	Off	07:00	Off	07:00	Off	07:00	Off	07:00	Off	07:00	Off
17:00	On	17:00	On	17:00	On	17:00	On	17:00	On	17:00	On
Normal	Alternate										
14										3rd Level public lights on	03:01
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Holiday 1	Holiday 2	Holiday 3		
06:00	On	06:00	On	06:00	On	06:00	On	06:00	On	06:00	On
06:00	On	06:00	On	06:00	On	06:00	On	06:00	On	06:00	On
Normal	Alternate										
LCP 23: Panel 83HA - Front GA (Was MODs 46 & 47) Relay 23-4: Gen Assy Lobby (Old 46/4) {83HA-7} Relay 23-5: Gen Assy Lobby (Old 46/5) {83HA-9} Relay 23-6: Gen Assy Lobby (Old 46/6) {83HA-11} Relay 23-7: Gen Assy Lobby (Old 46/7) {83HA-13} Relay 23-12: +51 Level 303 Hallway (Old 46/12) {83HA-22} Relay 23-13: Gen Assy N Soffit Lights (Old 46/13) {83LA-11} Relay 23-14: Gen Assy S Soffit Lights (Old 46/14) {83LA-13} Relay 23-15: +51 Level 304 Hallway (Old 46/15) {83HA-25} LCP 24: Panel 83HB - Front Ballrooms (Was MODs 48 & 49) Relay 24-1: Ballrooms Lobby (Old 48/1) {83HB-1} Relay 24-2: Ballrooms Lobby (Old 48/2) {83HB-3} Relay 24-3: Ballrooms Lobby (Old 48/3) {83HB-5} Relay 24-4: Ballrooms Lobby (Old 48/4) {83HB-7} Relay 24-9: +51 Level 301 Hallway (Old 48/9) {83HB-9} Relay 24-10: Ballroom Soffit Lts (Old 48/10) {83LB-10} Relay 24-11: Ballroom Soffit Lts (Old 48/11) {83LB-12} Relay 24-12: Ballroom Soffit Lts (Old 48/12) {83LB-14} Relay 24-13: Ballroom Soffit Lts (Old 48/13) {83LB-25} Relay 24-14: Ballroom Soffit Lts (Old 48/14) {83LB-26} Relay 24-15: 301 Hallway Soffit Lts (Old 48/15) {83LB-32} LCP 26: Panel 83HC - Front Hall B3 (Was MOD 52) Relay 26-13: Escl B 2-3 Soffit Lts (Old 52/13) {83HC-50(?) LCP 27: Panel 83HD - Rear Gen Assy (Was MOD 54) Relay 27-3: +51 Level 318 Hallway (Old 54/3) {83HD-5} Relay 27-4: +51 Level Back Hallway (Old 54/4) {83HD-7} Relay 27-5: +51 Level 317 Hallway (Old 54/5) {83HD-9} Relay 27-6: Soffit Lts 318 Hallway (Old 54/6) {83LD-20} Relay 27-7: Soffit Lts 317 Hallway (Old 54/7) {83LD-22} LCP 28: Panel 83HF - Rear Ballrooms (Was MOD 56) Relay 28-2: +51 Level Kitchen Hallway (Old 56/2) {83HF-5} Relay 28-3: +51 Level Back Hallway (Old 56/3) {83HF-7} Relay 28-4: +51 Lvl BR Service Hallway (Old 56/4) {83HF-9} Relay 28-5: +51 Lvl BR Service Hallway (Old 56/5) {83HF-11} Relay 28-6: +51 Level Back Hallway (Old 56/6) {83HF-13} Relay 28-7: Soffit Lts BR Svc Hall (Old 56/7) {83LF-19} Relay 28-8: Soffit Lts BR Svc Hall (Old 56/8) {83LF-21} LCP 204: LCP-35RPBA - Reg. A											

Relay 204-3: LIGHTING ABOVE ESCALATOR NW {35L2BC-2}  
 Relay 204-4: LIGHTING ABOVE ESCALATOR NW {35L2BC-4}  
 LCP 209: LCP-35RPDA - Reg. E  
 Relay 209-3: LIGHTING ABOVE ESCALATOR +0 SW {35L2DA-1}  
 Relay 209-4: LIGHTING ABOVE ESCALATOR +0 SW {35L2DA-3}  
 LCP 214: LCP-83RPC - Mtg. Rms Rear  
 Relay 214-1: CORRIDOR LIGHTING LVL 51 SE {83H2C-1}  
 Relay 214-2: CORRIDOR LIGHTING LVL 51 SE {83H2C-3}  
 Relay 214-3: CORRIDOR LIGHTING LVL 51 SE {83H2C-7}  
 Relay 214-4: CORRIDOR LIGHTING LVL 51 SE {83H2C-5}  
 LCP 215: LCP-83RPD - Mtg. Rms. Front  
 Relay 215-1: CORRIDOR LIGHTING LVL 51 SW {83H2D-1}  
 Relay 215-2: CORRIDOR LIGHTING LVL 51 SW {83H2D-3}  
 Relay 215-3: CORRIDOR LIGHTING LVL 51 SW {83H2D-5}  
 Relay 215-4: CORRIDOR LIGHTING LVL 51 SW {83H2D-7}  
 Relay 215-5: PUBLIC AREA LIGHTING LVL 51 SW {83H2D-2}  
 Relay 215-6: PUBLIC AREA LIGHTING LVL 51 SW {83H2D-4}  
 Relay 215-7: PUBLIC AREA LIGHTING LVL 51 SW {83H2D-6}

Schedule								Description	Occupancy Time
99								Special - As Needed	
Monday		Tuesday		Wednesday		Thursday		Friday	
08:00	Off	08:00	Off	08:00	Off	08:00	Off	08:00	
17:00	On	17:00	On	17:00	On	17:00	On	17:00	
Saturday		Sunday		Holiday 1		Holiday 2		Holiday 3	
08:00	Off	08:00	Off	08:00	Off	08:00	Off	08:00	
17:00	On	17:00	On	17:00	On	17:00	On	17:00	
Normal				Alternate					

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JACOBS

HFC GRBCC LIGHTING CONTROLS UPGRADE

APPENDIX B

LCP WIRING DOCUMENTATION EXPORT FROM EXISTING LIGHTING  
CONTROLS FRONT END

LCP Wiring Documentation						
George R. Brown Convention Center - George R. Brown Convention						
Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	
1	Panel PHA - Central Plant (Was MODs 2 & 3)	Sub Basement	Retrofit	32/32 Surface	115/277	
Rly	Circuit	Description	LV Switch			
17	PHA #8	Mod -3 relay 1				
18	PHA #1,3	Lot 5 North - (Old 3-2)				
19		Mod -3 relay 3				
20		Mod -3 relay 4				
21		Mod -3 relay 5				
22		Mod -3 relay 6				
23		Lots 3 & 4 - (Old 3-7)				
24		Mod -3 relay 8				
25		Mod -3 relay 9				
26		Mod -3 relay 10				
27		Mod -3 relay 11				
28		Mod -3 relay 12				
29		Mod -3 relay 13				
30		Mod -3 relay 14				
31	**Space**	Mod -3 relay 15				
32		Mod -3 relay 16				
Input	Type	Description				
9						
10						
11						
12						
13						
14						
15						
16						

  

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	
2	Panel 12HA - D Tunnel East (Was MOD 4)	Basement Rm 050 Tunnel East /S end	Retrofit	32/32 Surface	115/277	
Rly	Circuit	Description	LV Switch			
17	**Space**	Space				
18	**Space**	Space				
19	**Space**	Space				
20	**Space**	Space				



21	**Space**	Space	
22	**Space**	Space	
23	**Space**	Space	
24	**Space**	Space	
25	**Space**	Space	
26	**Space**	Space	
27	**Space**	Space	
28	**Space**	Space	
29	**Space**	Space	
30	**Space**	Space	
31	**Space**	Space	
32	**Space**	Space	
Input	Type	Description	
9			
10			
11			
12			
13			
14			
15			
16			

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
3	Panel 12HB - C Tunnel East (Was MOD 6)	Basement Rm 048 Tunnel East Middle	Retrofit	32/32 Surface	115/277
Rly	Circuit	Description	LV Switch		
17	**Space**	Space			
18	**Space**	Space			
19	**Space**	Space			
20	**Space**	Space			
21	**Space**	Space			
22	**Space**	Space			
23	**Space**	Space			
24	**Space**	Space			
25	**Space**	Space			
26	**Space**	Space			
27	**Space**	Space			
28	**Space**	Space			
29	**Space**	Space			
30	**Space**	Space			

31	**Space**	Space
32	**Space**	Space
<b>Input</b>	<b>Type</b>	<b>Description</b>
9		
10		
11		
12		
13		
14		
15		
16		

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
4	Panel 12HC - B Tunnel East (Was MOD 8)	Basement Rm 042 Tunnel East Mid Bldg	Retrofit	32/32 Surface	115/277
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
17	**Space**	Space			
18	**Space**	Space			
19	**Space**	Space			
20	**Space**	Space			
21	**Space**	Space			
22	**Space**	Space			
23	**Space**	Space			
24	**Space**	Space			
25	**Space**	Space			
26	**Space**	Space			
27	**Space**	Space			
28	**Space**	Space			
29	**Space**	Space			
30	**Space**	Space			
31	**Space**	Space			
32	**Space**	Space			
<b>Input</b>	<b>Type</b>	<b>Description</b>			
9					
10					
11					
12					
13					
14					
15					

16					
Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
5	Panel TB1 - Ticket Booth D (Was MODs 10 & 11)	Ticket Booth D	Retrofit	32/32 Surface	115/277
Rly	Circuit	Description	LV Switch		
17	12HD-25	Flagpole (Out of Svc)(Old 11/1)			
18		Mod -11 relay 2			
19		Mod -11 relay 3			
20		Mod -11 relay 4			
21		Mod -11 relay 5			
22		Mod -11 relay 6			
23		Mod -11 relay 7			
24		Mod -11 relay 8			
25		Mod -11 relay 9			
26		Mod -11 relay 10			
27		Mod -11 relay 11			
28	TB1-?	Plaza D Floods (Old 11/12)			
29	TB1-?	Plaza C Floods (Old 11/13)			
30	TB1-?	Plaza D (Old 11/14)			
31		Mod -11 relay 15			
32	TB1-?	Plaza C (Old 11/16)			
Input	Type	Description			
9					
10					
11					
12					
13					
14					
15					
16					

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
7	Panel TB3 - Ticket Booth B (Was MOD 14)	Ticket Booth B	Retrofit	32/32 Surface	115/277
Rly	Circuit	Description	LV Switch		
17	**Space**	Space			
18	**Space**	Space			
19	**Space**	Space			
20	**Space**	Space			

21	**Space**	Space	
22	**Space**	Space	
23	**Space**	Space	
24	**Space**	Space	
25	**Space**	Space	
26	**Space**	Space	
27	**Space**	Space	
28	**Space**	Space	
29	**Space**	Space	
30	**Space**	Space	
31	**Space**	Space	
32	**Space**	Space	
Input	Type	Description	
9			
10			
11			
12			
13			
14			
15			
16			

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
8	Panel 25HA - Reg. D (Was MODs 16 & 17)	2nd Floor Registration between 214/215	Retrofit	32/32 Surface	115/277
Rly	Circuit	Description	LV Switch		
17	25HA-2	EHD 50% (Old 17/1)			
18	25HA-4	EHD 50% (Old 17/2)			
19	25HA-6	EHD 50% (Old 17/3)			
20	25HA-8	EHD 50% (Old 17/4)			
21	25HA-10	EHD 50% (Old 17/5)			
22	25HA-26	EHD 50% (Top Stairs/Exits)(Old 17/6)			
23	25HA-28	Lobby D (Old 17/7)			
24	25HA-12	EHD 25% (Old 17/8)			
25	25HA-14	EHD 25% (Old 17/9)			
26	25HA-16	EHD 25% (Old 17/10)			
27	25HA-74	EHD 25% (Old 17/11)			
28	25HA-18	EHD 13% (Old 17/12)			
29	25HA-20	EHD 13% (Old 17/13)			
30	25HA-22	EHD 12% (Old 17/14)			

31	25HA-24	EHD 12% (Old 17/15)	
32	25HA-35	Truss/Escl D (Old 17/16)	
<b>Input</b>		<b>Type</b>	<b>Description</b>
9			
10			
11			
12			
13			
14			
15			
16			

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
9	Panel 25HA - Reg. D (Was MOD 18)	2nd Floor Registration between 214/215	Retrofit	32/32 Surface	115/277
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
17	**Space**	Space			
18	**Space**	Space			
19	**Space**	Space			
20	**Space**	Space			
21	**Space**	Space			
22	**Space**	Space			
23	**Space**	Space			
24	**Space**	Space			
25	**Space**	Space			
26	**Space**	Space			
27	**Space**	Space			
28	**Space**	Space			
29	**Space**	Space			
30	**Space**	Space			
31	**Space**	Space			
32	**Space**	Space			
<b>Input</b>		<b>Type</b>	<b>Description</b>		
9					
10					
11					
12					
13					
14					
15					

16					
Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
10	Panel 25HB - Reg. B (Was MODs 20 & 21)	2nd Floor Registration between 212/213	Retrofit	32/32 Surface	115/277
Rly	Circuit	Description	LV Switch		
17	25HB-6	EHB 50% (Old 21/1)			
18	25HB-8	EHB 50% (Old 21/2)			
19	25HB-10	EHB 50% (Old 21/3)			
20	25HB-12	EHB 50% (Old 21/4)			
21	25HB-14	EHB 50% (Old 21/5)			
22	25HB-30	EHB 50% (Top Stairs/Exits) (Old 21/6)			
23	25HB-32	Lobby B (Old 21/7)			
24	25HB-16	EHB 25% (Old 21/8)			
25	25HB-18	EHB 25% (Old 21/9)			
26	25HB-20	EHB 25% (Old 21/10)			
27	25HB-34	EHB 25% (Old 21/11)			
28	25HB-22	EHB 13% (Old 21/12)			
29	25HB-24	EHB 13% (Old 21/13)			
30	25HB-26	EHB 12% (Old 21/14)			
31	25HB-28	EHB 12% (Old 21/15)			
32		Mod -21 relay 16			
Input	Type	Description			
9					
10					
11					
12					
13					
14					
15					
16					
Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
11	Panel 25HC - 2R Boiler Room (Was MODs 22 & 23)	2R Past Boilers	Retrofit	32/32 Surface	115/277
Rly	Circuit	Description	LV Switch		
17	25HC-3	EHC 50% (Old 23/1)			
18	25HC-7	EHC 25% (Old 23/2)			
19	25HC-9	EHC 25% (Old 23/3)			
20	25HC-13	EHC 13% (Old 23/4)			

21	25HC-17	EHC 12% (Old 23/5)	
22	25HC-27	D Hall Restrmm (Rear) (Old 23/6)	
23	25HC-29	D Hall Restrmm (Rear) (Old 23/7)	
24	25HC-43	D Dock Nt Lts (Old 23/8)	
25	25HC-45	C Dock Nt Lts (Old 23/9)	
26	25LC-24	D Dock ??? Soffit Lts (Old 23/10)	
27	25LC-1	D Dock Spot Lts (Old 23/11)	
28	25LC-3	D Dock Spot Lts (Old 23/12)	
29	25LC-5	D Dock Spot Lts (Old 23/13)	
30	25LC-7	C Dock Spot Lts (Old 23/14)	
31	25LC-9	C Dock Spot Lts (Old 23/15)	
32	25LC-11	C Dock Spot Lts (Old 23/16)	
Input	Type	Description	
9			
10			
11			
12			
13			
14			
15			
16			

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
12	Panel 25HD - 2R Kitchen Warehouse (Was MOD 24)	2R Mid Bldg	Retrofit	32/32 Surface	115/277
Rly	Circuit	Description	LV Switch		
17	**Space**	Space			
18	**Space**	Space			
19	**Space**	Space			
20	**Space**	Space			
21	**Space**	Space			
22	**Space**	Space			
23	**Space**	Space			
24	**Space**	Space			
25	**Space**	Space			
26	**Space**	Space			
27	**Space**	Space			
28	**Space**	Space			
29	**Space**	Space			

30	**Space**	Space	
31	**Space**	Space	
32	**Space**	Space	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
9			
10			
11			
12			
13			
14			
15			
16			

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
13	Panel 35HA - Front Hall D (Was MODs 26 & 27)	MECH RM 107	Retrofit	32/32 Surface	115/277
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
17	35HA-2	EHD 25% (Old 27/1)			
18	35HA-4	EHD 25% (Old 27/2)			
19	35HA-15	EHD 25% (Old 27/3)			
20	35HA-21	EHD 25% (Old 27/4)			
21	35HA-10	EHD 25% (Old 27/5)			
22	35HA-12	EHD 25% (Old 27/6)			
23	35HA-14	EHD 25% (Old 27/7)			
24	35HA-18	EHD 13% (Old 27/8)			
25	35HA-20	EHD 13% (Old 27/9)			
26	35HA-30	EHD 13% (Old 27/10)			
27	35HA-24	EHD 13% (Old 27/11)			
28	35HA-1	EHD 12% (Old 27/12)			
29	35HA-26	EHD 12% (Old 27/13)			
30	35HA-28	EHD 12% (Old 27/14)			
31	35HA-22	EHD 12% (Old 27/15)			
32		Mod -27 relay 16			
<b>Input</b>	<b>Type</b>	<b>Description</b>			
9					
10					
11					
12					
13					
14					



15		
16		

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
14	Panel 35HA - Front Hall D (Was MOD 28)	MECH. RM 107	Retrofit	32/32 Surface	115/277
Rly	Circuit	Description	LV Switch		
17	**Space**	Space			
18	**Space**	Space			
19	**Space**	Space			
20	**Space**	Space			
21	**Space**	Space			
22	**Space**	Space			
23	**Space**	Space			
24	**Space**	Space			
25	**Space**	Space			
26	**Space**	Space			
27	**Space**	Space			
28	**Space**	Space			
29	**Space**	Space			
30	**Space**	Space			
31	**Space**	Space			
32	**Space**	Space			
Input	Type	Description			
9					
10					
11					
12					
13					
14					
15					
16					

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
15	Panel 35HB - Front Hall C (Was MODs 30 & 31)	MECH RM 111	Retrofit	32/32 Surface	115/277
Rly	Circuit	Description	LV Switch		
17	35HB-2	EHC 25% (Old 31/1)			
18	35HB-4	EHC 25% (Old 31/2)			
19	35HB-1	EHC 25% (Old 31/3)			
20	35HB-8	EHC 25% (Old 31/4)			

21	35HB-12	EHC 25% (Old 31/5)	
22	35HB-10	EHC 25% (Old 31/6)	
23	35HB-14	EHC 25% (Old 31/7)	
24	35HB-26	EHC 13% (Old 31/8)	
25	35HB-18	EHC 13% (Old 31/9)	
26	35HB-20	EHC 13% (Old 31/10)	
27	35HB-22	EHC 12% (Old 31/11)	
28	35HB-24	EHC 12% (Old 31/12)	
29	35HB-16	EHC 12% (Old 31/13)	
30	35HB-32	C Stairwells E/W (Old 31/14)	
31	35HB-34	C Stairwells E/W (Old 31/15)	
32		Mod -31 relay 16	
Input	Type	Description	
9			
10			
11			
12			
13			
14			
15			
16			

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
16	Panel 35HC - Front Hall B (Was MODs 32 & 33)	MECH RM 122	Retrofit	32/32 Surface	115/277
Rly	Circuit	Description	LV Switch		
17	35HC-2	EHB 25% (Old 33/1)			
18	35HC-4	EHB 25% (Old 33/2)			
19	35HC-6	EHB 25% (Old 33/3)			
20	35HC-8	EHB 25% (Old 33/4)			
21	35HC-10	EHB 25% (Old 33/5)			
22	35HC-12	EHB 25% (Old 33/6)			
23	35HC-14	EHB 25% (Old 33/7)			
24	35HC-18	EHB 13% (Old 33/8)			
25	35HC-16	EHB 13% (Old 33/9)			
26	35HC-20	EHB 13% (Old 33/10)			
27	35HC-22	EHB 12% (Old 33/11)			
28	35HC-24	EHB 12% (Old 33/12)			
29	35HC-26	EHB 12% (Old 33/13)			
30	35HC-32	B Stairwells E/W (Old 33/14)			

31	35HC-34	B Stairwells E/W (Old 33/15)	
32		Mod -33 relay 16	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
9			
10			
11			
12			
13			
14			
15			
16			

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
17	Panel 35HD - Rear Hall D (Was MODs 34 & 35)	MECH RM 137	Retrofit	32/32 Surface	115/277
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
17	35HD-33	EHD 50% (Old 35/1)			
18	35HD-35	EHD 50% (Old 35/2)			
19	35HD-41	EHD 50% (Old 35/3)			
20	35HD-6	EHD 25% (Old 35/4)			
21	35HD-4	EHD 25% (Old 35/5)			
22	35HD-2	EHD 25% (Old 35/6)			
23	35HD-23	EHD 25% (Old 35/7)			
24	35HD-8	EHD 25% (Old 35/8)			
25	35HD-12	EHD 25% (Old 35/9)			
26	35HD-14	EHD 25% (Old 35/10)			
27	35HD-16	EHD 25% (Old 35/11)			
28	35HD-31	EHD 25% (Old 35/12)			
29	35HD-20	EHD 13% (Old 35/13)			
30	35HD-22	EHD 13% (Old 35/14)			
31	35HD-24	EHD 13% (Old 35/15)			
32	35HD-26	EHD 13% (Old 35/16)			
<b>Input</b>	<b>Type</b>	<b>Description</b>			
9					
10					
11					
12					
13					
14					
15					

16					
Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
18	Panel 35HD - Rear Hall D (Was MOD 36)	MECH RM 137	Retrofit	32/32 Surface	115/277
Rly	Circuit	Description	LV Switch		
17	**Space**	Space			
18	**Space**	Space			
19	**Space**	Space			
20	**Space**	Space			
21	**Space**	Space			
22	**Space**	Space			
23	**Space**	Space			
24	**Space**	Space			
25	**Space**	Space			
26	**Space**	Space			
27	**Space**	Space			
28	**Space**	Space			
29	**Space**	Space			
30	**Space**	Space			
31	**Space**	Space			
32	**Space**	Space			
Input	Type	Description			
9					
10					
11					
12					
13					
14					
15					
16					

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
19	Panel 35HF - Rear Hall C (Was MODs 38 & 39)	MECH RM 139	Retrofit	32/32 Surface	115/277
Rly	Circuit	Description	LV Switch		
17	35HF-33	EHC 50% (Old 39/1)			
18	35HF-35	EHC 50% (Old 39/2)			
19	35HF-37	EHC 50% (Old 39/3)			
20	35HF-2	EHC 25% (Old 39/4)			
21	35HF-4	EHC 25% (Old 39/5)			

22	35HF-6	EHC 25% (Old 39/6)	
23	35HF-8	EHC 25% (Old 39/7)	
24	35HF-10	EHC 25% (Old 39/8)	
25	35HF-12	EHC 25% (Old 39/9)	
26	35HF-14	EHC 25% (Old 39/10)	
27	35HF-16	EHC 25% (Old 39/11)	
28	35HF-18	EHC 25% (Old 39/12)	
29	35HF-20	EHC 13% (Old 39/13)	
30	35HF-22	EHC 13% (Old 39/14)	
31	35HF-24	EHC 13% (Old 39/15)	
32	35HF-26	EHC 13% (Old 39/16)	
Input	Type	Description	
9			
10			
11			
12			
13			
14			
15			
16			

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
20	Panel 35HF - Rear Hall C (Was MOD 40)	MECH RM 139	Retrofit	32/32 Surface	115/277
Rly	Circuit	Description	LV Switch		
17	**Space**	Space			
18	**Space**	Space			
19	**Space**	Space			
20	**Space**	Space			
21	**Space**	Space			
22	**Space**	Space			
23	**Space**	Space			
24	**Space**	Space			
25	**Space**	Space			
26	**Space**	Space			
27	**Space**	Space			
28	**Space**	Space			
29	**Space**	Space			
30	**Space**	Space			
31	**Space**	Space			

32	**Space**	Space
<b>Input</b>	<b>Type</b>	<b>Description</b>
9		
10		
11		
12		
13		
14		
15		
16		

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
21	Panel 35HG - Rear Hall B (Was MODs 42 & 43)	MECH RM 229	Retrofit	32/32 Surface	115/277
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
17	35HG-33	EHB 50% (Old 43/1)			
18	35HG-35	EHB 50% (Old 43/2)			
19	35HG-37	EHB 50% (Old 43/3)			
20	35HG-2	EHB 25% (Old 43/4)			
21	35HG-4	EHB 25% (Old 43/5)			
22	35HG-6	EHB 25% (Old 43/6)			
23	35HG-8	EHB 25% (Old 43/7)			
24	35HG-10	EHB 25% (Old 43/8)			
25	35HG-12	EHB 25% (Old 43/9)			
26	35HG-14	EHB 25% (Old 43/10)			
27	35HG-16	EHB 25% (Old 43/11)			
28	35HG-18	EHB 25% (Old 43/12)			
29	35HG-20	EHB 13% (Old 43/13)			
30	35HG-22	EHB 13% (Old 43/14)			
31	35HG-24	EHB 13% (Old 43/15)			
32	35HG-26	EHB 13% (Old 43/16)			
<b>Input</b>	<b>Type</b>	<b>Description</b>			
9					
10					
11					
12					
13					
14					
15					
16					

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
22	Panel 35HG - Rear Hall B (Was MOD 44)	MECH RM 229	Retrofit	32/32 Surface	115/277
Rly	Circuit	Description	LV Switch		
17	**Space**	Space			
18	**Space**	Space			
19	**Space**	Space			
20	**Space**	Space			
21	**Space**	Space			
22	**Space**	Space			
23	**Space**	Space			
24	**Space**	Space			
25	**Space**	Space			
26	**Space**	Space			
27	**Space**	Space			
28	**Space**	Space			
29	**Space**	Space			
30	**Space**	Space			
31	**Space**	Space			
32	**Space**	Space			
Input	Type	Description			
9					
10					
11					
12					
13					
14					
15					
16					

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
23	Panel 83HA - Front GA (Was MODs 46 & 47)	MECH RM 208	Retrofit	32/32 Surface	115/277
Rly	Circuit	Description	LV Switch		
17	83HA-2	Truss D - Balcony D (Old 47/1)			
18	83HA-4	Truss D - Balcony D (Old 47/2)			
19	83HA-6	Truss D - Balcony D (Old 47/3)			
20	83HA-8	Truss D - Balcony D (Old 47/4)			
21	83HA-10	Truss D - Escalators D (Old 47/5)			
22	83HA-12	Truss D - Escalators D (Old 47/6)			

23	83HA-14	Truss D - Escalators D (Old 47/7)	
24	83HA-16	Truss D - Escalators D (Old 47/8)	
25	83HA-24	GA M Restroom N (Old 47/9)	
26	83HA-26	GA W Restroom N (Old 47/10)	
27	83HA-27	GA M Restroom S (Old 47/11)	
28	83HA-29	GA W Restroom S (Old 47/12)	
29	83HA-32	Bldg Directory (Old 47/13)	
30		Mod -47 relay 14	
31		Mod -47 relay 15	
32		Mod -47 relay 16	
Input	Type	Description	
9			
10			
11			
12			
13			
14			
15			
16			

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
24	Panel 83HB - Front Ballrooms (Was MODs 48 & 49)	MECH RM 210	Retrofit	32/32 Surface	115/277
Rly	Circuit	Description	LV Switch		
17	83HB-2	Truss C - Balcony C (Old 49/1)			
18	83HB-4	Truss C - Balcony C (Old 49/2)			
19	83HB-6	Truss C - Balcony C (Old 49/3)			
20	83HB-8	Truss C - Balcony C (Old 49/4)			
21	83HB-10	Truss C - Escalators C (Old 49/5)			
22	83HB-12	Truss C - Escalators C (Old 49/6)			
23	83HB-14	Truss C - Escalators C (Old 49/7)			
24	83HB-16	Truss C - Escalators C (Old 49/8)			
25	83HB-18	Truss C - Balcony B (Old 49/9)			
26	83HB-20	Truss C - Balcony B (Old 49/10)			
27	83HB-22	Truss C - Balcony B (Old 49/11)			
28	83HB-24	Truss C - Balcony B (Old 49/12)			
29		Mod -49 relay 13			
30		Mod -49 relay 14			
31		Mod -49 relay 15			



32		Mod -49 relay 16
<b>Input</b>	<b>Type</b>	<b>Description</b>
9		
10		
11		
12		
13		
14		
15		
16		

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
25	Panel 83HC - Front Hall B3 (Was MODs 50 & 51)	MECH RM 212	Retrofit	32/32 Surface	115/277
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
17	83HC-33	EHG 50% (Old 51/1)			
18	83HC-35	EHG 50% (Old 51/2)			
19	83HC-37	EHG 50% (Old 51/3)			
20	83HC-18	EHG 25% (Old 51/4)			
21	83HC-20	EHG 25% (Old 51/5)			
22	83HC-22	EHG 25% (Old 51/6)			
23	83HC-24	EHG 25% (Old 51/7)			
24	83HC-26	EHG 25% (Old 51/8)			
25	83HC-28	EHG 25% (Old 51/9)			
26	83HC-30	EHG 25% (Old 51/10)			
27	83HC-32	EHG 25% (Old 51/11)			
28	83HC-34	EHG 13% (Old 51/12)			
29	83HC-36	EHG 13% (Old 51/13)			
30	83HC-38	EHG 13% (Old 51/14)			
31	83HC-40	EHG 13% (Old 51/15)			
32	83HC-39	EHG Night Lts (Old 51/16)			
<b>Input</b>	<b>Type</b>	<b>Description</b>			
9					
10					
11					
12					
13					
14					
15					

16					
Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
26	Panel 83HC - Front Hall B3 (Was MOD 52)	MECH RM 212	Retrofit	32/32 Surface	115/277
Rly	Circuit	Description	LV Switch		
17	**Space**	Space			
18	**Space**	Space			
19	**Space**	Space			
20	**Space**	Space			
21	**Space**	Space			
22	**Space**	Space			
23	**Space**	Space			
24	**Space**	Space			
25	**Space**	Space			
26	**Space**	Space			
27	**Space**	Space			
28	**Space**	Space			
29	**Space**	Space			
30	**Space**	Space			
31	**Space**	Space			
32	**Space**	Space			
Input	Type	Description			
9					
10					
11					
12					
13					
14					
15					
16					
Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
27	Panel 83HD - Rear Gen Assy (Was MOD 54)	MECH RM 223	Retrofit	32/32 Surface	115/277
Rly	Circuit	Description	LV Switch		
17	**Space**	Space			
18	**Space**	Space			
19	**Space**	Space			
20	**Space**	Space			
21	**Space**	Space			

22	**Space**	Space	
23	**Space**	Space	
24	**Space**	Space	
25	**Space**	Space	
26	**Space**	Space	
27	**Space**	Space	
28	**Space**	Space	
29	**Space**	Space	
30	**Space**	Space	
31	**Space**	Space	
32	**Space**	Space	
Input	Type	Description	
9			
10			
11			
12			
13			
14			
15			
16			

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
28	Panel 83HF - Rear Ballrooms (Was MOD 56)	MECH RM 221	Retrofit	32/32 Surface	115/277
Rly	Circuit	Description	LV Switch		
17	**Space**	Space			
18	**Space**	Space			
19	**Space**	Space			
20	**Space**	Space			
21	**Space**	Space			
22	**Space**	Space			
23	**Space**	Space			
24	**Space**	Space			
25	**Space**	Space			
26	**Space**	Space			
27	**Space**	Space			
28	**Space**	Space			
29	**Space**	Space			
30	**Space**	Space			
31	**Space**	Space			

32	**Space**	Space
<b>Input</b>	<b>Type</b>	<b>Description</b>
9		
10		
11		
12		
13		
14	Master	
15		
16		

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
29	Panel 83HG - Rear Hall B3 (Was MODs 58 & 59)	MECH RM 217	Retrofit	32/32 Surface	115/277
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
17	83HG-2	EHG 25% (Old 59/1)			
18	83HG-4	EHG 25% [Shutterlights] (Old 59/2)			
19	83HG-6	EHG 25% (Old 59/3)			
20	83HG-8	EHG 25% (Old 59/4)			
21	83HG-10	EHG 25% (Old 59/5)			
22	83HG-12	EHG 25% (Old 59/6)			
23	83HG-14	EHG 25% (Old 59/7)			
24	83HG-16	EHG 13% (Old 59/8)			
25	83HG-18	EHG 13% (Old 59/9)			
26	83HG-20	EHG 13% (Old 59/10)			
27	83HG-22	EHG 13% (Old 59/11)			
28	83HG-24	EHG 12% (Old 59/12)			
29	83HG-26	EHG 12% (Old 59/13)			
30	83HG-28	EHG 12% (Old 59/14)			
31	83HG-30	EHG 12% (Old 59/15)			
32	83HG-32	East Wall Exit Dr Lts - G Hall (Old 59/16)			
<b>Input</b>	<b>Type</b>	<b>Description</b>			
9					
10					
11					
12					
13					
14					
15					
16					

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
30	Panel 83HG - Rear Hall B3 (Was MOD 60)	MECH RM 217	Retrofit	32/32 Surface	115/277
Rly	Circuit	Description	LV Switch		
17	**Space**	Space			
18	**Space**	Space			
19	**Space**	Space			
20	**Space**	Space			
21	**Space**	Space			
22	**Space**	Space			
23	**Space**	Space			
24	**Space**	Space			
25	**Space**	Space			
26	**Space**	Space			
27	**Space**	Space			
28	**Space**	Space			
29	**Space**	Space			
30	**Space**	Space			
31	**Space**	Space			
32	**Space**	Space			
Input	Type	Description			
9					
10					
11					
12					
13					
14					
15					
16					

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
201	LCP-12RPA - Tunnel A		CC	12/12 Surface	115/277
Rly	Circuit	Description	LV Switch		
1	12H2A-1	TUNNEL LIGHTING NE			
2	12H2A-2	TUNNEL LIGHTING NE			
3	12H2A-3	TUNNEL LIGHTING NE			
4	12H2A-4	TUNNEL LIGHTING NE			
5	12H2A-5	ELECTRICAL ROOM LEVEL -12 NE			
6	12H2A-23	WATER HEATER +0 NORTHEAST			

7		SPARE	
8		SPACE	
9		SPACE	
10		SPACE	
11		SPACE	
12		SPACE	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
A			
1			
2			
3			

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
202	LCP-35RPA - Rear Hall A		CC	48/48 Surface	115/277
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
1	35H2A-1	EXHIBIT HALL (LARGE STAGE) GROUP A +0 NE			
2	35H2A-3	EXHIBIT HALL (LARGE STAGE) GROUP B +0 NE			
3	35EH2A-11	EXHIBIT HALL (STAGE EMERG) GROUP C+0 NE			
4	35H2A-5	EXHIBIT HALL (LARGE STAGE) GROUP D +0 NE			
5	35H2A-2	EXHIBIT HALL (LARGE STAGE) GROUP E +0 NE			
6	35H2A-4	EXHIBIT HALL (LARGE STAGE) GROUP F +0 NE			
7	35H2A-6	EXHIBIT HALL (LARGE STAGE) GROUP G +0 NE			
8	35H2A-7	EXHIBIT HALL (LARGE STAGE) GROUP H +0 NE			
9	35H2A-9	EXHIBIT HALL (LARGE STAGE) GROUP A +0 NE			
10	35H2A-11	EXHIBIT HALL (LARGE STAGE) GROUP B +0 NE			
11	35EH2A-13	EXHIBIT HALL (STAGE EMERG) GROUP C +0 NE			

Rly	Circuit	Description	LV Switch
12	35H2A-8	EXHIBIT HALL (LARGE STAGE) GROUP D +0 NE	
25	35H2A-20	EXHIBIT HALL GROUP G +0 NE	
26	35H2A-22	EXHIBIT HALL GROUP H +0 NE	
27	35H2A-24	EXHIBIT HALL GROUP A +0 NE	
28	35H2A-19	EXHIBIT HALL GROUP B +0 NE	
29	35EH2A-17	EXHIBIT HALL (EMERG) GROUP C +0 NE	
30	35H2A-21	EXHIBIT HALL GROUP D +0 NE	
31	35H2A-23	EXHIBIT HALL GROUP E +0 NE	
32	35H2A-26	EXHIBIT HALL GROUP F +0 NE	
33	35H2A-28	EXHIBIT HALL GROUP G +0 NE	
34	35H2A-30	EXHIBIT HALL GROUP H +0 NE	
35	35H2A-25	EXHIBIT HALL GROUP A +0 NE	
36	35H2A-27	EXHIBIT HALL GROUP B +0 NE	
Input	Type	Description	
A			
1			
2			
3			
7			
8			
9			

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
203	LCP-35RPA-2 - Rear Hall A		CC	24/24 Surface	115/277
Rly	Circuit	Description	LV Switch		
1	35H2AA-13	EXHIBIT HALL REAR GROUP M +0 NE			
2	35H2AA-11	EXHIBIT HALL REAR GROUP N +0 NE			
3	35EH2A-14	EXHIBIT HALL REAR (EMERG) GROUP P +0 NE			
4	35H2A-35	EXHIBIT HALL REAR GROUP Q +0 NE			
5	35EH2A-9	LOADING DOCK LIGHTING (EMERG) NE +0			
6	35H2AA-1	LOADING DOCK LIGHTING NE +0			
7	35H2AA-3	LOADING DOCK LIGHTING NE +0			
8	35H2AA-5	LOADING DOCK LIGHTING NE +0			
9	35H2AA-2	LOADING DOCK LIGHTING NE +0			
10	35H2AA-4	LOADING DOCK LIGHTING NE +0			

11	35H2AA-6	WATER HEATER
12	35H2AA-14	ELECTRICAL ROOM +25 NE
<b>Input</b>	<b>Type</b>	<b>Description</b>
A		
1		
2		
3		

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
204	LCP-35RPBA - Reg. A	M-1 NW	CC	48/48 Surface	115/277
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
1	35H2BA-1	WATER HEATER LEVEL +25			
2	35H2BA-3	WATER HEATER LEVEL +0			
3	35L2BC-2	LIGHTING ABOVE ESCALATOR NW			
4	35L2BC-4	LIGHTING ABOVE ESCALATOR NW			
5	35H2BA-7	TICKET BOOTH LIGHTING +0 NW			
6	35H2BA-2	REGISTRATION +25 NW			
7	35H2BA-4	REGISTRATION +25 NW			
8	35H2BA-6	REGISTRATION +25 NW			
9	35H2BA-8	REGISTRATION +25 NW			
10	35H2BA-10	REGISTRATION +25 NW			
11	35H2BA-12	REGISTRATION +25 NW			
12	35H2BA-14	REGISTRATION +25 NW			
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
25	SPARE				
26	SPARE				
27	SPARE				
28	SPACE				
29	SPACE				
30	SPACE				
31	SPACE				
32	SPACE				
33	SPACE				
34	SPACE				
35	SPACE				
36	SPACE				
<b>Input</b>	<b>Type</b>	<b>Description</b>			



A		
1		
2		
3		
7		
8		
9		

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
205	LCP-35RPB - Front Hall A	M-1 NW BY AHU	CC	48/48 Surface	115/277
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
1	35H2B-1	EXHIBIT HALL (STAGE) GROUP A +0 NW			
2	35H2B-3	EXHIBIT HALL (STAGE) GROUP B +0 NW			
3	35EH2B-2	EXHIBIT HALL (STAGE- EMERG) GROUP C +0 NW			
4	35H2B-5	EXHIBIT HALL (STAGE) GROUP D +0 NW			
5	35H2B-2	EXHIBIT HALL (STAGE) GROUP E +0 NW			
6	35H2B-4	EXHIBIT HALL (STAGE) GROUP F +0 NW			
7	35H2B-6	EXHIBIT HALL (STAGE) GROUP G +0 NEW			
8	35H2B-7	EXHIBIT HALL (STAGE) GROUP H +0 NW			
9	35H2B-9	EXHIBIT HALL GROUP A +0 NW			
10	35H2B-11	EXHIBIT HALL GROUP B +0 NW			
11	35EH2B-4	EXHIBIT HALL (EMERG) GROUP C +0 NW			
12	35H2B-13	EXHIBIT HALL GROUP D +0 NW			
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
25	35H2B-20	EXHIBIT HALL FRONT GROUP W +0 NW			
26	35H2B-22	EXHIBIT HALL FRONT GROUP X +0 NW			
27	35H2B-24	EXHIBIT HALL FRONT GROUP Y +0 NW			
28	35H2B-25	EXHIBIT HALL FRONT GROUP Z +0 NW			
29	35EH2B-12	EXHIBIT HALL (FRONT-EMERG) GROUP W+0 NW			
30	35H2B-29	EXHIBIT HALL FRONT GROUP X +0 NW			
31	35H2BB-1	EXHIBIT HALL FRONT GROUP Y +0 NW			
32	35H2B-27	EXHIBIT HALL FRONT GROUP Z +0 NW			
33	35EH2B-8	EXHIBIT HALL (EMERG) FRONT +0 NW			
34	35H2B-26	EXHIBIT HALL FRONT GROUP W +0 NW			
35	35H2B-28	EXHIBIT HALL FRONT GROUP X +0 NW			

36	35H2B-30	EXHIBIT HALL FRONT GROUP Y +0 NW
<b>Input</b>	<b>Type</b>	<b>Description</b>
A		
1		
2		
3		
7		
8		
9		

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
206	LCP-83RPB - Front Hall A3		CC	48/48 Surface	115/277
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
1	83H2B-1	EXHIBIT HALL (STAGE) GROUP A +51 NW			
2	83H2B-3	EXHIBIT HALL (STAGE) GROUP B +51 NW			
3	83EH2B-1	EXHIBIT HALL (STAGE- EMERG) GROUP C +51 NW			
4	83H2B-5	EXHIBIT HALL (STAGE) GROUP D +51 NW			
5	83H2B-2	EXHIBIT HALL (STAGE) GROUP E +51 NW			
6	83H2B-4	EXHIBIT HALL (STAGE) GROUP F +51 NW			
7	83H2B-6	EXHIBIT HALL (STAGE) GROUP G +51 NW			
8	83H2B-7	EXHIBIT HALL (STAGE) GROUP H +51 NW			
9	83H2B-9	EXHIBIT HALL GROUP A +51 NW			
10	83H2B-11	EXHIBIT HALL GROUP B +51 NW			
11	83EH2B-3	EXHIBIT HALL (EMERG) GROUP C +51 NW			
12	83H2B-13	EXHIBIT HALL GROUP D +51 NW			
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
25	83H2B-20	EXHIBIT HALL FRONT GROUP W +51 NW			
26	83H2B-22	EXHIBIT HALL FRONT GROUP X +51 NW			
27	83H2B-24	EXHIBIT HALL FRONT GROUP Y +51 NW			
28	83H2B-25	EXHIBIT HALL FRONT GROUP Z +51 NW			
29	83EH2B-2	EXHIBIT HALL FRONT GROUP W +51 NW			
30	83H2B-32	EXHIBIT HALL FRONT GROUP X +51 NW			
31	83EH2B-7	EXHIBIT HALL (FRONT-EMER) GROUP Y +51 NW			
32	83H2B-34	EXHIBIT HALL FRONT GROUP Z +51 NW			
33	83H2B-27	Truss Lights A/F			

34	83H2B-26	Truss Lights A/F	
35	83H2B-28	Truss Lights A/F	
36	83H2B-30	Truss Lights A/F	
<b>Input</b>		<b>Type</b>	<b>Description</b>
A			
1			
2			
3			
7			
8			
9			

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
207	LCP-83RPA-1 - Rear Hall A3		CC	48/48 Surface	115/277
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
1	83H2A-1	EXHIBIT HALL (LARGE STAGE) GROUP A +51 NE			
2	83H2A-3	EXHIBIT HALL (LARGE STAGE) GROUP B +51 NE			
3	83EH2A-11	EXHIBIT HALL (STAGE EMERG) GROUP C +51 NE			
4	83H2A-5	EXHIBIT HALL (LARGE STAGE) GROUP D +51 NE			
5	83H2A-2	EXHIBIT HALL (LARGE STAGE) GROUP E +51 NE			
6	83H2A-4	EXHIBIT HALL (LARGE STAGE) GROUP F +51 NE			
7	83H2A-6	EXHIBIT HALL (LARGE STAGE) GROUP G +51 NE			
8	83H2A-7	EXHIBIT HALL (LARGE STAGE) GROUP H +51 NE			
9	83H2A-9	EXHIBIT HALL (LARGE STAGE) GROUP A +51 NE			
10	83H2A-11	EXHIBIT HALL (LARGE STAGE) GROUP B +51 NE			
11	83EH2A-13	EXHIBIT HALL (STAGE EMERG) GROUP C +51 NE			

12	83H2A-8	EXHIBIT HALL (LARGE STAGE) GROUP D +51 NE	
Rly	Circuit	Description	LV Switch
25	83H2A-16	EXHIBIT HALL GROUP G +51 NE	
26	83H2A-18	EXHIBIT HALL GROUP H +51 NE	
27	83H2A-20	EXHIBIT HALL GROUP A +51 NE	
28	83H2A-19	EXHIBIT HALL GROUP B +51 NE	
29	83EH2A-15	EXHIBIT HALL (EMERG) GROUP C +51 NE	
30	83H2A-21	EXHIBIT HALL GROUP D +51 NE	
31	83H2A-23	EXHIBIT HALL GROUP E +51 NE	
32	83H2A-22	EXHIBIT HALL GROUP F +51 NE	
33	83H2A-24	EXHIBIT HALL GROUP G +51 NE	
34	83H2A-26	EXHIBIT HALL GROUP H +51 NE	
35	83H2A-25	EXHIBIT HALL GROUP A +51 NE	
36	83H2A-27	EXHIBIT HALL GROUP B +51 NE	
Input	Type	Description	
A			
1			
2			
3			
7			
8			
9			

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
208	LCP-83RPA-2 - Rear Hall A3		CC	24/24 Surface	115/277
Rly	Circuit	Description	LV Switch		
1	83EH2A-7	LOADING DOCK LIGHTING (EMERG) NE +51			
2	83H2AA-4	LOADING DOCK LIGHTING NE +51			
3	83H2AA-6	LOADING DOCK LIGHTING NE +51			
4	83H2AA-8	LOADING DOCK LIGHTING NE +51			
5	83H2AA-10	LOADING DOCK LIGHTING NE +51			
6	83H2AA-12	MECHANICAL ROOM +83 VIA RELAY			
7	83L2A-23	ROOF TOP LIGHT VIA CONTACTOR			
8	83H2AA-4	LIGHTING +51 EXIT			
9	83L2A-23	GRBCC NEON SIGN LIGHTS North End			
10	83H2AA-9	LIGHTING STORAGE +51			

11		SPACE	
12		SPACE	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
A			
1			
2			
3			

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
209	LCP-35RPDA - Reg. E		CC	24/24 Surface	115/277
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
1	35H2DA-1	WATER HEATER LEVEL +25			
2	35H2DA-3	WATER HEATER LEVEL +0			
3	35L2DA-1	LIGHTING ABOVE ESCALATOR +0 SW			
4	35L2DA-3	LIGHTING ABOVE ESCALATOR +0 SW			
5	35H2DA-7	TICKET BOOTH LIGHTING +0 SW			
6	35H2DA-2	LIGHTING +25 SW			
7	35H2DA-4	LIGHTING +25 SW			
8	35H2DA-6	LIGHTING +25 SW			
9	35H2DA-8	LIGHTING +25 SW			
10	35H2DA-10	LIGHTING +25 SW			
11	35H2DA-12	LIGHTING +25 SW			
12	35H2DA-14	LIGHTING +25 RESTROOMS & STORAGE SW			
<b>Input</b>	<b>Type</b>	<b>Description</b>			
A					
1					
2					
3					

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
210	LCP-12RPC - Tunnel E		CC	12/12 Surface	115/277
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
1	12H2C-1	TUNNEL LIGHTING SE			
2	12H2C-2	TUNNEL LIGHTING SE			
3	12H2C-3	TUNNEL LIGHTING SE			
4	12H2C-4	TUNNEL LIGHTING SE			
5	12H2C-5	Electrical Room SE Tunnel			

6	12H2C-23	WATER HEATER LVL 0 SOUTHEAST	
7		SPARE	
8		SPACE	
9		SPACE	
10		SPACE	
11		SPACE	
12		SPACE	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
A			
1			
2			
3			

<b>Panel ID</b>	<b>Description</b>	<b>Location</b>	<b>Type</b>	<b>Interior/Enclosure</b>	<b>Power Supply</b>
211	LCP-35RPD - Front Hall E		CC	48/48 Surface	115/277
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
1	35H2D-1	EXHIBIT HALL (STAGE) GROUP A +0 SW			
2	35H2D-3	EXHIBIT HALL (STAGE) GROUP B +0 SW			
3	35EH2D-6	EXHIBIT HALL (STAGE- EMERG) GROUP C +0 SW			
4	35H2D-5	EXHIBIT HALL (STAGE) GROUP D +0 SW			
5	35H2D-2	EXHIBIT HALL (STAGE) GROUP E +0 SW			
6	35H2D-6	EXHIBIT HALL (STAGE) GROUP F +0 SW			
7	35H2D-6	EXHIBIT HALL (STAGE) GROUP G +0 SW			
8	35H2D-7	EXHIBIT HALL (STAGE) GROUP H +0 SW			
9	35H2D-9	EXHIBIT HALL GROUP A +0 SW			
10	35H2D-11	EXHIBIT HALL GROUP B +0 SW			
11	35EH2D-3	EXHIBIT HALL (EMERG) GROUP C +0 SW			
12	35H2D-13	EXHIBIT HALL GROUP D +0 SW			
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
25	35H2D-20	EXHIBIT HALL FRONT GROUP W +0 SW			
26	35H2D-22	EXHIBIT HALL FRONT GROUP X +0 SW			
27	35H2D-24	EXHIBIT HALL FRONT GROUP Y +0 SW			
28	35H2D-25	EXHIBIT HALL FRONT GROUP Z +0 SW			
29	35H2D-27	EXHIBIT HALL FRONT GROUP W +0 SW			
30	35H2D-29	EXHIBIT HALL FRONT GROUP X +0 SW			
31	35H2D-29	EXHIBIT HALL FRONT GROUP Y +0 SW			
32	35H2D-27	EXHIBIT HALL FRONT GROUP Z +0 SW			

33	35EH2D-2	EXHIBIT HALL (EMERG) FRONT +0 SW	
34	35H2D-26	EXHIBIT HALL FRONT GROUP W +0 SW	
35	35H2D-28	EXHIBIT HALL FRONT GROUP X +0 SW	
36	35H2D-30	EXHIBIT HALL FRONT GROUP Y +0 SW	
<b>Input</b>		<b>Type</b>	<b>Description</b>
A			
1			
2			
3			
7			
8			
9			

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
212	LCP-35RPC-1 - Rear Hall E		CC	48/48 Surface	115/277
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
1	35H2C-1	EXHIBIT HALL (LARGE STAGE) GROUP A +0 SE			
2	35H2C-3	EXHIBIT HALL (LARGE STAGE) GROUP B +0 SE			
3	35EH2C-11	EXHIBIT HALL (STAGE EMERG) GROUP C +0 SE			
4	35H2C-5	EXHIBIT HALL (LARGE STAGE) GROUP D +0 SE			
5	35H2C-2	EXHIBIT HALL (LARGE STAGE) GROUP E +0 SE			
6	35H2C-4	EXHIBIT HALL (LARGE STAGE) GROUP F +0 SE			
7	35H2C-6	EXHIBIT HALL (LARGE STAGE) GROUP G +0 SE			
8	35H2C-7	EXHIBIT HALL (LARGE STAGE) GROUP H +0 SE			
9	35H2C-9	EXHIBIT HALL (LARGE STAGE) GROUP A +0 SE			
10	35H2C-11	EXHIBIT HALL (LARGE STAGE) GROUP B +0 SE			

11	35EH2C-13	EXHIBIT HALL (STAGE EMERG) GROUP C +0 SE	
12	35H2C-8	EXHIBIT HALL (LARGE STAGE) GROUP D +0 SE	
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>
25	35H2C-20	EXHIBIT HALL GROUP G +0 SE	
26	35H2C-22	EXHIBIT HALL GROUP H +0 SE	
27	35H2C-24	EXHIBIT HALL GROUP A +0 SE	
28	35H2C-19	EXHIBIT HALL GROUP B +0 SE	
29	35EH2C-15	EXHIBIT HALL (EMERG) GROUP C +0 SE	
30	35H2C-21	EXHIBIT HALL GROUP D +0 SE	
31	35H2C-23	EXHIBIT HALL GROUP E +0 SE	
32	35H2C-26	EXHIBIT HALL GROUP F +0 SE	
33	35H2C-28	EXHIBIT HALL GROUP G +0 SE	
34	35H2C-30	EXHIBIT HALL GROUP H +0 SE	
35	35H2C-25	EXHIBIT HALL GROUP A +0 SE	
36	35H2C-27	EXHIBIT HALL GROUP B +0 SE	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
A			
1			
2			
3			
7			
8			
9			

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
213	LCP-35RPC-2 - Rear Hall E		CC	24/24 Surface	115/277
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
1	35H2C-35	EXHIBIT HALL REAR GROUP M +0 SE			
2	35H2CA-11	EXHIBIT HALL REAR GROUP N +0 SE			
3	35EH2C-8	EXHIBIT HALL REAR (EMERG) GROUP P +0 SE			
4	35H2C-35	EXHIBIT HALL REAR GROUP Q +0 SE			
5	35EH2C-9	LOADING DOCK LIGHTING (EMERG) +0 SE			
6	35H2CA-1	LOADING DOCK LIGHTING +0 SE			
7	35H2CA-3	LOADING DOCK LIGHTING +0 SE			
8	35H2CA-5	Storage/Exit Lighting SE			



9		SPARE	
10	35H2CA-4	MECHANICAL RM LIGHTING	
11	35H2CA-10	WATER HEATER	
12	35H2C-13	LEVEL +25 LIGHTING ELECTRICAL ROOM SE	
<b>Input</b>		<b>Type</b>	<b>Description</b>
A			
1	Master		
2	Master		
3	Master		

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
214	LCP-83RPC - Mtg. Rms Rear		CC	24/24 Surface	115/277
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
1	83H2C-1	CORRIDOR LIGHTING LVL 51 SE			
2	83H2C-3	CORRIDOR LIGHTING LVL 51 SE			
3	83H2C-7	CORRIDOR LIGHTING LVL 51 SE			
4	83H2C-5	CORRIDOR LIGHTING LVL 51 SE			
5	83H2C-9	DOCK LIGHTING LVL 51 SE			
6	83H2C-4	RESTROOM LIGHTING LVL 51 SE			
7	83L2C-33	ROOF TOP LIGHTING VIA CONTACTOR			
8	83L2C-37	GRBCC NEON SIGN LIGHTS South End			
9	83EH2C-5	MECHANICAL RM LTG LVL 83			
10	83H2CA-2	MECHANICAL RM LTG LVL 83			
11	83H2CA-6	PANTRY LIGHTING LVL +51			
12	83H2CA-4	STORAGE LVL +51 LIGHTING			
<b>Input</b>		<b>Type</b>	<b>Description</b>		
A					
1					
2					
3					

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply
215	LCP-83RPD - Mtg. Rms. Front		CC	24/24 Surface	115/277
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>		
1	83H2D-1	CORRIDOR LIGHTING LVL 51 SW			
2	83H2D-3	CORRIDOR LIGHTING LVL 51 SW			
3	83H2D-5	CORRIDOR LIGHTING LVL 51 SW			

4	83H2D-7	CORRIDOR LIGHTING LVL 51 SW	
5	83H2D-2	PUBLIC AREA LIGHTING LVL 51 SW	
6	83H2D-4	PUBLIC AREA LIGHTING LVL 51 SW	
7	83H2D-6	PUBLIC AREA LIGHTING LVL 51 SW	
8	83H2D-8	TRUSS E LIGHTING LVL 51 SW	
9	83H2D-10	TRUSS E LIGHTING LVL 51 SW	
10	83H2D-12	TRUSS E LIGHTING LVL 51 SW	
11	83H2D-14	TRUSS E LIGHTING LVL 51 SW-over Skybridge	
12	83H2D-9	RESTROOM LIGHTING LVL 51 SW	
<b>Input</b>		<b>Type</b>	<b>Description</b>
A			
1			
2			
3			

<b>Center</b>
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Circuit			
Rly	Circuit	Description	LV Switch
1		Lot 5 Far South - E Hall (Old 2-1)	
2		Mod -2 relay 2	
3		Mod -2 relay 3	
4	PHA	HPD Pkg Lot Pole Lts (Old 2-4)	
5	PHA	Lot 5 South (Old 2-5)	
6		Lot 5 Far North/HPD (Old 2-6)	
7		North/South Drive Up Ramps (Old 2-7)	
8		3rd Lvl Ramp High Lights - BR/GA (Old 2-8)	
9		3rd Lvl Ramp High Lights - Hall G (Old 2-9)	
10		Mod -2 relay 10 Ramp (?)	
11	**Space**	Mod -2 relay 11	
12	**Space**	Mod -2 relay 12	
13	**Space**	Mod -2 relay 13	
14	**Space**	Mod -2 relay 14	
15	**Space**	Mod -2 relay 15	
16	**Space**	Mod -2 relay 16	
Input	Type	Description	
1			
2			
3			
4			
5			
6			
7			
8			

Circuit			
Rly	Circuit	Description	LV Switch
1	12HA-1	D Tunnel (Old 4/1)	
2	12HA-3	D Tunnel (Old 4/2)	
3	12HA-5	D Tunnel (Old 4/3)	
4	12HA-6	D Tunnel (Old 4/4)	

5	12HA-7	D Tunnel (Old 4/5)	
6	12HA-4	D Tunnel Restrooms (Old 4/6)	
7		Mod -4 relay 7	
8		Mod -4 relay 8	
9		Mod -4 relay 9	
10		Mod -4 relay 10	
11		Mod -4 relay 11	
12		Mod -4 relay 12	
13		Mod -4 relay 13	
14		Mod -4 relay 14	
15		Mod -4 relay 15	
16		Mod -4 relay 16	
Input	Type	Description	
1			
2			
3			
4			
5			
6			
7			
8			

Circuit			
Rly	Circuit	Description	LV Switch
1	12HB-1	Tunnel - Hall C (Old 6-1)	
2	12HB-2	Tunnel - Hall C (Old 6-2)	
3	12HB-3	Tunnel - Hall C (Old 6-3)	
4	12HB-4	Tunnel - Hall C (Old 6-4)	
5	12HB-6	Restrooms - Tunnel C (Old 6-5)	
6		Mod -6 relay 6	
7		Mod -6 relay 7	
8		Mod -6 relay 8	
9		Mod -6 relay 9	
10		Mod -6 relay 10	
11		Mod -6 relay 11	
12		Mod -6 relay 12	
13		Mod -6 relay 13	
14		Mod -6 relay 14	

15		Mod -6 relay 15	
16		Mod -6 relay 16	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
1			
2			
3			
4			
5			
6			
7			
8			

<b>Circuit</b>			
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>
1	12HC-2	Tunnel - Hall B (Old 8-1)	
2	12HC-3	Tunnel - Hall B (Old 8-2)	
3	12HC-4	Tunnel - Hall B (Old 8-3)	
4	12HC-5	Tunnel - Hall B (Old 8-4)	
5	12HC-1	Restrooms - Tunnel B (Old 8-5)	
6		Mod -8 relay 6	
7		Mod -8 relay 7	
8		Mod -8 relay 8	
9		Mod -8 relay 9	
10		Mod -8 relay 10	
11		Mod -8 relay 11	
12		Mod -8 relay 12	
13		Mod -8 relay 13	
14		Mod -8 relay 14	
15		Mod -8 relay 15	
16		Mod -8 relay 16	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
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Circuit			
Rly	Circuit	Description	LV Switch
1	TB1-3	Canopy D (Old 10/1)	
2	TB1-5	Canopy D (Old 10/2)	
3	TB1-7	Plaza D (Old 10/3)	
4	TB1-9	Plaza D (Old 10/4)	
5	TB1-11	Canopy D (Old 10/5)	
6	TB1-13	Canopy D (Old 10/6)	
7	TB1-15	Canopy D (Old 10/7)	
8	TB1-17	Canopy D (Old 10/8)	
9	TB1-19	Canopy D (Old 10/9)	
10	TB1-21	Canopy D (Old 10/10)	
11	TB1-23	Canopy D (Old 10/11)	
12	TB1-25	Canopy D (Old 10/12)	
13	TB1-26	Plaza C (Old 10/13)	
14	TB1-27	Canopy D (Old 10/14)	
15	TB1-28	Canopy D (Old 10/15)	
16	TB1-29	Plaza C (Old 10/16)	
Input	Type	Description	
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7			
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Circuit			
Rly	Circuit	Description	LV Switch
1	TB3-3	Canopy B (Old 14/1)	
2	TB3-5	Canopy B (Old 14/2)	
3	TB3-7	Canopy B (Old 14/3)	
4	TB3-11	Canopy B (Old 14/4)	

5	TB3-13	Canopy B (Old 14/5)	
6	TB3-15	Canopy B (Old 14/6)	
7	TB3-17	Canopy B (Old 14/7)	
8	TB3-19	Canopy B (Old 14/8)	
9	TB3-21	Canopy B (Old 14/9)	
10	TB3-23	Canopy B (Old 14/10)	
11	TB3-25	Plaza A (Old 14/11)	
12	TB3-26	Plaza A (Old 14/12)	
13	TB3-27	Canopy B (Old 14/13)	
14	TB3-28	Plaza A (Old 14/14)	
15	12HG-25	Flagpole B (Old 14/15)	
16	TB3-?	Plaza A Floods (Old 14/16)	
Input	Type	Description	
1			
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6			
7			
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Circuit			
Rly	Circuit	Description	LV Switch
1	25HA-9	Reg. D (Old 16/1)	
2	25HA-11	Reg. D (Old 16/2)	
3	25HA-13	Reg. D (Old 16/3)	
4	25HA-15	Reg. D (Old 16/4)	
5	25HA-17	Reg. D (Old 16/5)	
6	25HA-19	Reg. D (Old 16/6)	
7	25HA-21	Reg. C (Old 16/7)	
8	25HA-23	Reg. C (Old 16/8)	
9	25HA-25	Reg. C (Old 16/9)	
10	25HA-27	Reg. C (Old 16/10)	
11	25HA-29	Reg. C (Old 16/11)	
12	25HA-31	Reg. C (Old 16/12)	
13	25HA-33	Reg. C (Old 16/13)	
14	25HA-5	Restrooms 214/215 (Old 16/14)	

15	25HA-58	Bldg Directory (Old 16/15)	
16	25HA-60	Bldg Directory (Old 16/16)	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
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<b>Circuit</b>			
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>
1	25HA-30	EHC 50% (Old 18/1)	
2	25HA-32	EHC 50% (Old 18/2)	
3	25HA-34	EHC 50% (Old 18/3)	
4	25HA-36	EHC 50% (Old 18/4)	
5	25HA-38	EHC 50% (Old 18/5)	
6	25HA-54	EHC 50% (Top Stairs/Exit) (Old 18/6)	
7	25HA-56	Lobby C (Old 18/7)	
8	25HA-40	EHC 25% (Old 18/8)	
9	25HA-42	EHC 25% (Old 18/9)	
10	25HA-44	EHC 25% (Old 18/10)	
11	25HA-76	EHC 25% (Old 18/11)	
12	25HA-46	EHC 13% (Old 18/12)	
13	25HA-48	EHC 13% (Old 18/13)	
14	25HA-50	EHC 12% (Old 18/14)	
15	25HA-52	EHC 12% (Old 18/15)	
16	25HA-41	+25 Level Nt Lts (Old 18/16)	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
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Circuit			
Rly	Circuit	Description	LV Switch
1	25HB-7	Reg. B (Old 20/1)	
2	25HB-9	Reg. B (Old 20/2)	
3	25HB-11	Reg. B (Old 20/3)	
4	25HB-13	Reg. B (Old 20/4)	
5	25HB-15	Reg. B (Old 20/5)	
6	25HB-17	Reg. B (Old 20/6)	
7	25HB-31	Restrooms 212/213 (Old 20/7)	
8	25HB-2	Truss/Escl B (Old 20/8)	
9	25HB-4	Truss/Escl C (Old 20/9)	
10	25HB-?	Truss/Escl C 2-3 (Old 20/10)	
11		Mod -20 relay 11	
12		Mod -20 relay 12	
13		Mod -20 relay 13	
14		Mod -20 relay 14	
15		Mod -20 relay 15	
16		Mod -20 relay 16	
Input	Type	Description	
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Circuit			
Rly	Circuit	Description	LV Switch
1	25HC-2	Dock D (Old 22/1)	
2	25HC-4	Dock D (Old 22/2)	
3	25HC-6	Dock D (Old 22/3)	
4	25HC-8	Dock D (Old 22/4)	

5	25HC-10	Dock D (Old 22/5)	
6	25HC-12	Dock C (Old 22/6)	
7	25HC-14	Dock C (Old 22/7)	
8	25HC-16	Dock C (Old 22/8)	
9	25HC-18	Dock C (Old 22/9)	
10	25HC-20	Dock C (Old 22/10)	
11	25HC-1	EHD 50% (Old 22/11)	
12	25HC-5	EHD 25% (Old 22/12)	
13	25LC-24	??? EHD 25% (Old 22/13)	
14	25HC-11	EHD 13% (Old 22/14)	
15	25HC-15	EHD 12% (Old 22/15)	
16	25LC-26	C Dock Soffit Lts (Old 22/16)	
Input	Type	Description	
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7			
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Circuit			
Rly	Circuit	Description	LV Switch
1	25HD-1	EHB 50% (Old 24/1)	
2	25HD-3	EHB 25% (Old 24/2)	
3	25HD-5	EHB 25% (Old 24/3)	
4	25HD-7	EHB 13% (Old 24/4)	
5	25HD-9	EHB 12% (Old 24/5)	
6	25HD-11	Dock B (Old 24/6)	
7	25HD-13	Dock B (Old 24/7)	
8	25HD-15	Dock B (Old 24/8)	
9	25HD-17	Dock B (Old 24/9)	
10	25HD-19	Dock B (Old 24/10)	
11	25HD-23	B Hall Restrms (Rear) (Old 24/11)	
12	25HD-25	B Hall Restrms (Rear) (Old 24/12)	
13	25HD-22	B Dock Nt Lts (Old 24/13)	

14	25LD-2	B Dock Spot Lts (Old 24/14)	
15	25LD-4	B Dock Spot Lts (Old 24/15)	
16	25LD-6	B Dock Spot Lts (Old 24/16)	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
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<b>Circuit</b>			
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>
1	35HA-16	EHD 50% (Old 26/1)	
2	35HA-3	EHD 50% (Old 26/2)	
3	35HA-5	EHD 50% (Old 26/3)	
4	35HA-7	EHD 50% (Old 26/4)	
5	35HA-9	EHD 50% (Old 26/5)	
6	35HA-11	EHD 50% (Old 26/6)	
7	35HA-13	EHD 50% (Old 26/7)	
8	35HA-6	EHD 50% (Old 26/8)	
9	35HA-17	EHD 50% (Old 26/9)	
10	35HA-19	EHD 50% (Old 26/10)	
11	35HA-8	EHD 50% (Old 26/11)	
12	35HA-23	EHD 50% (Old 26/12)	
13	35HA-25	EHD 50% (Old 26/13)	
14	35HA-27	EHD 50% (Old 26/14)	
15	35HA-29	EHD 50% (Old 26/15)	
16		Mod -26 relay 16	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
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Circuit			
Rly	Circuit	Description	LV Switch
1	35HA-32	EHD Nt Lts (Old 28/1)	
2	35HA-34	D Stairwells E/W (Old 28/2)	
3	35HA-36	D Stairwells E/W (Old 28/3)	
4		Mod -28 relay 4	
5		Mod -28 relay 5	
6		Mod -28 relay 6	
7		Mod -28 relay 7	
8		Mod -28 relay 8	
9		Mod -28 relay 9	
10		Mod -28 relay 10	
11		Mod -28 relay 11	
12		Mod -28 relay 12	
13		Mod -28 relay 13	
14		Mod -28 relay 14	
15		Mod -28 relay 15	
16		Mod -28 relay 16	
Input	Type	Description	
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Circuit			
Rly	Circuit	Description	LV Switch
1	35HB-6	EHC 50% (Old 30/1)	
2	35HB-3	EHC 50% (Old 30/2)	
3	35HB-5	EHC 50% (Old 30/3)	
4	35HB-7	EHC 50% (Old 30/4)	

5	35HB-9	EHC 50% (Old 30/5)	
6	35HB-11	EHC 50% (Old 30/6)	
7	35HB-13	EHC 50% (Old 30/7)	
8	35HB-15	EHC 50% (Old 30/8)	
9	35HB-17	EHC 50% (Old 30/9)	
10	35HB-19	EHC 50% (Old 30/10)	
11	35HB-21	EHC 50% (Old 30/11)	
12	35HB-25	EHC 50% (Old 30/12)	
13	35HB-23	EHC 50% (Old 30/13)	
14	35HB-27	EHC 50% (Old 30/14)	
15	35HB-29	EHC 50% (Old 30/15)	
16	35HB-31	EHC Nt Lts (Old 30/16)	
Input	Type	Description	
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7			
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Circuit			
Rly	Circuit	Description	LV Switch
1	35HC-1	EHB 50% (Old 32/1)	
2	35HC-3	EHB 50% (Old 32/2)	
3	35HC-5	EHB 50% (Old 32/3)	
4	35HC-7	EHB 50% (Old 32/4)	
5	35HC-9	EHB 50% (Old 32/5)	
6	35HC-11	EHB 50% (Old 32/6)	
7	35HC-13	EHB 50% (Old 32/7)	
8	35HC-15	EHB 50% (Old 32/8)	
9	35HC-17	EHB 50% (Old 32/9)	
10	35HC-19	EHB 50% (Old 32/10)	
11	35HC-21	EHB 50% (Old 32/11)	
12	35HC-23	EHB 50% (Old 32/12)	
13	35HC-25	EHB 50% (Old 32/13)	
14	35HC-27	EHB 50% (Old 32/14)	

15	35HC-29	EHB 50% (Old 32/15)	
16	35HC-31	EHB Nt Lts (Old 32/16)	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
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<b>Circuit</b>			
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>
1	35HD-1	EHD 50% (Old 34/1)	
2	35HD-3	EHD 50% (Old 34/2)	
3	35HD-5	EHD 50% (Old 34/3)moved to PNL.18-8	
4	35HD-7	EHD 50% (Old 34/4)	
5	35HD-9	EHD 50% (Old 34/5)	
6	35HD-11	EHD 50% (Old 34/6)	
7	35HD-13	EHD 50% (Old 34/7)	
8	35HD-15	EHD 50% (Old 34/8)	
9	35HD-17	EHD 50% (Old 34/9)	
10	35HD-19	EHD 50% (Old 34/10)	
11	35HD-21	EHD 50% (Old 34/11)	
12	35HD-10	EHD 50% (Old 34/12)	
13	35HD-25	EHD 50% (Old 34/13)	
14	35HD-27	EHD 50% (Old 34/14)	
15	35HD-28	EHD 50% (Old 34/15)	
16	35HD-18	EHD 50% (Old 34/16)	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
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Circuit			
Rly	Circuit	Description	LV Switch
1	35HD-29	EHD 12% (Old 36/1)	
2	35HD-30	EHD 12% (Old 36/2)	
3	35HD-32	EHD 12% (Old 36/3)	
4	35HD-34	EHD 12% (Old 36/4)	
5	35HD-37	EHD Nt Lts (Old 36/5)	
6	35HD-39	D Stairwells E/W (Old 36/6)	
7	35HD-?	D Hall Roll-up Doors (Old 36/7)	
8		Mod -36 relay 8 was 17-3 discontinued	
9		Mod -36 relay 9 relay not installed	
10	control voltage of F-1SE35	Exhaust fan D-Hall rear Restrooms	
11		Mod -36 relay 11	
12		Mod -36 relay 12	
13		Mod -36 relay 13	
14		Mod -36 relay 14	
15		Mod -36 relay 15	
16		Mod -36 relay 16	
Input	Type	Description	
1			
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4			
5			
6			
7			
8			

Circuit			
Rly	Circuit	Description	LV Switch
1	35HF-1	EHC 50% (Old 38/1)	
2	35HF-3	EHC 50% (Old 38/2)	
3	35HF-5	EHC 50% (Old 38/3)	
4	35HF-7	EHC 50% (Old 38/4)	
5	35HF-9	EHC 50% (Old 38/5)	

6	35HF-11	EHC 50% (Old 38/6)	
7	35HF-13	EHC 50% (Old 38/7)	
8	35HF-15	EHC 50% (Old 38/8)	
9	35HF-17	EHC 50% (Old 38/9)	
10	35HF-19	EHC 50% (Old 38/10)	
11	35HF-21	EHC 50% (Old 38/11)	
12	35HF-23	EHC 50% (Old 38/12)	
13	35HF-25	EHC 50% (Old 38/13)	
14	35HF-27	EHC 50% (Old 38/14)	
15	35HF-29	EHC 50% (Old 38/15)	
16	35HF-31	EHC 50% (Old 38/16)	
Input	Type	Description	
1			
2			
3			
4			
5			
6			
7			
8			

Circuit			
Rly	Circuit	Description	LV Switch
1	35HF-28	EHC 12% (Old 40/1)	
2	35HF-30	EHC 12% (Old 40/2)	
3	35HF-32	EHC 12% (Old 40/3)	
4	35HF-34	EHC 12% (Old 40/4)	
5	35HF-41	EHC Night Lights (Old 40/5)	
6	35HF-39	C Stairwells E/W (Old 40/6)	
7	35HF-?	C Hall Roll-up Doors (Old 40/7)	
8		Mod -40 relay 8	
9		Mod -40 relay 9	
10		Mod -40 relay 10	
11		Mod -40 relay 11	
12		Mod -40 relay 12	
13		Mod -40 relay 13	
14		Mod -40 relay 14	
15		Mod -40 relay 15	



Input	Type	Description
16		Mod -40 relay 16
1		
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6		
7	Master	
8		

Circuit			
Rly	Circuit	Description	LV Switch
1	35HG-1	EHB 50% (Old 42/1)	
2	35HG-3	EHB 50% (Old 42/2)	
3	35HG-5	EHB 50% (Old 42/3)	
4	35HG-7	EHB 50% (Old 42/4)	
5	35HG-9	EHB 50% (Old 42/5)	
6	35HG-11	EHB 50% (Old 42/6)	
7	35HG-13	EHB 50% (Old 42/7)	
8	35HG-15	EHB 50% (Old 42/8)	
9	35HG-17	EHB 50% (Old 42/9)	
10	35HG-19	EHB 50% (Old 42/10)	
11	35HG-25	EHB 50% (Old 42/11)	
12	35HG-21	EHB 50% (Old 42/12)	
13	35HG-23	EHB 50% (Old 42/13)	
14	35HG-27	EHB 50% (Old 42/14)	
15	35HG-29	EHB 50% (Old 42/15)	
16	35HG-31	EHB 50% (Old 42/16)	
Input	Type	Description	
1			
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3			
4			
5			
6			
7			
8			

Circuit			
Rly	Circuit	Description	LV Switch
1	35HG-28	EHB 12% (Old 44/1)	
2	35HG-30	EHB 12% (Old 44/2)	
3	35HG-32	EHB 12% (Old 44/3)	
4	35HG-34	EHB 12% (Old 44/4)	
5	35HG-39	EHB Night Lights (Old 44/5)	
6	35HG-41	B Stairwells E/W (Old 44/6)	
7	35HG-?	B Hall Roll-up Doors (Old 44/7)	
8		Mod -44 relay 8	
9		Mod -44 relay 9	
10		Mod -44 relay 10	
11		Mod -44 relay 11	
12		Mod -44 relay 12	
13		Mod -44 relay 13	
14		Mod -44 relay 14	
15		Mod -44 relay 15	
16		Mod -44 relay 16	
Input	Type	Description	
1			
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6			
7			
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Circuit			
Rly	Circuit	Description	LV Switch
1	83HA-1	+71 Level Public Area (Old 46/1)	
2	83HA-3	+71 Level Public Area (Old 46/2)	
3	83HA-5	+71 Level Public Area (Old 46/3)	
4	83HA-7	Gen Assy Lobby (Old 46/4)	
5	83HA-9	Gen Assy Lobby (Old 46/5)	
6	83HA-11	Gen Assy Lobby (Old 46/6)	

7	83HA-13	Gen Assy Lobby (Old 46/7)	
8	83HA-15	Gen Assy S Step Lts (Old 46/8)	
9	83HA-17	Gen Assy S Step Lts (Old 46/9)	
10	83HA-18	Gen Assy N Step Lts (Old 46/10)	
11	83HA-20	Gen Assy N Step Lts (Old 46-11)	
12	83HA-22	+51 Level 303 Hallway (Old 46/12)	
13	83LA-11	Gen Assy N Soffit Lights (Old 46/13)	
14	83LA-13	Gen Assy S Soffit Lights (Old 46/14)	
15	83HA-25	+51 Level 304 Hallway (Old 46/15)	
16		Mod -46 relay 16	
Input	Type	Description	
1			
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4			
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Circuit			
Rly	Circuit	Description	LV Switch
1	83HB-1	Ballrooms Lobby (Old 48/1)	
2	83HB-3	Ballrooms Lobby (Old 48/2)	
3	83HB-5	Ballrooms Lobby (Old 48/3)	
4	83HB-7	Ballrooms Lobby (Old 48/4)	
5	83HB-11	M Restrm 301 (Old 48/5)	
6	83HB-13	W Restrm 301 (Old 48/6)	
7	83HB-15	M Restrm Hall G (Old 48/7)	
8	83HB-21	+51 Level Night Lights (Old 48/8)	
9	83HB-9	+51 Level 301 Hallway (Old 48/9)	
10	83LB-10	Ballroom Soffit Lts (Old 48/10)	
11	83LB-12	Ballroom Soffit Lts (Old 48/11)	
12	83LB-14	Ballroom Soffit Lts (Old 48/12)	
13	83LB-25	Ballroom Soffit Lts (Old 48/13)	
14	83LB-26	Ballroom Soffit Lts (Old 48/14)	
15	83LB-32	301 Hallway Soffit Lts (Old 48/15)	

16		Mod -48 relay 16	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
1			
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7			
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Circuit			
Rly	Circuit	Description	LV Switch
1	83HC-1	EHG 50% (Old 50/1)	
2	83HC-3	EHG 50% (Old 50/2)	
3	83HC-5	EHG 50% (Old 50/3)	
4	83HC-7	EHG 50% (Old 50/4)	
5	83HC-9	EHG 50% (Old 50/5)	
6	83HC-11	EHG 50% (Old 50/6)	
7	83HC-13	EHG 50% (Old 50/7)	
8	83HC-15	EHG 50% (Old 50/8)	
9	83HC-17	EHG 50% (Old 50/9)	
10	83HC-19	EHG 50% (Old 50/10)	
11	83HC-21	EHG 50% (Old 50/11)	
12	83HC-23	EHG 50% (Old 50/12)	
13	83HC-25	EHG 50% (Old 50/13)	
14	83HC-27	EHG 50% (Old 50/14)	
15	83HC-29	EHG 50% [Shutterlight] (Old 50/15)	
16	83HC-31	EHG 50% (Old 50/16)	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
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Circuit			
Rly	Circuit	Description	LV Switch
1	83HC-42	EHG 12% (Old 52/1)	
2	83HC-44	EHG 12% (Old 52/2)	
3	83HC-46	EHG 12% (Old 52/3)	
4	83HC-48	EHG 12% (Old 52/4)	
5	83HC-50	Truss B - Balcony A (Old 52/5)	
6	83HC-4	Truss B - Balcony A (Old 52/6)	
7	83HC-6	Truss B - Balcony A (Old 52/7)	
8	83HC-8	Truss B - Balcony A (Old 52/8)	
9	83HC-10	Truss B - Escalators B (Old 52/9)	
10	83HC-12	Truss B - Escalators B (Old 52/10)	
11	83HC-14	Truss B - Escalators B (Old 52/11)	
12	83HC-16	Truss B - Escalators B (Old 52/12)	
13	83HC-50(?)	Escl B 2-3 Soffit Lts (Old 52/13)	
14		Mod -52 relay 14	
15		Mod -52 relay 15	
16		Mod -52 relay 16	
Input	Type	Description	
1			
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Circuit			
Rly	Circuit	Description	LV Switch
1	83HD-1	+71 Level Public Area (Old 54/1)	
2	83HD-3	+71 Level Public Area (Old 54/2)	
3	83HD-5	+51 Level 318 Hallway (Old 54/3)	
4	83HD-7	+51 Level Back Hallway (Old 54/4)	
5	83HD-9	+51 Level 317 Hallway (Old 54/5)	

6	83LD-20	Soffit Lts 318 Hallway (Old 54/6)	
7	83LD-22	Soffit Lts 317 Hallway (Old 54/7)	
8	83HD-2	GA Dock (Old 54/8)	
9	83HD-4	GA Dock (Old 54/9)	
10	83LD-8	GA Dock Spot Lts (Old 54/10)	
11	83HD-?	GA Roll-up Doors (Old 54/11)	
12		Mod -54 relay 12	
13		Mod -54 relay 13	
14		Mod -54 relay 14	
15		Mod -54 relay 15	
16		Mod -54 relay 16	
Input	Type	Description	
1			
2			
3			
4			
5			
6			
7			
8			

Circuit			
Rly	Circuit	Description	LV Switch
1	83HF-4	WRRm EHG/Kitchen RRms (Old 56/1)	
2	83HF-5	+51 Level Kitchen Hallway (Old 56/2)	
3	83HF-7	+51 Level Back Hallway (Old 56/3)	
4	83HF-9	+51 Lvl BR Service Hallway (Old 56/4)	
5	83HF-11	+51 Lvl BR Service Hallway (Old 56/5)	
6	83HF-13	+51 Level Back Hallway (Old 56/6)	
7	83LF-19	Soffit Lts BR Svc Hall (Old 56/7)	
8	83LF-21	Soffit Lts BR Svc Hall (Old 56/8)	
9	83HF-1	BR Dock (Old 56/9)	
10	83HF-3	BR Dock (Old 56/10)	
11	83HF-15	BR Dock (Old 56/11)	
12	83HF-17	BR Dock (Old 56/12)	
13	83LF-13	BR Dock Spot Lts (Old 56/13)	
14	83HF-?	BR Dock Roll-up Doors (Old 56/14)	
15		Mod -56 relay 15	

Input	Type	Description
16		Mod -56 relay 16
1		
2		
3		
4		
5		
6		
7		
8		

Circuit			
Rly	Circuit	Description	LV Switch
1	83HG-1	EHG 50% (Old 58/1)	
2	83HG-3	EHG 50% (Old 58/2)	
3	83HG-5	EHG 50% (Old 58/3)	
4	83HG-7	EHG 50% (Old 58/4)	
5	83HG-9	EHG 50% (Old 58/5)	
6	83HG-11	EHG 50% (Old 58/6)	
7	83HG-13	EHG 50% (Old 58/7)	
8	83HG-15	EHG 50% (Old 58/8)	
9	83HG-17	EHG 50% (Old 58/9)	
10	83HG-19	EHG 50% (Old 58/10)	
11	83HG-21	EHG 50% (Old 58/11)	
12	83HG-23	EHG 50% (Old 58/12)	
13	83HG-25	EHG 50% (Old 58/13)	
14	83HG-27	EHG 50% (Old 58/14)	
15	83HG-29	EHG 50% (Old 58/15)	
16	83HG-36	EHG Night Lts (Old 58/16)	
Input	Type	Description	
1			
2			
3			
4			
5			
6			
7			
8			

Circuit			
Rly	Circuit	Description	LV Switch
1	83HG-31	Dock G (Old 60/1)	
2	83HG-33	Dock G (Old 60/2)	
3	83HG-35	Dock G (Old 60/3)	
4	83HG-37	Dock G (Old 60/4)	
5	83HG-39	Dock G (Old 60/5)	
6	83HG-41	Dock G (Old 60/6)	
7	83LG-1	Dock G Spot Lts (Old 60/7)	
8	83HG-?	G Hall Roll-up Doors (Old 60/8)	
9		Mod -60 relay 9	
10		Mod -60 relay 10	
11		Mod -60 relay 11	
12		Mod -60 relay 12	
13		Mod -60 relay 13	
14		Mod -60 relay 14	
15		Mod -60 relay 15	
16		Mod -60 relay 16	
Input	Type	Description	
1			
2			
3			
4			
5			
6			
7			
8			
Circuit			



Input	Type	Description
B		

Circuit			
Rly	Circuit	Description	LV Switch
13	35H2A-10	EXHIBIT HALL (SMALL STAGE) GROUP E +0 NE	
14	35H2A-10	EXHIBIT HALL (SMALL STAGE) GROUP F +0 NE	
15	35H2A-12	EXHIBIT HALL (SMALL STAGE) GROUP G +0 NE	
16	35H2A-12	EXHIBIT HALL (SMALL STAGE) GROUP H +0 NE	
17	35H2A-13	EXHIBIT HALL (SMALL STAGE) GROUP A +0 NE	
18	35H2A-13	EXHIBIT HALL (SMALL STAGE) GROUP B +0 NE	
19	35H2A-15	EXHIBIT HALL GROUP A +0 NE	
20	35H2A-17	EXHIBIT HALL GROUP B +0 NE	
21	35EH2A-15	EXHIBIT HALL (EMERG) GROUP C +0 NE	
22	35H2A-14	EXHIBIT HALL GROUP D +0 NE	
23	35H2A-16	EXHIBIT HALL GROUP E +0 NE	

24	35H2A-18	EXHIBIT HALL GROUP F +0 NE	
Rly	Circuit	Description	LV Switch
37	35EH2A-19	EXHIBIT HALL (EMERG) GROUP C +0 NE	
38	35H2A-29	EXHIBIT HALL GROUP D +0 NE	
39	35H2A-32	EXHIBIT HALL GROUP E +0 NE	
40	35H2A-34	EXHIBIT HALL GROUP F +0 NE	
41	35H2A-36	EXHIBIT HALL GROUP G +0 NE	
42	35H2A-31	EXHIBIT HALL GROUP H +0 NE	
43	35EH2A-15	EXHIBIT HALL (EMERG) GROUP C +0 NE	
44	35H2A-33	EXHIBIT HALL GROUP D +0 NE	
45	35H2A-33	EXHIBIT HALL EXIT DOOR +0 NE	
46	35H2AA-7	EXHIBIT HALL EXIT DOOR +0 NE	
47	35H2AA-9	EXHIBIT HALL EXIT DOOR +0 NE	
48	35H2A-42	RESTROOM LIGHTING +0 NE	
Input	Type	Description	
B			
4			
5			
6			
10			
11			
12			

Circuit	Rly	Circuit	Description	LV Switch
	13		SPARE	
	14	35H2AA-16	MECHANICAL RM +35 NE	
	15	35H2AA-18	MECHANICAL RM +35 NE	
	16	35H2AA-12	Storage/Exit Lighting +0 NE	
	17		SPACE	
	18		SPACE	
	19		SPACE	
	20		SPACE	
	21		SPACE	
	22		SPACE	

23		SPACE	
24		SPACE	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
B			
4			
5			
6			

<b>Circuit</b>			
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>
13	35H2BA-11	WB LIGHTING +25 NW	
14	35H2BA-13	WB LIGHTING +25 NW	
15	35H2BA-15	MECH ROOM+35 NW	
16	35H2BA-17	LIGHTING LVL 35 NW	
17	35H2BA-24	LIGHTING Senior Games 2.5 offices	
18	35H2BA-9	LIGHTING LEVEL +25 LOW CEILING	
19	35H2BA-18	LIGHTING LEVEL +25 OFFICE NW	
20	35H2BA-20	LIGHTING LEVEL +25 OFFICE NW	
21	35H2BA-22	LIGHTING LEVEL +25 OFFICE NW	
22	35H2BA-16	LIGHTING LEVEL +25 RESTROOMS/HK-Warehouse NW	
23	35H2BA-23	WATER HEATER TICKET BOOTH	
24	SPARE		
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>
37			
38			
39			
40			
41			
42			
43		No Driver Card	
44			
45			
46			
47			
48			
<b>Input</b>	<b>Type</b>	<b>Description</b>	

B		
4		
5		
6		

Circuit			
Rly	Circuit	Description	LV Switch
13	35H2B-8	EXHIBIT HALL GROUP E +0 NW	
14	35H2B-10	EXHIBIT HALL GROUP F +0 NW	
15	35H2B-12	EXHIBIT HALL GROUP G +0 NW	
16	35H2B-15	EXHIBIT HALL GROUP H +0 NW	
17	35H2B-17	EXHIBIT HALL GROUP A +0 NW	
18	35H2B-19	EXHIBIT HALL GROUP B +0 NW	
19	35EH2B-6	EXHIBIT HALL (EMERG) GROUP C +0 NW	
20	35H2B-14	EXHIBIT HALL GROUP D +0 NW	
21	35H2B-16	EXHIBIT HALL GROUP E +0 NW	
22	35H2B-18	EXHIBIT HALL GROUP F +0 NW	
23	35H2B-21	EXHIBIT HALL GROUP G +0 NW	
24	35H2B-23	EXHIBIT HALL GROUP H +0 NW	
Rly	Circuit	Description	LV Switch
37	35H2B-31	EXHIBIT HALL FRONT GROUP Z +0 NW	
38	35H2B-33	ENTRANCE +0 NW	
39	35EH2B-10	ENTRANCE (EMERG) +0 NW	
40	35H2B-35	ENTRANCE +0 NW	
41	35H2B-32	ENTRANCE +0 NW	
42	35H2B-34	ENTRANCE +0 NW	
43	35H2B-36	RESTROOM LIGHTING ) NW	
44	35H2B-41	WATER HEATER +51	
45	35H2BB-5	CANOPY LIGHTING +0 NW	
46	35H2BB-2	CANOPY LIGHTING +0 NW	
47	35H2BB-3	ENTRANCE LIGHTING +0 NW	

48	35H2BB-4	SIGN LIGHTING +0 NW
Input	Type	Description
B		
4		
5		
6		
10		
11		
12		

Circuit			
Rly	Circuit	Description	LV Switch
13	83H2B-8	EXHIBIT HALL GROUP E +51 NW	
14	83H2B-10	EXHIBIT HALL GROUP F +51 NW	
15	83H2B-12	EXHIBIT HALL GROUP G +51 NW	
16	83H2B-15	EXHIBIT HALL GROUP H +51 NW	
17	83H2B-17	EXHIBIT HALL GROUP A +51 NW	
18	83H2B-19	EXHIBIT HALL GROUP B +51 NW	
19	83EH2B-5	EXHIBIT HALL (EMERG) GROUP C +51 NW	
20	83H2B-14	EXHIBIT HALL GROUP D +51 NW	
21	83H2B-16	EXHIBIT HALL GROUP E +51 NW	
22	83H2B-18	EXHIBIT HALL GROUP F +51 NW	
23	83H2B-21	EXHIBIT HALL GROUP G +51 NW	
24	83H2B-23	EXHIBIT HALL GROUP H +51 NW	
Rly	Circuit	Description	LV Switch
37	83H2B-31	EXHIBIT HALL FRONT RESTROOM +51 NW	
38	83H2B-33	ENTRANCE (EMERG) +51 NW	
39	83EH2B-4	ENTRANCE +51 NW	
40	83H2B-33	ENTRANCE +51 NW	
41	83H2B-37	LIGHTING MECH LVL 83	
42		SPARE	
43	83H2B-39	EXHIBIT HALL FRONT FURR DOWN +51NW	
44	SPARE		
45	SPARE		

46	SPARE	
47	SPARE	
48	SPARE	
Input	Type	Description
B		
4		
5		
6		
10		
11		
12		

Circuit			
Rly	Circuit	Description	LV Switch
13	83H2A-10	EXHIBIT HALL (SMALL STAGE) GROUP E +51 NE	
14	83H2A-10	EXHIBIT HALL (SMALL STAGE) GROUP F +51 NE	
15	83H2A-12	EXHIBIT HALL (SMALL STAGE) GROUP G +51 NE	
16	83H2A-12	EXHIBIT HALL (SMALL STAGE) GROUP H +51 NE	
17	83H2A-14	EXHIBIT HALL (SMALL STAGE) GROUP A +51 NE	
18	83H2A-14	EXHIBIT HALL (SMALL STAGE) GROUP B +51 NE	
19	83H2A-14	EXHIBIT HALL GROUP A +51 NE	
20	83H2A-13	EXHIBIT HALL GROUP B +51 NE	
21	35EH2A-15	EXHIBIT HALL (EMERG) GROUP C +51 NE	
22	83H2A-15	EXHIBIT HALL GROUP D +51 NE	
23	83H2A-17	EXHIBIT HALL GROUP E +51 NE	

24	83H2A-17	EXHIBIT HALL GROUP F +51 NE	
Rly	Circuit	Description	LV Switch
37	83EH2A-17	EXHIBIT HALL (EMERG) GROUP C +51 NE	
38	83H2A-29	EXHIBIT HALL GROUP D +51 NE	
39	83H2A-28	EXHIBIT HALL GROUP E +51 NE	
40	83H2A-30	EXHIBIT HALL GROUP F +51 NE	
41	83H2AA-1	EXHIBIT HALL GROUP G +51 NE	
42	83H2A-31	EXHIBIT HALL GROUP H +51 NE	
43	83EH2A-17	EXHIBIT HALL (EMERG) GROUP C +51 NE	
44	83H2A-15	EXHIBIT HALL GROUP D +51 NE	
45	83H2A-33	EXHIBIT HALL EXIT DOOR +51 NE	
46	83H2A-35	EXHIBIT HALL EXIT DOOR +51 NE	
47	83H2AA-3	EXHIBIT HALL EXIT DOOR +51 NE	
48	83H2AA-5	RESTROOM LIGHTING +51 NE	
Input	Type	Description	
B			
4			
5			
6			
10			
11			
12			

Circuit	Rly	Circuit	Description	LV Switch
	13			
	14			
	15			
	16			
	17			
	18			
	19			
	20			
	21			
	22			

23		
24		
<b>Input</b>	<b>Type</b>	<b>Description</b>
B		
4		
5		
6		

Circuit			
Rly	Circuit	Description	LV Switch
13	35H2DA-9	MECHANICAL RM LTG +35 SW	
14	35H2DA-11	MECHANICAL RM LTG +35 SW	
15	35H2DA-16	LIGHTING +25 SW	
16	35H2DA-18	LIGHTING +25 SHELL SW	
17	35H2DA-13	WATER HEATER TICKET BOOTH	
18		SPACE	
19		SPACE	
20		SPACE	
21		Space	
22		Space	
23		Space	
24		Space	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
B			
4			
5			
6			

Circuit			
---------	--	--	--



Input	Type	Description
B		

Circuit			
Rly	Circuit	Description	LV Switch
13	35H2D-8	EXHIBIT HALL GROUP E +0 SW	
14	35H2D-10	EXHIBIT HALL GROUP F +0 SW	
15	35H2D-12	EXHIBIT HALL GROUP G +0 SW	
16	35H2D-15	EXHIBIT HALL GROUP H +0 SW	
17	35H2D-17	EXHIBIT HALL GROUP A +0 SW	
18	35H2D-19	EXHIBIT HALL GROUP B +0 SW	
19	35EH2D-5	EXHIBIT HALL (EMERG) GROUP C +0 SW	
20	35H2D-14	EXHIBIT HALL GROUP D +0 SW	
21	35H2D-16	EXHIBIT HALL GROUP E +0 SW	
22	35H2D-18	EXHIBIT HALL GROUP F +0 SW	
23	35H2D-21	EXHIBIT HALL GROUP G +0 SW	
24	35H2D-23	EXHIBIT HALL GROUP H +0 SW	
Rly	Circuit	Description	LV Switch
37	35H2D-31	EXHIBIT HALL FRONT GROUP Z +0 SW	
38	35H2D-33	ENTRANCE +0 SW	
39	35EH2D-4	ENTRANCE (EMERG) +0 SW	
40	35H2D-35	ENTRANCE +0 SW	
41	35H2D-32	ENTRANCE +0 SW	
42	35H2D-34	ENTRANCE +0 SW	
43	35H2D-36	LIGHTING RESTROOMS +0 SW	
44	35H2D-41	WATER HEATER	

45	35H2DB-3	ENTRANCE LIGHTING +0 SW	
46	35H2DB-1	ENTRANCE CANOPY +0 SW	
47	35H2DB-5	ENTRANCE CANOPY +0 SW	
48	35H2DB-2	SIGN LIGHTING +0 SW	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
B			
4			
5			
6			
10			
11			
12			

<b>Circuit</b>			
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>
13	35H2C-10	EXHIBIT HALL (SMALL STAGE) GROUP E +0 SE	
14	35H2C-10	EXHIBIT HALL (SMALL STAGE) GROUP F +0 SE	
15	35H2C-12	EXHIBIT HALL (SMALL STAGE) GROUP G +0 SE	
16	35H2C-12	EXHIBIT HALL (SMALL STAGE) GROUP H +0 SE	
17	35H2C-13	EXHIBIT HALL (SMALL STAGE) GROUP A +0 SE	
18	35H2C-13	EXHIBIT HALL (SMALL STAGE) GROUP B +0 SE	
19	35H2C-15	EXHIBIT HALL GROUP A +0 SE	
20	35H2C-17	EXHIBIT HALL GROUP B +0 SE	
21	35EH2C-15	EXHIBIT HALL (EMERG) GROUP C +0 SE	
22	35H2C-14	EXHIBIT HALL GROUP D +0 SE	

23	35H2C-16	EXHIBIT HALL GROUP E +0 SE	
24	35H2C-18	EXHIBIT HALL GROUP F +0 SE	
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>
37	35EH2C-17	EXHIBIT HALL (EMERG) GROUP C +0 SE	
38	35H2C-29	EXHIBIT HALL GROUP D +0 SE	
39	35H2C-32	EXHIBIT HALL GROUP E +0 SE	
40	35H2C-34	EXHIBIT HALL GROUP F +0 SE	
41	35H2C-36	EXHIBIT HALL GROUP G +0 SE	
42	35H2C-31	EXHIBIT HALL GROUP H +0 SE	
43	35EH2C-7	EXHIBIT HALL (EMERG) GROUP C +0 SE	
44	35H2C-27	EXHIBIT HALL GROUP D +0 SE	
45	35H2C-33	EXHIBIT HALL EXIT DOOR +0 SE	
46	35H2CA-7	EXHIBIT HALL EXIT DOOR +0 SE	
47	35H2CA-9	EXHIBIT HALL EXIT DOOR +0 SE	
48	35H2C-42	RESTROOM LIGHTING +0 SE	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
B			
4			
5			
6			
10			
11			
12			

<b>Circuit</b>			
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>LV Switch</b>
13	35H2C-13	LEVEL +25 LIGHTING STORAGE SE	
14	35H2C-15	LEVEL +25 LIGHTING STORAGE SE	
15		SPACE	
16		SPACE	
17		Space	
18		Space	
19		Space	
20		Space	

21		Space	
22		Space	
23		Space	
24		Space	
Input	Type	Description	
B			
4	Master		
5	Master		
6	Master		

Circuit	Rly	Circuit	Description	LV Switch
	13	83H2CA-8	STORAGE LVL +51 LIGHTING	
	14		SPARE	
	15		SPARE	
	16		SPACE	
	17		SPACE	
	18		SPACE	
	19		SPACE	
	20		SPACE	
	21		SPACE	
	22		SPACE	
	23		SPACE	
	24		SPACE	
Input	Type	Description		
B				
4				
5				
6				

Circuit	Rly	Circuit	Description	LV Switch
	13		SPARE	
	14	83H2D-16	LIGHTING MECHANICAL +83 SW	
	15		SPARE	

16		SPARE	
17		SPACE	
18		SPACE	
19		Space	
20		Space	
21		Space	
22		Space	
23		Space	
24		Space	
<b>Input</b>	<b>Type</b>	<b>Description</b>	
B			
4			
5			
6			

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APPENDIX C

LCP RELAY CROSS REFERENCE EXPORT FROM EXISTING LIGHTING  
CONTROLS FRONT END

LCP Relay Cross Reference							
George R. Brown Convention Center - George R. Brown Convention Center							
Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit	
Rly	Circuit	Description	Settings	Timeout	Schedule	References	
1	Panel PHA - Central Plant (Was MODs 2 & 3)	Sub Basement	Retrofit	32/32 Surface	115/277		
1		Lot 5 Far South - E Hall (Old 2-1)			1 Sunset - Sunrise	<b>Phone Codes</b> 66   Parking Lot - All 69   Parking Lot 5 99   Outside Lights - All <b>Switch Codes</b> 100-2   Master   Parking Lot 5	
2		Mod -2 relay 2			1 Sunset - Sunrise	<b>Phone Codes</b> 66   Parking Lot - All 99   Outside Lights - All	
3		Mod -2 relay 3			1 Sunset - Sunrise	<b>Phone Codes</b> 66   Parking Lot - All 68   Routine Night Lighting 99   Outside Lights - All	
4	PHA	HPD Pkg Lot Pole Lts (Old 2-4)			1 Sunset - Sunrise	<b>Phone Codes</b> 66   Parking Lot - All 70   HPD Parking Lot 99   Outside Lights - All <b>Switch Codes</b> 100-3   Master   Parking Lot - HPD	
5	PHA	Lot 5 South (Old 2-5)			1 Sunset - Sunrise	<b>Phone Codes</b> 66   Parking Lot - All 69   Parking Lot 5 99   Outside Lights - All <b>Switch Codes</b> 100-2   Master   Parking Lot 5	
6		Lot 5 Far North/HPD (Old 2-6)			1 Sunset - Sunrise	<b>Phone Codes</b> 66   Parking Lot - All 69   Parking Lot 5 99   Outside Lights - All <b>Switch Codes</b> 100-2   Master   Parking Lot 5	
7		North/South Drive Up Ramps (Old 2-7)			1 Sunset - Sunrise	<b>Phone Codes</b> 59   Drive up Ramp 71   3rd Level Ramp - Drive Up Lights 99   Outside Lights - All <b>Switch Codes</b> 100-4   Master   3rd Lvl Ramp Drive Up Lts	
8		3rd Lvl Ramp High Lights - BR/GA (Old 2-8)			1 Sunset - Sunrise	<b>Phone Codes</b> 59   Drive up Ramp 72   3rd Level Ramp High Lights 99   Outside Lights - All <b>Switch Codes</b> 100-5   Master   3rd Level Ramp High Lights	
9		3rd Lvl Ramp High Lights - Hall G (Old 2-9)			1 Sunset - Sunrise	<b>Phone Codes</b> 59   Drive up Ramp 72   3rd Level Ramp High Lights 99   Outside Lights - All <b>Switch Codes</b> 100-5   Master   3rd Level Ramp High Lights	
10		Mod -2 relay 10 Ramp (?)			1 Sunset - Sunrise		
11	**Space**	Mod -2 relay 11					



12	**Space**	Mod -2 relay 12																
13	**Space**	Mod -2 relay 13																
14	**Space**	Mod -2 relay 14																
15	**Space**	Mod -2 relay 15																
16	**Space**	Mod -2 relay 16																
17	PHA #8	Mod -3 relay 1			1 Sunset - Sunrise	<table border="1"> <tr> <th colspan="2">Phone Codes</th> </tr> <tr> <td>66</td> <td>Parking Lot - All</td> </tr> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> </table>	Phone Codes		66	Parking Lot - All	99	Outside Lights - All						
Phone Codes																		
66	Parking Lot - All																	
99	Outside Lights - All																	
18	PHA #1,3	Lot 5 North - (Old 3-2)			1 Sunset - Sunrise	<table border="1"> <tr> <th colspan="2">Phone Codes</th> </tr> <tr> <td>66</td> <td>Parking Lot - All</td> </tr> <tr> <td>69</td> <td>Parking Lot 5</td> </tr> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>100-2</td> <td>Master Parking Lot 5</td> </tr> </table>	Phone Codes		66	Parking Lot - All	69	Parking Lot 5	99	Outside Lights - All	Switch Codes		100-2	Master Parking Lot 5
Phone Codes																		
66	Parking Lot - All																	
69	Parking Lot 5																	
99	Outside Lights - All																	
Switch Codes																		
100-2	Master Parking Lot 5																	
19		Mod -3 relay 3			1 Sunset - Sunrise	<table border="1"> <tr> <th colspan="2">Phone Codes</th> </tr> <tr> <td>66</td> <td>Parking Lot - All</td> </tr> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> </table>	Phone Codes		66	Parking Lot - All	99	Outside Lights - All						
Phone Codes																		
66	Parking Lot - All																	
99	Outside Lights - All																	
20		Mod -3 relay 4			1 Sunset - Sunrise	<table border="1"> <tr> <th colspan="2">Phone Codes</th> </tr> <tr> <td>66</td> <td>Parking Lot - All</td> </tr> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> </table>	Phone Codes		66	Parking Lot - All	99	Outside Lights - All						
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21		Mod -3 relay 5			1 Sunset - Sunrise	<table border="1"> <tr> <th colspan="2">Phone Codes</th> </tr> <tr> <td>66</td> <td>Parking Lot - All</td> </tr> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> </table>	Phone Codes		66	Parking Lot - All	99	Outside Lights - All						
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22		Mod -3 relay 6			1 Sunset - Sunrise	<table border="1"> <tr> <th colspan="2">Phone Codes</th> </tr> <tr> <td>66</td> <td>Parking Lot - All</td> </tr> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> </table>	Phone Codes		66	Parking Lot - All	99	Outside Lights - All						
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23		Lots 3 & 4 - (Old 3-7)			1 Sunset - Sunrise	<table border="1"> <tr> <th colspan="2">Phone Codes</th> </tr> <tr> <td>66</td> <td>Parking Lot - All</td> </tr> <tr> <td>67</td> <td>Parking Lots 3/4</td> </tr> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>100-1</td> <td>Master Parking Lots 3/4</td> </tr> </table>	Phone Codes		66	Parking Lot - All	67	Parking Lots 3/4	99	Outside Lights - All	Switch Codes		100-1	Master Parking Lots 3/4
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24		Mod -3 relay 8				<table border="1"> <tr> <th colspan="2">Phone Codes</th> </tr> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> </table>	Phone Codes		99	Outside Lights - All								
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25		Mod -3 relay 9				<table border="1"> <tr> <th colspan="2">Phone Codes</th> </tr> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> </table>	Phone Codes		99	Outside Lights - All								
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26		Mod -3 relay 10				<table border="1"> <tr> <th colspan="2">Phone Codes</th> </tr> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> </table>	Phone Codes		99	Outside Lights - All								
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28		Mod -3 relay 12				<table border="1"> <tr> <th colspan="2">Phone Codes</th> </tr> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> </table>	Phone Codes		99	Outside Lights - All								
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29		Mod -3 relay 13				<table border="1"> <tr> <th colspan="2">Phone Codes</th> </tr> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> </table>	Phone Codes		99	Outside Lights - All								
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30		Mod -3 relay 14				<table border="1"> <tr> <th colspan="2">Phone Codes</th> </tr> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> </table>	Phone Codes		99	Outside Lights - All								
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31	**Space**	Mod -3 relay 15				<table border="1"> <tr> <th colspan="2">Phone Codes</th> </tr> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> </table>	Phone Codes		99	Outside Lights - All								
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99	Outside Lights - All																	

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit
32			Mod -3 relay 16			
2	Panel 12HA - D Tunnel East (Was MOD 4)	Basement Rm 050 Tunnel East /S end	Retrofit	32/32 Surface	115/277	
1	12HA-1	D Tunnel (Old 4/1)				
2	12HA-3	D Tunnel (Old 4/2)				
3	12HA-5	D Tunnel (Old 4/3)				
4	12HA-6	D Tunnel (Old 4/4)				
5	12HA-7	D Tunnel (Old 4/5)				
6	12HA-4	D Tunnel Restrooms (Old 4/6)				
7			Mod -4 relay 7			
8			Mod -4 relay 8			
9			Mod -4 relay 9			
10			Mod -4 relay 10			
11			Mod -4 relay 11			
12			Mod -4 relay 12			
13			Mod -4 relay 13			
14			Mod -4 relay 14			
15			Mod -4 relay 15			
16			Mod -4 relay 16			
17	**Space**	Space				

18	**Space**	Space						
19	**Space**	Space						
20	**Space**	Space						
21	**Space**	Space						
22	**Space**	Space						
23	**Space**	Space						
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26	**Space**	Space						
27	**Space**	Space						
28	**Space**	Space						
29	**Space**	Space						
30	**Space**	Space						
31	**Space**	Space						
32	**Space**	Space						
Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit		
3	Panel 12HB - C Tunnel East (Was MOD 6)	Basement Rm 048 Tunnel East Middle	Retrofit	32/32 Surface	115/277			
Rly	Circuit	Description	Settings	Timeout	Schedule	References		
1	12HB-1	Tunnel - Hall C (Old 6-1)				<b>Phone Codes</b> 14   Tunnel - Storage Rooms <b>Switch Codes</b> 108-9   Master   Tunnel Lighting under C		
2	12HB-2	Tunnel - Hall C (Old 6-2)				<b>Phone Codes</b> 12   Tunnel - Central E.H.C. <b>Switch Codes</b> 108-9   Master   Tunnel Lighting under C		
3	12HB-3	Tunnel - Hall C (Old 6-3)				<b>Phone Codes</b> 12   Tunnel - Central E.H.C. 14   Tunnel - Storage Rooms <b>Switch Codes</b> 108-9   Master   Tunnel Lighting under C		
4	12HB-4	Tunnel - Hall C (Old 6-4)				<b>Phone Codes</b> 12   Tunnel - Central E.H.C. <b>Switch Codes</b> 108-9   Master   Tunnel Lighting under C		
5	12HB-6	Restrooms - Tunnel C (Old 6-5)				<b>Phone Codes</b> 1   Restrooms - Tunnel 15   Restrooms - ALL <b>Switch Codes</b> 108-7   Master   C Hall Restrooms (Front Tunnel)		
6		Mod -6 relay 6						
7		Mod -6 relay 7						
8		Mod -6 relay 8						
9		Mod -6 relay 9						

10		Mod -6 relay 10					
11		Mod -6 relay 11					
12		Mod -6 relay 12					
13		Mod -6 relay 13					
14		Mod -6 relay 14					
15		Mod -6 relay 15					
16		Mod -6 relay 16					
17	**Space**	Space					
18	**Space**	Space					
19	**Space**	Space					
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29	**Space**	Space					
30	**Space**	Space					
31	**Space**	Space					
32	**Space**	Space					
Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit	
4	Panel 12HC - B Tunnel East (Was MOD 8)	Basement Rm 042 Tunnel East Mid Bldg	Retrofit	32/32 Surface	115/277		
Relay	Circuit	Description	Settings	Timeout	Schedule	References	
1	12HC-2	Tunnel - Hall B (Old 8-1)					
							<b>Phone Codes</b>
							13   Tunnel - North - E.H.B.
							<b>Switch Codes</b>
							105-8   Master   Tunnel Lighting under B
2	12HC-3	Tunnel - Hall B (Old 8-2)					
							<b>Phone Codes</b>
							13   Tunnel - North - E.H.B.
							<b>Switch Codes</b>
							105-8   Master   Tunnel Lighting under B
3	12HC-4	Tunnel - Hall B (Old 8-3)					
							<b>Phone Codes</b>
							13   Tunnel - North - E.H.B.
							14   Tunnel - Storage Rooms
							<b>Switch Codes</b>
							105-8   Master   Tunnel Lighting under B
4	12HC-5	Tunnel - Hall B (Old 8-4)					
							<b>Phone Codes</b>
							13   Tunnel - North - E.H.B.

							14	Tunnel - Storage Rooms
							<b>Switch Codes</b>	
							105-8	Master Tunnel Lighting under B
							<b>Phone Codes</b>	
							1	Restrooms - Tunnel
							15	Restrooms - ALL
							<b>Switch Codes</b>	
							105-5	Master B Hall Restrooms (Front Tunnel)
							<b>Switch Codes</b>	
							105-5	Master B Hall Restrooms (Front Tunnel)
5	12HC-1	Restrooms - Tunnel B (Old 8-5)						
6		Mod -8 relay 6						
7		Mod -8 relay 7						
8		Mod -8 relay 8						
9		Mod -8 relay 9						
10		Mod -8 relay 10						
11		Mod -8 relay 11						
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13		Mod -8 relay 13						
14		Mod -8 relay 14						
15		Mod -8 relay 15						
16		Mod -8 relay 16						
17	**Space**	Space						
18	**Space**	Space						
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30	**Space**	Space						
31	**Space**	Space						
32	**Space**	Space						
<b>Panel ID</b>	<b>Description</b>	<b>Location</b>	<b>Type</b>	<b>Interior/Enclosure</b>	<b>Power Supply</b>	<b>Circuit</b>		
5	Panel TB1 - Ticket Booth D (Was MODs 10 & 11)	Ticket Booth D	Retrofit	32/32 Surface	115/277			
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>Settings</b>	<b>Timeout</b>	<b>Schedule</b>	<b>References</b>		

1	TB1-3	Canopy D (Old 10/1)			1 Sunset - Sunrise	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> <tr> <td>150</td> <td>Canopy All</td> </tr> <tr> <td>154</td> <td>Canopy D</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>111-2</td> <td>Master Canopy D</td> </tr> </tbody> </table>	Phone Codes		99	Outside Lights - All	150	Canopy All	154	Canopy D	Switch Codes		111-2	Master Canopy D		
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3	TB1-7	Plaza D (Old 10/3)			9 Sunrise off only	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> <tr> <td>150</td> <td>Canopy All</td> </tr> <tr> <td>154</td> <td>Canopy D</td> </tr> <tr> <td>164</td> <td>Under Balcony D Lights</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>111-3</td> <td>Master Plaza D Lights</td> </tr> </tbody> </table>	Phone Codes		99	Outside Lights - All	150	Canopy All	154	Canopy D	164	Under Balcony D Lights	Switch Codes		111-3	Master Plaza D Lights
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5	TB1-11	Canopy D (Old 10/5)			1 Sunset - Sunrise	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> <tr> <td>150</td> <td>Canopy All</td> </tr> <tr> <td>154</td> <td>Canopy D</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>111-2</td> <td>Master Canopy D</td> </tr> </tbody> </table>	Phone Codes		99	Outside Lights - All	150	Canopy All	154	Canopy D	Switch Codes		111-2	Master Canopy D		
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8	TB1-17	Canopy D (Old 10/8)			1 Sunset - Sunrise	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> <tr> <td>150</td> <td>Canopy All</td> </tr> <tr> <td>154</td> <td>Canopy D</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>111-2</td> <td>Master Canopy D</td> </tr> </tbody> </table>	Phone Codes		99	Outside Lights - All	150	Canopy All	154	Canopy D	Switch Codes		111-2	Master Canopy D		
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10	TB1-21	Canopy D (Old 10/10)			1 Sunset - Sunrise	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> </table>	Phone Codes													
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						<b>Switch Codes</b>	
					111-2	Master	Canopy D
11	TB1-23	Canopy D (Old 10/11)			1	Sunset - Sunrise	
						<b>Phone Codes</b>	
						73	Parking Lot - Flag Pole Lights
						99	Outside Lights - All
						150	Canopy All
						154	Canopy D
						<b>Switch Codes</b>	
					111-2	Master	Canopy D
12	TB1-25	Canopy D (Old 10/12)			1	Sunset - Sunrise	
						<b>Phone Codes</b>	
						99	Outside Lights - All
						150	Canopy All
						154	Canopy D
						<b>Switch Codes</b>	
					111-2	Master	Canopy D
13	TB1-26	Plaza C (Old 10/13)			9	Sunrise off only	
						<b>Phone Codes</b>	
						99	Outside Lights - All
						150	Canopy All
						153	Canopy C
						163	Under Balcony C Lights
						<b>Switch Codes</b>	
					108-5	Master	Plaza C Lights
14	TB1-27	Canopy D (Old 10/14)			1	Sunset - Sunrise	
						<b>Phone Codes</b>	
						99	Outside Lights - All
						150	Canopy All
						154	Canopy D
						<b>Switch Codes</b>	
					111-2	Master	Canopy D
15	TB1-28	Canopy D (Old 10/15)			1	Sunset - Sunrise	
						<b>Phone Codes</b>	
						99	Outside Lights - All
						150	Canopy All
						154	Canopy D
						<b>Switch Codes</b>	
					111-2	Master	Canopy D
16	TB1-29	Plaza C (Old 10/16)			9	Sunrise off only	
						<b>Phone Codes</b>	
						99	Outside Lights - All
						150	Canopy All
						153	Canopy C
						163	Under Balcony C Lights
						<b>Switch Codes</b>	
					108-5	Master	Plaza C Lights
17	12HD-25	Flagpole (Out of Svc)(Old 11/1)			1	Sunset - Sunrise	
						<b>Phone Codes</b>	
						68	Routine Night Lighting
						<b>Switch Codes</b>	
					129-1	Master	Flagpole Lights
18		Mod -11 relay 2					
19		Mod -11 relay 3					
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23		Mod -11 relay 7					

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28	TB1-?	Plaza D Floods (Old 11/12)				9 Sunrise off only		<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>150</td> <td>Canopy All</td> </tr> <tr> <td>154</td> <td>Canopy D</td> </tr> <tr> <td>164</td> <td>Under Balcony D Lights</td> </tr> <tr> <td>173</td> <td>Plaza D Floodlights</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>111-4</td> <td>Master Plaza D Floods</td> </tr> </tbody> </table>	Phone Codes		150	Canopy All	154	Canopy D	164	Under Balcony D Lights	173	Plaza D Floodlights	Switch Codes		111-4	Master Plaza D Floods
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111-3	Master Plaza D Lights																					
31		Mod -11 relay 15																				
32	TB1-?	Plaza C (Old 11/16)				9 Sunrise off only		<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>150</td> <td>Canopy All</td> </tr> <tr> <td>153</td> <td>Canopy C</td> </tr> <tr> <td>163</td> <td>Under Balcony C Lights</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>108-5</td> <td>Master Plaza C Lights</td> </tr> </tbody> </table>	Phone Codes		150	Canopy All	153	Canopy C	163	Under Balcony C Lights	Switch Codes		108-5	Master Plaza C Lights		
Phone Codes																						
150	Canopy All																					
153	Canopy C																					
163	Under Balcony C Lights																					
Switch Codes																						
108-5	Master Plaza C Lights																					
Panel ID	Description	Location	Type	Interior / Enclosure	Power Supply	Circuit	References															
7	Panel TB3 - Ticket Booth B (Was MOD 14)	Ticket Booth B	Retrofit	32/32 Surface	115/277																	
Rly	Circuit	Description	Settings	Timeout	Schedule	References																
1	TB3-3	Canopy B (Old 14/1)			1 Sunset - Sunrise	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> <tr> <td>150</td> <td>Canopy All</td> </tr> <tr> <td>152</td> <td>Canopy B</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>105-2</td> <td>Master Canopy B</td> </tr> </tbody> </table>	Phone Codes		99	Outside Lights - All	150	Canopy All	152	Canopy B	Switch Codes		105-2	Master Canopy B				
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Switch Codes																						
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2	TB3-5	Canopy B (Old 14/2)			1 Sunset - Sunrise	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> <tr> <td>150</td> <td>Canopy All</td> </tr> <tr> <td>152</td> <td>Canopy B</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>105-2</td> <td>Master Canopy B</td> </tr> </tbody> </table>	Phone Codes		99	Outside Lights - All	150	Canopy All	152	Canopy B	Switch Codes		105-2	Master Canopy B				
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150	Canopy All																					
152	Canopy B																					
Switch Codes																						
105-2	Master Canopy B																					
3	TB3-7	Canopy B (Old 14/3)			1 Sunset - Sunrise	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> <tr> <td>150</td> <td>Canopy All</td> </tr> <tr> <td>152</td> <td>Canopy B</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>105-2</td> <td>Master Canopy B</td> </tr> </tbody> </table>	Phone Codes		99	Outside Lights - All	150	Canopy All	152	Canopy B	Switch Codes		105-2	Master Canopy B				
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150	Canopy All																					
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Switch Codes																						
105-2	Master Canopy B																					
4	TB3-11	Canopy B (Old 14/4)			1 Sunset - Sunrise	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> </tbody> </table>	Phone Codes		99	Outside Lights - All												
Phone Codes																						
99	Outside Lights - All																					



						150	Canopy All
						152	Canopy B
						<b>Switch Codes</b>	
5	TB3-13	Canopy B (Old 14/5)			1	Sunset - Sunrise	105-2  Master  Canopy B
						<b>Phone Codes</b>	
						99	Outside Lights - All
						150	Canopy All
						152	Canopy B
						<b>Switch Codes</b>	
						105-2	Master  Canopy B
6	TB3-15	Canopy B (Old 14/6)			1	Sunset - Sunrise	105-2  Master  Canopy B
						<b>Phone Codes</b>	
						99	Outside Lights - All
						150	Canopy All
						152	Canopy B
						<b>Switch Codes</b>	
						105-2	Master  Canopy B
7	TB3-17	Canopy B (Old 14/7)			1	Sunset - Sunrise	105-2  Master  Canopy B
						<b>Phone Codes</b>	
						99	Outside Lights - All
						150	Canopy All
						152	Canopy B
						<b>Switch Codes</b>	
						105-2	Master  Canopy B
8	TB3-19	Canopy B (Old 14/8)			1	Sunset - Sunrise	105-2  Master  Canopy B
						<b>Phone Codes</b>	
						99	Outside Lights - All
						150	Canopy All
						152	Canopy B
						<b>Switch Codes</b>	
						105-2	Master  Canopy B
9	TB3-21	Canopy B (Old 14/9)			1	Sunset - Sunrise	105-2  Master  Canopy B
						<b>Phone Codes</b>	
						99	Outside Lights - All
						150	Canopy All
						152	Canopy B
						<b>Switch Codes</b>	
						105-2	Master  Canopy B
10	TB3-23	Canopy B (Old 14/10)			1	Sunset - Sunrise	105-2  Master  Canopy B
						<b>Phone Codes</b>	
						99	Outside Lights - All
						150	Canopy All
						152	Canopy B
						<b>Switch Codes</b>	
						105-2	Master  Canopy B
11	TB3-25	Plaza A (Old 14/11)			9	Sunrise off only	105-2  Master  Canopy B
						<b>Phone Codes</b>	
						99	Outside Lights - All
						150	Canopy All
						152	Canopy B
						161	Under Balcony A Lights
						<b>Switch Codes</b>	
						105-3	Master  Plaza A Lights
12	TB3-26	Plaza A (Old 14/12)			9	Sunrise off only	105-3  Master  Plaza A Lights
						<b>Phone Codes</b>	
						99	Outside Lights - All
						150	Canopy All
						152	Canopy B
						161	Under Balcony A Lights
						<b>Switch Codes</b>	
						105-3	Master  Plaza A Lights
13	TB3-27	Canopy B (Old 14/13)			1	Sunset - Sunrise	105-3  Master  Plaza A Lights
						<b>Phone Codes</b>	
						99	Outside Lights - All
						150	Canopy All
						152	Canopy B

14	TB3-28	Plaza A (Old 14/14)			9 Sunrise off only	105-2  Master  Canopy B	<table border="1"> <thead> <tr> <th colspan="2">Switch Codes</th> </tr> </thead> <tbody> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> <tr> <td>150</td> <td>Canopy All</td> </tr> <tr> <td>152</td> <td>Canopy B</td> </tr> <tr> <td>161</td> <td>Under Balcony A Lights</td> </tr> </tbody> </table>	Switch Codes		99	Outside Lights - All	150	Canopy All	152	Canopy B	161	Under Balcony A Lights		
Switch Codes																			
99	Outside Lights - All																		
150	Canopy All																		
152	Canopy B																		
161	Under Balcony A Lights																		
15	12HG-25	Flagpole B (Old 14/15)			1 Sunset - Sunrise	105-3  Master  Plaza A Lights	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>68</td> <td>Routine Night Lighting</td> </tr> <tr> <td>73</td> <td>Parking Lot - Flag Pole Lights</td> </tr> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> </tbody> </table>	Phone Codes		68	Routine Night Lighting	73	Parking Lot - Flag Pole Lights	99	Outside Lights - All				
Phone Codes																			
68	Routine Night Lighting																		
73	Parking Lot - Flag Pole Lights																		
99	Outside Lights - All																		
16	TB3-?	Plaza A Floods (Old 14/16)			9 Sunrise off only	105-4  Master  Plaza A Floods	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>99</td> <td>Outside Lights - All</td> </tr> <tr> <td>150</td> <td>Canopy All</td> </tr> <tr> <td>152</td> <td>Canopy B</td> </tr> <tr> <td>161</td> <td>Under Balcony A Lights</td> </tr> <tr> <td>170</td> <td>Plaza A Floodlights</td> </tr> </tbody> </table>	Phone Codes		99	Outside Lights - All	150	Canopy All	152	Canopy B	161	Under Balcony A Lights	170	Plaza A Floodlights
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170	Plaza A Floodlights																		
17	**Space**	Space																	
18	**Space**	Space																	
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27	**Space**	Space																	
28	**Space**	Space																	
29	**Space**	Space																	
30	**Space**	Space																	
31	**Space**	Space																	
32	**Space**	Space																	
<b>Panel ID</b>	<b>Description</b>	<b>Location</b>	<b>Type</b>	<b>Interior/Enclosure</b>	<b>Power Supply</b>	<b>Circuit</b>													
8	Panel 25HA - Reg. D (Was MODs 16 & 17)	2nd Floor Registration between 214/215	Retrofit	32/32 Surface	115/277														
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>Settings</b>	<b>Timeout</b>	<b>Schedule</b>	<b>References</b>													
1	25HA-9	Reg. D (Old 16/1)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>81</td> <td>Registration D +25 100%</td> </tr> <tr> <td>84</td> <td>Registration ALL + A, B, C, D &amp; E 100%</td> </tr> <tr> <td>223</td> <td>Registration D- 75%</td> </tr> </tbody> </table>	Phone Codes		81	Registration D +25 100%	84	Registration ALL + A, B, C, D & E 100%	223	Registration D- 75%					
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2	25HA-11	Reg. D (Old 16/2)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>81</td> <td>Registration D +25 100%</td> </tr> <tr> <td>84</td> <td>Registration ALL + A, B, C ,D &amp; E 100%</td> </tr> <tr> <td>218</td> <td>Registration D- 25%</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>126-1</td> <td>Master Registration D</td> </tr> </tbody> </table>	Phone Codes		81	Registration D +25 100%	84	Registration ALL + A, B, C ,D & E 100%	218	Registration D- 25%	Switch Codes		126-1	Master Registration D
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84	Registration ALL + A, B, C ,D & E 100%																	
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9	25HA-25	Reg. C (Old 16/9)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>82</td> <td>Registration C + 25 100%</td> </tr> <tr> <td>84</td> <td>Registration ALL + A, B, C ,D &amp; E 100%</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>125-1</td> <td>Master Registration C</td> </tr> </tbody> </table>	Phone Codes		82	Registration C + 25 100%	84	Registration ALL + A, B, C ,D & E 100%	Switch Codes		125-1	Master Registration C		
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12	25HA-31	Reg. C (Old 16/12)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> </table>	Phone Codes											
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						84	Registration ALL + A, B, C, D & E 100%
						<b>Switch Codes</b>	
					125-1	Master	Registration C
						<b>Phone Codes</b>	
					82	Registration C + 25 100%	
					84	Registration ALL + A, B, C, D & E 100%	
						<b>Switch Codes</b>	
					125-1	Master	Registration C
13	25HA-33	Reg. C (Old 16/13)					
						<b>Phone Codes</b>	
					3	Restrooms - 2nd Level	
					15	Restrooms - ALL	
						<b>Switch Codes</b>	
					125-7	Master	Reg. Restrooms 214/215
14	25HA-5	Restrooms 214/215 (Old 16/14)					
						<b>Phone Codes</b>	
					400	Exhibit Hall D - 100%	
					401	Exhibit Hall D - 50%	
					409	Exhibit Hall D - 17' Ceiling - 50% Front	
					410	Exhibit Hall D - 17' Ceiling - 100% Front	
						<b>Switch Codes</b>	
					110-6	Master	D Hall 50% (Front 17')
15	25HA-58	Bldg Directory (Old 16/15)					
16	25HA-60	Bldg Directory (Old 16/16)					
17	25HA-2	EHD 50% (Old 17/1)					
						<b>Phone Codes</b>	
					400	Exhibit Hall D - 100%	
					401	Exhibit Hall D - 50%	
					409	Exhibit Hall D - 17' Ceiling - 50% Front	
					410	Exhibit Hall D - 17' Ceiling - 100% Front	
						<b>Switch Codes</b>	
					110-6	Master	D Hall 50% (Front 17')
18	25HA-4	EHD 50% (Old 17/2)					
						<b>Phone Codes</b>	
					400	Exhibit Hall D - 100%	
					401	Exhibit Hall D - 50%	
					409	Exhibit Hall D - 17' Ceiling - 50% Front	
					410	Exhibit Hall D - 17' Ceiling - 100% Front	
						<b>Switch Codes</b>	
					110-6	Master	D Hall 50% (Front 17')
19	25HA-6	EHD 50% (Old 17/3)					
						<b>Phone Codes</b>	
					400	Exhibit Hall D - 100%	
					401	Exhibit Hall D - 50%	
					409	Exhibit Hall D - 17' Ceiling - 50% Front	
					410	Exhibit Hall D - 17' Ceiling - 100% Front	
						<b>Switch Codes</b>	
					110-6	Master	D Hall 50% (Front 17')
20	25HA-8	EHD 50% (Old 17/4)					
						<b>Phone Codes</b>	
					400	Exhibit Hall D - 100%	
					401	Exhibit Hall D - 50%	
					409	Exhibit Hall D - 17' Ceiling - 50% Front	
					410	Exhibit Hall D - 17' Ceiling - 100% Front	
						<b>Switch Codes</b>	
					110-6	Master	D Hall 50% (Front 17')
21	25HA-10	EHD 50% (Old 17/5)					
						<b>Phone Codes</b>	
					400	Exhibit Hall D - 100%	
					401	Exhibit Hall D - 50%	
					409	Exhibit Hall D - 17' Ceiling - 50% Front	
					410	Exhibit Hall D - 17' Ceiling - 100% Front	
						<b>Switch Codes</b>	
					110-6	Master	D Hall 50% (Front 17')
22	25HA-26	EHD 50% (Top Stairs/Exits)(Old 17/6)					
						<b>Phone Codes</b>	
					400	Exhibit Hall D - 100%	
					401	Exhibit Hall D - 50%	
					409	Exhibit Hall D - 17' Ceiling - 50% Front	
					410	Exhibit Hall D - 17' Ceiling - 100% Front	
						<b>Switch Codes</b>	

23	25HA-28	Lobby D (Old 17/7)			7 Truss Lights (morning)	110-6 Master D Hall 50% (Front 17')
						<b>Phone Codes</b>
						57 Lobby D - Foyer
						<b>Switch Codes</b>
						111-1 Master Lobby D
						<b>Phone Codes</b>
						400 Exhibit Hall D - 100%
						402 Exhibit Hall D - 25%
						405 Exhibit Hall D - 38% Work Lights
						408 Exhibit Hall D - 17' Ceiling - 25% Front
						410 Exhibit Hall D - 17' Ceiling - 100% Front
						<b>Switch Codes</b>
						110-7 Master D Hall 25% (Front 17')
						<b>Phone Codes</b>
						400 Exhibit Hall D - 100%
						402 Exhibit Hall D - 25%
						405 Exhibit Hall D - 38% Work Lights
						408 Exhibit Hall D - 17' Ceiling - 25% Front
						410 Exhibit Hall D - 17' Ceiling - 100% Front
						<b>Switch Codes</b>
						110-7 Master D Hall 25% (Front 17')
						<b>Phone Codes</b>
						400 Exhibit Hall D - 100%
						402 Exhibit Hall D - 25%
						405 Exhibit Hall D - 38% Work Lights
						408 Exhibit Hall D - 17' Ceiling - 25% Front
						410 Exhibit Hall D - 17' Ceiling - 100% Front
						<b>Switch Codes</b>
						110-7 Master D Hall 25% (Front 17')
						<b>Phone Codes</b>
						400 Exhibit Hall D - 100%
						402 Exhibit Hall D - 25%
						405 Exhibit Hall D - 38% Work Lights
						408 Exhibit Hall D - 17' Ceiling - 25% Front
						410 Exhibit Hall D - 17' Ceiling - 100% Front
						<b>Switch Codes</b>
						110-7 Master D Hall 25% (Front 17')
						<b>Phone Codes</b>
						400 Exhibit Hall D - 100%
						402 Exhibit Hall D - 25%
						405 Exhibit Hall D - 38% Work Lights
						407 Exhibit Hall D - 17' Ceiling - 13% Front
						410 Exhibit Hall D - 17' Ceiling - 100% Front
						<b>Switch Codes</b>
						110-8 Master D Hall 13% (Front 17')
						<b>Phone Codes</b>
						400 Exhibit Hall D - 100%
						403 Exhibit Hall D - 13%
						405 Exhibit Hall D - 38% Work Lights
						407 Exhibit Hall D - 17' Ceiling - 13% Front
						410 Exhibit Hall D - 17' Ceiling - 100% Front
						<b>Switch Codes</b>
						110-8 Master D Hall 13% (Front 17')
						<b>Phone Codes</b>
						400 Exhibit Hall D - 100%
						404 Exhibit Hall D - 12%
						406 Exhibit Hall D - 17' Ceiling - 12% Front
						410 Exhibit Hall D - 17' Ceiling - 100% Front
						<b>Switch Codes</b>

31	25HA-24	EHD 12% (Old 17/15)						110-9 Master	D Hall 12% (Front 17')
<b>Phone Codes</b>									
	400	Exhibit Hall D - 100%							
	404	Exhibit Hall D - 12%							
	406	Exhibit Hall D - 17' Ceiling - 12% Front							
	410	Exhibit Hall D - 17' Ceiling - 100% Front							
<b>Switch Codes</b>									
	110-9	Master D Hall 12% (Front 17')							
32	25HA-35	Truss/Escl D (Old 17/16)							
<b>Phone Codes</b>									
	10	Restrooms - Stair Hall D							
<b>Switch Codes</b>									
	111-5	Master D Hall Restrooms (Front Tunnel)							
<b>Panel ID</b>	<b>Description</b>	<b>Location</b>	<b>Type</b>	<b>Interior/Enclosure</b>	<b>Power Supply</b>	<b>Circuit</b>	<b>Panel ID</b>	<b>Description</b>	<b>Location</b>
9	Panel 25HA - Reg. D (Was MOD 18)	2nd Floor Registration 214/215	Retrofit	32/32 Surface	115/277				
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>Settings</b>	<b>Timeout</b>	<b>Schedule</b>	<b>References</b>			
1	25HA-30	EHC 50% (Old 18/1)							
<b>Phone Codes</b>									
	300	Exhibit Hall C - 100%							
	301	Exhibit Hall C - 50%							
	309	Exhibit Hall C - 17' Ceiling - 50% Front							
	310	Exhibit Hall C - 17' Ceiling - 100% Front							
<b>Switch Codes</b>									
	107-6	Master C Hall 50% (Front 17')							
2	25HA-32	EHC 50% (Old 18/2)							
<b>Phone Codes</b>									
	300	Exhibit Hall C - 100%							
	301	Exhibit Hall C - 50%							
	309	Exhibit Hall C - 17' Ceiling - 50% Front							
	310	Exhibit Hall C - 17' Ceiling - 100% Front							
<b>Switch Codes</b>									
	107-6	Master C Hall 50% (Front 17')							
3	25HA-34	EHC 50% (Old 18/3)							
<b>Phone Codes</b>									
	300	Exhibit Hall C - 100%							
	301	Exhibit Hall C - 50%							
	309	Exhibit Hall C - 17' Ceiling - 50% Front							
	310	Exhibit Hall C - 17' Ceiling - 100% Front							
<b>Switch Codes</b>									
	107-6	Master C Hall 50% (Front 17')							
4	25HA-36	EHC 50% (Old 18/4)							
<b>Phone Codes</b>									
	300	Exhibit Hall C - 100%							
	301	Exhibit Hall C - 50%							
	309	Exhibit Hall C - 17' Ceiling - 50% Front							
	310	Exhibit Hall C - 17' Ceiling - 100% Front							
<b>Switch Codes</b>									
	107-6	Master C Hall 50% (Front 17')							
5	25HA-38	EHC 50% (Old 18/5)							
<b>Phone Codes</b>									
	300	Exhibit Hall C - 100%							
	301	Exhibit Hall C - 50%							
	309	Exhibit Hall C - 17' Ceiling - 50% Front							
	310	Exhibit Hall C - 17' Ceiling - 100% Front							
<b>Switch Codes</b>									
	107-6	Master C Hall 50% (Front 17')							
6	25HA-54	EHC 50% (Top Stairs/Exit) (Old 18/6)							
<b>Phone Codes</b>									
	300	Exhibit Hall C - 100%							
	301	Exhibit Hall C - 50%							
	309	Exhibit Hall C - 17' Ceiling - 50% Front							
	310	Exhibit Hall C - 17' Ceiling - 100% Front							
<b>Switch Codes</b>									
	107-6	Master C Hall 50% (Front 17')							
7	25HA-56	Lobby C (Old 18/7)				7 Truss Lights (morning)			
<b>Phone Codes</b>									

						56	Lobby C - Foyer
						<b>Switch Codes</b>	
						108-1	Master Lobby C
						<b>Phone Codes</b>	
						300	Exhibit Hall C - 100%
						302	Exhibit Hall C - 25%
						305	Exhibit Hall C - 38% Work Lights
						308	Exhibit Hall C - 17' Ceiling - 25% Front
						310	Exhibit Hall C - 17' Ceiling - 100% Front
						<b>Switch Codes</b>	
						107-7	Master C Hall 25% (Front 17')
						<b>Phone Codes</b>	
						300	Exhibit Hall C - 100%
						302	Exhibit Hall C - 25%
						305	Exhibit Hall C - 38% Work Lights
						308	Exhibit Hall C - 17' Ceiling - 25% Front
						310	Exhibit Hall C - 17' Ceiling - 100% Front
						<b>Switch Codes</b>	
						107-7	Master C Hall 25% (Front 17')
						<b>Phone Codes</b>	
						300	Exhibit Hall C - 100%
						302	Exhibit Hall C - 25%
						305	Exhibit Hall C - 38% Work Lights
						308	Exhibit Hall C - 17' Ceiling - 25% Front
						310	Exhibit Hall C - 17' Ceiling - 100% Front
						<b>Switch Codes</b>	
						107-7	Master C Hall 25% (Front 17')
						<b>Phone Codes</b>	
						300	Exhibit Hall C - 100%
						302	Exhibit Hall C - 25%
						305	Exhibit Hall C - 38% Work Lights
						308	Exhibit Hall C - 17' Ceiling - 25% Front
						310	Exhibit Hall C - 17' Ceiling - 100% Front
						<b>Switch Codes</b>	
						107-7	Master C Hall 25% (Front 17')
						<b>Phone Codes</b>	
						300	Exhibit Hall C - 100%
						302	Exhibit Hall C - 13%
						305	Exhibit Hall C - 38% Work Lights
						307	Exhibit Hall C - 17' Ceiling - 13% Front
						310	Exhibit Hall C - 17' Ceiling - 100% Front
						<b>Switch Codes</b>	
						107-8	Master C Hall 13% (Front 17')
						<b>Phone Codes</b>	
						300	Exhibit Hall C - 100%
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						305	Exhibit Hall C - 38% Work Lights
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						107-8	Master C Hall 13% (Front 17')
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						300	Exhibit Hall C - 100%
						304	Exhibit Hall C - 12%
						306	Exhibit Hall C - 17' Ceiling - 12% Front
						310	Exhibit Hall C - 17' Ceiling - 100% Front
						<b>Switch Codes</b>	
						107-9	Master C Hall 12% (Front 17')
						<b>Phone Codes</b>	
8	25HA-40	EHC 25% (Old 18/8)					
9	25HA-42	EHC 25% (Old 18/9)					
10	25HA-44	EHC 25% (Old 18/10)					
11	25HA-76	EHC 25% (Old 18/11)					
12	25HA-46	EHC 13% (Old 18/12)					
13	25HA-48	EHC 13% (Old 18/13)					
14	25HA-50	EHC 12% (Old 18/14)					
15	25HA-52	EHC 12% (Old 18/15)					

										300	Exhibit Hall C - 100%
										304	Exhibit Hall C - 12%
										306	Exhibit Hall C - 17' Ceiling - 12% Front
										310	Exhibit Hall C - 17' Ceiling - 100% Front
										<b>Switch Codes</b>	
										107-9	Master   C Hall 12% (Front 17')
										<b>Phone Codes</b>	
										800	Night Lights - All
										808	Night Lights - 2nd Level
										<b>Switch Codes</b>	
										125-8	Master   2nd Level Night Lights
16	25HA-41	+25 Level Nt Lts (Old 18/16)									
17	**Space**	Space									
18	**Space**	Space									
19	**Space**	Space									
20	**Space**	Space									
21	**Space**	Space									
22	**Space**	Space									
23	**Space**	Space									
24	**Space**	Space									
25	**Space**	Space									
26	**Space**	Space									
27	**Space**	Space									
28	**Space**	Space									
29	**Space**	Space									
30	**Space**	Space									
31	**Space**	Space									
32	**Space**	Space									
	<b>Panel ID</b>	<b>Description</b>	<b>Location</b>	<b>Type</b>	<b>Interior / Enclosure</b>	<b>Power Supply</b>	<b>Circuit</b>				
10	Panel 25HB - Reg. B (Was MODs 20 & 21)	2nd Floor Registration between 212/213		Retrofit	32/32 Surface	115/277					
	<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>Settings</b>	<b>Timeout</b>	<b>Schedule</b>	<b>References</b>				
1	25HB-7	Reg. B (Old 20/1)									
										<b>Phone Codes</b>	
										83	Registration B +25 100%
										84	Registration ALL + A, B, C, D & E 100%
										221	Registration B- 75%
										<b>Switch Codes</b>	
										124-1	Master   Registration B
2	25HB-9	Reg. B (Old 20/2)									
										<b>Phone Codes</b>	
										83	Registration B +25 100%
										84	Registration ALL + A, B, C, D & E 100%
										220	Registration B- 25%
										<b>Switch Codes</b>	
										124-1	Master   Registration B
3	25HB-11	Reg. B (Old 20/3)									
										<b>Phone Codes</b>	
										83	Registration B +25 100%
										84	Registration ALL + A, B, C, D & E 100%
										221	Registration B- 75%
										<b>Switch Codes</b>	
										124-1	Master   Registration B



4	25HB-13	Reg. B (Old 20/4)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>83</td> <td>Registration B +25 100%</td> </tr> <tr> <td>84</td> <td>Registration ALL + A, B, C ,D &amp; E 100%</td> </tr> <tr> <td>221</td> <td>Registration B- 75%</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>124-1</td> <td>Master Registration B</td> </tr> </tbody> </table>	Phone Codes		83	Registration B +25 100%	84	Registration ALL + A, B, C ,D & E 100%	221	Registration B- 75%	Switch Codes		124-1	Master Registration B		
Phone Codes																				
83	Registration B +25 100%																			
84	Registration ALL + A, B, C ,D & E 100%																			
221	Registration B- 75%																			
Switch Codes																				
124-1	Master Registration B																			
5	25HB-15	Reg. B (Old 20/5)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>83</td> <td>Registration B +25 100%</td> </tr> <tr> <td>84</td> <td>Registration ALL + A, B, C ,D &amp; E 100%</td> </tr> <tr> <td>220</td> <td>Registration B- 25%</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>124-1</td> <td>Master Registration B</td> </tr> </tbody> </table>	Phone Codes		83	Registration B +25 100%	84	Registration ALL + A, B, C ,D & E 100%	220	Registration B- 25%	Switch Codes		124-1	Master Registration B		
Phone Codes																				
83	Registration B +25 100%																			
84	Registration ALL + A, B, C ,D & E 100%																			
220	Registration B- 25%																			
Switch Codes																				
124-1	Master Registration B																			
6	25HB-17	Reg. B (Old 20/6)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>83</td> <td>Registration B +25 100%</td> </tr> <tr> <td>84</td> <td>Registration ALL + A, B, C ,D &amp; E 100%</td> </tr> <tr> <td>221</td> <td>Registration B- 75%</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>124-1</td> <td>Master Registration B</td> </tr> </tbody> </table>	Phone Codes		83	Registration B +25 100%	84	Registration ALL + A, B, C ,D & E 100%	221	Registration B- 75%	Switch Codes		124-1	Master Registration B		
Phone Codes																				
83	Registration B +25 100%																			
84	Registration ALL + A, B, C ,D & E 100%																			
221	Registration B- 75%																			
Switch Codes																				
124-1	Master Registration B																			
7	25HB-31	Restrooms 212/213 (Old 20/7)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>Restrooms - 2nd Level</td> </tr> <tr> <td>15</td> <td>Restrooms - ALL</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>125-6</td> <td>Master Reg. Restrooms 212/213</td> </tr> </tbody> </table>	Phone Codes		3	Restrooms - 2nd Level	15	Restrooms - ALL	Switch Codes		125-6	Master Reg. Restrooms 212/213				
Phone Codes																				
3	Restrooms - 2nd Level																			
15	Restrooms - ALL																			
Switch Codes																				
125-6	Master Reg. Restrooms 212/213																			
8	25HB-2	Truss/Escl B (Old 20/8)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>8</td> <td>Restrooms - Stair Hall B</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>105-5</td> <td>Master B Hall Restrooms (Front Tunnel)</td> </tr> </tbody> </table>	Phone Codes		8	Restrooms - Stair Hall B	Switch Codes		105-5	Master B Hall Restrooms (Front Tunnel)						
Phone Codes																				
8	Restrooms - Stair Hall B																			
Switch Codes																				
105-5	Master B Hall Restrooms (Front Tunnel)																			
9	25HB-4	Truss/Escl C (Old 20/9)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>9</td> <td>Restrooms - Stair Hall C</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>108-7</td> <td>Master C Hall Restrooms (Front Tunnel)</td> </tr> </tbody> </table>	Phone Codes		9	Restrooms - Stair Hall C	Switch Codes		108-7	Master C Hall Restrooms (Front Tunnel)						
Phone Codes																				
9	Restrooms - Stair Hall C																			
Switch Codes																				
108-7	Master C Hall Restrooms (Front Tunnel)																			
10	25HB-?	Truss/Escl C 2-3 (Old 20/10)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>82</td> <td>Registration C + 25 100%</td> </tr> <tr> <td>84</td> <td>Registration ALL + A, B, C ,D &amp; E 100%</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>125-2</td> <td>Master Lights under Escalators C</td> </tr> </tbody> </table>	Phone Codes		82	Registration C + 25 100%	84	Registration ALL + A, B, C ,D & E 100%	Switch Codes		125-2	Master Lights under Escalators C				
Phone Codes																				
82	Registration C + 25 100%																			
84	Registration ALL + A, B, C ,D & E 100%																			
Switch Codes																				
125-2	Master Lights under Escalators C																			
11		Mod -20 relay 11																		
12		Mod -20 relay 12																		
13		Mod -20 relay 13																		
14		Mod -20 relay 14																		
15		Mod -20 relay 15																		
16		Mod -20 relay 16																		
17	25HB-6	EHB 50% (Old 21/1)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>200</td> <td>Exhibit Hall B - 100%</td> </tr> <tr> <td>201</td> <td>Exhibit Hall B - 50%</td> </tr> <tr> <td>209</td> <td>Exhibit Hall B - 17' Ceiling - 50% Front</td> </tr> <tr> <td>210</td> <td>Exhibit Hall B - 17' Ceiling - 100% Front</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>104-6</td> <td>Master B Hall 50% (Front 17')</td> </tr> </tbody> </table>	Phone Codes		200	Exhibit Hall B - 100%	201	Exhibit Hall B - 50%	209	Exhibit Hall B - 17' Ceiling - 50% Front	210	Exhibit Hall B - 17' Ceiling - 100% Front	Switch Codes		104-6	Master B Hall 50% (Front 17')
Phone Codes																				
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209	Exhibit Hall B - 17' Ceiling - 50% Front																			
210	Exhibit Hall B - 17' Ceiling - 100% Front																			
Switch Codes																				
104-6	Master B Hall 50% (Front 17')																			
18	25HB-8	EHB 50% (Old 21/2)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>200</td> <td>Exhibit Hall B - 100%</td> </tr> <tr> <td>201</td> <td>Exhibit Hall B - 50%</td> </tr> </tbody> </table>	Phone Codes		200	Exhibit Hall B - 100%	201	Exhibit Hall B - 50%								
Phone Codes																				
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201	Exhibit Hall B - 50%																			

						209	Exhibit Hall B - 17' Ceiling - 50% Front
						210	Exhibit Hall B - 17' Ceiling - 100% Front
						<b>Switch Codes</b>	
					104-6	Master	B Hall 50% (Front 17')
						<b>Phone Codes</b>	
					200	Exhibit Hall B - 100%	
					201	Exhibit Hall B - 50%	
					209	Exhibit Hall B - 17' Ceiling - 50% Front	
					210	Exhibit Hall B - 17' Ceiling - 100% Front	
						<b>Switch Codes</b>	
					104-6	Master	B Hall 50% (Front 17')
19	25HB-10	EHB 50% (Old 21/3)				<b>Phone Codes</b>	
					200	Exhibit Hall B - 100%	
					201	Exhibit Hall B - 50%	
					209	Exhibit Hall B - 17' Ceiling - 50% Front	
					210	Exhibit Hall B - 17' Ceiling - 100% Front	
						<b>Switch Codes</b>	
					104-6	Master	B Hall 50% (Front 17')
20	25HB-12	EHB 50% (Old 21/4)				<b>Phone Codes</b>	
					200	Exhibit Hall B - 100%	
					201	Exhibit Hall B - 50%	
					209	Exhibit Hall B - 17' Ceiling - 50% Front	
					210	Exhibit Hall B - 17' Ceiling - 100% Front	
						<b>Switch Codes</b>	
					104-6	Master	B Hall 50% (Front 17')
21	25HB-14	EHB 50% (Old 21/5)				<b>Phone Codes</b>	
					200	Exhibit Hall B - 100%	
					201	Exhibit Hall B - 50%	
					209	Exhibit Hall B - 17' Ceiling - 50% Front	
					210	Exhibit Hall B - 17' Ceiling - 100% Front	
						<b>Switch Codes</b>	
					104-6	Master	B Hall 50% (Front 17')
22	25HB-30	EHB 50% (Top Stairs/Exits) (Old 21/6)				<b>Phone Codes</b>	
					200	Exhibit Hall B - 100%	
					201	Exhibit Hall B - 50%	
					209	Exhibit Hall B - 17' Ceiling - 50% Front	
					210	Exhibit Hall B - 17' Ceiling - 100% Front	
						<b>Switch Codes</b>	
					104-6	Master	B Hall 50% (Front 17')
23	25HB-32	Lobby B (Old 21/7)			7	Truss Lights (morning)	
						<b>Phone Codes</b>	
					55	Lobby B - Foyer	
						<b>Switch Codes</b>	
					105-1	Master	Lobby B
24	25HB-16	EHB 25% (Old 21/8)				<b>Phone Codes</b>	
					200	Exhibit Hall B - 100%	
					202	Exhibit Hall B - 25%	
					205	Exhibit Hall B - 38% Work Lights	
					208	Exhibit Hall B - 17' Ceiling - 25% Front	
					210	Exhibit Hall B - 17' Ceiling - 100% Front	
						<b>Switch Codes</b>	
					104-7	Master	B Hall 25% (Front 17')
25	25HB-18	EHB 25% (Old 21/9)				<b>Phone Codes</b>	
					200	Exhibit Hall B - 100%	
					202	Exhibit Hall B - 25%	
					205	Exhibit Hall B - 38% Work Lights	
					208	Exhibit Hall B - 17' Ceiling - 25% Front	
					210	Exhibit Hall B - 17' Ceiling - 100% Front	
						<b>Switch Codes</b>	
					104-7	Master	B Hall 25% (Front 17')
26	25HB-20	EHB 25% (Old 21/10)				<b>Phone Codes</b>	
					200	Exhibit Hall B - 100%	
					202	Exhibit Hall B - 25%	
					205	Exhibit Hall B - 38% Work Lights	
					208	Exhibit Hall B - 17' Ceiling - 25% Front	
					210	Exhibit Hall B - 17' Ceiling - 100% Front	
						<b>Switch Codes</b>	

27	25HB-34	EHB 25% (Old 21/11)				104-7 Master B Hall 25% (Front 17')
<b>Phone Codes</b>						
200	Exhibit Hall B - 100%					
202	Exhibit Hall B - 25%					
205	Exhibit Hall B - 38% Work Lights					
208	Exhibit Hall B - 17' Ceiling - 25% Front					
210	Exhibit Hall B - 17' Ceiling - 100% Front					
<b>Switch Codes</b>						
104-7	Master	B Hall 25% (Front 17')				
28	25HB-22	EHB 13% (Old 21/12)				104-7 Master B Hall 25% (Front 17')
<b>Phone Codes</b>						
200	Exhibit Hall B - 100%					
203	Exhibit Hall B - 13%					
205	Exhibit Hall B - 38% Work Lights					
207	Exhibit Hall B - 17' Ceiling - 13% Front					
210	Exhibit Hall B - 17' Ceiling - 100% Front					
<b>Switch Codes</b>						
104-8	Master	B Hall 13% (Front 17')				
29	25HB-24	EHB 13% (Old 21/13)				104-8 Master B Hall 13% (Front 17')
<b>Phone Codes</b>						
200	Exhibit Hall B - 100%					
203	Exhibit Hall B - 13%					
205	Exhibit Hall B - 38% Work Lights					
207	Exhibit Hall B - 17' Ceiling - 13% Front					
210	Exhibit Hall B - 17' Ceiling - 100% Front					
<b>Switch Codes</b>						
104-8	Master	B Hall 13% (Front 17')				
30	25HB-26	EHB 12% (Old 21/14)				104-8 Master B Hall 13% (Front 17')
<b>Phone Codes</b>						
200	Exhibit Hall B - 100%					
204	Exhibit Hall B - 12%					
206	Exhibit Hall B - 17' Ceiling - 12% Front					
210	Exhibit Hall B - 17' Ceiling - 100% Front					
<b>Switch Codes</b>						
104-9	Master	B Hall 12% (Front 17')				
31	25HB-28	EHB 12% (Old 21/15)				104-9 Master B Hall 12% (Front 17')
<b>Phone Codes</b>						
200	Exhibit Hall B - 100%					
204	Exhibit Hall B - 12%					
206	Exhibit Hall B - 17' Ceiling - 12% Front					
210	Exhibit Hall B - 17' Ceiling - 100% Front					
<b>Switch Codes</b>						
104-9	Master	B Hall 12% (Front 17')				
32		Mod -21 relay 16				
<b>Panel ID</b>	<b>Description</b>	<b>Location</b>	<b>Type</b>	<b>Interior/Enclosure</b>	<b>Power Supply</b>	<b>Circuit</b>
11	Panel 25HC - 2R Boiler Room (Was MODs 22 & 23)	2R Past Boilers	Retrofit	32/32 Surface	115/277	
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>Settings</b>	<b>Timeout</b>	<b>Schedule</b>	<b>References</b>
1	25HC-2	Dock D (Old 22/1)			1 Sunset - Sunrise	
<b>Phone Codes</b>						
30	Loading Dock - All					
34	Loading Dock - Hall D					
<b>Switch Codes</b>						
130-8	Master	Dock D				
2	25HC-4	Dock D (Old 22/2)			1 Sunset - Sunrise	
<b>Phone Codes</b>						
30	Loading Dock - All					
34	Loading Dock - Hall D					
42	Partial Dock Lighting					
<b>Switch Codes</b>						
130-7	Master	Dock D (Partial)				
3	25HC-6	Dock D (Old 22/3)			1 Sunset - Sunrise	
<b>Phone Codes</b>						
30	Loading Dock - All					
34	Loading Dock - Hall D					

4	25HC-8	Dock D (Old 22/4)			1 Sunset - Sunrise	<table border="1"> <thead> <tr> <th colspan="2">Switch Codes</th> </tr> </thead> <tbody> <tr> <td>130-8</td> <td>Master Dock D</td> </tr> <tr> <th colspan="2">Phone Codes</th> </tr> <tr> <td>30</td> <td>Loading Dock - All</td> </tr> <tr> <td>34</td> <td>Loading Dock - Hall D</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>130-8</td> <td>Master Dock D</td> </tr> </tbody> </table>	Switch Codes		130-8	Master Dock D	Phone Codes		30	Loading Dock - All	34	Loading Dock - Hall D	Switch Codes		130-8	Master Dock D		
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5	25HC-10	Dock D (Old 22/5)			1 Sunset - Sunrise	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>30</td> <td>Loading Dock - All</td> </tr> <tr> <td>34</td> <td>Loading Dock - Hall D</td> </tr> <tr> <td>42</td> <td>Partial Dock Lighting</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>130-7</td> <td>Master Dock D (Partial)</td> </tr> </tbody> </table>	Phone Codes		30	Loading Dock - All	34	Loading Dock - Hall D	42	Partial Dock Lighting	Switch Codes		130-7	Master Dock D (Partial)				
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6	25HC-12	Dock C (Old 22/6)			1 Sunset - Sunrise	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>30</td> <td>Loading Dock - All</td> </tr> <tr> <td>33</td> <td>Loading Dock - Hall C</td> </tr> <tr> <td>42</td> <td>Partial Dock Lighting</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>130-5</td> <td>Master Dock C (Partial)</td> </tr> </tbody> </table>	Phone Codes		30	Loading Dock - All	33	Loading Dock - Hall C	42	Partial Dock Lighting	Switch Codes		130-5	Master Dock C (Partial)				
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7	25HC-14	Dock C (Old 22/7)			1 Sunset - Sunrise	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>30</td> <td>Loading Dock - All</td> </tr> <tr> <td>33</td> <td>Loading Dock - Hall C</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>130-6</td> <td>Master Dock C</td> </tr> </tbody> </table>	Phone Codes		30	Loading Dock - All	33	Loading Dock - Hall C	Switch Codes		130-6	Master Dock C						
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13	25LC-24	??? EHD 25% (Old 22/13)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>68</td> <td>Routine Night Lighting</td> </tr> </tbody> </table>	Phone Codes		68	Routine Night Lighting												
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					110-11	Master	D Hall 25% (Rear 17')
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						400	Exhibit Hall D - 100%
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					110-12	Master	D Hall 13% (Rear 17')
15	25HC-15	EHD 12% (Old 22/15)					
						<b>Phone Codes</b>	
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						415	Exhibit Hall D - 17' Ceiling - 12% Rear
						<b>Switch Codes</b>	
					110-13	Master	D Hall 12% (Rear 17')
16	25LC-26	C Dock Soffit Lts (Old 22/16)			1	Sunset - Sunrise	
						<b>Phone Codes</b>	
						30	Loading Dock - All
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						68	Routine Night Lighting
						<b>Switch Codes</b>	
					130-6	Master	Dock C
17	25HC-3	EHC 50% (Old 23/1)					
						<b>Phone Codes</b>	
						300	Exhibit Hall C - 100%
						301	Exhibit Hall C - 50%
						311	Exhibit Hall C - 17' Ceiling - 100% Rear
						312	Exhibit Hall C - 17' Ceiling - 50% Rear
						<b>Switch Codes</b>	
					107-10	Master	C Hall 50% (Rear 17')
18	25HC-7	EHC 25% (Old 23/2)					
						<b>Phone Codes</b>	
						300	Exhibit Hall C - 100%
						302	Exhibit Hall C - 25%
						305	Exhibit Hall C - 38% Work Lights
						311	Exhibit Hall C - 17' Ceiling - 100% Rear
						313	Exhibit Hall C - 17' Ceiling - 25% Rear
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					107-11	Master	C Hall 25% (Rear 17')
19	25HC-9	EHC 25% (Old 23/3)					
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21	25HC-17	EHC 12% (Old 23/5)					

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22	25HC-27	D Hall Restrm (Rear) (Old 23/6)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Restrooms - 1st Level</td> </tr> <tr> <td>15</td> <td>Restrooms - ALL</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>111-6</td> <td>Master D Hall Restrooms (Rear)</td> </tr> </tbody> </table>	Phone Codes		2	Restrooms - 1st Level	15	Restrooms - ALL	Switch Codes		111-6	Master D Hall Restrooms (Rear)								
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<b>Panel ID</b>	<b>Description</b>	<b>Location</b>	<b>Type</b>	<b>Interior/Enclosure</b>	<b>Power Supply</b>	<b>Schedule</b>	<b>Circuit</b>
13	Panel 35HA - Front Hall D (Was MODs 26 & 27)	MECH RM 107	Retrofit	32/32 Surface	115/277		
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>Settings</b>	<b>Timeout</b>	<b>Schedule</b>	<b>References</b>	
1	35HA-16	EHD 50% (Old 26/1)					
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405	Exhibit Hall D - 38% Work Lights																					
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135-9	Master Hall B-3 walk through to Hall A-3																					
20	35HA-21	EHD 25% (Old 27/4)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> </table>	Phone Codes															
Phone Codes																						

						400	Exhibit Hall D - 100%
						402	Exhibit Hall D - 25%
						405	Exhibit Hall D - 38% Work Lights
						<b>Switch Codes</b>	
					110-2	Master	D Hall 25% (35')
					110-14	Master	Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
					135-9	Master	Hall B-3 walk through to Hall A-3
21	35HA-10	EHD 25% (Old 27/5)				<b>Phone Codes</b>	
						400	Exhibit Hall D - 100%
						402	Exhibit Hall D - 25%
						405	Exhibit Hall D - 38% Work Lights
						<b>Switch Codes</b>	
					110-2	Master	D Hall 25% (35')
					110-14	Master	Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
					135-9	Master	Hall B-3 walk through to Hall A-3
22	35HA-12	EHD 25% (Old 27/6)				<b>Phone Codes</b>	
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						402	Exhibit Hall D - 25%
						405	Exhibit Hall D - 38% Work Lights
						<b>Switch Codes</b>	
					110-2	Master	D Hall 25% (35')
					110-14	Master	Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
					135-9	Master	Hall B-3 walk through to Hall A-3
23	35HA-14	EHD 25% (Old 27/7)				<b>Phone Codes</b>	
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						402	Exhibit Hall D - 25%
						405	Exhibit Hall D - 38% Work Lights
						<b>Switch Codes</b>	
					110-2	Master	D Hall 25% (35')
					110-14	Master	Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
					135-9	Master	Hall B-3 walk through to Hall A-3
24	35HA-18	EHD 13% (Old 27/8)				<b>Phone Codes</b>	
						400	Exhibit Hall D - 100%
						403	Exhibit Hall D - 13%
						405	Exhibit Hall D - 38% Work Lights
						<b>Switch Codes</b>	
					110-3	Master	D Hall 13% (35')
					110-14	Master	Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
25	35HA-20	EHD 13% (Old 27/9)				<b>Phone Codes</b>	
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						403	Exhibit Hall D - 13%
						405	Exhibit Hall D - 38% Work Lights
						<b>Switch Codes</b>	
					110-3	Master	D Hall 13% (35')
					110-14	Master	Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
26	35HA-30	EHD 13% (Old 27/10)				<b>Phone Codes</b>	
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						403	Exhibit Hall D - 13%
						405	Exhibit Hall D - 38% Work Lights
						<b>Switch Codes</b>	
					110-3	Master	D Hall 13% (35')
					110-14	Master	Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
27	35HA-24	EHD 13% (Old 27/11)				<b>Phone Codes</b>	

											400	Exhibit Hall D - 100%
											403	Exhibit Hall D - 13%
											405	Exhibit Hall D - 38% Work Lights
											<b>Switch Codes</b>	
										110-3	Master	D Hall 13% (35')
										110-14	Master	Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
28	35HA-1	EHD 12% (Old 27/12)										
											<b>Phone Codes</b>	
											400	Exhibit Hall D - 100%
											404	Exhibit Hall D - 12%
											<b>Switch Codes</b>	
										110-4	Master	D Hall 12% (35')
										110-14	Master	Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
29	35HA-26	EHD 12% (Old 27/13)										
											<b>Phone Codes</b>	
											400	Exhibit Hall D - 100%
											404	Exhibit Hall D - 12%
											<b>Switch Codes</b>	
										110-4	Master	D Hall 12% (35')
										110-14	Master	Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
30	35HA-28	EHD 12% (Old 27/14)										
											<b>Phone Codes</b>	
											400	Exhibit Hall D - 100%
											404	Exhibit Hall D - 12%
											<b>Switch Codes</b>	
										110-4	Master	D Hall 12% (35')
										110-14	Master	Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
31	35HA-22	EHD 12% (Old 27/15)										
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											400	Exhibit Hall D - 100%
											404	Exhibit Hall D - 12%
											<b>Switch Codes</b>	
										110-4	Master	D Hall 12% (35')
										110-14	Master	Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
32		Mod -27 relay 16										
<b>Panel ID</b>	<b>Description</b>	<b>Location</b>	<b>Type</b>	<b>Interior/Enclosure</b>	<b>Power Supply</b>	<b>Circuit</b>						
14	Panel 35HA - Front Hall D (Was MOD 28)	MECH. RM 107	Retrofit	32/32 Surface	115/277							
<b>Relay</b>	<b>Circuit</b>	<b>Description</b>	<b>Settings</b>	<b>Timeout</b>	<b>Schedule</b>	<b>References</b>						
1	35HA-32	EHD Nt Lts (Old 28/1)										
											<b>Phone Codes</b>	
											800	Night Lights - All
											804	Night Lights - Hall D
											<b>Switch Codes</b>	
										110-5	Master	D Hall Nt Lts
2	35HA-34	D Stairwells E/W (Old 28/2)				1 Sunset - Sunrise						
											<b>Phone Codes</b>	
											62	Stairwells - All
											63	Stairwells - South - East/West
											<b>Switch Codes</b>	
										126-5	Master	Exit Stairwells - D Hall
3	35HA-36	D Stairwells E/W (Old 28/3)				1 Sunset - Sunrise						
											<b>Phone Codes</b>	
											62	Stairwells - All
											63	Stairwells - South - East/West
											<b>Switch Codes</b>	
										126-5	Master	Exit Stairwells - D Hall
4		Mod -28 relay 4										
											<b>Phone Codes</b>	
											7	Roll Up Doors - All Freight Doors
5		Mod -28 relay 5										

6		Mod -28 relay 6																	
7		Mod -28 relay 7																	
8		Mod -28 relay 8																	
9		Mod -28 relay 9																	
10		Mod -28 relay 10																	
11		Mod -28 relay 11																	
12		Mod -28 relay 12																	
13		Mod -28 relay 13																	
14		Mod -28 relay 14																	
15		Mod -28 relay 15																	
16		Mod -28 relay 16																	
17	**Space**	Space																	
18	**Space**	Space																	
19	**Space**	Space																	
20	**Space**	Space																	
21	**Space**	Space																	
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26	**Space**	Space																	
27	**Space**	Space																	
28	**Space**	Space																	
29	**Space**	Space																	
30	**Space**	Space																	
31	**Space**	Space																	
32	**Space**	Space																	
Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit													
15	Panel 35HB - Front Hall C (Was MODs 30 & 31)	MECH RM 111	Retrofit	32/32 Surface	115/277														
Rly	Circuit	Description	Settings	Timeout	Schedule	References													
1	35HB-6	EHC 50% (Old 30/1)				<table border="1"> <thead> <tr><th colspan="2">Phone Codes</th></tr> </thead> <tbody> <tr><td>300</td><td>Exhibit Hall C - 100%</td></tr> <tr><td>301</td><td>Exhibit Hall C - 50%</td></tr> <tr><th colspan="2">Switch Codes</th></tr> <tr><td>107-1</td><td>Master C Hall 50% (35')</td></tr> <tr><td>107-14</td><td>Master Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)</td></tr> </tbody> </table>		Phone Codes		300	Exhibit Hall C - 100%	301	Exhibit Hall C - 50%	Switch Codes		107-1	Master C Hall 50% (35')	107-14	Master Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
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2	35HB-3	EHC 50% (Old 30/2)				<table border="1"> <thead> <tr><th colspan="2">Phone Codes</th></tr> </thead> <tbody> </tbody> </table>		Phone Codes											
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						300	Exhibit Hall C - 100%
						301	Exhibit Hall C - 50%
						<b>Switch Codes</b>	
					107-1	Master	C Hall 50% (35')
					107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
3	35HB-5	EHC 50% (Old 30/3)					
						<b>Phone Codes</b>	
					300	Exhibit Hall C - 100%	
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						<b>Switch Codes</b>	
					107-1	Master	C Hall 50% (35')
					107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
4	35HB-7	EHC 50% (Old 30/4)					
						<b>Phone Codes</b>	
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					107-1	Master	C Hall 50% (35')
					107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
5	35HB-9	EHC 50% (Old 30/5)					
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					107-1	Master	C Hall 50% (35')
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6	35HB-11	EHC 50% (Old 30/6)					
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						<b>Switch Codes</b>	
					107-1	Master	C Hall 50% (35')
					107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
7	35HB-13	EHC 50% (Old 30/7)					
						<b>Phone Codes</b>	
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						<b>Switch Codes</b>	
					107-1	Master	C Hall 50% (35')
					107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
8	35HB-15	EHC 50% (Old 30/8)					
						<b>Phone Codes</b>	
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					301	Exhibit Hall C - 50%	
						<b>Switch Codes</b>	
					107-1	Master	C Hall 50% (35')
					107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
9	35HB-17	EHC 50% (Old 30/9)					
						<b>Phone Codes</b>	
					300	Exhibit Hall C - 100%	
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						<b>Switch Codes</b>	
					107-1	Master	C Hall 50% (35')
					107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
10	35HB-19	EHC 50% (Old 30/10)					
						<b>Phone Codes</b>	
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						<b>Switch Codes</b>	

11	35HB-21	EHC 50% (Old 30/11)				<table border="1"> <tr> <td>107-1</td> <td>Master</td> <td>C Hall 50% (35')</td> </tr> <tr> <td>107-14</td> <td>Master</td> <td>Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>Phone Codes</b></td> </tr> <tr> <td>300</td> <td></td> <td>Exhibit Hall C - 100%</td> </tr> <tr> <td>301</td> <td></td> <td>Exhibit Hall C - 50%</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>Switch Codes</b></td> </tr> <tr> <td>107-1</td> <td>Master</td> <td>C Hall 50% (35')</td> </tr> <tr> <td>107-14</td> <td>Master</td> <td>Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)</td> </tr> </table>	107-1	Master	C Hall 50% (35')	107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)	<b>Phone Codes</b>			300		Exhibit Hall C - 100%	301		Exhibit Hall C - 50%	<b>Switch Codes</b>			107-1	Master	C Hall 50% (35')	107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
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12	35HB-25	EHC 50% (Old 30/12)				<table border="1"> <tr> <td colspan="3" style="text-align: center;"><b>Phone Codes</b></td> </tr> <tr> <td>300</td> <td></td> <td>Exhibit Hall C - 100%</td> </tr> <tr> <td>301</td> <td></td> <td>Exhibit Hall C - 50%</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>Switch Codes</b></td> </tr> <tr> <td>107-1</td> <td>Master</td> <td>C Hall 50% (35')</td> </tr> <tr> <td>107-14</td> <td>Master</td> <td>Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)</td> </tr> </table>	<b>Phone Codes</b>			300		Exhibit Hall C - 100%	301		Exhibit Hall C - 50%	<b>Switch Codes</b>			107-1	Master	C Hall 50% (35')	107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)						
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13	35HB-23	EHC 50% (Old 30/13)				<table border="1"> <tr> <td colspan="3" style="text-align: center;"><b>Phone Codes</b></td> </tr> <tr> <td>300</td> <td></td> <td>Exhibit Hall C - 100%</td> </tr> <tr> <td>301</td> <td></td> <td>Exhibit Hall C - 50%</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>Switch Codes</b></td> </tr> <tr> <td>107-1</td> <td>Master</td> <td>C Hall 50% (35')</td> </tr> <tr> <td>107-14</td> <td>Master</td> <td>Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)</td> </tr> </table>	<b>Phone Codes</b>			300		Exhibit Hall C - 100%	301		Exhibit Hall C - 50%	<b>Switch Codes</b>			107-1	Master	C Hall 50% (35')	107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)						
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14	35HB-27	EHC 50% (Old 30/14)				<table border="1"> <tr> <td colspan="3" style="text-align: center;"><b>Phone Codes</b></td> </tr> <tr> <td>300</td> <td></td> <td>Exhibit Hall C - 100%</td> </tr> <tr> <td>301</td> <td></td> <td>Exhibit Hall C - 50%</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>Switch Codes</b></td> </tr> <tr> <td>107-1</td> <td>Master</td> <td>C Hall 50% (35')</td> </tr> <tr> <td>107-14</td> <td>Master</td> <td>Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)</td> </tr> </table>	<b>Phone Codes</b>			300		Exhibit Hall C - 100%	301		Exhibit Hall C - 50%	<b>Switch Codes</b>			107-1	Master	C Hall 50% (35')	107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)						
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15	35HB-29	EHC 50% (Old 30/15)				<table border="1"> <tr> <td colspan="3" style="text-align: center;"><b>Phone Codes</b></td> </tr> <tr> <td>300</td> <td></td> <td>Exhibit Hall C - 100%</td> </tr> <tr> <td>301</td> <td></td> <td>Exhibit Hall C - 50%</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>Switch Codes</b></td> </tr> <tr> <td>107-1</td> <td>Master</td> <td>C Hall 50% (35')</td> </tr> <tr> <td>107-14</td> <td>Master</td> <td>Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)</td> </tr> </table>	<b>Phone Codes</b>			300		Exhibit Hall C - 100%	301		Exhibit Hall C - 50%	<b>Switch Codes</b>			107-1	Master	C Hall 50% (35')	107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)						
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16	35HB-31	EHC Nt Lts (Old 30/16)				<table border="1"> <tr> <td colspan="3" style="text-align: center;"><b>Phone Codes</b></td> </tr> <tr> <td>800</td> <td></td> <td>Night Lights - All</td> </tr> <tr> <td>803</td> <td></td> <td>Night Lights - Hall C</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>Switch Codes</b></td> </tr> <tr> <td>107-5</td> <td>Master</td> <td>C Hall Nt Lts</td> </tr> <tr> <td>107-14</td> <td>Master</td> <td>Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)</td> </tr> </table>	<b>Phone Codes</b>			800		Night Lights - All	803		Night Lights - Hall C	<b>Switch Codes</b>			107-5	Master	C Hall Nt Lts	107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)						
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17	35HB-2	EHC 25% (Old 31/1)				<table border="1"> <tr> <td colspan="3" style="text-align: center;"><b>Phone Codes</b></td> </tr> <tr> <td>300</td> <td></td> <td>Exhibit Hall C - 100%</td> </tr> <tr> <td>302</td> <td></td> <td>Exhibit Hall C - 25%</td> </tr> <tr> <td>305</td> <td></td> <td>Exhibit Hall C - 38% Work Lights</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>Switch Codes</b></td> </tr> <tr> <td>107-2</td> <td>Master</td> <td>C Hall 25% (35')</td> </tr> <tr> <td>107-14</td> <td>Master</td> <td>Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)</td> </tr> </table>	<b>Phone Codes</b>			300		Exhibit Hall C - 100%	302		Exhibit Hall C - 25%	305		Exhibit Hall C - 38% Work Lights	<b>Switch Codes</b>			107-2	Master	C Hall 25% (35')	107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)			
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18	35HB-4	EHC 25% (Old 31/2)				<table border="1"> <tr> <td colspan="3" style="text-align: center;"><b>Phone Codes</b></td> </tr> <tr> <td>300</td> <td></td> <td>Exhibit Hall C - 100%</td> </tr> <tr> <td>302</td> <td></td> <td>Exhibit Hall C - 25%</td> </tr> <tr> <td>305</td> <td></td> <td>Exhibit Hall C - 38% Work Lights</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>Switch Codes</b></td> </tr> <tr> <td>107-2</td> <td>Master</td> <td>C Hall 25% (35')</td> </tr> </table>	<b>Phone Codes</b>			300		Exhibit Hall C - 100%	302		Exhibit Hall C - 25%	305		Exhibit Hall C - 38% Work Lights	<b>Switch Codes</b>			107-2	Master	C Hall 25% (35')						
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19	35HB-1	EHC 25% (Old 31/3)				107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
<b>Phone Codes</b>								
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	302							Exhibit Hall C - 25%
	305							Exhibit Hall C - 38% Work Lights
<b>Switch Codes</b>								
	107-2	Master	C Hall 25% (35)					
20	35HB-8	EHC 25% (Old 31/4)				107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
<b>Phone Codes</b>								
	300							Exhibit Hall C - 100%
	302							Exhibit Hall C - 25%
	305							Exhibit Hall C - 38% Work Lights
<b>Switch Codes</b>								
	107-2	Master	C Hall 25% (35)					
21	35HB-12	EHC 25% (Old 31/5)				107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
<b>Phone Codes</b>								
	300							Exhibit Hall C - 100%
	302							Exhibit Hall C - 25%
	305							Exhibit Hall C - 38% Work Lights
<b>Switch Codes</b>								
	107-2	Master	C Hall 25% (35)					
22	35HB-10	EHC 25% (Old 31/6)				107-2	Master	C Hall 25% (35)
<b>Phone Codes</b>								
	300							Exhibit Hall C - 100%
	302							Exhibit Hall C - 25%
	305							Exhibit Hall C - 38% Work Lights
<b>Switch Codes</b>								
	107-2	Master	C Hall 25% (35)					
23	35HB-14	EHC 25% (Old 31/7)				107-2	Master	C Hall 25% (35)
<b>Phone Codes</b>								
	300							Exhibit Hall C - 100%
	302							Exhibit Hall C - 25%
	305							Exhibit Hall C - 38% Work Lights
<b>Switch Codes</b>								
	107-2	Master	C Hall 25% (35)					
24	35HB-26	EHC 13% (Old 31/8)				107-2	Master	C Hall 25% (35)
<b>Phone Codes</b>								
	300							Exhibit Hall C - 100%
	303							Exhibit Hall C - 13%
	305							Exhibit Hall C - 38% Work Lights
<b>Switch Codes</b>								
	107-3	Master	C Hall 13% (35)					
25	35HB-18	EHC 13% (Old 31/9)				107-3	Master	C Hall 13% (35)
<b>Phone Codes</b>								
	300							Exhibit Hall C - 100%
	303							Exhibit Hall C - 13%
	305							Exhibit Hall C - 38% Work Lights
<b>Switch Codes</b>								
	107-3	Master	C Hall 13% (35)					
26	35HB-20	EHC 13% (Old 31/10)				107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
<b>Phone Codes</b>								
	300							Exhibit Hall C - 100%
	303							Exhibit Hall C - 13%
	305							Exhibit Hall C - 38% Work Lights
<b>Switch Codes</b>								
	107-3	Master	C Hall 13% (35)					
27	35HB-22	EHC 12% (Old 31/11)				107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)

28	35HB-24	EHC 12% (Old 31/12)								<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>300</td> <td>Exhibit Hall C - 100%</td> </tr> <tr> <td>304</td> <td>Exhibit Hall C - 12%</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>107-4</td> <td>Master C Hall 12% (35')</td> </tr> <tr> <td>107-14</td> <td>Master Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)</td> </tr> </tbody> </table>	Phone Codes		300	Exhibit Hall C - 100%	304	Exhibit Hall C - 12%	Switch Codes		107-4	Master C Hall 12% (35')	107-14	Master Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)	
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107-14	Master Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)																						
29	35HB-16	EHC 12% (Old 31/13)								<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>300</td> <td>Exhibit Hall C - 100%</td> </tr> <tr> <td>304</td> <td>Exhibit Hall C - 12%</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>107-4</td> <td>Master C Hall 12% (35')</td> </tr> <tr> <td>107-14</td> <td>Master Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)</td> </tr> </tbody> </table>	Phone Codes		300	Exhibit Hall C - 100%	304	Exhibit Hall C - 12%	Switch Codes		107-4	Master C Hall 12% (35')	107-14	Master Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)	
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107-14	Master Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)																						
30	35HB-32	C Stairwells E/W (Old 31/14)				1	Sunset - Sunrise			<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>62</td> <td>Stairwells - All</td> </tr> <tr> <td>64</td> <td>Stairwells - Central - East/West</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>125-9</td> <td>Master Exit Stairwells - C Hall</td> </tr> </tbody> </table>	Phone Codes		62	Stairwells - All	64	Stairwells - Central - East/West	Switch Codes		125-9	Master Exit Stairwells - C Hall			
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31	35HB-34	C Stairwells E/W (Old 31/15)				1	Sunset - Sunrise			<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>62</td> <td>Stairwells - All</td> </tr> <tr> <td>64</td> <td>Stairwells - Central - East/West</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>125-9</td> <td>Master Exit Stairwells - C Hall</td> </tr> </tbody> </table>	Phone Codes		62	Stairwells - All	64	Stairwells - Central - East/West	Switch Codes		125-9	Master Exit Stairwells - C Hall			
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32		Mod -31 relay 16																					
Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit																	
16	Panel 35HC - Front Hall B (Was MODs 32 & 33)	MECH RM 122	Retrofit	32/32 Surface	115/277																		
Rly	Circuit	Description	Settings	Timeout	Schedule	References																	
1	35HC-1	EHB 50% (Old 32/1)									<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>200</td> <td>Exhibit Hall B - 100%</td> </tr> <tr> <td>201</td> <td>Exhibit Hall B - 50%</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>104-1</td> <td>Master B Hall 50% (35')</td> </tr> <tr> <td>104-14</td> <td>Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)</td> </tr> </tbody> </table>	Phone Codes		200	Exhibit Hall B - 100%	201	Exhibit Hall B - 50%	Switch Codes		104-1	Master B Hall 50% (35')	104-14	Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
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2	35HC-3	EHB 50% (Old 32/2)									<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>200</td> <td>Exhibit Hall B - 100%</td> </tr> <tr> <td>201</td> <td>Exhibit Hall B - 50%</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>104-1</td> <td>Master B Hall 50% (35')</td> </tr> <tr> <td>104-14</td> <td>Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)</td> </tr> </tbody> </table>	Phone Codes		200	Exhibit Hall B - 100%	201	Exhibit Hall B - 50%	Switch Codes		104-1	Master B Hall 50% (35')	104-14	Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
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3	35HC-5	EHB 50% (Old 32/3)									<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>200</td> <td>Exhibit Hall B - 100%</td> </tr> <tr> <td>201</td> <td>Exhibit Hall B - 50%</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>104-1</td> <td>Master B Hall 50% (35')</td> </tr> <tr> <td>104-14</td> <td>Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)</td> </tr> </tbody> </table>	Phone Codes		200	Exhibit Hall B - 100%	201	Exhibit Hall B - 50%	Switch Codes		104-1	Master B Hall 50% (35')	104-14	Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
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4	35HC-7	EHB 50% (Old 32/4)									<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>200</td> <td>Exhibit Hall B - 100%</td> </tr> <tr> <td>201</td> <td>Exhibit Hall B - 50%</td> </tr> </tbody> </table>	Phone Codes		200	Exhibit Hall B - 100%	201	Exhibit Hall B - 50%						
Phone Codes																							
200	Exhibit Hall B - 100%																						
201	Exhibit Hall B - 50%																						

5	35HC-9	EHB 50% (Old 32/5)				<b>Switch Codes</b>	
						104-1	Master B Hall 50% (35)
						104-14	Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
						<b>Phone Codes</b>	
						200	Exhibit Hall B - 100%
						201	Exhibit Hall B - 50%
						<b>Switch Codes</b>	
						104-1	Master B Hall 50% (35)
						104-14	Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
6	35HC-11	EHB 50% (Old 32/6)				<b>Phone Codes</b>	
						200	Exhibit Hall B - 100%
						201	Exhibit Hall B - 50%
						<b>Switch Codes</b>	
						104-1	Master B Hall 50% (35)
						104-14	Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
7	35HC-13	EHB 50% (Old 32/7)				<b>Phone Codes</b>	
						200	Exhibit Hall B - 100%
						201	Exhibit Hall B - 50%
						<b>Switch Codes</b>	
						104-1	Master B Hall 50% (35)
						104-14	Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
8	35HC-15	EHB 50% (Old 32/8)				<b>Phone Codes</b>	
						200	Exhibit Hall B - 100%
						201	Exhibit Hall B - 50%
						<b>Switch Codes</b>	
						104-1	Master B Hall 50% (35)
						104-14	Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
9	35HC-17	EHB 50% (Old 32/9)				<b>Phone Codes</b>	
						200	Exhibit Hall B - 100%
						201	Exhibit Hall B - 50%
						<b>Switch Codes</b>	
						104-1	Master B Hall 50% (35)
						104-14	Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
10	35HC-19	EHB 50% (Old 32/10)				<b>Phone Codes</b>	
						200	Exhibit Hall B - 100%
						201	Exhibit Hall B - 50%
						<b>Switch Codes</b>	
						104-1	Master B Hall 50% (35)
						104-14	Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
11	35HC-21	EHB 50% (Old 32/11)				<b>Phone Codes</b>	
						200	Exhibit Hall B - 100%
						201	Exhibit Hall B - 50%
						<b>Switch Codes</b>	
						104-1	Master B Hall 50% (35)
						104-14	Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
12	35HC-23	EHB 50% (Old 32/12)				<b>Phone Codes</b>	
						200	Exhibit Hall B - 100%
						201	Exhibit Hall B - 50%
						<b>Switch Codes</b>	
						104-1	Master B Hall 50% (35)
						104-14	Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
13	35HC-25	EHB 50% (Old 32/13)				<b>Phone Codes</b>	
						200	Exhibit Hall B - 100%
						201	Exhibit Hall B - 50%
						<b>Switch Codes</b>	
						104-1	Master B Hall 50% (35)
						104-14	Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)

14	35HC-27	EHB 50% (Old 32/14)				104-1 Master B Hall 50% (35')
						<b>Phone Codes</b>
						200 Exhibit Hall B - 100%
						201 Exhibit Hall B - 50%
						<b>Switch Codes</b>
						104-1 Master B Hall 50% (35')
15	35HC-29	EHB 50% (Old 32/15)				<b>Phone Codes</b>
						200 Exhibit Hall B - 100%
						201 Exhibit Hall B - 50%
						<b>Switch Codes</b>
						104-1 Master B Hall 50% (35')
16	35HC-31	EHB Nt Lts (Old 32/16)				<b>Phone Codes</b>
						800 Night Lights - All
						802 Night Lights - Hall B
						<b>Switch Codes</b>
						104-5 Master B Hall Nt Lts
						104-14 Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
17	35HC-2	EHB 25% (Old 33/1)				<b>Phone Codes</b>
						200 Exhibit Hall B - 100%
						202 Exhibit Hall B - 25%
						205 Exhibit Hall B - 38% Work Lights
						<b>Switch Codes</b>
						104-2 Master B Hall 25% (35')
						104-14 Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
18	35HC-4	EHB 25% (Old 33/2)				<b>Phone Codes</b>
						200 Exhibit Hall B - 100%
						202 Exhibit Hall B - 25%
						205 Exhibit Hall B - 38% Work Lights
						<b>Switch Codes</b>
						104-2 Master B Hall 25% (35')
						104-14 Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
19	35HC-6	EHB 25% (Old 33/3)				<b>Phone Codes</b>
						200 Exhibit Hall B - 100%
						202 Exhibit Hall B - 25%
						205 Exhibit Hall B - 38% Work Lights
						<b>Switch Codes</b>
						104-2 Master B Hall 25% (35')
						104-14 Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
20	35HC-8	EHB 25% (Old 33/4)				<b>Phone Codes</b>
						200 Exhibit Hall B - 100%
						202 Exhibit Hall B - 25%
						205 Exhibit Hall B - 38% Work Lights
						<b>Switch Codes</b>
						104-2 Master B Hall 25% (35')
						104-14 Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
21	35HC-10	EHB 25% (Old 33/5)				<b>Phone Codes</b>
						200 Exhibit Hall B - 100%
						202 Exhibit Hall B - 25%
						205 Exhibit Hall B - 38% Work Lights
						<b>Switch Codes</b>
						104-2 Master B Hall 25% (35')
						104-14 Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
22	35HC-12	EHB 25% (Old 33/6)				<b>Phone Codes</b>
						200 Exhibit Hall B - 100%

						202	Exhibit Hall B - 25%
						205	Exhibit Hall B - 38% Work Lights
						<b>Switch Codes</b>	
					104-2	Master	B Hall 25% (35')
						<b>Phone Codes</b>	
					200		Exhibit Hall B - 100%
					202		Exhibit Hall B - 25%
					205		Exhibit Hall B - 38% Work Lights
						<b>Switch Codes</b>	
					104-2	Master	B Hall 25% (35')
23	35HC-14	EHB 25% (Old 33/7)					
						<b>Phone Codes</b>	
					200		Exhibit Hall B - 100%
					203		Exhibit Hall B - 13%
					205		Exhibit Hall B - 38% Work Lights
						<b>Switch Codes</b>	
					104-3	Master	B Hall 13% (35')
					104-14	Master	Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
24	35HC-18	EHB 13% (Old 33/8)					
						<b>Phone Codes</b>	
					200		Exhibit Hall B - 100%
					203		Exhibit Hall B - 13%
					205		Exhibit Hall B - 38% Work Lights
						<b>Switch Codes</b>	
					104-3	Master	B Hall 13% (35')
					104-14	Master	Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
25	35HC-16	EHB 13% (Old 33/9)					
						<b>Phone Codes</b>	
					200		Exhibit Hall B - 100%
					203		Exhibit Hall B - 13%
					205		Exhibit Hall B - 38% Work Lights
						<b>Switch Codes</b>	
					104-3	Master	B Hall 13% (35')
					104-14	Master	Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
26	35HC-20	EHB 13% (Old 33/10)					
						<b>Phone Codes</b>	
					200		Exhibit Hall B - 100%
					203		Exhibit Hall B - 13%
					205		Exhibit Hall B - 38% Work Lights
						<b>Switch Codes</b>	
					104-3	Master	B Hall 13% (35')
					104-14	Master	Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
27	35HC-22	EHB 12% (Old 33/11)					
						<b>Phone Codes</b>	
					200		Exhibit Hall B - 100%
					204		Exhibit Hall B - 12%
						<b>Switch Codes</b>	
					104-4	Master	B Hall 12% (35')
					104-14	Master	Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
28	35HC-24	EHB 12% (Old 33/12)					
						<b>Phone Codes</b>	
					200		Exhibit Hall B - 100%
					204		Exhibit Hall B - 12%
						<b>Switch Codes</b>	
					104-4	Master	B Hall 12% (35')
					104-14	Master	Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
29	35HC-26	EHB 12% (Old 33/13)					
						<b>Phone Codes</b>	
					200		Exhibit Hall B - 100%
					204		Exhibit Hall B - 12%
						<b>Switch Codes</b>	
					104-4	Master	B Hall 12% (35')
					104-14	Master	Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
30	35HC-32	B Stairwells E/W (Old 33/14)			1	Sunset - Sunrise	
						<b>Phone Codes</b>	
					62		Stairwells - All
					65		Stairwells - North - East/West
						<b>Switch Codes</b>	

31	35HC-34	B Stairwells E/W (Old 33/15)				1 Sunset - Sunrise	124-5 Master Fire Stairwells - B Hall
<b>Phone Codes</b>							
							62 Stairwells - All
							65 Stairwells - North - East/West
<b>Switch Codes</b>							
							124-5 Master Fire Stairwells - B Hall
32		Mod -33 relay 16					
<b>Phone Codes</b>							
							7 Roll Up Doors - All Freight Doors
<b>Panel ID</b>	<b>Description</b>	<b>Location</b>	<b>Type</b>	<b>Interior/Enclosure</b>	<b>Power Supply</b>	<b>Circuit</b>	
17	Panel 35HD - Rear Hall D (Was MODs 34 & 35)	MECH RM 137	Retrofit	32/32 Surface	115/277		
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>Settings</b>	<b>Timeout</b>	<b>Schedule</b>	<b>References</b>	
1	35HD-1	EHD 50% (Old 34/1)					
<b>Phone Codes</b>							
							400 Exhibit Hall D - 100%
							401 Exhibit Hall D - 50%
<b>Switch Codes</b>							
							110-1 Master D Hall 50% (35')
							110-14 Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
							110-15 Master NEA Voting/Business Look
2	35HD-3	EHD 50% (Old 34/2)					
<b>Phone Codes</b>							
							400 Exhibit Hall D - 100%
							401 Exhibit Hall D - 50%
<b>Switch Codes</b>							
							110-1 Master D Hall 50% (35')
							110-14 Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
3	35HD-5	EHD 50% (Old 34/3)moved to PNL.18-8					
<b>Phone Codes</b>							
							400 Exhibit Hall D - 100%
							401 Exhibit Hall D - 50%
<b>Switch Codes</b>							
							110-1 Master D Hall 50% (35')
							110-14 Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
4	35HD-7	EHD 50% (Old 34/4)					
<b>Phone Codes</b>							
							400 Exhibit Hall D - 100%
							401 Exhibit Hall D - 50%
<b>Switch Codes</b>							
							110-1 Master D Hall 50% (35')
							110-14 Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
5	35HD-9	EHD 50% (Old 34/5)					
<b>Phone Codes</b>							
							400 Exhibit Hall D - 100%
							401 Exhibit Hall D - 50%
<b>Switch Codes</b>							
							110-1 Master D Hall 50% (35')
							110-14 Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
6	35HD-11	EHD 50% (Old 34/6)					
<b>Phone Codes</b>							
							400 Exhibit Hall D - 100%
							401 Exhibit Hall D - 50%
<b>Switch Codes</b>							
							110-1 Master D Hall 50% (35')
							110-14 Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
7	35HD-13	EHD 50% (Old 34/7)					
<b>Phone Codes</b>							
							400 Exhibit Hall D - 100%
							401 Exhibit Hall D - 50%

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8	35HD-15	EHD 50% (Old 34/8)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>400</td> <td>Exhibit Hall D - 100%</td> </tr> <tr> <td>401</td> <td>Exhibit Hall D - 50%</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">Switch Codes</th> </tr> </thead> <tbody> <tr> <td>110-1</td> <td>Master D Hall 50% (35')</td> </tr> <tr> <td>110-14</td> <td>Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)</td> </tr> </tbody> </table>	Phone Codes		400	Exhibit Hall D - 100%	401	Exhibit Hall D - 50%	Switch Codes		110-1	Master D Hall 50% (35')	110-14	Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)		
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9	35HD-17	EHD 50% (Old 34/9)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>400</td> <td>Exhibit Hall D - 100%</td> </tr> <tr> <td>401</td> <td>Exhibit Hall D - 50%</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">Switch Codes</th> </tr> </thead> <tbody> <tr> <td>110-1</td> <td>Master D Hall 50% (35')</td> </tr> <tr> <td>110-14</td> <td>Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)</td> </tr> </tbody> </table>	Phone Codes		400	Exhibit Hall D - 100%	401	Exhibit Hall D - 50%	Switch Codes		110-1	Master D Hall 50% (35')	110-14	Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)		
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10	35HD-19	EHD 50% (Old 34/10)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>400</td> <td>Exhibit Hall D - 100%</td> </tr> <tr> <td>401</td> <td>Exhibit Hall D - 50%</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">Switch Codes</th> </tr> </thead> <tbody> <tr> <td>110-1</td> <td>Master D Hall 50% (35')</td> </tr> <tr> <td>110-14</td> <td>Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)</td> </tr> </tbody> </table>	Phone Codes		400	Exhibit Hall D - 100%	401	Exhibit Hall D - 50%	Switch Codes		110-1	Master D Hall 50% (35')	110-14	Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)		
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110-14	Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)																			
11	35HD-21	EHD 50% (Old 34/11)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>400</td> <td>Exhibit Hall D - 100%</td> </tr> <tr> <td>401</td> <td>Exhibit Hall D - 50%</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">Switch Codes</th> </tr> </thead> <tbody> <tr> <td>110-1</td> <td>Master D Hall 50% (35')</td> </tr> <tr> <td>110-14</td> <td>Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)</td> </tr> </tbody> </table>	Phone Codes		400	Exhibit Hall D - 100%	401	Exhibit Hall D - 50%	Switch Codes		110-1	Master D Hall 50% (35')	110-14	Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)		
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110-14	Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)																			
12	35HD-10	EHD 50% (Old 34/12)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>400</td> <td>Exhibit Hall D - 100%</td> </tr> <tr> <td>401</td> <td>Exhibit Hall D - 50%</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">Switch Codes</th> </tr> </thead> <tbody> <tr> <td>110-1</td> <td>Master D Hall 50% (35')</td> </tr> <tr> <td>110-14</td> <td>Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)</td> </tr> <tr> <td>135-9</td> <td>Master Hall B-3 walk through to Hall A-3</td> </tr> </tbody> </table>	Phone Codes		400	Exhibit Hall D - 100%	401	Exhibit Hall D - 50%	Switch Codes		110-1	Master D Hall 50% (35')	110-14	Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)	135-9	Master Hall B-3 walk through to Hall A-3
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Phone Codes																				
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Switch Codes																				
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135-9	Master Hall B-3 walk through to Hall A-3																			
14	35HD-27	EHD 50% (Old 34/14)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>400</td> <td>Exhibit Hall D - 100%</td> </tr> <tr> <td>401</td> <td>Exhibit Hall D - 50%</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">Switch Codes</th> </tr> </thead> <tbody> <tr> <td>110-1</td> <td>Master D Hall 50% (35')</td> </tr> <tr> <td>135-9</td> <td>Master Hall B-3 walk through to Hall A-3</td> </tr> </tbody> </table>	Phone Codes		400	Exhibit Hall D - 100%	401	Exhibit Hall D - 50%	Switch Codes		110-1	Master D Hall 50% (35')	135-9	Master Hall B-3 walk through to Hall A-3		
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135-9	Master Hall B-3 walk through to Hall A-3																			
15	35HD-28	EHD 50% (Old 34/15)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>400</td> <td>Exhibit Hall D - 100%</td> </tr> <tr> <td>401</td> <td>Exhibit Hall D - 50%</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">Switch Codes</th> </tr> </thead> <tbody> <tr> <td>110-1</td> <td>Master D Hall 50% (35')</td> </tr> <tr> <td>135-9</td> <td>Master Hall B-3 walk through to Hall A-3</td> </tr> </tbody> </table>	Phone Codes		400	Exhibit Hall D - 100%	401	Exhibit Hall D - 50%	Switch Codes		110-1	Master D Hall 50% (35')	135-9	Master Hall B-3 walk through to Hall A-3		
Phone Codes																				
400	Exhibit Hall D - 100%																			
401	Exhibit Hall D - 50%																			
Switch Codes																				
110-1	Master D Hall 50% (35')																			
135-9	Master Hall B-3 walk through to Hall A-3																			

16	35HD-18	EHD 50% (Old 34/16)				<b>Phone Codes</b>	
						400	Exhibit Hall D - 100%
						401	Exhibit Hall D - 50%
						<b>Switch Codes</b>	
						110-1	Master D Hall 50% (35')
						135-9	Master Hall B-3 walk through to Hall A-3
						<b>Phone Codes</b>	
						400	Exhibit Hall D - 100%
						401	Exhibit Hall D - 50%
						<b>Switch Codes</b>	
110-1	Master D Hall 50% (35')						
135-9	Master Hall B-3 walk through to Hall A-3						
17	35HD-33	EHD 50% (Old 35/1)				<b>Phone Codes</b>	
						400	Exhibit Hall D - 100%
						401	Exhibit Hall D - 50%
						<b>Switch Codes</b>	
						110-1	Master D Hall 50% (35')
						135-9	Master Hall B-3 walk through to Hall A-3
						<b>Phone Codes</b>	
						400	Exhibit Hall D - 100%
						401	Exhibit Hall D - 50%
						<b>Switch Codes</b>	
110-1	Master D Hall 50% (35')						
135-9	Master Hall B-3 walk through to Hall A-3						
18	35HD-35	EHD 50% (Old 35/2)				<b>Phone Codes</b>	
						400	Exhibit Hall D - 100%
						401	Exhibit Hall D - 50%
						<b>Switch Codes</b>	
						110-1	Master D Hall 50% (35')
						135-9	Master Hall B-3 walk through to Hall A-3
						<b>Phone Codes</b>	
						400	Exhibit Hall D - 100%
						401	Exhibit Hall D - 50%
						<b>Switch Codes</b>	
110-1	Master D Hall 50% (35')						
135-9	Master Hall B-3 walk through to Hall A-3						
19	35HD-41	EHD 50% (Old 35/3)				<b>Phone Codes</b>	
						400	Exhibit Hall D - 100%
						401	Exhibit Hall D - 50%
						<b>Switch Codes</b>	
						110-1	Master D Hall 50% (35')
						110-14	Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
						135-9	Master Hall B-3 walk through to Hall A-3
						<b>Phone Codes</b>	
						400	Exhibit Hall D - 100%
						401	Exhibit Hall D - 50%
<b>Switch Codes</b>							
110-1	Master D Hall 50% (35')						
110-14	Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)						
135-9	Master Hall B-3 walk through to Hall A-3						
20	35HD-6	EHD 25% (Old 35/4)				<b>Phone Codes</b>	
						400	Exhibit Hall D - 100%
						402	Exhibit Hall D - 25%
						405	Exhibit Hall D - 38% Work Lights
						<b>Switch Codes</b>	
						110-2	Master D Hall 25% (35')
						110-14	Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
						110-15	Master NEA Voting/Business Look
						135-9	Master Hall B-3 walk through to Hall A-3
						<b>Phone Codes</b>	
400	Exhibit Hall D - 100%						
402	Exhibit Hall D - 25%						
405	Exhibit Hall D - 38% Work Lights						
<b>Switch Codes</b>							
110-2	Master D Hall 25% (35')						
110-14	Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)						
135-9	Master Hall B-3 walk through to Hall A-3						
21	35HD-4	EHD 25% (Old 35/5)				<b>Phone Codes</b>	
						400	Exhibit Hall D - 100%
						402	Exhibit Hall D - 25%
						405	Exhibit Hall D - 38% Work Lights
						<b>Switch Codes</b>	
						110-2	Master D Hall 25% (35')
						110-14	Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
						135-9	Master Hall B-3 walk through to Hall A-3
						<b>Phone Codes</b>	
						400	Exhibit Hall D - 100%
402	Exhibit Hall D - 25%						
405	Exhibit Hall D - 38% Work Lights						
<b>Switch Codes</b>							
110-2	Master D Hall 25% (35')						
110-14	Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)						
135-9	Master Hall B-3 walk through to Hall A-3						
22	35HD-2	EHD 25% (Old 35/6)				<b>Phone Codes</b>	
						400	Exhibit Hall D - 100%
						402	Exhibit Hall D - 25%
						405	Exhibit Hall D - 38% Work Lights
						<b>Switch Codes</b>	
						110-2	Master D Hall 25% (35')
						110-14	Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
						135-9	Master Hall B-3 walk through to Hall A-3
						<b>Phone Codes</b>	
						400	Exhibit Hall D - 100%
402	Exhibit Hall D - 25%						
405	Exhibit Hall D - 38% Work Lights						
<b>Switch Codes</b>							
110-2	Master D Hall 25% (35')						
110-14	Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)						
135-9	Master Hall B-3 walk through to Hall A-3						
23	35HD-23	EHD 25% (Old 35/7)				<b>Phone Codes</b>	
						400	Exhibit Hall D - 100%
						402	Exhibit Hall D - 25%
						405	Exhibit Hall D - 38% Work Lights
						<b>Switch Codes</b>	
						110-2	Master D Hall 25% (35')
						110-14	Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
						135-9	Master Hall B-3 walk through to Hall A-3
						<b>Phone Codes</b>	
						400	Exhibit Hall D - 100%
402	Exhibit Hall D - 25%						
405	Exhibit Hall D - 38% Work Lights						
<b>Switch Codes</b>							
110-2	Master D Hall 25% (35')						
110-14	Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)						
135-9	Master Hall B-3 walk through to Hall A-3						



						110-2 Master D Hall 25% (35')
						110-14 Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
						135-9 Master Hall B-3 walk through to Hall A-3
						<b>Phone Codes</b>
					400	Exhibit Hall D - 100%
					402	Exhibit Hall D - 25%
					405	Exhibit Hall D - 38% Work Lights
						<b>Switch Codes</b>
					110-2 Master D Hall 25% (35')	
					110-14 Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)	
24	35HD-8	EHD 25% (Old 35/8)				
						<b>Phone Codes</b>
					400	Exhibit Hall D - 100%
					402	Exhibit Hall D - 25%
					405	Exhibit Hall D - 38% Work Lights
						<b>Switch Codes</b>
					110-2 Master D Hall 25% (35')	
					110-14 Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)	
25	35HD-12	EHD 25% (Old 35/9)				
						<b>Phone Codes</b>
					400	Exhibit Hall D - 100%
					402	Exhibit Hall D - 25%
					405	Exhibit Hall D - 38% Work Lights
						<b>Switch Codes</b>
					110-2 Master D Hall 25% (35')	
					110-14 Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)	
26	35HD-14	EHD 25% (Old 35/10)				
						<b>Phone Codes</b>
					400	Exhibit Hall D - 100%
					402	Exhibit Hall D - 25%
					405	Exhibit Hall D - 38% Work Lights
						<b>Switch Codes</b>
					110-2 Master D Hall 25% (35')	
					135-9 Master Hall B-3 walk through to Hall A-3	
27	35HD-16	EHD 25% (Old 35/11)				
						<b>Phone Codes</b>
					400	Exhibit Hall D - 100%
					402	Exhibit Hall D - 25%
					405	Exhibit Hall D - 38% Work Lights
						<b>Switch Codes</b>
					110-2 Master D Hall 25% (35')	
					135-9 Master Hall B-3 walk through to Hall A-3	
28	35HD-31	EHD 25% (Old 35/12)				
						<b>Phone Codes</b>
					400	Exhibit Hall D - 100%
					402	Exhibit Hall D - 25%
					405	Exhibit Hall D - 38% Work Lights
						<b>Switch Codes</b>
					110-2 Master D Hall 25% (35')	
					135-9 Master Hall B-3 walk through to Hall A-3	
29	35HD-20	EHD 13% (Old 35/13)				
						<b>Phone Codes</b>
					400	Exhibit Hall D - 100%
					403	Exhibit Hall D - 13%
					405	Exhibit Hall D - 38% Work Lights
						<b>Switch Codes</b>
					110-3 Master D Hall 13% (35')	
					135-9 Master Hall B-3 walk through to Hall A-3	
30	35HD-22	EHD 13% (Old 35/14)				
						<b>Phone Codes</b>
					400	Exhibit Hall D - 100%
					403	Exhibit Hall D - 13%
					405	Exhibit Hall D - 38% Work Lights
						<b>Switch Codes</b>
					110-3 Master D Hall 13% (35')	
					135-9 Master Hall B-3 walk through to Hall A-3	
31	35HD-24	EHD 13% (Old 35/15)				
						<b>Phone Codes</b>
					400	Exhibit Hall D - 100%
					403	Exhibit Hall D - 13%
					405	Exhibit Hall D - 38% Work Lights

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit
32	35HD-26	EHD 13% (Old 35/16)				
18	Panel 35HD - Rear Hall D (Was MOD 36)	MECH RM 137	Retrofit	32/32 Surface	115/277	
1	35HD-29	EHD 12% (Old 36/1)				
2	35HD-30	EHD 12% (Old 36/2)				
3	35HD-32	EHD 12% (Old 36/3)				
4	35HD-34	EHD 12% (Old 36/4)				
5	35HD-37	EHD Nt Lts (Old 36/5)				
6	35HD-39	D Stairwells E/W (Old 36/6)				
7	35HD-?	D Hall Roll-up Doors (Old 36/7)				

  

Switch Codes	
110-3	Master D Hall 13% (35')
135-9	Master Hall B-3 walk through to Hall A-3
Phone Codes	
400	Exhibit Hall D - 100%
403	Exhibit Hall D - 13%
405	Exhibit Hall D - 38% Work Lights
Switch Codes	
110-3	Master D Hall 13% (35')
135-9	Master Hall B-3 walk through to Hall A-3
References	

  

Phone Codes	
400	Exhibit Hall D - 100%
404	Exhibit Hall D - 12%
Switch Codes	
110-4	Master D Hall 12% (35')
110-14	Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
135-9	Master Hall B-3 walk through to Hall A-3
Phone Codes	
400	Exhibit Hall D - 100%
404	Exhibit Hall D - 12%
Switch Codes	
110-4	Master D Hall 12% (35')
110-14	Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
135-9	Master Hall B-3 walk through to Hall A-3
Phone Codes	
400	Exhibit Hall D - 100%
404	Exhibit Hall D - 12%
Switch Codes	
110-4	Master D Hall 12% (35')
110-14	Master Encore Championship 2019 Lighting Sector Hall D (CC-17 Marci)
Phone Codes	
800	Night Lights - All
804	Night Lights - Hall D
Switch Codes	
110-5	Master D Hall Nt Lts
135-9	Master Hall B-3 walk through to Hall A-3
Phone Codes	
62	Stairwells - All
63	Stairwells - South - East/West
Switch Codes	
126-5	Master Exit Stairwells - D Hall
Phone Codes	
7	Roll Up Doors - All Freight Doors
46	Roll Up Doors - Hall D
Switch Codes	
111-7	Master D Hall Roll-up Doors

8		Mod -36 relay 8 was 17-3 discontinued																	
9		Mod -36 relay 9 relay not installed																	
10	control voltage of F-1SE35	Exhaust fan D-Hall rear Restrooms				6 Gilbane Office													
11		Mod -36 relay 11																	
12		Mod -36 relay 12																	
13		Mod -36 relay 13																	
14		Mod -36 relay 14																	
15		Mod -36 relay 15																	
16		Mod -36 relay 16																	
17	**Space**	Space																	
18	**Space**	Space																	
19	**Space**	Space																	
20	**Space**	Space																	
21	**Space**	Space																	
22	**Space**	Space																	
23	**Space**	Space																	
24	**Space**	Space																	
25	**Space**	Space																	
26	**Space**	Space																	
27	**Space**	Space																	
28	**Space**	Space																	
29	**Space**	Space																	
30	**Space**	Space																	
31	**Space**	Space																	
32	**Space**	Space																	
Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit													
19	Panel 35HF - Rear Hall C (Was MODs 38 & 39)	MECH RM 139	Retrofit	32/32 Surface	115/277														
Rly	Circuit	Description	Settings	Timeout	Schedule	References													
1	35HF-1	EHC 50% (Old 38/1)																	
							<table border="1"> <tr><th colspan="2">Phone Codes</th></tr> <tr><td>300</td><td>Exhibit Hall C - 100%</td></tr> <tr><td>301</td><td>Exhibit Hall C - 50%</td></tr> <tr><th colspan="2">Switch Codes</th></tr> <tr><td>107-1</td><td>Master C Hall 50% (35')</td></tr> <tr><td>107-14</td><td>Master Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)</td></tr> </table>	Phone Codes		300	Exhibit Hall C - 100%	301	Exhibit Hall C - 50%	Switch Codes		107-1	Master C Hall 50% (35')	107-14	Master Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
Phone Codes																			
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301	Exhibit Hall C - 50%																		
Switch Codes																			
107-1	Master C Hall 50% (35')																		
107-14	Master Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)																		
2	35HF-3	EHC 50% (Old 38/2)																	
							<table border="1"> <tr><th colspan="2">Phone Codes</th></tr> <tr><td>300</td><td>Exhibit Hall C - 100%</td></tr> <tr><td>301</td><td>Exhibit Hall C - 50%</td></tr> <tr><th colspan="2">Switch Codes</th></tr> <tr><td>107-1</td><td>Master C Hall 50% (35')</td></tr> </table>	Phone Codes		300	Exhibit Hall C - 100%	301	Exhibit Hall C - 50%	Switch Codes		107-1	Master C Hall 50% (35')		
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300	Exhibit Hall C - 100%																		
301	Exhibit Hall C - 50%																		
Switch Codes																			
107-1	Master C Hall 50% (35')																		

3	35HF-5	EHC 50% (Old 38/3)				107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
<b>Phone Codes</b>								
						300		Exhibit Hall C - 100%
						301		Exhibit Hall C - 50%
<b>Switch Codes</b>								
						107-1	Master	C Hall 50% (35')
						107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
4	35HF-7	EHC 50% (Old 38/4)						
<b>Phone Codes</b>								
						300		Exhibit Hall C - 100%
						301		Exhibit Hall C - 50%
<b>Switch Codes</b>								
						107-1	Master	C Hall 50% (35')
						107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
5	35HF-9	EHC 50% (Old 38/5)						
<b>Phone Codes</b>								
						300		Exhibit Hall C - 100%
						301		Exhibit Hall C - 50%
<b>Switch Codes</b>								
						107-1	Master	C Hall 50% (35')
						107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
6	35HF-11	EHC 50% (Old 38/6)						
<b>Phone Codes</b>								
						300		Exhibit Hall C - 100%
						301		Exhibit Hall C - 50%
<b>Switch Codes</b>								
						107-1	Master	C Hall 50% (35')
						107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
7	35HF-13	EHC 50% (Old 38/7)						
<b>Phone Codes</b>								
						300		Exhibit Hall C - 100%
						301		Exhibit Hall C - 50%
<b>Switch Codes</b>								
						107-1	Master	C Hall 50% (35')
						107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
8	35HF-15	EHC 50% (Old 38/8)						
<b>Phone Codes</b>								
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						301		Exhibit Hall C - 50%
<b>Switch Codes</b>								
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						107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
9	35HF-17	EHC 50% (Old 38/9)						
<b>Phone Codes</b>								
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<b>Switch Codes</b>								
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						107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
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<b>Switch Codes</b>								
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11	35HF-21	EHC 50% (Old 38/11)						

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20	35HF-2	EHC 25% (Old 39/4)				<table border="1"> <thead> <tr> <th colspan="3">Switch Codes</th> </tr> </thead> <tbody> <tr> <td>107-1</td> <td>Master</td> <td>C Hall 50% (35)</td> </tr> <tr> <td>107-14</td> <td>Master</td> <td>Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)</td> </tr> </tbody> </table>	Switch Codes			107-1	Master	C Hall 50% (35)	107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
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21	35HF-4	EHC 25% (Old 39/5)				<table border="1"> <thead> <tr> <th colspan="3">Switch Codes</th> </tr> </thead> <tbody> <tr> <td>107-2</td> <td>Master</td> <td>C Hall 25% (35)</td> </tr> <tr> <td>107-14</td> <td>Master</td> <td>Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)</td> </tr> </tbody> </table>	Switch Codes			107-2	Master	C Hall 25% (35)	107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
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22	35HF-6	EHC 25% (Old 39/6)				<table border="1"> <thead> <tr> <th colspan="3">Switch Codes</th> </tr> </thead> <tbody> <tr> <td>107-2</td> <td>Master</td> <td>C Hall 25% (35)</td> </tr> <tr> <td>107-14</td> <td>Master</td> <td>Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)</td> </tr> </tbody> </table>	Switch Codes			107-2	Master	C Hall 25% (35)	107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
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23	35HF-8	EHC 25% (Old 39/7)				<table border="1"> <thead> <tr> <th colspan="3">Switch Codes</th> </tr> </thead> <tbody> <tr> <td>107-2</td> <td>Master</td> <td>C Hall 25% (35)</td> </tr> <tr> <td>107-14</td> <td>Master</td> <td>Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)</td> </tr> </tbody> </table>	Switch Codes			107-2	Master	C Hall 25% (35)	107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
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24	35HF-10	EHC 25% (Old 39/8)				<table border="1"> <thead> <tr> <th colspan="3">Switch Codes</th> </tr> </thead> <tbody> <tr> <td>107-2</td> <td>Master</td> <td>C Hall 25% (35)</td> </tr> <tr> <td>107-14</td> <td>Master</td> <td>Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)</td> </tr> </tbody> </table>	Switch Codes			107-2	Master	C Hall 25% (35)	107-14	Master	Encore Championship 2019 Lighting Sector Hall C (CC-17 Marci)
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7	35HF-?	C Hall Roll-up Doors (Old 40/7)								<table border="1"> <thead> <tr> <th colspan="3">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>7</td> <td></td> <td>Roll Up Doors - All Freight Doors</td> </tr> <tr> <td>45</td> <td></td> <td>Roll Up Doors - Hall C</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="3">Switch Codes</th> </tr> </thead> <tbody> <tr> <td>108-8</td> <td>Master</td> <td>C Hall Roll-up Doors</td> </tr> </tbody> </table>	Phone Codes			7		Roll Up Doors - All Freight Doors	45		Roll Up Doors - Hall C	Switch Codes			108-8	Master	C Hall Roll-up Doors			
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21	Panel 35HG - Rear Hall B (Was MODs 42 & 43)	MECH RM 229	Retrofit	32/32 Surface	115/277														
Rly	Circuit	Description	Settings	Timeout	Schedule	References													
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26	35HG-14	EHB 25% (Old 43/10)	HID			<table border="1"> <tbody> <tr> <td colspan="3" style="text-align: center;"><b>Phone Codes</b></td> </tr> <tr> <td>200</td> <td></td> <td>Exhibit Hall B - 100%</td> </tr> <tr> <td>202</td> <td></td> <td>Exhibit Hall B - 25%</td> </tr> <tr> <td>205</td> <td></td> <td>Exhibit Hall B - 38% Work Lights</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>Switch Codes</b></td> </tr> <tr> <td>104-2</td> <td>Master</td> <td>B Hall 25% (35')</td> </tr> <tr> <td>104-14</td> <td>Master</td> <td>Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)</td> </tr> </tbody> </table>	<b>Phone Codes</b>			200		Exhibit Hall B - 100%	202		Exhibit Hall B - 25%	205		Exhibit Hall B - 38% Work Lights	<b>Switch Codes</b>			104-2	Master	B Hall 25% (35')	104-14	Master	Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)						
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29	35HG-20	EHB 13% (Old 43/13)	HID			<table border="1"> <tbody> <tr> <td colspan="3" style="text-align: center;"><b>Phone Codes</b></td> </tr> <tr> <td>200</td> <td></td> <td>Exhibit Hall B - 100%</td> </tr> <tr> <td>203</td> <td></td> <td>Exhibit Hall B - 13%</td> </tr> <tr> <td>205</td> <td></td> <td>Exhibit Hall B - 38% Work Lights</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>Switch Codes</b></td> </tr> <tr> <td>104-3</td> <td>Master</td> <td>B Hall 13% (35')</td> </tr> <tr> <td>104-14</td> <td>Master</td> <td>Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)</td> </tr> </tbody> </table>	<b>Phone Codes</b>			200		Exhibit Hall B - 100%	203		Exhibit Hall B - 13%	205		Exhibit Hall B - 38% Work Lights	<b>Switch Codes</b>			104-3	Master	B Hall 13% (35')	104-14	Master	Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)						
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Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit														
31	35HG-24	EHB 13% (Old 43/15)	HID																	
32	35HG-26	EHB 13% (Old 43/16)	HID																	
22	Panel 35HG - Rear Hall B (Was MOD 44)	MECH RM 229	Retrofit	32/32 Surface	115/277															
Rly	Circuit	Description	Settings	Timeout	Schedule	References														
1	35HG-28	EHB 12% (Old 44/1)				<table border="1"> <thead> <tr><th colspan="2">Phone Codes</th></tr> </thead> <tbody> <tr><td>200</td><td>Exhibit Hall B - 100%</td></tr> <tr><td>203</td><td>Exhibit Hall B - 13%</td></tr> <tr><td>205</td><td>Exhibit Hall B - 38% Work Lights</td></tr> </tbody> </table> <table border="1"> <thead> <tr><th colspan="2">Switch Codes</th></tr> </thead> <tbody> <tr><td>104-3</td><td>Master B Hall 13% (35')</td></tr> <tr><td>104-14</td><td>Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)</td></tr> </tbody> </table>	Phone Codes		200	Exhibit Hall B - 100%	203	Exhibit Hall B - 13%	205	Exhibit Hall B - 38% Work Lights	Switch Codes		104-3	Master B Hall 13% (35')	104-14	Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
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2	35HG-30	EHB 12% (Old 44/2)				<table border="1"> <thead> <tr><th colspan="2">Phone Codes</th></tr> </thead> <tbody> <tr><td>200</td><td>Exhibit Hall B - 100%</td></tr> <tr><td>203</td><td>Exhibit Hall B - 13%</td></tr> <tr><td>205</td><td>Exhibit Hall B - 38% Work Lights</td></tr> </tbody> </table> <table border="1"> <thead> <tr><th colspan="2">Switch Codes</th></tr> </thead> <tbody> <tr><td>104-3</td><td>Master B Hall 13% (35')</td></tr> <tr><td>104-14</td><td>Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)</td></tr> </tbody> </table>	Phone Codes		200	Exhibit Hall B - 100%	203	Exhibit Hall B - 13%	205	Exhibit Hall B - 38% Work Lights	Switch Codes		104-3	Master B Hall 13% (35')	104-14	Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)
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3	35HG-32	EHB 12% (Old 44/3)				<table border="1"> <thead> <tr><th colspan="2">Phone Codes</th></tr> </thead> <tbody> <tr><td>200</td><td>Exhibit Hall B - 100%</td></tr> <tr><td>204</td><td>Exhibit Hall B - 12%</td></tr> </tbody> </table> <table border="1"> <thead> <tr><th colspan="2">Switch Codes</th></tr> </thead> <tbody> <tr><td>104-4</td><td>Master B Hall 12% (35')</td></tr> <tr><td>104-14</td><td>Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)</td></tr> </tbody> </table>	Phone Codes		200	Exhibit Hall B - 100%	204	Exhibit Hall B - 12%	Switch Codes		104-4	Master B Hall 12% (35')	104-14	Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)		
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4	35HG-34	EHB 12% (Old 44/4)				<table border="1"> <thead> <tr><th colspan="2">Phone Codes</th></tr> </thead> <tbody> <tr><td>200</td><td>Exhibit Hall B - 100%</td></tr> <tr><td>204</td><td>Exhibit Hall B - 12%</td></tr> </tbody> </table> <table border="1"> <thead> <tr><th colspan="2">Switch Codes</th></tr> </thead> <tbody> <tr><td>104-4</td><td>Master B Hall 12% (35')</td></tr> <tr><td>104-14</td><td>Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)</td></tr> </tbody> </table>	Phone Codes		200	Exhibit Hall B - 100%	204	Exhibit Hall B - 12%	Switch Codes		104-4	Master B Hall 12% (35')	104-14	Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)		
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104-4	Master B Hall 12% (35')																			
104-14	Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)																			
5	35HG-39	EHB Night Lights (Old 44/5)				<table border="1"> <thead> <tr><th colspan="2">Phone Codes</th></tr> </thead> <tbody> <tr><td>800</td><td>Night Lights - All</td></tr> <tr><td>802</td><td>Night Lights - Hall B</td></tr> </tbody> </table> <table border="1"> <thead> <tr><th colspan="2">Switch Codes</th></tr> </thead> <tbody> <tr><td>104-5</td><td>Master B Hall Nt Lts</td></tr> <tr><td>104-14</td><td>Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)</td></tr> </tbody> </table>	Phone Codes		800	Night Lights - All	802	Night Lights - Hall B	Switch Codes		104-5	Master B Hall Nt Lts	104-14	Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)		
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104-5	Master B Hall Nt Lts																			
104-14	Master Encore Championship 2019 Lighting Sector Hall B (CC-17 Marci)																			
6	35HG-41	B Stairwells E/W (Old 44/6)				<table border="1"> <thead> <tr><th colspan="2">Phone Codes</th></tr> </thead> </table>	Phone Codes													
Phone Codes																				

7	35HG-?	B Hall Roll-up Doors (Old 44/7)									62	Stairwells - All
											65	Stairwells - North - East/West
											<b>Switch Codes</b>	
											124-5	Master Fire Stairwells - B Hall
											<b>Phone Codes</b>	
											7	Roll Up Doors - All Freight Doors
											44	Roll Up Doors - Hall B
											<b>Switch Codes</b>	
											105-7	Master B Hall Roll-up Doors
8		Mod -44 relay 8										
9		Mod -44 relay 9										
10		Mod -44 relay 10										
11		Mod -44 relay 11										
12		Mod -44 relay 12										
13		Mod -44 relay 13										
14		Mod -44 relay 14										
15		Mod -44 relay 15										
16		Mod -44 relay 16										
17	**Space**	Space										
18	**Space**	Space										
19	**Space**	Space										
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31	**Space**	Space										
32	**Space**	Space										
<b>Panel ID</b>	<b>Description</b>	<b>Location</b>	<b>Type</b>	<b>Interior / Enclosure</b>	<b>Power Supply</b>	<b>Circuit</b>						
23	Panel 83HA - Front GA (Was MODs 46 & 47)	MECH RM 208	Retrofit	32/32 Surface	115/277							
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>Settings</b>	<b>Timeout</b>	<b>Schedule</b>	<b>References</b>						
1	83HA-1	+71 Level Public Area (Old 46/1)										
											<b>Phone Codes</b>	
											28	4th Level Public Area + General Assemble (71 level SW)
											<b>Switch Codes</b>	

2	83HA-3	+71 Level Public Area (Old 46/2)				133-6 Master +71 Level Public Area
<b>Phone Codes</b>						
	28					4th Level Public Area + General Assemble (71 level SW)
<b>Switch Codes</b>						
	133-6	Master				+71 Level Public Area
3	83HA-5	+71 Level Public Area (Old 46/3)				
<b>Phone Codes</b>						
	28					4th Level Public Area + General Assemble (71 level SW)
<b>Switch Codes</b>						
	133-6	Master				+71 Level Public Area
4	83HA-7	Gen Assy Lobby (Old 46/4)			14 3rd Level public lights on	
<b>Phone Codes</b>						
	22					Level 3 Public Area - Old Bldg
	931					3rd Level Gen Assy Lobby
<b>Switch Codes</b>						
	133-1	Master				Gen Assy Foyer
5	83HA-9	Gen Assy Lobby (Old 46/5)			14 3rd Level public lights on	
<b>Phone Codes</b>						
	22					Level 3 Public Area - Old Bldg
	931					3rd Level Gen Assy Lobby
<b>Switch Codes</b>						
	133-1	Master				Gen Assy Foyer
6	83HA-11	Gen Assy Lobby (Old 46/6)			14 3rd Level public lights on	
<b>Phone Codes</b>						
	22					Level 3 Public Area - Old Bldg
	931					3rd Level Gen Assy Lobby
<b>Switch Codes</b>						
	133-1	Master				Gen Assy Foyer
7	83HA-13	Gen Assy Lobby (Old 46/7)			14 3rd Level public lights on	
<b>Phone Codes</b>						
	22					Level 3 Public Area - Old Bldg
	931					3rd Level Gen Assy Lobby
<b>Switch Codes</b>						
	133-1	Master				Gen Assy Foyer
8	83HA-15	Gen Assy S Step Lts (Old 46/8)				
<b>Phone Codes</b>						
	29					General Assembly Step /LANDING
	945					Gen Assy South - Step lights
<b>Switch Codes</b>						
	133-5	Master				Gen Assy S Step Lights
9	83HA-17	Gen Assy S Step Lts (Old 46/9)				
<b>Phone Codes</b>						
	29					General Assembly Step /LANDING
	945					Gen Assy South - Step lights
<b>Switch Codes</b>						
	133-5	Master				Gen Assy S Step Lights
10	83HA-18	Gen Assy N Step Lts (Old 46/10)				
<b>Phone Codes</b>						
	29					General Assembly Step /LANDING
	947					Gen Assy North - Step lights
<b>Switch Codes</b>						
	133-4	Master				Gen Assy N Step Lights
11	83HA-20	Gen Assy N Step Lts (Old 46-11)				
<b>Phone Codes</b>						
	29					General Assembly Step /LANDING
	947					Gen Assy North - Step lights
<b>Switch Codes</b>						
	133-4	Master				Gen Assy N Step Lights
12	83HA-22	+51 Level 303 Hallway (Old 46/12)			14 3rd Level public lights on	
<b>Phone Codes</b>						
	23					General Assembly/corridors
	949					3rd level - 303 Hallway
<b>Switch Codes</b>						
	133-2	Master				+51 Level 303 Hallway

13	83LA-11	Gen Assy N Soffit Lights (Old 46/13)			14 3rd Level public lights on	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>23</td> <td>General Assembly/corridors</td> </tr> <tr> <td>931</td> <td>3rd Level Gen Assy Lobby</td> </tr> <tr> <td>935</td> <td>3rd Level Gen Assy Soffit Lts</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>133-1</td> <td>Master Gen Assy Foyer</td> </tr> </tbody> </table>	Phone Codes		23	General Assembly/corridors	931	3rd Level Gen Assy Lobby	935	3rd Level Gen Assy Soffit Lts	Switch Codes		133-1	Master Gen Assy Foyer
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133-1	Master Gen Assy Foyer																	
14	83LA-13	Gen Assy S Soffit Lights (Old 46/14)			14 3rd Level public lights on	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>23</td> <td>General Assembly/corridors</td> </tr> <tr> <td>931</td> <td>3rd Level Gen Assy Lobby</td> </tr> <tr> <td>935</td> <td>3rd Level Gen Assy Soffit Lts</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>133-1</td> <td>Master Gen Assy Foyer</td> </tr> </tbody> </table>	Phone Codes		23	General Assembly/corridors	931	3rd Level Gen Assy Lobby	935	3rd Level Gen Assy Soffit Lts	Switch Codes		133-1	Master Gen Assy Foyer
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935	3rd Level Gen Assy Soffit Lts																	
Switch Codes																		
133-1	Master Gen Assy Foyer																	
15	83HA-25	+51 Level 304 Hallway (Old 46/15)			14 3rd Level public lights on	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>23</td> <td>General Assembly/corridors</td> </tr> <tr> <td>950</td> <td>3rd Level - 304 Hallway</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>133-3</td> <td>Master +51 Level 304 Hallway</td> </tr> </tbody> </table>	Phone Codes		23	General Assembly/corridors	950	3rd Level - 304 Hallway	Switch Codes		133-3	Master +51 Level 304 Hallway		
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133-3	Master +51 Level 304 Hallway																	
16		Mod -46 relay 16																
17	83HA-2	Truss D - Balcony D (Old 47/1)			7 Truss Lights (morning)	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>856</td> <td>Truss Lights - Escalators D</td> </tr> <tr> <td>901</td> <td>Truss D Lower- Balcony D</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>126-4</td> <td>Master Truss D Lighting - Balcony D</td> </tr> </tbody> </table>	Phone Codes		856	Truss Lights - Escalators D	901	Truss D Lower- Balcony D	Switch Codes		126-4	Master Truss D Lighting - Balcony D		
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18	83HA-4	Truss D - Balcony D (Old 47/2)			7 Truss Lights (morning)	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>856</td> <td>Truss Lights - Escalators D</td> </tr> <tr> <td>901</td> <td>Truss D Lower- Balcony D</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>126-4</td> <td>Master Truss D Lighting - Balcony D</td> </tr> </tbody> </table>	Phone Codes		856	Truss Lights - Escalators D	901	Truss D Lower- Balcony D	Switch Codes		126-4	Master Truss D Lighting - Balcony D		
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										<b>Phone Codes</b>	
										4	Restrooms - G.A.
										15	Restrooms - ALL
										<b>Switch Codes</b>	
										133-7	Master +51 Level 303 Restrooms
										<b>Phone Codes</b>	
										4	Restrooms - G.A.
										15	Restrooms - ALL
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										15	Restrooms - ALL
										<b>Switch Codes</b>	
										133-8	Master +51 Level 304 Restrooms
25	83HA-24	GA M Restroom N (Old 47/9)									
26	83HA-26	GA W Restroom N (Old 47/10)									
27	83HA-27	GA M Restroom S (Old 47/11)									
28	83HA-29	GA W Restroom S (Old 47/12)									
29	83HA-32	Bldg Directory (Old 47/13)									
30		Mod -47 relay 14									
31		Mod -47 relay 15									
32		Mod -47 relay 16									
<b>Panel ID</b>	<b>Description</b>	<b>Location</b>	<b>Type</b>	<b>Interior/Enclosure</b>	<b>Power Supply</b>	<b>Circuit</b>					
24	Panel 83HB - Front Ballrooms (Was MODs 48 & 49)	MECH RM 210	Retrofit	32/32 Surface	115/277						
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>Settings</b>	<b>Timeout</b>	<b>Schedule</b>	<b>References</b>					
1	83HB-1	Ballrooms Lobby (Old 48/1)			14 3rd Level public lights on						
										<b>Phone Codes</b>	
										22	Level 3 Public Area - Old Bldg
										938	3rd Level Ballroom Sub-Prefunction
										<b>Switch Codes</b>	
										132-1	Master Ballroom Foyer
2	83HB-3	Ballrooms Lobby (Old 48/2)			14 3rd Level public lights on						
										<b>Phone Codes</b>	
										22	Level 3 Public Area - Old Bldg
										938	3rd Level Ballroom Sub-Prefunction
										<b>Switch Codes</b>	
										132-1	Master Ballroom Foyer
3	83HB-5	Ballrooms Lobby (Old 48/3)			14 3rd Level public lights on						
										<b>Phone Codes</b>	
										22	Level 3 Public Area - Old Bldg
										938	3rd Level Ballroom Sub-Prefunction
										<b>Switch Codes</b>	
										132-1	Master Ballroom Foyer
4	83HB-7	Ballrooms Lobby (Old 48/4)			14 3rd Level public lights on						
										<b>Phone Codes</b>	
										22	Level 3 Public Area - Old Bldg
										938	3rd Level Ballroom Sub-Prefunction
										<b>Switch Codes</b>	
										132-1	Master Ballroom Foyer
5	83HB-11	M Restrm 301 (Old 48/5)									
										<b>Phone Codes</b>	
										5	Restrooms - BR/KIT
										<b>Switch Codes</b>	

6	83HB-13	W Restrm 301 (Old 48/6)				132-7 Master +51 Level 301 Restrooms
						<b>Phone Codes</b>
						5 Restrooms - BR/KIT
						<b>Switch Codes</b>
7	83HB-15	M Restrm Hall G (Old 48/7)				132-7 Master +51 Level 301 Restrooms
						<b>Phone Codes</b>
						5 Restrooms - BR/KIT
						6 Restrooms - Ex Hall F/G
						<b>Switch Codes</b>
8	83HB-21	+51 Level Night Lights (Old 48/8)				120-1 Master G Hall Restrooms/Aramark RR
						<b>Phone Codes</b>
						800 Night Lights - All
						809 Night Lights - 3rd Level
						<b>Switch Codes</b>
9	83HB-9	+51 Level 301 Hallway (Old 48/9)			14 3rd Level public lights on	132-2 Master +51 Level Night Lights
						<b>Phone Codes</b>
						24 Ballroom/corridors
						957 3rd Level - 301 Hallway
						<b>Switch Codes</b>
10	83LB-10	Ballroom Soffit Lts (Old 48/10)			14 3rd Level public lights on	132-3 Master +51 Level 301 Hallway
						<b>Phone Codes</b>
						24 Ballroom/corridors
						938 3rd Level Ballroom Sub-Prefunction
						942 3rd Level Ballroom Sub-Pref Soffit Lts
						<b>Switch Codes</b>
11	83LB-12	Ballroom Soffit Lts (Old 48/11)			14 3rd Level public lights on	132-1 Master Ballroom Foyer
						<b>Phone Codes</b>
						24 Ballroom/corridors
						938 3rd Level Ballroom Sub-Prefunction
						942 3rd Level Ballroom Sub-Pref Soffit Lts
						<b>Switch Codes</b>
12	83LB-14	Ballroom Soffit Lts (Old 48/12)			14 3rd Level public lights on	132-1 Master Ballroom Foyer
						<b>Phone Codes</b>
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						942 3rd Level Ballroom Sub-Pref Soffit Lts
						<b>Switch Codes</b>
13	83LB-25	Ballroom Soffit Lts (Old 48/13)			14 3rd Level public lights on	132-1 Master Ballroom Foyer
						<b>Phone Codes</b>
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14	83LB-26	Ballroom Soffit Lts (Old 48/14)			14 3rd Level public lights on	132-1 Master Ballroom Foyer
						<b>Phone Codes</b>
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						938 3rd Level Ballroom Sub-Prefunction
						942 3rd Level Ballroom Sub-Pref Soffit Lts
						<b>Switch Codes</b>
15	83LB-32	301 Hallway Soffit Lts (Old 48/15)			14 3rd Level public lights on	132-1 Master Ballroom Foyer
						<b>Phone Codes</b>
						24 Ballroom/corridors
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						<b>Switch Codes</b>
16		Mod -48 relay 16				132-3 Master +51 Level 301 Hallway

17	83HB-2	Truss C - Balcony C (Old 49/1)			7 Truss Lights (morning)	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>854</td> <td>Truss Lights - Escalators C+ registration</td> </tr> <tr> <td>909</td> <td>Truss C Lower- Balcony C</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>125-5</td> <td>Master Truss C Lighting - Balcony C</td> </tr> </tbody> </table>	Phone Codes		854	Truss Lights - Escalators C+ registration	909	Truss C Lower- Balcony C	Switch Codes		125-5	Master Truss C Lighting - Balcony C
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29		Mod -49 relay 13																						
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31		Mod -49 relay 15																						
32		Mod -49 relay 16																						
25	Panel 83HC - Front Hall B3 (Was MODs 50 & 51)	MECH RM 212	Retrofit	32/32 Surface	115/277																			
Rly	Circuit	Description	Settings	Timeout	Schedule	References																		
1	83HC-1	EHG 50% (Old 50/1)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr><td>854</td><td>Truss Lights - Escalators C+ registration</td></tr> <tr><td>917</td><td>Truss C Lower- Balcony B</td></tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr><td>125-3</td><td>Master Truss C Lighting - Balcony B</td></tr> </tbody> </table>	Phone Codes		854	Truss Lights - Escalators C+ registration	917	Truss C Lower- Balcony B	Switch Codes		125-3	Master Truss C Lighting - Balcony B								
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2	83HC-3	EHG 50% (Old 50/2)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr><td>700</td><td>Exhibit Hall G - 100%</td></tr> <tr><td>701</td><td>Exhibit Hall G - 50%</td></tr> <tr><td>707</td><td>Blackout West End Hall G</td></tr> <tr><td>709</td><td>G Hall Blackout all except shutterlights</td></tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr><td>119-3</td><td>Master G Hall West 50%</td></tr> <tr><td>120-2</td><td>Master KIPP 2019 (Brenda CC-4)</td></tr> <tr><td>120-3</td><td>Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td></tr> </tbody> </table>	Phone Codes		700	Exhibit Hall G - 100%	701	Exhibit Hall G - 50%	707	Blackout West End Hall G	709	G Hall Blackout all except shutterlights	Switch Codes		119-3	Master G Hall West 50%	120-2	Master KIPP 2019 (Brenda CC-4)	120-3	Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
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3	83HC-5	EHG 50% (Old 50/3)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr><td>700</td><td>Exhibit Hall G - 100%</td></tr> <tr><td>701</td><td>Exhibit Hall G - 50%</td></tr> <tr><td>707</td><td>Blackout West End Hall G</td></tr> <tr><td>709</td><td>G Hall Blackout all except shutterlights</td></tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr><td>119-3</td><td>Master G Hall West 50%</td></tr> <tr><td>120-2</td><td>Master KIPP 2019 (Brenda CC-4)</td></tr> <tr><td>120-3</td><td>Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td></tr> </tbody> </table>	Phone Codes		700	Exhibit Hall G - 100%	701	Exhibit Hall G - 50%	707	Blackout West End Hall G	709	G Hall Blackout all except shutterlights	Switch Codes		119-3	Master G Hall West 50%	120-2	Master KIPP 2019 (Brenda CC-4)	120-3	Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
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4	83HC-7	EHG 50% (Old 50/4)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr><td>700</td><td>Exhibit Hall G - 100%</td></tr> <tr><td>701</td><td>Exhibit Hall G - 50%</td></tr> <tr><td>707</td><td>Blackout West End Hall G</td></tr> <tr><td>709</td><td>G Hall Blackout all except shutterlights</td></tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr><td>119-3</td><td>Master G Hall West 50%</td></tr> <tr><td>120-2</td><td>Master KIPP 2019 (Brenda CC-4)</td></tr> <tr><td>120-3</td><td>Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td></tr> </tbody> </table>	Phone Codes		700	Exhibit Hall G - 100%	701	Exhibit Hall G - 50%	707	Blackout West End Hall G	709	G Hall Blackout all except shutterlights	Switch Codes		119-3	Master G Hall West 50%	120-2	Master KIPP 2019 (Brenda CC-4)	120-3	Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
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5	83HC-9	EHG 50% (Old 50/5)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr><td>700</td><td>Exhibit Hall G - 100%</td></tr> <tr><td>701</td><td>Exhibit Hall G - 50%</td></tr> <tr><td>707</td><td>Blackout West End Hall G</td></tr> <tr><td>709</td><td>G Hall Blackout all except shutterlights</td></tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr><td>119-3</td><td>Master G Hall West 50%</td></tr> <tr><td>120-2</td><td>Master KIPP 2019 (Brenda CC-4)</td></tr> <tr><td>120-3</td><td>Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td></tr> </tbody> </table>	Phone Codes		700	Exhibit Hall G - 100%	701	Exhibit Hall G - 50%	707	Blackout West End Hall G	709	G Hall Blackout all except shutterlights	Switch Codes		119-3	Master G Hall West 50%	120-2	Master KIPP 2019 (Brenda CC-4)	120-3	Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
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6	83HC-11	EHG 50% (Old 50/6)				119-3 Master	G Hall West 50%
						120-3 Master	ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
<b>Phone Codes</b>							
						700	Exhibit Hall G - 100%
						701	Exhibit Hall G - 50%
						707	Blackout West End Hall G
						709	G Hall Blackout all except shutterlights
<b>Switch Codes</b>							
						119-3 Master	G Hall West 50%
						120-3 Master	ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
7	83HC-13	EHG 50% (Old 50/7)				119-3 Master	G Hall West 50%
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<b>Switch Codes</b>							
						119-3 Master	G Hall West 50%
						120-3 Master	ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
8	83HC-15	EHG 50% (Old 50/8)				119-3 Master	G Hall West 50%
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						119-3 Master	G Hall West 50%
						120-3 Master	ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
9	83HC-17	EHG 50% (Old 50/9)				119-3 Master	G Hall West 50%
						120-2 Master	KIPP 2019 (Brenda CC-4)
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10	83HC-19	EHG 50% (Old 50/10)				119-3 Master	G Hall West 50%
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11	83HC-21	EHG 50% (Old 50/11)				119-3 Master	G Hall West 50%
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12	83HC-23	EHG 50% (Old 50/12)					

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14	83HC-27	EHG 50% (Old 50/14)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>700</td> <td>Exhibit Hall G - 100%</td> </tr> <tr> <td>701</td> <td>Exhibit Hall G - 50%</td> </tr> <tr> <td>707</td> <td>Blackout West End Hall G</td> </tr> <tr> <td>709</td> <td>G Hall Blackout all except shutterlights</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>119-2</td> <td>Master G Hall Ctr 50%</td> </tr> <tr> <td>120-2</td> <td>Master KIPP 2019 (Brenda CC-4)</td> </tr> <tr> <td>120-3</td> <td>Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td> </tr> </tbody> </table>	Phone Codes		700	Exhibit Hall G - 100%	701	Exhibit Hall G - 50%	707	Blackout West End Hall G	709	G Hall Blackout all except shutterlights	Switch Codes		119-2	Master G Hall Ctr 50%	120-2	Master KIPP 2019 (Brenda CC-4)	120-3	Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
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15	83HC-29	EHG 50% [Shutterlight] (Old 50/15)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>700</td> <td>Exhibit Hall G - 100%</td> </tr> <tr> <td>701</td> <td>Exhibit Hall G - 50%</td> </tr> <tr> <td>710</td> <td>G Hall Shutterlights only</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>119-15</td> <td>Master G Hall 50% Shutterlights</td> </tr> <tr> <td>120-2</td> <td>Master KIPP 2019 (Brenda CC-4)</td> </tr> <tr> <td>120-3</td> <td>Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td> </tr> </tbody> </table>	Phone Codes		700	Exhibit Hall G - 100%	701	Exhibit Hall G - 50%	710	G Hall Shutterlights only	Switch Codes		119-15	Master G Hall 50% Shutterlights	120-2	Master KIPP 2019 (Brenda CC-4)	120-3	Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)		
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16	83HC-31	EHG 50% (Old 50/16)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>700</td> <td>Exhibit Hall G - 100%</td> </tr> <tr> <td>701</td> <td>Exhibit Hall G - 50%</td> </tr> <tr> <td>709</td> <td>G Hall Blackout all except shutterlights</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>119-2</td> <td>Master G Hall Ctr 50%</td> </tr> <tr> <td>120-2</td> <td>Master KIPP 2019 (Brenda CC-4)</td> </tr> <tr> <td>120-3</td> <td>Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td> </tr> </tbody> </table>	Phone Codes		700	Exhibit Hall G - 100%	701	Exhibit Hall G - 50%	709	G Hall Blackout all except shutterlights	Switch Codes		119-2	Master G Hall Ctr 50%	120-2	Master KIPP 2019 (Brenda CC-4)	120-3	Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)		
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17	83HC-33	EHG 50% (Old 51/1)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>700</td> <td>Exhibit Hall G - 100%</td> </tr> <tr> <td>701</td> <td>Exhibit Hall G - 50%</td> </tr> <tr> <td>709</td> <td>G Hall Blackout all except shutterlights</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>119-2</td> <td>Master G Hall Ctr 50%</td> </tr> <tr> <td>120-2</td> <td>Master KIPP 2019 (Brenda CC-4)</td> </tr> <tr> <td>120-3</td> <td>Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td> </tr> </tbody> </table>	Phone Codes		700	Exhibit Hall G - 100%	701	Exhibit Hall G - 50%	709	G Hall Blackout all except shutterlights	Switch Codes		119-2	Master G Hall Ctr 50%	120-2	Master KIPP 2019 (Brenda CC-4)	120-3	Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)		
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18	83HC-35	EHG 50% (Old 51/2)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>700</td> <td>Exhibit Hall G - 100%</td> </tr> <tr> <td>701</td> <td>Exhibit Hall G - 50%</td> </tr> <tr> <td>709</td> <td>G Hall Blackout all except shutterlights</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>119-2</td> <td>Master G Hall Ctr 50%</td> </tr> </tbody> </table>	Phone Codes		700	Exhibit Hall G - 100%	701	Exhibit Hall G - 50%	709	G Hall Blackout all except shutterlights	Switch Codes		119-2	Master G Hall Ctr 50%						
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19	83HC-37	EHG 50% (Old 51/3)				120-3 Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
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	709	G Hall Blackout all except shutterlights				
<b>Switch Codes</b>						
	119-2 Master	G Hall Ctr 50%				
	120-3 Master	ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)				
20	83HC-18	EHG 25% (Old 51/4)				
<b>Phone Codes</b>						
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	702	Exhibit Hall G - 25%				
	705	Exhibit Hall G 38% Work Lights				
	707	Blackout West End Hall G				
	709	G Hall Blackout all except shutterlights				
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	120-2 Master	KIPP 2019 (Brenda CC-4)				
	120-3 Master	ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)				
21	83HC-20	EHG 25% (Old 51/5)				
<b>Phone Codes</b>						
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	702	Exhibit Hall G - 25%				
	705	Exhibit Hall G 38% Work Lights				
	707	Blackout West End Hall G				
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<b>Switch Codes</b>						
	119-6 Master	G Hall West 25%				
	120-3 Master	ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)				
22	83HC-22	EHG 25% (Old 51/6)				
<b>Phone Codes</b>						
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	702	Exhibit Hall G - 25%				
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	120-2 Master	KIPP 2019 (Brenda CC-4)				
	120-3 Master	ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)				
23	83HC-24	EHG 25% (Old 51/7)				
<b>Phone Codes</b>						
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	702	Exhibit Hall G - 25%				
	705	Exhibit Hall G 38% Work Lights				
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	120-2 Master	KIPP 2019 (Brenda CC-4)				
	120-3 Master	ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)				
24	83HC-26	EHG 25% (Old 51/8)				
<b>Phone Codes</b>						
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	702	Exhibit Hall G - 25%				
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	119-6 Master	G Hall West 25%				
	120-2 Master	KIPP 2019 (Brenda CC-4)				

25	83HC-28	EHG 25% (Old 51/9)				<table border="1"> <tbody> <tr> <td>120-3</td> <td>Master</td> <td>ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>Phone Codes</b></td> </tr> <tr> <td>700</td> <td></td> <td>Exhibit Hall G - 100%</td> </tr> <tr> <td>702</td> <td></td> <td>Exhibit Hall G - 25%</td> </tr> <tr> <td>705</td> <td></td> <td>Exhibit Hall G 38% Work Lights</td> </tr> <tr> <td>707</td> <td></td> <td>Blackout West End Hall G</td> </tr> <tr> <td>709</td> <td></td> <td>G Hall Blackout all except shutterlights</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>Switch Codes</b></td> </tr> <tr> <td>119-6</td> <td>Master</td> <td>G Hall West 25%</td> </tr> <tr> <td>120-2</td> <td>Master</td> <td>KIPP 2019 (Brenda CC-4)</td> </tr> <tr> <td>120-3</td> <td>Master</td> <td>ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td> </tr> </tbody> </table>	120-3	Master	ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)	<b>Phone Codes</b>			700		Exhibit Hall G - 100%	702		Exhibit Hall G - 25%	705		Exhibit Hall G 38% Work Lights	707		Blackout West End Hall G	709		G Hall Blackout all except shutterlights	<b>Switch Codes</b>			119-6	Master	G Hall West 25%	120-2	Master	KIPP 2019 (Brenda CC-4)	120-3	Master	ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
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27	83HC-32	EHG 25% (Old 51/11)				<table border="1"> <tbody> <tr> <td colspan="3" style="text-align: center;"><b>Phone Codes</b></td> </tr> <tr> <td>700</td> <td></td> <td>Exhibit Hall G - 100%</td> </tr> <tr> <td>702</td> <td></td> <td>Exhibit Hall G - 25%</td> </tr> <tr> <td>705</td> <td></td> <td>Exhibit Hall G 38% Work Lights</td> </tr> <tr> <td>709</td> <td></td> <td>G Hall Blackout all except shutterlights</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>Switch Codes</b></td> </tr> <tr> <td>119-5</td> <td>Master</td> <td>G Hall Ctr 25%</td> </tr> <tr> <td>120-2</td> <td>Master</td> <td>KIPP 2019 (Brenda CC-4)</td> </tr> <tr> <td>120-3</td> <td>Master</td> <td>ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td> </tr> </tbody> </table>	<b>Phone Codes</b>			700		Exhibit Hall G - 100%	702		Exhibit Hall G - 25%	705		Exhibit Hall G 38% Work Lights	709		G Hall Blackout all except shutterlights	<b>Switch Codes</b>			119-5	Master	G Hall Ctr 25%	120-2	Master	KIPP 2019 (Brenda CC-4)	120-3	Master	ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)						
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28	83HC-34	EHG 13% (Old 51/12)				<table border="1"> <tbody> <tr> <td colspan="3" style="text-align: center;"><b>Phone Codes</b></td> </tr> <tr> <td>700</td> <td></td> <td>Exhibit Hall G - 100%</td> </tr> <tr> <td>703</td> <td></td> <td>Exhibit Hall G - 13%</td> </tr> <tr> <td>705</td> <td></td> <td>Exhibit Hall G 38% Work Lights</td> </tr> <tr> <td>707</td> <td></td> <td>Blackout West End Hall G</td> </tr> <tr> <td>709</td> <td></td> <td>G Hall Blackout all except shutterlights</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>Switch Codes</b></td> </tr> <tr> <td>119-9</td> <td>Master</td> <td>G Hall West 13%</td> </tr> <tr> <td>120-3</td> <td>Master</td> <td>ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td> </tr> </tbody> </table>	<b>Phone Codes</b>			700		Exhibit Hall G - 100%	703		Exhibit Hall G - 13%	705		Exhibit Hall G 38% Work Lights	707		Blackout West End Hall G	709		G Hall Blackout all except shutterlights	<b>Switch Codes</b>			119-9	Master	G Hall West 13%	120-3	Master	ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)						
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29	83HC-36	EHG 13% (Old 51/13)				<table border="1"> <tbody> <tr> <td colspan="3" style="text-align: center;"><b>Phone Codes</b></td> </tr> <tr> <td>700</td> <td></td> <td>Exhibit Hall G - 100%</td> </tr> <tr> <td>703</td> <td></td> <td>Exhibit Hall G - 13%</td> </tr> <tr> <td>705</td> <td></td> <td>Exhibit Hall G 38% Work Lights</td> </tr> <tr> <td>707</td> <td></td> <td>Blackout West End Hall G</td> </tr> <tr> <td>709</td> <td></td> <td>G Hall Blackout all except shutterlights</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>Switch Codes</b></td> </tr> <tr> <td>119-9</td> <td>Master</td> <td>G Hall West 13%</td> </tr> <tr> <td>120-2</td> <td>Master</td> <td>KIPP 2019 (Brenda CC-4)</td> </tr> <tr> <td>120-3</td> <td>Master</td> <td>ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td> </tr> </tbody> </table>	<b>Phone Codes</b>			700		Exhibit Hall G - 100%	703		Exhibit Hall G - 13%	705		Exhibit Hall G 38% Work Lights	707		Blackout West End Hall G	709		G Hall Blackout all except shutterlights	<b>Switch Codes</b>			119-9	Master	G Hall West 13%	120-2	Master	KIPP 2019 (Brenda CC-4)	120-3	Master	ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)			
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30	83HC-38	EHG 13% (Old 51/14)				<table border="1"> <tbody> <tr> <td colspan="3" style="text-align: center;"><b>Phone Codes</b></td> </tr> <tr> <td>700</td> <td></td> <td>Exhibit Hall G - 100%</td> </tr> <tr> <td>703</td> <td></td> <td>Exhibit Hall G - 13%</td> </tr> <tr> <td>705</td> <td></td> <td>Exhibit Hall G 38% Work Lights</td> </tr> <tr> <td>707</td> <td></td> <td>Blackout West End Hall G</td> </tr> <tr> <td>709</td> <td></td> <td>G Hall Blackout all except shutterlights</td> </tr> <tr> <td colspan="3" style="text-align: center;"><b>Switch Codes</b></td> </tr> </tbody> </table>	<b>Phone Codes</b>			700		Exhibit Hall G - 100%	703		Exhibit Hall G - 13%	705		Exhibit Hall G 38% Work Lights	707		Blackout West End Hall G	709		G Hall Blackout all except shutterlights	<b>Switch Codes</b>														
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Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit
31	83HC-40	EHG 13% (Old 51/15)				
						119-9 Master G Hall West 13% 120-2 Master KIPP 2019 (Brenda CC-4) 120-3 Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
						<b>Phone Codes</b> 700 Exhibit Hall G - 100% 703 Exhibit Hall G - 13% 705 Exhibit Hall G 38% Work Lights 709 G Hall Blackout all except shutterlights
						<b>Switch Codes</b> 119-8 Master G Hall Ctr 13% 120-3 Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
32	83HC-39	EHG Night Lts (Old 51/16)				
						<b>Phone Codes</b> 700 Exhibit Hall G - 100% 707 Blackout West End Hall G 709 G Hall Blackout all except shutterlights 800 Night Lights - All 807 Night Lights - Hall G
						<b>Switch Codes</b> 119-14 Master G Hall West Night Lights 120-2 Master KIPP 2019 (Brenda CC-4) 120-3 Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit
26	Panel 83HC - Front Hall B3 (Was MOD 52)	MECH RM 212	Retrofit	32/32 Surface	115/277	
Rly	Circuit	Description	Settings	Timeout	Schedule	References
1	83HC-42	EHG 12% (Old 52/1)				
						<b>Phone Codes</b> 700 Exhibit Hall G - 100% 704 Exhibit Hall G - 12% 707 Blackout West End Hall G 709 G Hall Blackout all except shutterlights
						<b>Switch Codes</b> 119-12 Master G Hall West 12% 120-2 Master KIPP 2019 (Brenda CC-4) 120-3 Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
2	83HC-44	EHG 12% (Old 52/2)				
						<b>Phone Codes</b> 700 Exhibit Hall G - 100% 704 Exhibit Hall G - 12% 707 Blackout West End Hall G 709 G Hall Blackout all except shutterlights
						<b>Switch Codes</b> 119-12 Master G Hall West 12% 120-2 Master KIPP 2019 (Brenda CC-4) 120-3 Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
3	83HC-46	EHG 12% (Old 52/3)				
						<b>Phone Codes</b> 700 Exhibit Hall G - 100% 704 Exhibit Hall G - 12% 707 Blackout West End Hall G 709 G Hall Blackout all except shutterlights
						<b>Switch Codes</b> 119-12 Master G Hall West 12% 120-2 Master KIPP 2019 (Brenda CC-4) 120-3 Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
4	83HC-48	EHG 12% (Old 52/4)				
						<b>Phone Codes</b> 700 Exhibit Hall G - 100% 704 Exhibit Hall G - 12% 709 G Hall Blackout all except shutterlights

					<b>Switch Codes</b>	
					119-11	Master   G Hall Ctr 12%
					120-2	Master   K1PP 2019 (Brenda CC-4)
					120-3	Master   ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
5	83HC-50	Truss B - Balcony A (Old 52/5)			7	Truss Lights (morning)
					<b>Phone Codes</b>	
					851	Truss Lights - Escalators B/G
					925	Truss B Lower- Balcony A
					<b>Switch Codes</b>	
					124-3	Master   Truss B Lighting - Balcony A
6	83HC-4	Truss B - Balcony A (Old 52/6)			7	Truss Lights (morning)
					<b>Phone Codes</b>	
					851	Truss Lights - Escalators B/G
					925	Truss B Lower- Balcony A
					<b>Switch Codes</b>	
					124-3	Master   Truss B Lighting - Balcony A
7	83HC-6	Truss B - Balcony A (Old 52/7)			7	Truss Lights (morning)
					<b>Phone Codes</b>	
					851	Truss Lights - Escalators B/G
					925	Truss B Lower- Balcony A
					<b>Switch Codes</b>	
					124-3	Master   Truss B Lighting - Balcony A
8	83HC-8	Truss B - Balcony A (Old 52/8)			7	Truss Lights (morning)
					<b>Phone Codes</b>	
					851	Truss Lights - Escalators B/G
					925	Truss B Lower- Balcony A
					<b>Switch Codes</b>	
					124-3	Master   Truss B Lighting - Balcony A
9	83HC-10	Truss B - Escalators B (Old 52/9)			7	Truss Lights (morning)
					<b>Phone Codes</b>	
					851	Truss Lights - Escalators B/G
					921	Truss B Partial - Escalators B
					<b>Switch Codes</b>	
					124-4	Master   Truss B Lighting - Escalators B
10	83HC-12	Truss B - Escalators B (Old 52/10)			7	Truss Lights (morning)
					<b>Phone Codes</b>	
					851	Truss Lights - Escalators B/G
					921	Truss B Partial - Escalators B
					<b>Switch Codes</b>	
					124-4	Master   Truss B Lighting - Escalators B
11	83HC-14	Truss B - Escalators B (Old 52/11)			7	Truss Lights (morning)
					<b>Phone Codes</b>	
					851	Truss Lights - Escalators B/G
					921	Truss B Partial - Escalators B
					<b>Switch Codes</b>	
					124-4	Master   Truss B Lighting - Escalators B
12	83HC-16	Truss B - Escalators B (Old 52/12)			7	Truss Lights (morning)
					<b>Phone Codes</b>	
					851	Truss Lights - Escalators B/G
					921	Truss B Partial - Escalators B
					<b>Switch Codes</b>	
					124-4	Master   Truss B Lighting - Escalators B
13	83HC-50(?)	Escl B 2-3 Soffit Lts (Old 52/13)			14	3rd Level public lights on
					<b>Phone Codes</b>	
					83	Registration B +25 100%
					<b>Switch Codes</b>	
					124-2	Master   Lights under Escalators B (2-3)
14		Mod -52 relay 14				
15		Mod -52 relay 15				
16		Mod -52 relay 16				
17	**Space**	Space				
18	**Space**	Space				

19	**Space**	Space						
20	**Space**	Space						
21	**Space**	Space						
22	**Space**	Space						
23	**Space**	Space						
24	**Space**	Space						
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27	**Space**	Space						
28	**Space**	Space						
29	**Space**	Space						
30	**Space**	Space						
31	**Space**	Space						
32	**Space**	Space						
Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit		
27	Panel 83HD - Rear Gen Assy (Was MOD 54)	MECH RM 223	Retrofit	32/32 Surface	115/277			
Rly	Circuit	Description	Settings	Timeout	Schedule	References		
1	83HD-1	+71 Level Public Area (Old 54/1)						
							<b>Phone Codes</b>	
							23	General Assembly/corridors
							28	4th Level Public Area + General Assemble (71 level SW)
							<b>Switch Codes</b>	
							133-6	Master +71 Level Public Area
2	83HD-3	+71 Level Public Area (Old 54/2)						
							<b>Phone Codes</b>	
							23	General Assembly/corridors
							28	4th Level Public Area + General Assemble (71 level SW)
							<b>Switch Codes</b>	
							133-6	Master +71 Level Public Area
3	83HD-5	+51 Level 318 Hallway (Old 54/3)				14 3rd Level public lights on		
							<b>Phone Codes</b>	
							23	General Assembly/corridors
							953	3rd Level - 318 Hallway
							<b>Switch Codes</b>	
							133-10	Master +51 Level 318 Hallway
4	83HD-7	+51 Level Back Hallway (Old 54/4)				14 3rd Level public lights on		
							<b>Phone Codes</b>	
							23	General Assembly/corridors
							952	3rd Level - Back Hallway (317-318)
							<b>Switch Codes</b>	
							133-11	Master +51 Level Back Hallway
5	83HD-9	+51 Level 317 Hallway (Old 54/5)				14 3rd Level public lights on		
							<b>Phone Codes</b>	
							23	General Assembly/corridors
							951	3rd Level - 317 Hallway
							<b>Switch Codes</b>	
							133-9	Master +51 Level 317 Hallway
6	83LD-20	Soffit Lts 318 Hallway (Old 54/6)				14 3rd Level public lights on		
							<b>Phone Codes</b>	
							23	General Assembly/corridors
							953	3rd Level - 318 Hallway

						<b>Switch Codes</b>	
7	83LD-22	Soffit Lts 317 Hallway (Old 54/7)			14 3rd Level public lights on	133-10	Master +51 Level 318 Hallway
						<b>Phone Codes</b>	
						23	General Assembly/corridors
						951	3rd Level - 317 Hallway
						<b>Switch Codes</b>	
						133-9	Master +51 Level 317 Hallway
8	83HD-2	GA Dock (Old 54/8)			1 Sunset - Sunrise	<b>Phone Codes</b>	
						30	Loading Dock - All
						39	Loading Dock - General Assembly
						42	Partial Dock Lighting
						68	Routine Night Lighting
						<b>Switch Codes</b>	
						131-1	Master GA Dock (Partial)
9	83HD-4	GA Dock (Old 54/9)			1 Sunset - Sunrise	<b>Phone Codes</b>	
						30	Loading Dock - All
						39	Loading Dock - General Assembly
						<b>Switch Codes</b>	
						131-2	Master GA Dock
10	83LD-8	GA Dock Spot Lts (Old 54/10)				<b>Phone Codes</b>	
						30	Loading Dock - All
						39	Loading Dock - General Assembly
						<b>Switch Codes</b>	
						131-5	Master Dock Spot Lights
11	83HD-?	GA Roll-up Doors (Old 54/11)				<b>Phone Codes</b>	
						7	Roll Up Doors - All Freight Doors
						49	Roll Up Doors - General Assembly
						<b>Switch Codes</b>	
						133-12	Master Gen Assy Roll-up Doors
12		Mod -54 relay 12					
13		Mod -54 relay 13					
14		Mod -54 relay 14					
15		Mod -54 relay 15			1 Sunset - Sunrise	<b>Phone Codes</b>	
						68	Routine Night Lighting
16		Mod -54 relay 16					
17	**Space**	Space					
18	**Space**	Space					
19	**Space**	Space					
20	**Space**	Space					
21	**Space**	Space					
22	**Space**	Space					
23	**Space**	Space					
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27	**Space**	Space					
28	**Space**	Space					

29	**Space**	Space						
30	**Space**	Space						
31	**Space**	Space						
32	**Space**	Space						
Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit		
28	Panel 83HF - Rear Ballrooms (Was MOD 56)	MECH RM 221	Retrofit	32/32 Surface	115/277			
Rly	Circuit	Description	Settings	Timeout	Schedule	References		
1	83HF-4	WRRm EHG/Kitchen RRms (Old 56/1)						
							<b>Phone Codes</b>	
							5	Restrooms - BR/KIT
							6	Restrooms - Ex Hall F/G
								<b>Switch Codes</b>
							120-1	Master G Hall Restrooms/Aramark RR
2	83HF-5	+51 Level Kitchen Hallway (Old 56/2)				14 3rd Level public lights on		
								<b>Phone Codes</b>
							24	Ballroom/corridors
							956	3rd Level - Kitchen Hallway
								<b>Switch Codes</b>
							132-4	Master +51 Level Kitchen Hallway
3	83HF-7	+51 Level Back Hallway (Old 56/3)				14 3rd Level public lights on		
								<b>Phone Codes</b>
							24	Ballroom/corridors
							955	3rd Level - Back Hallway (Ballrooms)
								<b>Switch Codes</b>
							132-6	Master Back Hallway (Ballrooms)
4	83HF-9	+51 Lvl BR Service Hallway (Old 56/4)				14 3rd Level public lights on		
								<b>Phone Codes</b>
							24	Ballroom/corridors
							954	3rd Level Ballroom Service Hall
								<b>Switch Codes</b>
							132-5	Master Ballroom Service Hallway
5	83HF-11	+51 Lvl BR Service Hallway (Old 56/5)				14 3rd Level public lights on		
								<b>Phone Codes</b>
							24	Ballroom/corridors
							954	3rd Level Ballroom Service Hall
								<b>Switch Codes</b>
							132-5	Master Ballroom Service Hallway
6	83HF-13	+51 Level Back Hallway (Old 56/6)				14 3rd Level public lights on		
								<b>Phone Codes</b>
							24	Ballroom/corridors
							955	3rd Level - Back Hallway (Ballrooms)
								<b>Switch Codes</b>
							132-6	Master Back Hallway (Ballrooms)
7	83LF-19	Soffit Lts BR Svc Hall (Old 56/7)				14 3rd Level public lights on		
								<b>Phone Codes</b>
							24	Ballroom/corridors
							954	3rd Level Ballroom Service Hall
							958	Ballroom Service Hall Soffit Lts
								<b>Switch Codes</b>
							132-5	Master Ballroom Service Hallway
8	83LF-21	Soffit Lts BR Svc Hall (Old 56/8)				14 3rd Level public lights on		
								<b>Phone Codes</b>
							24	Ballroom/corridors
							954	3rd Level Ballroom Service Hall
							958	Ballroom Service Hall Soffit Lts
								<b>Switch Codes</b>
							132-5	Master Ballroom Service Hallway
9	83HF-1	BR Dock (Old 56/9)				1 Sunset - Sunrise		
								<b>Phone Codes</b>
							30	Loading Dock - All
							38	Loading Dock - Ballroom
								<b>Switch Codes</b>

10	83HF-3	BR Dock (Old 56/10)			1 Sunset - Sunrise	130-16 Master BR Dock
						<b>Phone Codes</b>
						30 Loading Dock - All
						38 Loading Dock - Ballroom
						<b>Switch Codes</b>
						130-16 Master BR Dock
11	83HF-15	BR Dock (Old 56/11)			1 Sunset - Sunrise	130-16 Master BR Dock
						<b>Phone Codes</b>
						30 Loading Dock - All
						38 Loading Dock - Ballroom
						<b>Switch Codes</b>
						130-16 Master BR Dock
12	83HF-17	BR Dock (Old 56/12)			1 Sunset - Sunrise	130-16 Master BR Dock
						<b>Phone Codes</b>
						30 Loading Dock - All
						38 Loading Dock - Ballroom
						42 Partial Dock Lighting
						68 Routine Night Lighting
						<b>Switch Codes</b>
						130-15 Master BR Dock (Partial)
13	83LF-13	BR Dock Spot Lts (Old 56/13)				130-15 Master BR Dock (Partial)
						<b>Phone Codes</b>
						30 Loading Dock - All
						38 Loading Dock - Ballroom
						<b>Switch Codes</b>
						131-5 Master Dock Spot Lights
14	83HF-?	BR Dock Roll-up Doors (Old 56/14)				131-5 Master Dock Spot Lights
						<b>Phone Codes</b>
						7 Roll Up Doors - All Freight Doors
						48 Roll Up Doors - Ballroom
						<b>Switch Codes</b>
						132-8 Master Ballroom Roll-up Doors
15		Mod -56 relay 15				
16		Mod -56 relay 16				
17	**Space**	Space				
18	**Space**	Space				
19	**Space**	Space				
20	**Space**	Space				
21	**Space**	Space				
22	**Space**	Space				
23	**Space**	Space				
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26	**Space**	Space				
27	**Space**	Space				
28	**Space**	Space				
29	**Space**	Space				
30	**Space**	Space				
31	**Space**	Space				
32	**Space**	Space				

Panel ID	Description	Location	Type	Interior / Enclosure	Power Supply	Circuit																		
29	Panel 83HG - Rear Hall B3 (Was MODs 58 & 59)	MECH RM 217	Retrofit	32/32 Surface	115/277																			
Rly	Circuit	Description	Settings	Timeout	Schedule	References																		
1	83HG-1	EHG 50% (Old 58/1)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>700</td> <td>Exhibit Hall G - 100%</td> </tr> <tr> <td>701</td> <td>Exhibit Hall G - 50%</td> </tr> <tr> <td>709</td> <td>G Hall Blackout all except shutterlights</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>119-2</td> <td>Master G Hall Ctr 50%</td> </tr> <tr> <td>120-2</td> <td>Master KIPP 2019 (Brenda CC-4)</td> </tr> <tr> <td>120-3</td> <td>Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td> </tr> </tbody> </table>	Phone Codes		700	Exhibit Hall G - 100%	701	Exhibit Hall G - 50%	709	G Hall Blackout all except shutterlights	Switch Codes		119-2	Master G Hall Ctr 50%	120-2	Master KIPP 2019 (Brenda CC-4)	120-3	Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)		
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17	83HG-2	EHG 25% (Old 59/1)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>700</td> <td>Exhibit Hall G - 100%</td> </tr> <tr> <td>702</td> <td>Exhibit Hall G - 25%</td> </tr> <tr> <td>705</td> <td>Exhibit Hall G 38% Work Lights</td> </tr> <tr> <td>709</td> <td>G Hall Blackout all except shutterlights</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>119-5</td> <td>Master G Hall Ctr 25%</td> </tr> <tr> <td>120-2</td> <td>Master KIPP 2019 (Brenda CC-4)</td> </tr> <tr> <td>120-3</td> <td>Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td> </tr> </tbody> </table>	Phone Codes		700	Exhibit Hall G - 100%	702	Exhibit Hall G - 25%	705	Exhibit Hall G 38% Work Lights	709	G Hall Blackout all except shutterlights	Switch Codes		119-5	Master G Hall Ctr 25%	120-2	Master KIPP 2019 (Brenda CC-4)	120-3	Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)		
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18	83HG-4	EHG 25% [Shutterlights] (Old 59/2)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>700</td> <td>Exhibit Hall G - 100%</td> </tr> <tr> <td>702</td> <td>Exhibit Hall G - 25%</td> </tr> <tr> <td>705</td> <td>Exhibit Hall G 38% Work Lights</td> </tr> <tr> <td>710</td> <td>G Hall Shutterlights only</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>119-16</td> <td>Master G Hall 25% Shutterlights</td> </tr> <tr> <td>120-2</td> <td>Master KIPP 2019 (Brenda CC-4)</td> </tr> <tr> <td>120-3</td> <td>Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td> </tr> </tbody> </table>	Phone Codes		700	Exhibit Hall G - 100%	702	Exhibit Hall G - 25%	705	Exhibit Hall G 38% Work Lights	710	G Hall Shutterlights only	Switch Codes		119-16	Master G Hall 25% Shutterlights	120-2	Master KIPP 2019 (Brenda CC-4)	120-3	Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)		
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19	83HG-6	EHG 25% (Old 59/3)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>700</td> <td>Exhibit Hall G - 100%</td> </tr> <tr> <td>702</td> <td>Exhibit Hall G - 25%</td> </tr> <tr> <td>705</td> <td>Exhibit Hall G 38% Work Lights</td> </tr> <tr> <td>710</td> <td>G Hall Shutterlights only</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>119-16</td> <td>Master G Hall 25% Shutterlights</td> </tr> <tr> <td>120-2</td> <td>Master KIPP 2019 (Brenda CC-4)</td> </tr> <tr> <td>120-3</td> <td>Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td> </tr> </tbody> </table>	Phone Codes		700	Exhibit Hall G - 100%	702	Exhibit Hall G - 25%	705	Exhibit Hall G 38% Work Lights	710	G Hall Shutterlights only	Switch Codes		119-16	Master G Hall 25% Shutterlights	120-2	Master KIPP 2019 (Brenda CC-4)	120-3	Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)		
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20	83HG-8	EHG 25% (Old 59/4)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr><td>700</td><td>Exhibit Hall G - 100%</td></tr> <tr><td>702</td><td>Exhibit Hall G - 25%</td></tr> <tr><td>705</td><td>Exhibit Hall G 38% Work Lights</td></tr> <tr><td>708</td><td>Blackout East End Hall G</td></tr> <tr><td>709</td><td>G Hall Blackout all except shutterlights</td></tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr><td>119-4</td><td>Master G Hall E 25%</td></tr> <tr><td>120-2</td><td>Master KIPP 2019 (Brenda CC-4)</td></tr> <tr><td>120-3</td><td>Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td></tr> </tbody> </table>	Phone Codes		700	Exhibit Hall G - 100%	702	Exhibit Hall G - 25%	705	Exhibit Hall G 38% Work Lights	708	Blackout East End Hall G	709	G Hall Blackout all except shutterlights	Switch Codes		119-4	Master G Hall E 25%	120-2	Master KIPP 2019 (Brenda CC-4)	120-3	Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
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21	83HG-10	EHG 25% (Old 59/5)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr><td>700</td><td>Exhibit Hall G - 100%</td></tr> <tr><td>702</td><td>Exhibit Hall G - 25%</td></tr> <tr><td>705</td><td>Exhibit Hall G 38% Work Lights</td></tr> <tr><td>708</td><td>Blackout East End Hall G</td></tr> <tr><td>709</td><td>G Hall Blackout all except shutterlights</td></tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr><td>119-4</td><td>Master G Hall E 25%</td></tr> <tr><td>120-2</td><td>Master KIPP 2019 (Brenda CC-4)</td></tr> <tr><td>120-3</td><td>Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td></tr> </tbody> </table>	Phone Codes		700	Exhibit Hall G - 100%	702	Exhibit Hall G - 25%	705	Exhibit Hall G 38% Work Lights	708	Blackout East End Hall G	709	G Hall Blackout all except shutterlights	Switch Codes		119-4	Master G Hall E 25%	120-2	Master KIPP 2019 (Brenda CC-4)	120-3	Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
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22	83HG-12	EHG 25% (Old 59/6)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr><td>700</td><td>Exhibit Hall G - 100%</td></tr> <tr><td>702</td><td>Exhibit Hall G - 25%</td></tr> <tr><td>705</td><td>Exhibit Hall G 38% Work Lights</td></tr> <tr><td>708</td><td>Blackout East End Hall G</td></tr> <tr><td>709</td><td>G Hall Blackout all except shutterlights</td></tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr><td>119-4</td><td>Master G Hall E 25%</td></tr> <tr><td>120-2</td><td>Master KIPP 2019 (Brenda CC-4)</td></tr> <tr><td>120-3</td><td>Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td></tr> </tbody> </table>	Phone Codes		700	Exhibit Hall G - 100%	702	Exhibit Hall G - 25%	705	Exhibit Hall G 38% Work Lights	708	Blackout East End Hall G	709	G Hall Blackout all except shutterlights	Switch Codes		119-4	Master G Hall E 25%	120-2	Master KIPP 2019 (Brenda CC-4)	120-3	Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
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120-3	Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)																									
23	83HG-14	EHG 25% (Old 59/7)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr><td>700</td><td>Exhibit Hall G - 100%</td></tr> <tr><td>702</td><td>Exhibit Hall G - 25%</td></tr> <tr><td>705</td><td>Exhibit Hall G 38% Work Lights</td></tr> <tr><td>708</td><td>Blackout East End Hall G</td></tr> <tr><td>709</td><td>G Hall Blackout all except shutterlights</td></tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr><td>119-4</td><td>Master G Hall E 25%</td></tr> <tr><td>120-2</td><td>Master KIPP 2019 (Brenda CC-4)</td></tr> <tr><td>120-3</td><td>Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)</td></tr> </tbody> </table>	Phone Codes		700	Exhibit Hall G - 100%	702	Exhibit Hall G - 25%	705	Exhibit Hall G 38% Work Lights	708	Blackout East End Hall G	709	G Hall Blackout all except shutterlights	Switch Codes		119-4	Master G Hall E 25%	120-2	Master KIPP 2019 (Brenda CC-4)	120-3	Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
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120-2	Master KIPP 2019 (Brenda CC-4)																									
120-3	Master ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)																									
24	83HG-16	EHG 13% (Old 59/8)				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr><td>700</td><td>Exhibit Hall G - 100%</td></tr> <tr><td>703</td><td>Exhibit Hall G - 13%</td></tr> <tr><td>705</td><td>Exhibit Hall G 38% Work Lights</td></tr> <tr><td>708</td><td>Blackout East End Hall G</td></tr> <tr><td>709</td><td>G Hall Blackout all except shutterlights</td></tr> <tr> <th colspan="2">Switch Codes</th> </tr> </tbody> </table>	Phone Codes		700	Exhibit Hall G - 100%	703	Exhibit Hall G - 13%	705	Exhibit Hall G 38% Work Lights	708	Blackout East End Hall G	709	G Hall Blackout all except shutterlights	Switch Codes							
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708	Blackout East End Hall G																									
709	G Hall Blackout all except shutterlights																									
Switch Codes																										

25	83HG-18	EHG 13% (Old 59/9)				119-7 Master	G Hall East 13%
						120-2 Master	KIPP 2019 (Brenda CC-4)
						120-3 Master	ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
						<b>Phone Codes</b>	
						700	Exhibit Hall G - 100%
						703	Exhibit Hall G - 13%
						705	Exhibit Hall G 38% Work Lights
						708	Blackout East End Hall G
						709	G Hall Blackout all except shutterlights
						<b>Switch Codes</b>	
119-7 Master	G Hall East 13%						
120-2 Master	KIPP 2019 (Brenda CC-4)						
120-3 Master	ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)						
26	83HG-20	EHG 13% (Old 59/10)				<b>Phone Codes</b>	
						700	Exhibit Hall G - 100%
						703	Exhibit Hall G - 13%
						705	Exhibit Hall G 38% Work Lights
						708	Blackout East End Hall G
						709	G Hall Blackout all except shutterlights
						<b>Switch Codes</b>	
						119-7 Master	G Hall East 13%
						120-2 Master	KIPP 2019 (Brenda CC-4)
						120-3 Master	ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
27	83HG-22	EHG 13% (Old 59/11)				<b>Phone Codes</b>	
						700	Exhibit Hall G - 100%
						703	Exhibit Hall G - 13%
						705	Exhibit Hall G 38% Work Lights
						708	Blackout East End Hall G
						709	G Hall Blackout all except shutterlights
						<b>Switch Codes</b>	
						119-7 Master	G Hall East 13%
						120-2 Master	KIPP 2019 (Brenda CC-4)
						120-3 Master	ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
28	83HG-24	EHG 12% (Old 59/12)				<b>Phone Codes</b>	
						700	Exhibit Hall G - 100%
						704	Exhibit Hall G - 12%
						708	Blackout East End Hall G
						709	G Hall Blackout all except shutterlights
						<b>Switch Codes</b>	
						119-10 Master	G Hall East 12%
						120-2 Master	KIPP 2019 (Brenda CC-4)
						120-3 Master	ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)
						29	83HG-26
700	Exhibit Hall G - 100%						
704	Exhibit Hall G - 12%						
708	Blackout East End Hall G						
709	G Hall Blackout all except shutterlights						
<b>Switch Codes</b>							
119-10 Master	G Hall East 12%						
120-2 Master	KIPP 2019 (Brenda CC-4)						
120-3 Master	ABB Customer World 2019 Show Lights(B3 Tony Rodriguez)						
30	83HG-28	EHG 12% (Old 59/14)					
						700	Exhibit Hall G - 100%
						704	Exhibit Hall G - 12%
						708	Blackout East End Hall G
						708	Blackout East End Hall G



7	83LG-1	Dock G Spot Lts (Old 60/7)					130-13	Master	Dock G (Partial)	
<b>Phone Codes</b>										
							30		Loading Dock - All	
							37		Loading Dock - Hall G	
<b>Switch Codes</b>										
							131-5	Master	Dock Spot Lights	
8	83HG-?	G Hall Roll-up Doors (Old 60/8)								
<b>Phone Codes</b>										
							7		Roll Up Doors - All Freight Doors	
							47		Roll Up Doors - Hall G	
<b>Switch Codes</b>										
							120-6	Master	G Hall Roll-up Doors	
9		Mod -60 relay 9								
10		Mod -60 relay 10								
11		Mod -60 relay 11								
12		Mod -60 relay 12								
13		Mod -60 relay 13								
14		Mod -60 relay 14								
15		Mod -60 relay 15								
<b>Phone Codes</b>										
							68		Routine Night Lighting	
16		Mod -60 relay 16								
17	**Space**	Space								
18	**Space**	Space								
19	**Space**	Space								
20	**Space**	Space								
21	**Space**	Space								
22	**Space**	Space								
23	**Space**	Space								
24	**Space**	Space								
25	**Space**	Space								
26	**Space**	Space								
27	**Space**	Space								
28	**Space**	Space								
29	**Space**	Space								
30	**Space**	Space								
31	**Space**	Space								
32	**Space**	Space								
<b>Panel ID</b>	<b>Description</b>	<b>Location</b>	<b>Type</b>	<b>Interior/Enclosure</b>	<b>Power Supply</b>	<b>Circuit</b>				
201	LCP-12RPA - Tunnel A		CC	12/12 Surface	115/277					
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>Settings</b>	<b>Timeout</b>	<b>Schedule</b>	<b>References</b>				
1	12H2A-1	TUNNEL LIGHTING NE								
<b>Phone Codes</b>										
							18		Tunnel Lighting NE	

2	12H2A-2	TUNNEL LIGHTING NE								<b>Switch Codes</b> 122-8  Master Tunnel Lighting under A <b>Phone Codes</b> 18  Tunnel Lighting NE <b>Switch Codes</b> 122-8  Master Tunnel Lighting under A
3	12H2A-3	TUNNEL LIGHTING NE								<b>Phone Codes</b> 18  Tunnel Lighting NE <b>Switch Codes</b> 122-8  Master Tunnel Lighting under A
4	12H2A-4	TUNNEL LIGHTING NE								<b>Phone Codes</b> 18  Tunnel Lighting NE <b>Switch Codes</b> 122-8  Master Tunnel Lighting under A
5	12H2A-5	ELECTRICAL ROOM LEVEL -12 NE	Blink							<b>Phone Codes</b> 80  ELECTRICAL&MECHANICAL ROOMS <b>Switch Codes</b> 135-1  Master Elec/Mech Rms - N Tunnel
6	12H2A-23	WATER HEATER +0 NORTHEAST	Blink			5 Water Heaters				<b>Phone Codes</b> 2599  Water Heaters / Schedule ALL 3200  Tunnel - Water Heater + 0 Northeast <b>Switch Codes</b> 122-7  Master Water Heaters - A Hall
7		SPARE								
8		SPACE								
9		SPACE								
10		SPACE								
11		SPACE								
12		SPACE								
<b>Panel ID</b>	<b>Description</b>	<b>Location</b>	<b>Type</b>	<b>Interior/Enclosure</b>	<b>Power Supply</b>	<b>Circuit</b>				
202	LCP-35RPA - Rear Hall A		CC	48/48 Surface	115/277					
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>Settings</b>	<b>Timeout</b>	<b>Schedule</b>	<b>References</b>				
1	35H2A-1	EXHIBIT HALL (LARGE STAGE) GROUP A +0 NE								<b>Phone Codes</b> 101  Exhibit Hall A - 25.0% 102  Exhibit Hall A - 38% Work Lights 103  Exhibit Hall A - 50% 105  Exhibit Hall A - 75.0% 107  Exhibit Hall A - 100.0% <b>Switch Codes</b> 102-2  Master A Hall Step 2 - North Stage
2	35H2A-3	EXHIBIT HALL (LARGE STAGE) GROUP B +0 NE								<b>Phone Codes</b> 102  Exhibit Hall A - 38% Work Lights 103  Exhibit Hall A - 50% 105  Exhibit Hall A - 75.0% 107  Exhibit Hall A - 100.0% <b>Switch Codes</b> 102-3  Master A Hall Step 3 - North Stage
3	35EH2A-11	EXHIBIT HALL (STAGE EMERG) GROUP C+0 NE								<b>Phone Codes</b> 100  Exhibit Hall A - 12.5% 101  Exhibit Hall A - 25.0% 102  Exhibit Hall A - 38% Work Lights 103  Exhibit Hall A - 50% 105  Exhibit Hall A - 75.0%

						107	Exhibit Hall A - 100.0%
						<b>Switch Codes</b>	
					102-1	Master	A Hall Step 1 - North Stage
						<b>Phone Codes</b>	
					103		Exhibit Hall A - 50%
					105		Exhibit Hall A - 75.0%
					107		Exhibit Hall A - 100.0%
						<b>Switch Codes</b>	
					102-4	Master	A Hall Step 4 - North Stage
						<b>Phone Codes</b>	
					105		Exhibit Hall A - 75.0%
					106		Exhibit Hall A - 87.5%
					107		Exhibit Hall A - 100.0%
						<b>Switch Codes</b>	
					102-5	Master	A Hall Step 5 - North Stage
						<b>Phone Codes</b>	
					105		Exhibit Hall A - 75.0%
					106		Exhibit Hall A - 87.5%
					107		Exhibit Hall A - 100.0%
						<b>Switch Codes</b>	
					102-6	Master	A Hall Step 6 - North Stage
						<b>Phone Codes</b>	
					106		Exhibit Hall A - 87.5%
					107		Exhibit Hall A - 100.0%
						<b>Switch Codes</b>	
					102-7	Master	A Hall Step 7 - North Stage
						<b>Phone Codes</b>	
					107		Exhibit Hall A - 100.0%
						<b>Switch Codes</b>	
					102-8	Master	A Hall Step 8 - North Stage
						<b>Phone Codes</b>	
					101		Exhibit Hall A - 25.0%
					102		Exhibit Hall A - 38% Work Lights
					103		Exhibit Hall A - 50%
					105		Exhibit Hall A - 75.0%
					107		Exhibit Hall A - 100.0%
						<b>Switch Codes</b>	
					102-2	Master	A Hall Step 2 - North Stage
						<b>Phone Codes</b>	
					102		Exhibit Hall A - 38% Work Lights
					103		Exhibit Hall A - 50%
					105		Exhibit Hall A - 75.0%
					107		Exhibit Hall A - 100.0%
						<b>Switch Codes</b>	
					102-3	Master	A Hall Step 3 - North Stage
						<b>Phone Codes</b>	
					100		Exhibit Hall A - 12.5%
					101		Exhibit Hall A - 25.0%
					102		Exhibit Hall A - 38% Work Lights
					103		Exhibit Hall A - 50%
					105		Exhibit Hall A - 75.0%
					107		Exhibit Hall A - 100.0%
						<b>Switch Codes</b>	
					102-1	Master	A Hall Step 1 - North Stage
						<b>Phone Codes</b>	
					103		Exhibit Hall A - 50%
					105		Exhibit Hall A - 75.0%
					106		Exhibit Hall A - 87.5%
4	35H2A-5	EXHIBIT HALL (LARGE STAGE) GROUP D +0 NE					
5	35H2A-2	EXHIBIT HALL (LARGE STAGE) GROUP E +0 NE					
6	35H2A-4	EXHIBIT HALL (LARGE STAGE) GROUP F +0 NE					
7	35H2A-6	EXHIBIT HALL (LARGE STAGE) GROUP G +0 NE					
8	35H2A-7	EXHIBIT HALL (LARGE STAGE) GROUP H +0 NE					
9	35H2A-9	EXHIBIT HALL (LARGE STAGE) GROUP A +0 NE					
10	35H2A-11	EXHIBIT HALL (LARGE STAGE) GROUP B +0 NE					
11	35EH2A-13	EXHIBIT HALL (STAGE EMERG) GROUP C +0 NE					
12	35H2A-8	EXHIBIT HALL (LARGE STAGE) GROUP D +0 NE					

13	35H2A-10	EXHIBIT HALL (SMALL STAGE) GROUP E +0 NE				107	Exhibit Hall A - 100.0%
						<b>Switch Codes</b>	
						102-4	Master A Hall Step 4 - North Stage
						<b>Phone Codes</b>	
						105	Exhibit Hall A - 75.0%
						106	Exhibit Hall A - 87.5%
						107	Exhibit Hall A - 100.0%
						<b>Switch Codes</b>	
						103-5	Master A Hall Step 5 - East Stage
						103-9	Master Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
14	35H2A-10	EXHIBIT HALL (SMALL STAGE) GROUP F +0 NE				<b>Phone Codes</b>	
						105	Exhibit Hall A - 75.0%
						106	Exhibit Hall A - 87.5%
						107	Exhibit Hall A - 100.0%
						<b>Switch Codes</b>	
						103-6	Master A Hall Step 6 - East Stage
						103-9	Master Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
15	35H2A-12	EXHIBIT HALL (SMALL STAGE) GROUP G +0 NE				<b>Phone Codes</b>	
						106	Exhibit Hall A - 87.5%
						107	Exhibit Hall A - 100.0%
						<b>Switch Codes</b>	
						103-7	Master A Hall Step 7 - East Stage
						103-9	Master Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
16	35H2A-12	EXHIBIT HALL (SMALL STAGE) GROUP H +0 NE				<b>Phone Codes</b>	
						107	Exhibit Hall A - 100.0%
						<b>Switch Codes</b>	
						103-8	Master A Hall Step 8 - East Stage
						103-9	Master Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
17	35H2A-13	EXHIBIT HALL (SMALL STAGE) GROUP A +0 NE				<b>Phone Codes</b>	
						101	Exhibit Hall A - 25.0%
						102	Exhibit Hall A - 38% Work Lights
						103	Exhibit Hall A - 50%
						105	Exhibit Hall A - 75.0%
						107	Exhibit Hall A - 100.0%
						<b>Switch Codes</b>	
						103-2	Master A Hall Step 2 - East Stage
						103-9	Master Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
18	35H2A-13	EXHIBIT HALL (SMALL STAGE) GROUP B +0 NE				<b>Phone Codes</b>	
						102	Exhibit Hall A - 38% Work Lights
						103	Exhibit Hall A - 50%
						105	Exhibit Hall A - 75.0%
						107	Exhibit Hall A - 100.0%
						<b>Switch Codes</b>	
						103-3	Master A Hall Step 3 - East Stage
						103-9	Master Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
19	35H2A-15	EXHIBIT HALL GROUP A +0 NE				<b>Phone Codes</b>	
						101	Exhibit Hall A - 25.0%
						102	Exhibit Hall A - 38% Work Lights
						103	Exhibit Hall A - 50%
						105	Exhibit Hall A - 75.0%
						107	Exhibit Hall A - 100.0%
						<b>Switch Codes</b>	
						101-2	Master A Hall Step 2 (35')



20	35H2A-17	EXHIBIT HALL GROUP B +0 NE				103-9 Master Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
<b>Phone Codes</b>						
	102	Exhibit Hall A - 38% Work Lights				
	103	Exhibit Hall A - 50%				
	105	Exhibit Hall A - 75.0%				
	107	Exhibit Hall A - 100.0%				
<b>Switch Codes</b>						
	101-3 Master	A Hall Step 3 (35')				
	103-9 Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)				
21	35EH2A-15	EXHIBIT HALL (EMERG) GROUP C +0 NE				
<b>Phone Codes</b>						
	100	Exhibit Hall A - 12.5%				
	101	Exhibit Hall A - 25.0%				
	102	Exhibit Hall A - 38% Work Lights				
	103	Exhibit Hall A - 50%				
	105	Exhibit Hall A - 75.0%				
	107	Exhibit Hall A - 100.0%				
<b>Switch Codes</b>						
	101-1 Master	A Hall Step 1 (35')				
	103-9 Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)				
22	35H2A-14	EXHIBIT HALL GROUP D +0 NE				
<b>Phone Codes</b>						
	103	Exhibit Hall A - 50%				
	105	Exhibit Hall A - 75.0%				
	106	Exhibit Hall A - 87.5%				
	107	Exhibit Hall A - 100.0%				
<b>Switch Codes</b>						
	101-4 Master	A Hall Step 4 (35')				
	103-9 Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)				
23	35H2A-16	EXHIBIT HALL GROUP E +0 NE				
<b>Phone Codes</b>						
	105	Exhibit Hall A - 75.0%				
	106	Exhibit Hall A - 87.5%				
	107	Exhibit Hall A - 100.0%				
<b>Switch Codes</b>						
	101-5 Master	A Hall Step 5 (35')				
	103-9 Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)				
24	35H2A-18	EXHIBIT HALL GROUP F +0 NE				
<b>Phone Codes</b>						
	105	Exhibit Hall A - 75.0%				
	106	Exhibit Hall A - 87.5%				
	107	Exhibit Hall A - 100.0%				
<b>Switch Codes</b>						
	101-6 Master	A Hall Step 6 (35')				
	103-9 Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)				
25	35H2A-20	EXHIBIT HALL GROUP G +0 NE				
<b>Phone Codes</b>						
	106	Exhibit Hall A - 87.5%				
	107	Exhibit Hall A - 100.0%				
<b>Switch Codes</b>						
	101-7 Master	A Hall Step 7 (35')				
	103-9 Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)				
26	35H2A-22	EXHIBIT HALL GROUP H +0 NE				
<b>Phone Codes</b>						
	107	Exhibit Hall A - 100.0%				
<b>Switch Codes</b>						
	101-8 Master	A Hall Step 8 (35')				
	103-9 Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)				

27	35H2A-24	EXHIBIT HALL GROUP A +0 NE				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>101</td> <td>Exhibit Hall A - 25.0%</td> </tr> <tr> <td>102</td> <td>Exhibit Hall A - 38% Work Lights</td> </tr> <tr> <td>103</td> <td>Exhibit Hall A - 50%</td> </tr> <tr> <td>105</td> <td>Exhibit Hall A - 75.0%</td> </tr> <tr> <td>107</td> <td>Exhibit Hall A - 100.0%</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>101-2</td> <td>Master A Hall Step 2 (35')</td> </tr> </tbody> </table>	Phone Codes		101	Exhibit Hall A - 25.0%	102	Exhibit Hall A - 38% Work Lights	103	Exhibit Hall A - 50%	105	Exhibit Hall A - 75.0%	107	Exhibit Hall A - 100.0%	Switch Codes		101-2	Master A Hall Step 2 (35')		
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29	35EH2A-17	EXHIBIT HALL (EMERG) GROUP C +0 NE				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>100</td> <td>Exhibit Hall A - 12.5%</td> </tr> <tr> <td>101</td> <td>Exhibit Hall A - 25.0%</td> </tr> <tr> <td>102</td> <td>Exhibit Hall A - 38% Work Lights</td> </tr> <tr> <td>103</td> <td>Exhibit Hall A - 50%</td> </tr> <tr> <td>105</td> <td>Exhibit Hall A - 75.0%</td> </tr> <tr> <td>107</td> <td>Exhibit Hall A - 100.0%</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>101-1</td> <td>Master A Hall Step 1 (35')</td> </tr> </tbody> </table>	Phone Codes		100	Exhibit Hall A - 12.5%	101	Exhibit Hall A - 25.0%	102	Exhibit Hall A - 38% Work Lights	103	Exhibit Hall A - 50%	105	Exhibit Hall A - 75.0%	107	Exhibit Hall A - 100.0%	Switch Codes		101-1	Master A Hall Step 1 (35')
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30	35H2A-21	EXHIBIT HALL GROUP D +0 NE				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>103</td> <td>Exhibit Hall A - 50%</td> </tr> <tr> <td>105</td> <td>Exhibit Hall A - 75.0%</td> </tr> <tr> <td>106</td> <td>Exhibit Hall A - 87.5%</td> </tr> <tr> <td>107</td> <td>Exhibit Hall A - 100.0%</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>101-4</td> <td>Master A Hall Step 4 (35')</td> </tr> </tbody> </table>	Phone Codes		103	Exhibit Hall A - 50%	105	Exhibit Hall A - 75.0%	106	Exhibit Hall A - 87.5%	107	Exhibit Hall A - 100.0%	Switch Codes		101-4	Master A Hall Step 4 (35')				
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31	35H2A-23	EXHIBIT HALL GROUP E +0 NE				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>105</td> <td>Exhibit Hall A - 75.0%</td> </tr> <tr> <td>106</td> <td>Exhibit Hall A - 87.5%</td> </tr> <tr> <td>107</td> <td>Exhibit Hall A - 100.0%</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>101-5</td> <td>Master A Hall Step 5 (35')</td> </tr> </tbody> </table>	Phone Codes		105	Exhibit Hall A - 75.0%	106	Exhibit Hall A - 87.5%	107	Exhibit Hall A - 100.0%	Switch Codes		101-5	Master A Hall Step 5 (35')						
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32	35H2A-26	EXHIBIT HALL GROUP F +0 NE				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>105</td> <td>Exhibit Hall A - 75.0%</td> </tr> <tr> <td>106</td> <td>Exhibit Hall A - 87.5%</td> </tr> <tr> <td>107</td> <td>Exhibit Hall A - 100.0%</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>101-6</td> <td>Master A Hall Step 6 (35')</td> </tr> <tr> <td>103-9</td> <td>Master Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)</td> </tr> </tbody> </table>	Phone Codes		105	Exhibit Hall A - 75.0%	106	Exhibit Hall A - 87.5%	107	Exhibit Hall A - 100.0%	Switch Codes		101-6	Master A Hall Step 6 (35')	103-9	Master Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)				
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101-6	Master A Hall Step 6 (35')																							
103-9	Master Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)																							
33	35H2A-28	EXHIBIT HALL GROUP G +0 NE				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>106</td> <td>Exhibit Hall A - 87.5%</td> </tr> <tr> <td>107</td> <td>Exhibit Hall A - 100.0%</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>101-7</td> <td>Master A Hall Step 7 (35')</td> </tr> <tr> <td>103-9</td> <td>Master Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)</td> </tr> </tbody> </table>	Phone Codes		106	Exhibit Hall A - 87.5%	107	Exhibit Hall A - 100.0%	Switch Codes		101-7	Master A Hall Step 7 (35')	103-9	Master Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)						
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34	35H2A-30	EXHIBIT HALL GROUP H +0 NE				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>107</td> <td>Exhibit Hall A - 100.0%</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>101-8</td> <td>Master A Hall Step 8 (35')</td> </tr> <tr> <td>103-9</td> <td>Master Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)</td> </tr> </tbody> </table>	Phone Codes		107	Exhibit Hall A - 100.0%	Switch Codes		101-8	Master A Hall Step 8 (35')	103-9	Master Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)								
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103-9	Master Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)																							
35	35H2A-25	EXHIBIT HALL GROUP A +0 NE																						



42	35H2A-31	EXHIBIT HALL GROUP H +0 NE				103-9 Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
<b>Phone Codes</b>							
	107	Exhibit Hall A - 100.0%					
<b>Switch Codes</b>							
	101-8 Master	A Hall Step 8 (35')					
43	35EH2A-15	EXHIBIT HALL (EMERG) GROUP C +0 NE				103-9 Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
<b>Phone Codes</b>							
	100	Exhibit Hall A - 12.5%					
	101	Exhibit Hall A - 25.0%					
	102	Exhibit Hall A - 38% Work Lights					
	103	Exhibit Hall A - 50%					
	105	Exhibit Hall A - 75.0%					
	107	Exhibit Hall A - 100.0%					
<b>Switch Codes</b>							
	103-1 Master	A Hall Step 1 - East Stage					
44	35H2A-33	EXHIBIT HALL GROUP D +0 NE				103-9 Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
<b>Phone Codes</b>							
	103	Exhibit Hall A - 50%					
	105	Exhibit Hall A - 75.0%					
	106	Exhibit Hall A - 87.5%					
	107	Exhibit Hall A - 100.0%					
<b>Switch Codes</b>							
	103-4 Master	A Hall Step 4 - East Stage					
45	35H2A-33	EXHIBIT HALL EXIT DOOR +0 NE				103-9 Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
<b>Phone Codes</b>							
	102	Exhibit Hall A - 38% Work Lights					
	105	Exhibit Hall A - 75.0%					
	107	Exhibit Hall A - 100.0%					
<b>Switch Codes</b>							
	103-9 Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)					
	103-13 Master	A Hall North Exit Lights - Main					
46	35H2AA-7	EXHIBIT HALL EXIT DOOR +0 NE					
<b>Phone Codes</b>							
	105	Exhibit Hall A - 75.0%					
	106	Exhibit Hall A - 87.5%					
	107	Exhibit Hall A - 100.0%					
<b>Switch Codes</b>							
	103-9 Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)					
	103-13 Master	A Hall North Exit Lights - Main					
47	35H2AA-9	EXHIBIT HALL EXIT DOOR +0 NE					
<b>Phone Codes</b>							
	105	Exhibit Hall A - 75.0%					
	106	Exhibit Hall A - 87.5%					
	107	Exhibit Hall A - 100.0%					
<b>Switch Codes</b>							
	103-9 Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)					
	103-12 Master	A Hall North Exit Lights - Partial					
48	35H2A-42	RESTROOM LIGHTING +0 NE	Blink	02:00			
<b>Phone Codes</b>							
	15	Restrooms - ALL					
	9095	Exhibit Hall A - Restrmt Ltg + 0 NE					
<b>Switch Codes</b>							
	122-5 Master	Restrooms - A Hall Rear					
<b>Panel ID</b>	<b>Description</b>	<b>Location</b>	<b>Type</b>	<b>Interior/Enclosure</b>	<b>Power Supply</b>	<b>Circuit</b>	
203	LCP-35RPA-2 - Rear Hall A		CC	24/24 Surface	115/277		
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>Settings</b>	<b>Timeout</b>	<b>Schedule</b>	<b>References</b>	

1	35H2AA-13	EXHIBIT HALL REAR GROUP M +0 NE				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr><td>105</td><td>Exhibit Hall A - 75.0%</td></tr> <tr><td>106</td><td>Exhibit Hall A - 87.5%</td></tr> <tr><td>107</td><td>Exhibit Hall A - 100.0%</td></tr> <tr><td>115</td><td>Exhibit Hall A 17' Ceiling 100% Rear</td></tr> <tr><td>116</td><td>Exhibit Hall A 17' Ceiling 50% Rear</td></tr> <tr><td>117</td><td>Exhibit Hall A 17' Ceiling 25% Rear</td></tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr><td>101-16</td><td>Master   A Hall Step 4 (Rear 17')</td></tr> </tbody> </table>	Phone Codes		105	Exhibit Hall A - 75.0%	106	Exhibit Hall A - 87.5%	107	Exhibit Hall A - 100.0%	115	Exhibit Hall A 17' Ceiling 100% Rear	116	Exhibit Hall A 17' Ceiling 50% Rear	117	Exhibit Hall A 17' Ceiling 25% Rear	Switch Codes		101-16	Master   A Hall Step 4 (Rear 17')
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2	35H2AA-11	EXHIBIT HALL REAR GROUP N +0 NE				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr><td>103</td><td>Exhibit Hall A - 50%</td></tr> <tr><td>105</td><td>Exhibit Hall A - 75.0%</td></tr> <tr><td>106</td><td>Exhibit Hall A - 87.5%</td></tr> <tr><td>107</td><td>Exhibit Hall A - 100.0%</td></tr> <tr><td>115</td><td>Exhibit Hall A 17' Ceiling 100% Rear</td></tr> <tr><td>118</td><td>Exhibit Hall A 17' Ceiling 12.5% Rear</td></tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr><td>101-14</td><td>Master   A Hall Step 2 (Rear 17')</td></tr> </tbody> </table>	Phone Codes		103	Exhibit Hall A - 50%	105	Exhibit Hall A - 75.0%	106	Exhibit Hall A - 87.5%	107	Exhibit Hall A - 100.0%	115	Exhibit Hall A 17' Ceiling 100% Rear	118	Exhibit Hall A 17' Ceiling 12.5% Rear	Switch Codes		101-14	Master   A Hall Step 2 (Rear 17')
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4	35H2A-35	EXHIBIT HALL REAR GROUP Q +0 NE	Blink	02:00		<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr><td>105</td><td>Exhibit Hall A - 75.0%</td></tr> <tr><td>106</td><td>Exhibit Hall A - 87.5%</td></tr> <tr><td>107</td><td>Exhibit Hall A - 100.0%</td></tr> <tr><td>115</td><td>Exhibit Hall A 17' Ceiling 100% Rear</td></tr> <tr><td>116</td><td>Exhibit Hall A 17' Ceiling 50% Rear</td></tr> <tr><td>117</td><td>Exhibit Hall A 17' Ceiling 25% Rear</td></tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr><td>101-15</td><td>Master   A Hall Step 3 (Rear 17')</td></tr> </tbody> </table>	Phone Codes		105	Exhibit Hall A - 75.0%	106	Exhibit Hall A - 87.5%	107	Exhibit Hall A - 100.0%	115	Exhibit Hall A 17' Ceiling 100% Rear	116	Exhibit Hall A 17' Ceiling 50% Rear	117	Exhibit Hall A 17' Ceiling 25% Rear	Switch Codes		101-15	Master   A Hall Step 3 (Rear 17')
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5	35EH2A-9	LOADING DOCK LIGHTING (EMERG) NE +0	Blink		1 Sunset - Sunrise	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr><td>30</td><td>Loading Dock - All</td></tr> <tr><td>31</td><td>Loading Dock - Hall A</td></tr> <tr><td>42</td><td>Partial Dock Lighting</td></tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr><td>130-1</td><td>Master   Dock A (Partial)</td></tr> </tbody> </table>	Phone Codes		30	Loading Dock - All	31	Loading Dock - Hall A	42	Partial Dock Lighting	Switch Codes		130-1	Master   Dock A (Partial)						
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10	35H2AA-4	LOADING DOCK LIGHTING NE +0	Blink		1	Sunset - Sunrise	130-2  Master Dock A
						<b>Phone Codes</b>	
						30	Loading Dock - All
						31	Loading Dock - Hall A
						<b>Switch Codes</b>	
11	35H2AA-6	WATER HEATER			5	Water Heaters	130-2  Master Dock A
						<b>Phone Codes</b>	
						2599	Water Heaters / Schedule ALL
						9010	Exhibit Hall F - Water Heater (Back of Hall)
						<b>Switch Codes</b>	
12	35H2AA-14	ELECTRICAL ROOM +25 NE					116-13  Master Water Heaters - F Hall
						<b>Phone Codes</b>	
						80	ELECTRICAL&MECHANICAL ROOMS
						<b>Switch Codes</b>	
13		SPARE					135-2  Master Elec/Mech Rms - N +25
14	35H2AA-16	MECHANICAL RM +35 NE	Blink	02:00			
						<b>Phone Codes</b>	
						80	ELECTRICAL&MECHANICAL ROOMS
						<b>Switch Codes</b>	
15	35H2AA-18	MECHANICAL RM +35 NE	Blink	02:00			135-3  Master Elec/Mech Rms - N +35
						<b>Phone Codes</b>	
						80	ELECTRICAL&MECHANICAL ROOMS
						<b>Switch Codes</b>	
16	35H2AA-12	Storage/Exit Lighting +0 NE	Blink	02:00			135-3  Master Elec/Mech Rms - N +35
						<b>Phone Codes</b>	
						9040	Exhibit Hall A - Storage Ltq + 0 NE
						<b>Switch Codes</b>	
17		SPACE					122-6  Master Storage/Exit Ltq 0 NE
18		SPACE					
19		SPACE					
20		SPACE					
21		SPACE					
22		SPACE					
23		SPACE					
24		SPACE					
<b>Panel ID</b>	<b>Description</b>	<b>Location</b>	<b>Type</b>	<b>Interior / Enclosure</b>	<b>Power Supply</b>	<b>Circuit</b>	
204	LCP-35RPBA - Reg. A	M-1 NW	CC	48/48 Surface	115/277		
<b>Relay</b>	<b>Circuit</b>	<b>Description</b>	<b>Settings</b>	<b>Timeout</b>	<b>Schedule</b>	<b>References</b>	
1	35H2BA-1	WATER HEATER LEVEL +25	Blink		5	Water Heaters	
						<b>Phone Codes</b>	
						2599	Water Heaters / Schedule ALL
						9050	Exhibit Hall A - Water Heater Lvl + 25
						<b>Switch Codes</b>	
2	35H2BA-3	WATER HEATER LEVEL +0	Blink		5	Water Heaters	123-10  Master Water Heater - Reg. A
						<b>Phone Codes</b>	
						2599	Water Heaters / Schedule ALL
						9060	Exhibit Hall A - Water Heater Lvl + 0

3	35L2BC-2	LIGHTING ABOVE ESCALATOR NW			14 3rd Level public lights on	<table border="1"> <thead> <tr> <th colspan="2">Switch Codes</th> </tr> </thead> <tbody> <tr> <td>122-7</td> <td>Master Water Heaters - A Hall</td> </tr> <tr> <th colspan="2">Phone Codes</th> </tr> <tr> <td>84</td> <td>Registration ALL + A, B, C ,D &amp; E 100%</td> </tr> <tr> <td>85</td> <td>Registration A + 25 100%</td> </tr> <tr> <td>849</td> <td>Lights under Escalators A</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>123-1</td> <td>Master Registration A</td> </tr> <tr> <td>123-4</td> <td>Master Lights under Escalators A</td> </tr> <tr> <th colspan="2">Phone Codes</th> </tr> <tr> <td>84</td> <td>Registration ALL + A, B, C ,D &amp; E 100%</td> </tr> <tr> <td>85</td> <td>Registration A + 25 100%</td> </tr> <tr> <td>849</td> <td>Lights under Escalators A</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>123-1</td> <td>Master Registration A</td> </tr> <tr> <td>123-4</td> <td>Master Lights under Escalators A</td> </tr> </tbody> </table>	Switch Codes		122-7	Master Water Heaters - A Hall	Phone Codes		84	Registration ALL + A, B, C ,D & E 100%	85	Registration A + 25 100%	849	Lights under Escalators A	Switch Codes		123-1	Master Registration A	123-4	Master Lights under Escalators A	Phone Codes		84	Registration ALL + A, B, C ,D & E 100%	85	Registration A + 25 100%	849	Lights under Escalators A	Switch Codes		123-1	Master Registration A	123-4	Master Lights under Escalators A
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17	35H2BA-24	LIGHTING Senior Games 2.5 offices	Blink		8 24Hour special		Phone Codes			--------------	--		9098	Exhibit Hall A - Ltq GILBANE OFFICE		Switch Codes			122-3	Master NW Offices (Gilbane)		Phone Codes			84	Registration ALL + A, B, C ,D & E 100%		85	Registration A + 25 100%		9099	Exhibit Hall A - Ltq Lvl + 25 Low Ceiling		Switch Codes			123-3	Master Reg. A Low Ceiling Lights		Phone Codes			9085	Exhibit Hall A - Ltq Lvl + 25 Office NW		Switch Codes			123-2	Master Office Lighting Reg. A		Phone Codes			9085	Exhibit Hall A - Ltq Lvl + 25 Office NW		Switch Codes			123-2	Master Office Lighting Reg. A		Phone Codes			9085	Exhibit Hall A - Ltq Lvl + 25 Office NW		Switch Codes			123-7	Master Storage/Shell Reg. A		Phone Codes			9086	Exhibit Hall A - Ltq Lvl + 25 Restrms NW		Switch Codes			123-6	Master Restroom Ltq - Reg. A		Phone Codes			2599	Water Heaters / Schedule ALL		9087	Exhibit Hall A - Water Heater Ticket Booth		Switch Codes			122-7	Master Water Heaters - A Hall	
18	35H2BA-9	LIGHTING LEVEL +25 LOW CEILING	Blink				Phone Codes			--------------	--		84	Registration ALL + A, B, C ,D & E 100%		85	Registration A + 25 100%		9099	Exhibit Hall A - Ltq Lvl + 25 Low Ceiling		Switch Codes			123-3	Master Reg. A Low Ceiling Lights		Phone Codes			9085	Exhibit Hall A - Ltq Lvl + 25 Office NW		Switch Codes			123-2	Master Office Lighting Reg. A		Phone Codes			9085	Exhibit Hall A - Ltq Lvl + 25 Office NW		Switch Codes			123-2	Master Office Lighting Reg. A		Phone Codes			9085	Exhibit Hall A - Ltq Lvl + 25 Office NW		Switch Codes			123-7	Master Storage/Shell Reg. A		Phone Codes			9086	Exhibit Hall A - Ltq Lvl + 25 Restrms NW		Switch Codes			123-6	Master Restroom Ltq - Reg. A		Phone Codes			2599	Water Heaters / Schedule ALL		9087	Exhibit Hall A - Water Heater Ticket Booth		Switch Codes			122-7	Master Water Heaters - A Hall													
19	35H2BA-18	LIGHTING LEVEL +25 OFFICE NW	Blink				Phone Codes			--------------	--		9085	Exhibit Hall A - Ltq Lvl + 25 Office NW		Switch Codes			123-2	Master Office Lighting Reg. A		Phone Codes			9085	Exhibit Hall A - Ltq Lvl + 25 Office NW		Switch Codes			123-2	Master Office Lighting Reg. A		Phone Codes			9085	Exhibit Hall A - Ltq Lvl + 25 Office NW		Switch Codes			123-7	Master Storage/Shell Reg. A		Phone Codes			9086	Exhibit Hall A - Ltq Lvl + 25 Restrms NW		Switch Codes			123-6	Master Restroom Ltq - Reg. A		Phone Codes			2599	Water Heaters / Schedule ALL		9087	Exhibit Hall A - Water Heater Ticket Booth		Switch Codes			122-7	Master Water Heaters - A Hall																															
20	35H2BA-20	LIGHTING LEVEL +25 OFFICE NW	Blink				Phone Codes			--------------	--		9085	Exhibit Hall A - Ltq Lvl + 25 Office NW		Switch Codes			123-2	Master Office Lighting Reg. A		Phone Codes			9085	Exhibit Hall A - Ltq Lvl + 25 Office NW		Switch Codes			123-2	Master Office Lighting Reg. A		Phone Codes			9085	Exhibit Hall A - Ltq Lvl + 25 Office NW		Switch Codes			123-7	Master Storage/Shell Reg. A		Phone Codes			9086	Exhibit Hall A - Ltq Lvl + 25 Restrms NW		Switch Codes			123-6	Master Restroom Ltq - Reg. A		Phone Codes			2599	Water Heaters / Schedule ALL		9087	Exhibit Hall A - Water Heater Ticket Booth		Switch Codes			122-7	Master Water Heaters - A Hall																															
21	35H2BA-22	LIGHTING LEVEL +25 OFFICE NW	Blink				Phone Codes			--------------	--		9085	Exhibit Hall A - Ltq Lvl + 25 Office NW		Switch Codes			123-2	Master Office Lighting Reg. A		Phone Codes			9085	Exhibit Hall A - Ltq Lvl + 25 Office NW		Switch Codes			123-7	Master Storage/Shell Reg. A		Phone Codes			9086	Exhibit Hall A - Ltq Lvl + 25 Restrms NW		Switch Codes			123-6	Master Restroom Ltq - Reg. A		Phone Codes			2599	Water Heaters / Schedule ALL		9087	Exhibit Hall A - Water Heater Ticket Booth		Switch Codes			122-7	Master Water Heaters - A Hall																																											
22	35H2BA-16	LIGHTING LEVEL +25 RESTROOMS/HK- Warehouse NW	Blink				Phone Codes			--------------	--		9086	Exhibit Hall A - Ltq Lvl + 25 Restrms NW		Switch Codes			123-6	Master Restroom Ltq - Reg. A		Phone Codes			2599	Water Heaters / Schedule ALL		9087	Exhibit Hall A - Water Heater Ticket Booth		Switch Codes			122-7	Master Water Heaters - A Hall																																																																			
23	35H2BA-23	WATER HEATER TICKET BOOTH	Blink		5 Water Heaters		Phone Codes			--------------	--		2599	Water Heaters / Schedule ALL		9087	Exhibit Hall A - Water Heater Ticket Booth		Switch Codes			122-7	Master Water Heaters - A Hall																																																																															
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35	SPACE								
36	SPACE								
Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit			
205	LCP-35RPB - Front Hall A	M-1 NW BY AHU	CC	48/48 Surface	115/277				
Rly	Circuit	Description	Settings	Timeout	Schedule	References			
1	35H2B-1	EXHIBIT HALL (STAGE) GROUP A +0 NW							
<b>Phone Codes</b>									
101		Exhibit Hall A - 25.0%							
103		Exhibit Hall A - 50%							
105		Exhibit Hall A - 75.0%							
107		Exhibit Hall A - 100.0%							
<b>Switch Codes</b>									
102-10	Master	A Hall Step 2 - South Stage							
103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)							
2	35H2B-3	EXHIBIT HALL (STAGE) GROUP B +0 NW							
<b>Phone Codes</b>									
102		Exhibit Hall A - 38% Work Lights							
103		Exhibit Hall A - 50%							
105		Exhibit Hall A - 75.0%							
107		Exhibit Hall A - 100.0%							
<b>Switch Codes</b>									
102-11	Master	A Hall Step 3 - South Stage							
103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)							
3	35EH2B-2	EXHIBIT HALL (STAGE- EMERG) GROUP C +0 NW							
<b>Phone Codes</b>									
100		Exhibit Hall A - 12.5%							
101		Exhibit Hall A - 25.0%							
102		Exhibit Hall A - 38% Work Lights							
103		Exhibit Hall A - 50%							
105		Exhibit Hall A - 75.0%							
107		Exhibit Hall A - 100.0%							
<b>Switch Codes</b>									
102-9	Master	A Hall Step 1 - South Stage							
103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)							
4	35H2B-5	EXHIBIT HALL (STAGE) GROUP D +0 NW							
<b>Phone Codes</b>									
103		Exhibit Hall A - 50%							
105		Exhibit Hall A - 75.0%							
106		Exhibit Hall A - 87.5%							
107		Exhibit Hall A - 100.0%							
<b>Switch Codes</b>									
102-12	Master	A Hall Step 4 - South Stage							
103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)							
5	35H2B-2	EXHIBIT HALL (STAGE) GROUP E +0 NW							
<b>Phone Codes</b>									
105		Exhibit Hall A - 75.0%							
106		Exhibit Hall A - 87.5%							
107		Exhibit Hall A - 100.0%							
<b>Switch Codes</b>									
102-13	Master	A Hall Step 5 - South Stage							

6	35H2B-4	EXHIBIT HALL (STAGE) GROUP F +0 NW				103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)						
						<b>Phone Codes</b>								
						105		Exhibit Hall A - 75.0%						
						106		Exhibit Hall A - 87.5%						
						107		Exhibit Hall A - 100.0%						
						<b>Switch Codes</b>								
						102-14	Master	A Hall Step 6 - South Stage						
						103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)						
						<b>Phone Codes</b>								
						<b>Switch Codes</b>								
7	35H2B-6	EXHIBIT HALL (STAGE) GROUP G +0 NEW				<b>Phone Codes</b>								
						106		Exhibit Hall A - 87.5%						
						107		Exhibit Hall A - 100.0%						
						<b>Switch Codes</b>								
						102-15	Master	A Hall Step 7 - South Stage						
						103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)						
						<b>Phone Codes</b>								
						<b>Switch Codes</b>								
						8	35H2B-7	EXHIBIT HALL (STAGE) GROUP H +0 NW				<b>Phone Codes</b>		
												107		Exhibit Hall A - 100.0%
<b>Switch Codes</b>														
102-16	Master	A Hall Step 8 - South Stage												
103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)												
<b>Phone Codes</b>														
<b>Switch Codes</b>														
9	35H2B-9	EXHIBIT HALL GROUP A +0 NW										<b>Phone Codes</b>		
												101		Exhibit Hall A - 25.0%
												102		Exhibit Hall A - 38% Work Lights
						103		Exhibit Hall A - 50%						
						105		Exhibit Hall A - 75.0%						
						107		Exhibit Hall A - 100.0%						
						<b>Switch Codes</b>								
						101-2	Master	A Hall Step 2 (35')						
						103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)						
						10	35H2B-11	EXHIBIT HALL GROUP B +0 NW				<b>Phone Codes</b>		
102		Exhibit Hall A - 38% Work Lights												
103		Exhibit Hall A - 50%												
105		Exhibit Hall A - 75.0%												
107		Exhibit Hall A - 100.0%												
<b>Switch Codes</b>														
101-3	Master	A Hall Step 3 (35')												
103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)												
11	35EH2B-4	EXHIBIT HALL (EMERG) GROUP C +0 NW										<b>Phone Codes</b>		
												100		Exhibit Hall A - 12.5%
						101		Exhibit Hall A - 25.0%						
						102		Exhibit Hall A - 38% Work Lights						
						103		Exhibit Hall A - 50%						
						105		Exhibit Hall A - 75.0%						
						107		Exhibit Hall A - 100.0%						
						<b>Switch Codes</b>								
						101-1	Master	A Hall Step 1 (35')						
						103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)						
12	35H2B-13	EXHIBIT HALL GROUP D +0 NW				<b>Phone Codes</b>								
						103		Exhibit Hall A - 50%						
						105		Exhibit Hall A - 75.0%						
						106		Exhibit Hall A - 87.5%						
						107		Exhibit Hall A - 100.0%						
						<b>Switch Codes</b>								
						101-4	Master	A Hall Step 4 (35')						

13	35H2B-8	EXHIBIT HALL GROUP E +0 NW				103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
						<b>Phone Codes</b>		
						105		Exhibit Hall A - 75.0%
						106		Exhibit Hall A - 87.5%
						107		Exhibit Hall A - 100.0%
						<b>Switch Codes</b>		
						101-5	Master	A Hall Step 5 (35')
						103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
						<b>Phone Codes</b>		
						105		Exhibit Hall A - 75.0%
106		Exhibit Hall A - 87.5%						
107		Exhibit Hall A - 100.0%						
<b>Switch Codes</b>								
101-6	Master	A Hall Step 6 (35')						
103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)						
14	35H2B-10	EXHIBIT HALL GROUP F +0 NW				103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
						<b>Phone Codes</b>		
						105		Exhibit Hall A - 75.0%
						106		Exhibit Hall A - 87.5%
						107		Exhibit Hall A - 100.0%
						<b>Switch Codes</b>		
						101-6	Master	A Hall Step 6 (35')
						103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
						<b>Phone Codes</b>		
						106		Exhibit Hall A - 87.5%
107		Exhibit Hall A - 100.0%						
<b>Switch Codes</b>								
101-7	Master	A Hall Step 7 (35')						
103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)						
15	35H2B-12	EXHIBIT HALL GROUP G +0 NW				103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
						<b>Phone Codes</b>		
						106		Exhibit Hall A - 87.5%
						107		Exhibit Hall A - 100.0%
						<b>Switch Codes</b>		
						101-7	Master	A Hall Step 7 (35')
						103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
						<b>Phone Codes</b>		
						107		Exhibit Hall A - 100.0%
						<b>Switch Codes</b>		
101-8	Master	A Hall Step 8 (35')						
103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)						
16	35H2B-15	EXHIBIT HALL GROUP H +0 NW				103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
						<b>Phone Codes</b>		
						107		Exhibit Hall A - 100.0%
						<b>Switch Codes</b>		
						101-8	Master	A Hall Step 8 (35')
						103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
						<b>Phone Codes</b>		
						101		Exhibit Hall A - 25.0%
						102		Exhibit Hall A - 38% Work Lights
						103		Exhibit Hall A - 50%
105		Exhibit Hall A - 75.0%						
107		Exhibit Hall A - 100.0%						
<b>Switch Codes</b>								
101-2	Master	A Hall Step 2 (35')						
103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)						
17	35H2B-17	EXHIBIT HALL GROUP A +0 NW				103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
						<b>Phone Codes</b>		
						102		Exhibit Hall A - 38% Work Lights
						103		Exhibit Hall A - 50%
						105		Exhibit Hall A - 75.0%
						107		Exhibit Hall A - 100.0%
						<b>Switch Codes</b>		
						101-3	Master	A Hall Step 3 (35')
						103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
						<b>Phone Codes</b>		
102		Exhibit Hall A - 38% Work Lights						
103		Exhibit Hall A - 50%						
105		Exhibit Hall A - 75.0%						
107		Exhibit Hall A - 100.0%						
<b>Switch Codes</b>								
101-3	Master	A Hall Step 3 (35')						
103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)						
18	35H2B-19	EXHIBIT HALL GROUP B +0 NW				103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
						<b>Phone Codes</b>		
						102		Exhibit Hall A - 38% Work Lights
						103		Exhibit Hall A - 50%
						105		Exhibit Hall A - 75.0%
						107		Exhibit Hall A - 100.0%
						<b>Switch Codes</b>		
						101-3	Master	A Hall Step 3 (35')
						103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
						<b>Phone Codes</b>		
100		Exhibit Hall A - 12.5%						
101		Exhibit Hall A - 25.0%						
102		Exhibit Hall A - 38% Work Lights						
103		Exhibit Hall A - 50%						
105		Exhibit Hall A - 75.0%						
107		Exhibit Hall A - 100.0%						
<b>Switch Codes</b>								
101-1	Master	A Hall Step 1 (35')						
19	35EH2B-6	EXHIBIT HALL (EMERG) GROUP C +0 NW				103-9	Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
						<b>Phone Codes</b>		
						100		Exhibit Hall A - 12.5%
						101		Exhibit Hall A - 25.0%
						102		Exhibit Hall A - 38% Work Lights
						103		Exhibit Hall A - 50%
						105		Exhibit Hall A - 75.0%
						107		Exhibit Hall A - 100.0%
						<b>Switch Codes</b>		
						101-1	Master	A Hall Step 1 (35')

20	35H2B-14	EXHIBIT HALL GROUP D +0 NW				103-9 Master Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)
<b>Phone Codes</b>						
	103	Exhibit Hall A - 50%				
	105	Exhibit Hall A - 75.0%				
	106	Exhibit Hall A - 87.5%				
	107	Exhibit Hall A - 100.0%				
<b>Switch Codes</b>						
	101-4 Master	A Hall Step 4 (35')				
	103-9 Master	Encore Championship 2019 Lighting Sector Hall A (CC-17 Marci)				
21	35H2B-16	EXHIBIT HALL GROUP E +0 NW				
<b>Phone Codes</b>						
	105	Exhibit Hall A - 75.0%				
	106	Exhibit Hall A - 87.5%				
	107	Exhibit Hall A - 100.0%				
<b>Switch Codes</b>						
	101-5 Master	A Hall Step 5 (35')				
22	35H2B-18	EXHIBIT HALL GROUP F +0 NW				
<b>Phone Codes</b>						
	105	Exhibit Hall A - 75.0%				
	106	Exhibit Hall A - 87.5%				
	107	Exhibit Hall A - 100.0%				
<b>Switch Codes</b>						
	101-6 Master	A Hall Step 6 (35')				
23	35H2B-21	EXHIBIT HALL GROUP G +0 NW				
<b>Phone Codes</b>						
	106	Exhibit Hall A - 87.5%				
	107	Exhibit Hall A - 100.0%				
<b>Switch Codes</b>						
	101-7 Master	A Hall Step 7 (35')				
24	35H2B-23	EXHIBIT HALL GROUP H +0 NW				
<b>Phone Codes</b>						
	107	Exhibit Hall A - 100.0%				
<b>Switch Codes</b>						
	101-8 Master	A Hall Step 8 (35')				
25	35H2B-20	EXHIBIT HALL FRONT GROUP W +0 NW				
<b>Phone Codes</b>						
	103	Exhibit Hall A - 50%				
	105	Exhibit Hall A - 75.0%				
	106	Exhibit Hall A - 87.5%				
	107	Exhibit Hall A - 100.0%				
	112	Exhibit Hall A 17' Ceiling 50% Front				
	113	Exhibit Hall A 17' Ceiling 100% Front				
<b>Switch Codes</b>						
	101-9 Master	A Hall Step 1 (Front 17')				
26	35H2B-22	EXHIBIT HALL FRONT GROUP X +0 NW				
<b>Phone Codes</b>						
	105	Exhibit Hall A - 75.0%				
	106	Exhibit Hall A - 87.5%				
	107	Exhibit Hall A - 100.0%				
	111	Exhibit Hall A 17' Ceiling 25% Front				
	113	Exhibit Hall A 17' Ceiling 100% Front				
<b>Switch Codes</b>						
	101-11 Master	A Hall Step 3 (Front 17')				
27	35H2B-24	EXHIBIT HALL FRONT GROUP Y +0 NW				
<b>Phone Codes</b>						
	105	Exhibit Hall A - 75.0%				
	106	Exhibit Hall A - 87.5%				
	107	Exhibit Hall A - 100.0%				
	112	Exhibit Hall A 17' Ceiling 50% Front				
	113	Exhibit Hall A 17' Ceiling 100% Front				
<b>Switch Codes</b>						
	101-12 Master	A Hall Step 4 (Front 17')				
28	35H2B-25	EXHIBIT HALL FRONT GROUP Z +0 NW				
<b>Phone Codes</b>						

						103	Exhibit Hall A - 50%
						105	Exhibit Hall A - 75.0%
						106	Exhibit Hall A - 87.5%
						107	Exhibit Hall A - 100.0%
						111	Exhibit Hall A 17' Ceiling 25% Front
						113	Exhibit Hall A 17' Ceiling 100% Front
						<b>Switch Codes</b>	
					101-10	Master	A Hall Step 2 (Front 17')
						<b>Phone Codes</b>	
						103	Exhibit Hall A - 50%
						105	Exhibit Hall A - 75.0%
						106	Exhibit Hall A - 87.5%
						107	Exhibit Hall A - 100.0%
						112	Exhibit Hall A 17' Ceiling 50% Front
						113	Exhibit Hall A 17' Ceiling 100% Front
						<b>Switch Codes</b>	
					101-9	Master	A Hall Step 1 (Front 17')
						<b>Phone Codes</b>	
						105	Exhibit Hall A - 75.0%
						106	Exhibit Hall A - 87.5%
						107	Exhibit Hall A - 100.0%
						110	Exhibit Hall A 17' Ceiling 12.5% Front
						113	Exhibit Hall A 17' Ceiling 100% Front
						<b>Switch Codes</b>	
					101-11	Master	A Hall Step 3 (Front 17')
						<b>Phone Codes</b>	
						103	Exhibit Hall A - 50%
						105	Exhibit Hall A - 75.0%
						106	Exhibit Hall A - 87.5%
						107	Exhibit Hall A - 100.0%
						112	Exhibit Hall A 17' Ceiling 50% Front
						113	Exhibit Hall A 17' Ceiling 100% Front
						<b>Switch Codes</b>	
					101-12	Master	A Hall Step 4 (Front 17')
						<b>Phone Codes</b>	
						103	Exhibit Hall A - 50%
						105	Exhibit Hall A - 75.0%
						106	Exhibit Hall A - 87.5%
						107	Exhibit Hall A - 100.0%
						110	Exhibit Hall A 17' Ceiling 12.5% Front
						111	Exhibit Hall A 17' Ceiling 25% Front
						113	Exhibit Hall A 17' Ceiling 100% Front
						<b>Switch Codes</b>	
					101-10	Master	A Hall Step 2 (Front 17')
						<b>Phone Codes</b>	
						102	Exhibit Hall A - 38% Work Lights
						103	Exhibit Hall A - 50%
						105	Exhibit Hall A - 75.0%
						107	Exhibit Hall A - 100.0%
						112	Exhibit Hall A 17' Ceiling 50% Front
						113	Exhibit Hall A 17' Ceiling 100% Front
						513	Exhibit Hall E 17' Ceiling 100% Front
						<b>Switch Codes</b>	
					101-9	Master	A Hall Step 1 (Front 17')
						<b>Phone Codes</b>	
						103	Exhibit Hall A - 50%
						105	Exhibit Hall A - 75.0%
						106	Exhibit Hall A - 87.5%
						107	Exhibit Hall A - 100.0%
						113	Exhibit Hall A 17' Ceiling 100% Front
						<b>Switch Codes</b>	
29	35EH2B-12	EXHIBIT HALL (FRONT-EMERG) GROUP W+0 NW					
30	35H2B-29	EXHIBIT HALL FRONT GROUP X +0 NW					
31	35H2BB-1	EXHIBIT HALL FRONT GROUP Y +0 NW					
32	35H2B-27	EXHIBIT HALL FRONT GROUP Z +0 NW					
33	35EH2B-8	EXHIBIT HALL (EMERG) FRONT +0 NW					
34	35H2B-26	EXHIBIT HALL FRONT GROUP W +0 NW					

35	35H2B-28	EXHIBIT HALL FRONT GROUP X +0 NW				101-9 Master A Hall Step 1 (Front 17')
						<b>Phone Codes</b>
						105 Exhibit Hall A - 75.0%
						106 Exhibit Hall A - 87.5%
						107 Exhibit Hall A - 100.0%
						112 Exhibit Hall A 17' Ceiling 50% Front
						113 Exhibit Hall A 17' Ceiling 100% Front
						<b>Switch Codes</b>
36	35H2B-30	EXHIBIT HALL FRONT GROUP Y +0 NW				101-11 Master A Hall Step 3 (Front 17')
						<b>Phone Codes</b>
						105 Exhibit Hall A - 75.0%
						106 Exhibit Hall A - 87.5%
						107 Exhibit Hall A - 100.0%
						111 Exhibit Hall A 17' Ceiling 25% Front
						113 Exhibit Hall A 17' Ceiling 100% Front
						<b>Switch Codes</b>
37	35H2B-31	EXHIBIT HALL FRONT GROUP Z +0 NW				101-12 Master A Hall Step 4 (Front 17')
						<b>Phone Codes</b>
						103 Exhibit Hall A - 50%
						105 Exhibit Hall A - 75.0%
						106 Exhibit Hall A - 87.5%
						107 Exhibit Hall A - 100.0%
						112 Exhibit Hall A 17' Ceiling 50% Front
						113 Exhibit Hall A 17' Ceiling 100% Front
						<b>Switch Codes</b>
38	35H2B-33	ENTRANCE +0 NW			7 Truss Lights (morning)	101-10 Master A Hall Step 2 (Front 17')
						<b>Phone Codes</b>
						54 Lobby A - Foyer
						9090 Exhibit Hall A - Entrance + 0 NW
						<b>Switch Codes</b>
39	35EH2B-10	ENTRANCE (EMERG) +0 NW	Blink			103-14 Master Lobby A
						<b>Phone Codes</b>
						54 Lobby A - Foyer
						9090 Exhibit Hall A - Entrance + 0 NW
						<b>Switch Codes</b>
40	35H2B-35	ENTRANCE +0 NW	Blink			103-14 Master Lobby A
						<b>Phone Codes</b>
						102 Exhibit Hall A - 38% Work Lights
						103 Exhibit Hall A - 50%
						105 Exhibit Hall A - 75.0%
						107 Exhibit Hall A - 100.0%
						<b>Switch Codes</b>
41	35H2B-32	ENTRANCE +0 NW	Blink			103-12 Master A Hall North Exit Lights - Partial
						<b>Phone Codes</b>
						105 Exhibit Hall A - 75.0%
						106 Exhibit Hall A - 87.5%
						107 Exhibit Hall A - 100.0%
						<b>Switch Codes</b>
42	35H2B-34	ENTRANCE +0 NW	Blink			103-13 Master A Hall North Exit Lights - Main
						<b>Phone Codes</b>
						105 Exhibit Hall A - 75.0%
						106 Exhibit Hall A - 87.5%
						107 Exhibit Hall A - 100.0%
						<b>Switch Codes</b>
43	35H2B-36	RESTROOM LIGHTING ) NW	Blink			103-13 Master A Hall North Exit Lights - Main
						<b>Phone Codes</b>
						15 Restrooms - ALL
						9091 Exhibit Hall A - Restrm Ltg NW

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit																																																								
44	35H2B-41	WATER HEATER +51	Blink		5 Water Heaters																																																									
<table border="1"> <thead> <tr> <th colspan="2">Switch Codes</th> </tr> </thead> <tbody> <tr> <td>122-4</td> <td>Master Restrooms - A Hall Front</td> </tr> <tr> <th colspan="2">Phone Codes</th> </tr> <tr> <td>2599</td> <td>Water Heaters / Schedule ALL</td> </tr> <tr> <td>9092</td> <td>Exhibit Hall A - Water Heater + 51</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>116-13</td> <td>Master Water Heaters - F Hall</td> </tr> <tr> <th colspan="2">Phone Codes</th> </tr> <tr> <td>150</td> <td>Canopy All</td> </tr> <tr> <td>151</td> <td>Canopy A</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>103-15</td> <td>Master Canopy A</td> </tr> <tr> <th colspan="2">Phone Codes</th> </tr> <tr> <td>150</td> <td>Canopy All</td> </tr> <tr> <td>151</td> <td>Canopy A</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>103-15</td> <td>Master Canopy A</td> </tr> </tbody> </table>							Switch Codes		122-4	Master Restrooms - A Hall Front	Phone Codes		2599	Water Heaters / Schedule ALL	9092	Exhibit Hall A - Water Heater + 51	Switch Codes		116-13	Master Water Heaters - F Hall	Phone Codes		150	Canopy All	151	Canopy A	Switch Codes		103-15	Master Canopy A	Phone Codes		150	Canopy All	151	Canopy A	Switch Codes		103-15	Master Canopy A																						
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103-15	Master Canopy A																																																													
45	35H2BB-5	CANOPY LIGHTING +0 NW			1 Sunset - Sunrise																																																									
46	35H2BB-2	CANOPY LIGHTING +0 NW			9 Sunrise off only																																																									
47	35H2BB-3	ENTRANCE LIGHTING +0 NW	Blink																																																											
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48	35H2BB-4	SIGN LIGHTING +0 NW			10 Sunset on - Midnight off																																																									
206	LCP-83RPB - Front Hall A3		CC	48/48 Surface	115/277																																																									
Rly	Circuit	Description	Settings	Timeout	Schedule	References																																																								
1	83H2B-1	EXHIBIT HALL (STAGE) GROUP A +51 NW																																																												
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2	83H2B-3	EXHIBIT HALL (STAGE) GROUP B +51 NW																																																												
3	83EH2B-1	EXHIBIT HALL (STAGE- EMERG) GROUP C +51 NW																																																												

						607	Exhibit Hall F - 12.5%
						<b>Switch Codes</b>	
					117-9	Master	F Hall Step 1 - South Stage
					118-10	Master	Allegis 2018 (2nd sector for show)
						<b>Phone Codes</b>	
					600	Exhibit Hall F - 100%	
					601	Exhibit Hall F - 87.5%	
					602	Exhibit Hall F - 75%	
					603	Exhibit Hall F - 62.5%	
					604	Exhibit Hall F - 50.0%	
						<b>Switch Codes</b>	
					117-12	Master	F Hall Step 4 - South Stage
					118-10	Master	Allegis 2018 (2nd sector for show)
						<b>Phone Codes</b>	
					600	Exhibit Hall F - 100%	
					601	Exhibit Hall F - 87.5%	
					602	Exhibit Hall F - 75%	
						<b>Switch Codes</b>	
					117-13	Master	F Hall Step 5 - South Stage
					118-10	Master	Allegis 2018 (2nd sector for show)
						<b>Phone Codes</b>	
					600	Exhibit Hall F - 100%	
					601	Exhibit Hall F - 87.5%	
					602	Exhibit Hall F - 75%	
					603	Exhibit Hall F - 62.5%	
						<b>Switch Codes</b>	
					117-14	Master	F Hall Step 6 - South Stage
					118-10	Master	Allegis 2018 (2nd sector for show)
						<b>Phone Codes</b>	
					600	Exhibit Hall F - 100%	
					601	Exhibit Hall F - 87.5%	
						<b>Switch Codes</b>	
					117-15	Master	F Hall Step 7 - South Stage
					118-10	Master	Allegis 2018 (2nd sector for show)
						<b>Phone Codes</b>	
					600	Exhibit Hall F - 100%	
						<b>Switch Codes</b>	
					117-16	Master	F Hall Step 8 - South Stage
					118-10	Master	Allegis 2018 (2nd sector for show)
						<b>Phone Codes</b>	
					600	Exhibit Hall F - 100%	
					601	Exhibit Hall F - 87.5%	
					602	Exhibit Hall F - 75%	
					603	Exhibit Hall F - 62.5%	
					604	Exhibit Hall F - 50.0%	
					605	Exhibit Hall F - 38% Work Lights	
					606	Exhibit Hall F - 25.0%	
						<b>Switch Codes</b>	
					116-2	Master	F Hall Step 2 (Main)
						<b>Phone Codes</b>	
					600	Exhibit Hall F - 100%	
					601	Exhibit Hall F - 87.5%	
					602	Exhibit Hall F - 75%	
					603	Exhibit Hall F - 62.5%	
					604	Exhibit Hall F - 50.0%	
					605	Exhibit Hall F - 38% Work Lights	
						<b>Switch Codes</b>	
					116-3	Master	F Hall Step 3 (Main)
						<b>Phone Codes</b>	
4	83H2B-5	EXHIBIT HALL (STAGE) GROUP D +51 NW					
5	83H2B-2	EXHIBIT HALL (STAGE) GROUP E +51 NW					
6	83H2B-4	EXHIBIT HALL (STAGE) GROUP F +51 NW					
7	83H2B-6	EXHIBIT HALL (STAGE) GROUP G +51 NW					
8	83H2B-7	EXHIBIT HALL (STAGE) GROUP H +51 NW					
9	83H2B-9	EXHIBIT HALL GROUP A +51 NW					
10	83H2B-11	EXHIBIT HALL GROUP B +51 NW					
11	83EH2B-3	EXHIBIT HALL (EMERG) GROUP C +51 NW	Blink				



						600	Exhibit Hall F - 100%
						602	Exhibit Hall F - 75%
						603	Exhibit Hall F - 62.5%
						604	Exhibit Hall F - 50.0%
						605	Exhibit Hall F - 38% Work Lights
						606	Exhibit Hall F - 25.0%
						607	Exhibit Hall F - 12.5%
						<b>Switch Codes</b>	
					116-1	Master	F Hall Step 1 (Main)
						<b>Phone Codes</b>	
					600	Exhibit Hall F - 100%	
					601	Exhibit Hall F - 87.5%	
					602	Exhibit Hall F - 75%	
					603	Exhibit Hall F - 62.5%	
					604	Exhibit Hall F - 50.0%	
						<b>Switch Codes</b>	
					116-4	Master	F Hall Step 4 (Main)
						<b>Phone Codes</b>	
					600	Exhibit Hall F - 100%	
					601	Exhibit Hall F - 87.5%	
					602	Exhibit Hall F - 75%	
						<b>Switch Codes</b>	
					116-5	Master	F Hall Step 5 (Main)
					118-10	Master	Allegis 2018 (2nd sector for show)
						<b>Phone Codes</b>	
					600	Exhibit Hall F - 100%	
					601	Exhibit Hall F - 87.5%	
					602	Exhibit Hall F - 75%	
					603	Exhibit Hall F - 62.5%	
						<b>Switch Codes</b>	
					116-6	Master	F Hall Step 6 (Main)
					118-10	Master	Allegis 2018 (2nd sector for show)
						<b>Phone Codes</b>	
					600	Exhibit Hall F - 100%	
					601	Exhibit Hall F - 87.5%	
						<b>Switch Codes</b>	
					116-7	Master	F Hall Step 7 (Main)
					118-10	Master	Allegis 2018 (2nd sector for show)
						<b>Phone Codes</b>	
					600	Exhibit Hall F - 100%	
						<b>Switch Codes</b>	
					116-8	Master	F Hall Step 8 (Main)
					118-10	Master	Allegis 2018 (2nd sector for show)
						<b>Phone Codes</b>	
					600	Exhibit Hall F - 100%	
					601	Exhibit Hall F - 87.5%	
					602	Exhibit Hall F - 75%	
					603	Exhibit Hall F - 62.5%	
					604	Exhibit Hall F - 50.0%	
					605	Exhibit Hall F - 38% Work Lights	
					606	Exhibit Hall F - 25.0%	
						<b>Switch Codes</b>	
					116-2	Master	F Hall Step 2 (Main)
						<b>Phone Codes</b>	
					600	Exhibit Hall F - 100%	
					601	Exhibit Hall F - 87.5%	
					602	Exhibit Hall F - 75%	
					603	Exhibit Hall F - 62.5%	
					604	Exhibit Hall F - 50.0%	
					605	Exhibit Hall F - 38% Work Lights	



27	83H2B-24	EXHIBIT HALL FRONT GROUP Y +51 NW				116-5 Master F Hall Step 5 (Main)
						<b>Phone Codes</b>
						600 Exhibit Hall F - 100%
						601 Exhibit Hall F - 87.5%
						602 Exhibit Hall F - 75%
						<b>Switch Codes</b>
						116-1 Master F Hall Step 1 (Main)
28	83H2B-25	EXHIBIT HALL FRONT GROUP Z +51 NW				<b>Phone Codes</b>
						600 Exhibit Hall F - 100%
						601 Exhibit Hall F - 87.5%
						602 Exhibit Hall F - 75%
						603 Exhibit Hall F - 62.5%
						604 Exhibit Hall F - 50.0%
						<b>Switch Codes</b>
						116-7 Master F Hall Step 7 (Main)
29	83EH2B-2	EXHIBIT HALL FRONT GROUP W +51 NW				<b>Phone Codes</b>
						600 Exhibit Hall F - 100%
						601 Exhibit Hall F - 87.5%
						602 Exhibit Hall F - 75%
						603 Exhibit Hall F - 62.5%
						604 Exhibit Hall F - 50.0%
						<b>Switch Codes</b>
						116-3 Master F Hall Step 3 (Main)
30	83H2B-32	EXHIBIT HALL FRONT GROUP X +51 NW				<b>Phone Codes</b>
						600 Exhibit Hall F - 100%
						601 Exhibit Hall F - 87.5%
						602 Exhibit Hall F - 75%
						<b>Switch Codes</b>
						116-5 Master F Hall Step 5 (Main)
						118-10 Master Allegis 2018 (2nd sector for show)
31	83EH2B-7	EXHIBIT HALL (FRONT-EMER) GROUP Y +51 NW				<b>Phone Codes</b>
						600 Exhibit Hall F - 100%
						601 Exhibit Hall F - 87.5%
						602 Exhibit Hall F - 75%
						603 Exhibit Hall F - 62.5%
						604 Exhibit Hall F - 50.0%
						605 Exhibit Hall F - 38% Work Lights
						606 Exhibit Hall F - 25.0%
						607 Exhibit Hall F - 12.5%
						<b>Switch Codes</b>
						116-1 Master F Hall Step 1 (Main)
						118-9 Master ACAAI 2019 Lighting sector ( CC-12 Kelly)
32	83H2B-34	EXHIBIT HALL FRONT GROUP Z +51 NW				<b>Phone Codes</b>
						600 Exhibit Hall F - 100%
						601 Exhibit Hall F - 87.5%
						602 Exhibit Hall F - 75%
						603 Exhibit Hall F - 62.5%
						604 Exhibit Hall F - 50.0%
						<b>Switch Codes</b>
						116-7 Master F Hall Step 7 (Main)
						118-9 Master ACAAI 2019 Lighting sector ( CC-12 Kelly)
33	83H2B-27	Truss Lights A/F			7 Truss Lights (morning)	<b>Phone Codes</b>
						601 Exhibit Hall F - 87.5%
						602 Exhibit Hall F - 75%
						603 Exhibit Hall F - 62.5%
						604 Exhibit Hall F - 50.0%
						605 Exhibit Hall F - 38% Work Lights
						850 Truss Lights - Escalators A/F
						<b>Switch Codes</b>
						118-10 Master Allegis 2018 (2nd sector for show)

34	83H2B-26	Truss Lights A/F			7 Truss Lights (morning)	123-5 Master Truss A Lighting <b>Phone Codes</b> 850 Truss Lights - Escalators A/F 7070 Exhibit Hall F - Front + 51 NW (doesn't include Relay 33) <b>Switch Codes</b> 118-10 Master Allegis 2018 (2nd sector for show) 123-5 Master Truss A Lighting
35	83H2B-28	Truss Lights A/F			7 Truss Lights (morning)	<b>Phone Codes</b> 850 Truss Lights - Escalators A/F 7070 Exhibit Hall F - Front + 51 NW (doesn't include Relay 33) <b>Switch Codes</b> 118-10 Master Allegis 2018 (2nd sector for show) 123-5 Master Truss A Lighting
36	83H2B-30	Truss Lights A/F			7 Truss Lights (morning)	<b>Phone Codes</b> 850 Truss Lights - Escalators A/F 7070 Exhibit Hall F - Front + 51 NW (doesn't include Relay 33) <b>Switch Codes</b> 118-10 Master Allegis 2018 (2nd sector for show) 123-5 Master Truss A Lighting
37	83H2B-31	EXHIBIT HALL FRONT RESTROOM +51 NW				<b>Phone Codes</b> 6 Restrooms - Ex Hall F/G 15 Restrooms - ALL 7000 Exhibit Hall F - Restrm Ltg +51 NE and NW <b>Switch Codes</b> 116-10 Master F Hall Restrooms - West
38	83H2B-33	ENTRANCE (EMERG) +51 NW				<b>Phone Codes</b> 600 Exhibit Hall F - 100% 601 Exhibit Hall F - 87.5% 602 Exhibit Hall F - 75% 603 Exhibit Hall F - 62.5% 604 Exhibit Hall F - 50.0% 605 Exhibit Hall F - 38% Work Lights 606 Exhibit Hall F - 25.0% 607 Exhibit Hall F - 12.5% <b>Switch Codes</b> 118-10 Master Allegis 2018 (2nd sector for show) 118-13 Master F Hall North Wall Lights - Main
39	83EH2B-4	ENTRANCE +51 NW	Blink			<b>Phone Codes</b> 600 Exhibit Hall F - 100% 601 Exhibit Hall F - 87.5% 602 Exhibit Hall F - 75% <b>Switch Codes</b> 118-10 Master Allegis 2018 (2nd sector for show) 118-12 Master F Hall North Wall Lights - Partial
40	83H2B-33	ENTRANCE +51 NW	Blink			<b>Phone Codes</b> 600 Exhibit Hall F - 100% 601 Exhibit Hall F - 87.5% 602 Exhibit Hall F - 75% <b>Switch Codes</b> 118-10 Master Allegis 2018 (2nd sector for show) 118-13 Master F Hall North Wall Lights - Main
41	83H2B-37	LIGHTING MECH LVL 83	Blink			<b>Phone Codes</b> 80 ELECTRICAL&MECHANICAL ROOMS <b>Switch Codes</b> 135-4 Master Elec/Mech Rms - N +83
42		SPARE				



5	83H2A-2	EXHIBIT HALL (LARGE STAGE) GROUP E +51 NE	117-4	Master	F Hall Step 4 - North Stage			
			118-9	Master	ACAAI 2019 Lighting sector ( CC-12 Kelly)			
			118-10	Master	Allegis 2018 (2nd sector for show)			
			<b>Phone Codes</b>					
			600		Exhibit Hall F - 100%			
			601		Exhibit Hall F - 87.5%			
			602		Exhibit Hall F - 75%			
			<b>Switch Codes</b>					
			117-5	Master	F Hall Step 5 - North Stage			
			118-9	Master	ACAAI 2019 Lighting sector ( CC-12 Kelly)			
			118-10	Master	Allegis 2018 (2nd sector for show)			
6	83H2A-4	EXHIBIT HALL (LARGE STAGE) GROUP F +51 NE	<b>Phone Codes</b>					
			600		Exhibit Hall F - 100%			
			601		Exhibit Hall F - 87.5%			
			602		Exhibit Hall F - 75%			
			603		Exhibit Hall F - 62.5%			
			<b>Switch Codes</b>					
			117-6	Master	F Hall Step 6 - North Stage			
			118-9	Master	ACAAI 2019 Lighting sector ( CC-12 Kelly)			
			118-10	Master	Allegis 2018 (2nd sector for show)			
			7	83H2A-6	EXHIBIT HALL (LARGE STAGE) GROUP G +51 NE	<b>Phone Codes</b>		
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<b>Switch Codes</b>								
117-7	Master	F Hall Step 7 - North Stage						
118-10	Master	Allegis 2018 (2nd sector for show)						
8	83H2A-7	EXHIBIT HALL (LARGE STAGE) GROUP H +51 NE				<b>Phone Codes</b>		
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						<b>Switch Codes</b>		
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			118-10	Master	Allegis 2018 (2nd sector for show)			
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						603		Exhibit Hall F - 62.5%
604		Exhibit Hall F - 50.0%						
605		Exhibit Hall F - 38% Work Lights						
606		Exhibit Hall F - 25.0%						
<b>Switch Codes</b>								
117-2	Master	F Hall Step 2 - North Stage						
118-10	Master	Allegis 2018 (2nd sector for show)						
10	83H2A-11	EXHIBIT HALL (LARGE STAGE) GROUP B +51 NE	<b>Phone Codes</b>					
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			605		Exhibit Hall F - 38% Work Lights			
			<b>Switch Codes</b>					
			117-3	Master	F Hall Step 3 - North Stage			
			118-10	Master	Allegis 2018 (2nd sector for show)			
			11	83EH2A-13	EXHIBIT HALL (STAGE EMERG) GROUP C +51 NE	<b>Phone Codes</b>		
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						606	Exhibit Hall F - 25.0%
						607	Exhibit Hall F - 12.5%
						<b>Switch Codes</b>	
						117-1	Master F Hall Step 1 - North Stage
						118-10	Master Allegis 2018 (2nd sector for show)
						<b>Phone Codes</b>	
						600	Exhibit Hall F - 100%
						601	Exhibit Hall F - 87.5%
						602	Exhibit Hall F - 75%
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						<b>Switch Codes</b>	
						117-4	Master F Hall Step 4 - North Stage
						118-10	Master Allegis 2018 (2nd sector for show)
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						602	Exhibit Hall F - 75%
						<b>Switch Codes</b>	
						118-5	Master F Hall Step 5 - East Stage
						118-10	Master Allegis 2018 (2nd sector for show)
						<b>Phone Codes</b>	
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19	83H2A-14	EXHIBIT HALL GROUP A +51 NE				<b>Switch Codes</b>	
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						<b>Phone Codes</b>	
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						606	Exhibit Hall F - 25.0%
						<b>Switch Codes</b>	
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20	83H2A-13	EXHIBIT HALL GROUP B +51 NE				<b>Phone Codes</b>	
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						116-3	Master F Hall Step 3 (Main)
						118-10	Master Allegis 2018 (2nd sector for show)
21	35EH2A-15	EXHIBIT HALL (EMERG) GROUP C +51 NE				<b>Phone Codes</b>	
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						116-1	Master F Hall Step 1 (Main)
						118-10	Master Allegis 2018 (2nd sector for show)
22	83H2A-15	EXHIBIT HALL GROUP D +51 NE				<b>Phone Codes</b>	
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						116-4	Master F Hall Step 4 (Main)
						118-10	Master Allegis 2018 (2nd sector for show)
23	83H2A-17	EXHIBIT HALL GROUP E +51 NE				<b>Phone Codes</b>	
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						602	Exhibit Hall F - 75%
						<b>Switch Codes</b>	
						116-5	Master F Hall Step 5 (Main)
						118-10	Master Allegis 2018 (2nd sector for show)
24	83H2A-17	EXHIBIT HALL GROUP F +51 NE				<b>Phone Codes</b>	
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						118-10	Master Allegis 2018 (2nd sector for show)
25	83H2A-16	EXHIBIT HALL GROUP G +51 NE					



26	83H2A-18	EXHIBIT HALL GROUP H +51 NE				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>600</td> <td>Exhibit Hall F - 100%</td> </tr> <tr> <td>601</td> <td>Exhibit Hall F - 87.5%</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>116-7</td> <td>Master F Hall Step 7 (Main)</td> </tr> <tr> <td>118-10</td> <td>Master Allegis 2018 (2nd sector for show)</td> </tr> </tbody> </table>	Phone Codes		600	Exhibit Hall F - 100%	601	Exhibit Hall F - 87.5%	Switch Codes		116-7	Master F Hall Step 7 (Main)	118-10	Master Allegis 2018 (2nd sector for show)												
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46	83H2A-35	EXHIBIT HALL EXIT DOOR +51 NE				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>600</td> <td>Exhibit Hall F - 100%</td> </tr> <tr> <td>601</td> <td>Exhibit Hall F - 87.5%</td> </tr> </tbody> </table>	Phone Codes		600	Exhibit Hall F - 100%	601	Exhibit Hall F - 87.5%																		
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Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit	
47	83H2AA-3	EXHIBIT HALL EXIT DOOR +51 NE					
48	83H2AA-5	RESTROOM LIGHTING +51 NE	Blink				
208	LCP-83RPA-2 - Rear Hall A3		CC	24/24 Surface	115/277		
	<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>Settings</b>	<b>Timeout</b>	<b>Schedule</b>	<b>References</b>
1	83EH2A-7	LOADING DOCK LIGHTING (EMERG) NE +51				1 Sunset - Sunrise	602 Exhibit Hall F- 75% <b>Switch Codes</b> 118-10 Master Allegis 2018 (2nd sector for show) 118-13 Master F Hall North Wall Lights - Main <b>Phone Codes</b> 600 Exhibit Hall F - 100% 601 Exhibit Hall F - 87.5% 602 Exhibit Hall F- 75% <b>Switch Codes</b> 118-10 Master Allegis 2018 (2nd sector for show) 118-13 Master F Hall North Wall Lights - Main <b>Phone Codes</b> 6 Restrooms - Ex Hall F/G 15 Restrooms - ALL 7000 Exhibit Hall F - Restrm Ltg +51 NE and NW <b>Switch Codes</b> 116-11 Master F Hall Restrooms - East
2	83H2AA-4	LOADING DOCK LIGHTING NE +51	Blink			1 Sunset - Sunrise	<b>Phone Codes</b> 30 Loading Dock - All 36 Loading Dock - Hall F 42 Partial Dock Lighting <b>Switch Codes</b> 130-11 Master Dock F (Partial)
3	83H2AA-6	LOADING DOCK LIGHTING NE +51	Blink			1 Sunset - Sunrise	<b>Phone Codes</b> 30 Loading Dock - All 36 Loading Dock - Hall F <b>Switch Codes</b> 130-12 Master Dock F
4	83H2AA-8	LOADING DOCK LIGHTING NE +51	Blink			1 Sunset - Sunrise	<b>Phone Codes</b> 30 Loading Dock - All 36 Loading Dock - Hall F <b>Switch Codes</b> 130-12 Master Dock F
5	83H2AA-10	LOADING DOCK LIGHTING NE +51	Blink			1 Sunset - Sunrise	<b>Phone Codes</b> 30 Loading Dock - All 36 Loading Dock - Hall F <b>Switch Codes</b> 130-12 Master Dock F
6	83H2AA-12	MECHANICAL ROOM +83 VIA RELAY	Blink				<b>Phone Codes</b> 80 ELECTRICAL&MECHANICAL ROOMS <b>Switch Codes</b> 135-4 Master Elec/Mech Rms - N +83
7	83L2A-23	ROOF TOP LIGHT VIA CONTACTOR				1 Sunset - Sunrise	<b>Watched Relays</b> 8 LIGHTING +51 EXIT <b>Phone Codes</b> 9910 Pnl 83RPC - Roof Top Lights Via Contactor <b>Switch Codes</b> 129-4 Master Christmas Lights - North
8	83H2AA-4	LIGHTING +51 EXIT	Blink				<b>Phone Codes</b>

9	83L2A-23	GRBCC NEON SIGN LIGHTS North End			12	Building Signs	7040	Exhibit Hall F - Ltg + 51 Exit
<b>Switch Codes</b>								
	116-12	Master	F Hall Storage/Exit Lts - East					
<b>Phone Codes</b>								
	79		GRBCC Neon Sign North End					
<b>Switch Codes</b>								
	129-2	Master	North GRBCC Sign					
<b>Phone Codes</b>								
	7040		Exhibit Hall F - Ltg + 51 Exit					
<b>Switch Codes</b>								
	116-12	Master	F Hall Storage/Exit Lts - East					
10	83H2AA-9	LIGHTING STORAGE +51	Blink					
11		SPACE						
12		SPACE						
13			Blink HID					
14			Blink HID					
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20			Blink HID					
21			Blink HID					
22			Blink HID					
23			Blink HID					
24			Blink HID					
Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit		
209	LCP-35RPDA - Reg. E		CC	24/24 Surface	115/277			
Rly	Circuit	Description	Settings	Timeout	Schedule	References		
1	35H2DA-1	WATER HEATER LEVEL +25			5	Water Heaters		
<b>Phone Codes</b>								
	2599		Water Heaters / Schedule ALL					
	8086		Exhibit Hall E - Water Heater Lvl + 25					
<b>Phone Codes</b>								
	2599		Water Heaters / Schedule ALL					
	8087		Exhibit Hall E - Water Heater Lvl + 0					
<b>Switch Codes</b>								
	128-8	Master	Water Heaters - Hall E					
2	35H2DA-3	WATER HEATER LEVEL +0			5	Water Heaters		
<b>Phone Codes</b>								
	2599		Water Heaters / Schedule ALL					
	8087		Exhibit Hall E - Water Heater Lvl + 0					
<b>Switch Codes</b>								
	128-8	Master	Water Heaters - Hall E					
3	35L2DA-1	LIGHTING ABOVE ESCALATOR +0 SW			14	3rd Level public lights on		
<b>Phone Codes</b>								
	84		Registration ALL + A, B, C, D & E 100%					
	857		Truss Lights - Escalators E					
	858		Lights under Escalators E +0 SW					
<b>Switch Codes</b>								
	127-1	Master	Registration E					
	127-2	Master	Lights under Escalators E					
4	35L2DA-3	LIGHTING ABOVE ESCALATOR +0 SW			14	3rd Level public lights on		
<b>Phone Codes</b>								
	84		Registration ALL + A, B, C, D & E 100%					
	857		Truss Lights - Escalators E					
	858		Lights under Escalators E +0 SW					

5	35H2DA-7	TICKET BOOTH LIGHTING +0 SW																					
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6	35H2DA-2	LIGHTING +25 SW																					
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86	Registration E+25 SW Administration Hallway 100%																						
Switch Codes																							
127-1	Master Registration E																						
12	35H2DA-14	LIGHTING +25 RESTROOMS & STORAGE SW																					
<table border="1"> <tr><th colspan="2">Phone Codes</th></tr> <tr><td>15</td><td>Restrooms - ALL</td></tr> <tr><td>8091</td><td>Exhibit Hall E - Ltg + 25 Restrms@ StarBucks &amp; Storage SW</td></tr> <tr><th colspan="2">Switch Codes</th></tr> <tr><td>127-3</td><td>Master Reg. E Restroom Ltg</td></tr> </table>										Phone Codes		15	Restrooms - ALL	8091	Exhibit Hall E - Ltg + 25 Restrms@ StarBucks & Storage SW	Switch Codes		127-3	Master Reg. E Restroom Ltg				
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13	35H2DA-9	MECHANICAL RM LTG +35 SW																					
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15	35H2DA-16	LIGHTING +25 SW				Alt: 4 Admintistration, Sales offices 2nd level	135-7 Master	Elec/Mech Rms - S +35
<b>Switch Codes</b>								
16	35H2DA-18	LIGHTING +25 SHELL SW					127-1 Master	Registration E
<b>Phone Codes</b>								
							8094	Exhibit Hall E - Ltg + 25 Gift Shop& Telephone Rm SW
17	35H2DA-13	WATER HEATER TICKET BOOTH				5 Water Heaters		
<b>Phone Codes</b>								
							2599	Water Heaters / Schedule ALL
							8095	Exhibit Hall E - Water Heater Ticket Booth
<b>Switch Codes</b>								
							128-8 Master	Water Heaters - Hall E
18		SPACE						
19		SPACE						
20		SPACE						
21		Space						
22		Space						
23		Space						
24		Space						
<b>Panel ID</b>	<b>Description</b>	<b>Location</b>	<b>Type</b>	<b>Interior/Enclosure</b>	<b>Power Supply</b>	<b>Circuit</b>		
210	LCP-12RPC - Tunnel E		CC	12/12 Surface	115/277			
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>Settings</b>	<b>Timeout</b>	<b>Schedule</b>	<b>References</b>		
1	12H2C-1	TUNNEL LIGHTING SE					<b>Phone Codes</b>	
							19	Tunnel Lighting SE
<b>Switch Codes</b>								
							128-9 Master	Tunnel Lighting under E
2	12H2C-2	TUNNEL LIGHTING SE					<b>Phone Codes</b>	
							19	Tunnel Lighting SE
<b>Switch Codes</b>								
							128-9 Master	Tunnel Lighting under E
3	12H2C-3	TUNNEL LIGHTING SE					<b>Phone Codes</b>	
							19	Tunnel Lighting SE
<b>Switch Codes</b>								
							128-9 Master	Tunnel Lighting under E
4	12H2C-4	TUNNEL LIGHTING SE					<b>Phone Codes</b>	
							19	Tunnel Lighting SE
<b>Switch Codes</b>								
							128-9 Master	Tunnel Lighting under E
5	12H2C-5	Electrical Room SE Tunnel					<b>Switch Codes</b>	
							135-5 Master	Elec/Mech Rms - S Tunnel
6	12H2C-23	WATER HEATER LVL 0 SOUTHEAST	Blink			5 Water Heaters	<b>Phone Codes</b>	
							2599	Water Heaters / Schedule ALL
							3400	Tunnel - Water Heater Lvl 0 Southeast
<b>Switch Codes</b>								
							127-5 Master	Water Heater - Reg. E
							128-8 Master	Water Heaters - Hall E
7		SPARE						
8		SPACE						
9		SPACE						

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit																				
10		SPACE																								
11		SPACE																								
12		SPACE																								
211	LCP-35RPD - Front Hall E		CC	48/48 Surface	115/277																					
Rly	Circuit	Description	Settings	Timeout	Schedule	References																				
1	35H2D-1	EXHIBIT HALL (STAGE) GROUP A +0 SW				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr><td>500</td><td>Exhibit Hall E - 100 %</td></tr> <tr><td>501</td><td>Exhibit Hall E - 87.5%</td></tr> <tr><td>502</td><td>Exhibit Hall E - 75 %</td></tr> <tr><td>504</td><td>Exhibit Hall E - 50 %</td></tr> <tr><td>505</td><td>Exhibit Hall E - 38% Work Lights</td></tr> <tr><td>506</td><td>Exhibit Hall E - 25 %</td></tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr><td>114-2</td><td>Master E Hall Step 2 - North Stage</td></tr> <tr><td>115-9</td><td>Master SACSCOC 2019 Hall E (CC-4 Brenda)</td></tr> </tbody> </table>	Phone Codes		500	Exhibit Hall E - 100 %	501	Exhibit Hall E - 87.5%	502	Exhibit Hall E - 75 %	504	Exhibit Hall E - 50 %	505	Exhibit Hall E - 38% Work Lights	506	Exhibit Hall E - 25 %	Switch Codes		114-2	Master E Hall Step 2 - North Stage	115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)
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						<b>Switch Codes</b>	
					113-7	Master	E Hall Step 7 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
16	35H2D-15	EXHIBIT HALL GROUP H +0 SW				<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						<b>Switch Codes</b>	
					113-8	Master	E Hall Step 8 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
17	35H2D-17	EXHIBIT HALL GROUP A +0 SW				<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						501	Exhibit Hall E - 87.5%
						502	Exhibit Hall E - 75 %
						504	Exhibit Hall E - 50 %
						505	Exhibit Hall E - 38% Work Lights
						506	Exhibit Hall E - 25 %
						<b>Switch Codes</b>	
					113-2	Master	E Hall Step 2 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
18	35H2D-19	EXHIBIT HALL GROUP B +0 SW				<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						501	Exhibit Hall E - 87.5%
						502	Exhibit Hall E - 75 %
						503	Exhibit Hall E - 62.5%
						504	Exhibit Hall E - 50 %
						505	Exhibit Hall E - 38% Work Lights
						<b>Switch Codes</b>	
					113-3	Master	E Hall Step 3 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
19	35EH2D-5	EXHIBIT HALL (EMERG) GROUP C +0 SW				<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						501	Exhibit Hall E - 87.5%
						502	Exhibit Hall E - 75 %
						504	Exhibit Hall E - 50 %
						505	Exhibit Hall E - 38% Work Lights
						506	Exhibit Hall E - 25 %
						507	Exhibit Hall E - 12.5%
						<b>Switch Codes</b>	
					113-1	Master	E Hall Step 1 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
20	35H2D-14	EXHIBIT HALL GROUP D +0 SW				<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						501	Exhibit Hall E - 87.5%
						502	Exhibit Hall E - 75 %
						503	Exhibit Hall E - 62.5%
						504	Exhibit Hall E - 50 %
						<b>Switch Codes</b>	
					113-4	Master	E Hall Step 4 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
21	35H2D-16	EXHIBIT HALL GROUP E +0 SW				<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						501	Exhibit Hall E - 87.5%
						502	Exhibit Hall E - 75 %

						503	Exhibit Hall E - 62.5%
						<b>Switch Codes</b>	
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					501		Exhibit Hall E - 87.5%
					502		Exhibit Hall E - 75 %
						<b>Switch Codes</b>	
					113-5	Master	E Hall Step 5 (35')
					113-6	Master	E Hall Step 6 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
22	35H2D-18	EXHIBIT HALL GROUP F +0 SW					
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					501		Exhibit Hall E - 87.5%
						<b>Switch Codes</b>	
					113-7	Master	E Hall Step 7 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
23	35H2D-21	EXHIBIT HALL GROUP G +0 SW					
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					501		Exhibit Hall E - 87.5%
						<b>Switch Codes</b>	
					113-7	Master	E Hall Step 7 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
24	35H2D-23	EXHIBIT HALL GROUP H +0 SW					
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
						<b>Switch Codes</b>	
					113-8	Master	E Hall Step 8 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
25	35H2D-20	EXHIBIT HALL FRONT GROUP W +0 SW					
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					513		Exhibit Hall E 17' Ceiling 100% Front
						<b>Switch Codes</b>	
					113-9	Master	E Hall Step 1 (Front 17')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
26	35H2D-22	EXHIBIT HALL FRONT GROUP X +0 SW					
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					513		Exhibit Hall E 17' Ceiling 100% Front
						<b>Switch Codes</b>	
					113-11	Master	E Hall Step 3 (Front 17')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
27	35H2D-24	EXHIBIT HALL FRONT GROUP Y +0 SW					
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					512		Exhibit Hall E 17' Ceiling 50% Front
					513		Exhibit Hall E 17' Ceiling 100% Front
						<b>Switch Codes</b>	
					113-12	Master	E Hall Step 4 (Front 17')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
28	35H2D-25	EXHIBIT HALL FRONT GROUP Z +0 SW					
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					510		Exhibit Hall-E 17' Ceiling 12.5% Front
					511		Exhibit Hall-E 17' Ceiling 25% Front
					512		Exhibit Hall E 17' Ceiling 50% Front
					513		Exhibit Hall E 17' Ceiling 100% Front
						<b>Switch Codes</b>	
					113-10	Master	E Hall Step 2 (Front 17')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
29	35H2D-27	EXHIBIT HALL FRONT GROUP W +0 SW					
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					511		Exhibit Hall-E 17' Ceiling 25% Front
					512		Exhibit Hall E 17' Ceiling 50% Front
					513		Exhibit Hall E 17' Ceiling 100% Front
						<b>Switch Codes</b>	
					113-9	Master	E Hall Step 1 (Front 17')
30	35H2D-29	EXHIBIT HALL FRONT GROUP X +0 SW					
						<b>Phone Codes</b>	

						500	Exhibit Hall E - 100 %
						512	Exhibit Hall E 17' Ceiling 50% Front
						513	Exhibit Hall E 17' Ceiling 100% Front
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						<b>Switch Codes</b>	
					113-12	Master	E Hall Step 4 (Front 17')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
31	35H2D-29	EXHIBIT HALL FRONT GROUP Y +0 SW					
						<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						512	Exhibit Hall E 17' Ceiling 50% Front
						513	Exhibit Hall E 17' Ceiling 100% Front
						<b>Switch Codes</b>	
					113-10	Master	E Hall Step 2 (Front 17')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
32	35H2D-27	EXHIBIT HALL FRONT GROUP Z +0 SW					
						<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						512	Exhibit Hall E 17' Ceiling 50% Front
						513	Exhibit Hall E 17' Ceiling 100% Front
						<b>Switch Codes</b>	
					113-10	Master	E Hall Step 2 (Front 17')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
33	35EH2D-2	EXHIBIT HALL (EMERG) FRONT +0 SW					
						<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						511	Exhibit Hall-E 17' Ceiling 25% Front
						512	Exhibit Hall E 17' Ceiling 50% Front
						513	Exhibit Hall E 17' Ceiling 100% Front
						<b>Switch Codes</b>	
					113-9	Master	E Hall Step 1 (Front 17')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
34	35H2D-26	EXHIBIT HALL FRONT GROUP W +0 SW					
						<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						513	Exhibit Hall E 17' Ceiling 100% Front
						<b>Switch Codes</b>	
					113-9	Master	E Hall Step 1 (Front 17')
35	35H2D-28	EXHIBIT HALL FRONT GROUP X +0 SW					
						<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						512	Exhibit Hall E 17' Ceiling 50% Front
						513	Exhibit Hall E 17' Ceiling 100% Front
						<b>Switch Codes</b>	
					113-11	Master	E Hall Step 3 (Front 17')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
36	35H2D-30	EXHIBIT HALL FRONT GROUP Y +0 SW					
						<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						513	Exhibit Hall E 17' Ceiling 100% Front
						<b>Switch Codes</b>	
					113-12	Master	E Hall Step 4 (Front 17')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
37	35H2D-31	EXHIBIT HALL FRONT GROUP Z +0 SW					
						<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						510	Exhibit Hall-E 17' Ceiling 12.5% Front
						511	Exhibit Hall-E 17' Ceiling 25% Front
						<b>Switch Codes</b>	
					113-10	Master	E Hall Step 2 (Front 17')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
38	35H2D-33	ENTRANCE +0 SW			7	Truss Lights (morning)	
						<b>Phone Codes</b>	
						58	Lobby E - Foyer
						8000	Exhibit Hall E - Entrance + 0 SW
						<b>Switch Codes</b>	
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
					115-14	Master	Lobby E
39	35EH2D-4	ENTRANCE (EMERG) +0 SW	Blink				

						<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>58</td> <td>Lobby E - Foyer</td> </tr> <tr> <td>500</td> <td>Exhibit Hall E - 100 %</td> </tr> <tr> <td>8000</td> <td>Exhibit Hall E - Entrance + 0 SW</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>115-9</td> <td>Master SACSCOC 2019 Hall E (CC-4 Brenda)</td> </tr> <tr> <td>115-14</td> <td>Master Lobby E</td> </tr> </tbody> </table>	Phone Codes		58	Lobby E - Foyer	500	Exhibit Hall E - 100 %	8000	Exhibit Hall E - Entrance + 0 SW	Switch Codes		115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)	115-14	Master Lobby E								
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40	35H2D-35	ENTRANCE +0 SW	Blink			<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>500</td> <td>Exhibit Hall E - 100 %</td> </tr> <tr> <td>501</td> <td>Exhibit Hall E - 87.5%</td> </tr> <tr> <td>502</td> <td>Exhibit Hall E - 75 %</td> </tr> <tr> <td>503</td> <td>Exhibit Hall E - 62.5%</td> </tr> <tr> <td>504</td> <td>Exhibit Hall E - 50 %</td> </tr> <tr> <td>505</td> <td>Exhibit Hall E - 38% Work Lights</td> </tr> <tr> <td>513</td> <td>Exhibit Hall E 17' Ceiling 100% Front</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>115-9</td> <td>Master SACSCOC 2019 Hall E (CC-4 Brenda)</td> </tr> <tr> <td>115-12</td> <td>Master E Hall South Exit Lights - Partial</td> </tr> </tbody> </table>	Phone Codes		500	Exhibit Hall E - 100 %	501	Exhibit Hall E - 87.5%	502	Exhibit Hall E - 75 %	503	Exhibit Hall E - 62.5%	504	Exhibit Hall E - 50 %	505	Exhibit Hall E - 38% Work Lights	513	Exhibit Hall E 17' Ceiling 100% Front	Switch Codes		115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)	115-12	Master E Hall South Exit Lights - Partial
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41	35H2D-32	ENTRANCE +0 SW	Blink			<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>500</td> <td>Exhibit Hall E - 100 %</td> </tr> <tr> <td>501</td> <td>Exhibit Hall E - 87.5%</td> </tr> <tr> <td>502</td> <td>Exhibit Hall E - 75 %</td> </tr> <tr> <td>513</td> <td>Exhibit Hall E 17' Ceiling 100% Front</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>115-9</td> <td>Master SACSCOC 2019 Hall E (CC-4 Brenda)</td> </tr> <tr> <td>115-13</td> <td>Master E Hall South Exit Lights - Main</td> </tr> </tbody> </table>	Phone Codes		500	Exhibit Hall E - 100 %	501	Exhibit Hall E - 87.5%	502	Exhibit Hall E - 75 %	513	Exhibit Hall E 17' Ceiling 100% Front	Switch Codes		115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)	115-13	Master E Hall South Exit Lights - Main						
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42	35H2D-34	ENTRANCE +0 SW	Blink			<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>500</td> <td>Exhibit Hall E - 100 %</td> </tr> <tr> <td>501</td> <td>Exhibit Hall E - 87.5%</td> </tr> <tr> <td>502</td> <td>Exhibit Hall E - 75 %</td> </tr> <tr> <td>513</td> <td>Exhibit Hall E 17' Ceiling 100% Front</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>115-9</td> <td>Master SACSCOC 2019 Hall E (CC-4 Brenda)</td> </tr> <tr> <td>115-13</td> <td>Master E Hall South Exit Lights - Main</td> </tr> </tbody> </table>	Phone Codes		500	Exhibit Hall E - 100 %	501	Exhibit Hall E - 87.5%	502	Exhibit Hall E - 75 %	513	Exhibit Hall E 17' Ceiling 100% Front	Switch Codes		115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)	115-13	Master E Hall South Exit Lights - Main						
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43	35H2D-36	LIGHTING RESTROOMS +0 SW	Blink			<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Restrooms - 1st Level</td> </tr> <tr> <td>15</td> <td>Restrooms - ALL</td> </tr> <tr> <td>8010</td> <td>Exhibit Hall E - Ltg Restrms + 0 SW</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>128-3</td> <td>Master Restrooms - E Hall Front</td> </tr> </tbody> </table>	Phone Codes		2	Restrooms - 1st Level	15	Restrooms - ALL	8010	Exhibit Hall E - Ltg Restrms + 0 SW	Switch Codes		128-3	Master Restrooms - E Hall Front										
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44	35H2D-41	WATER HEATER	Blink		5 Water Heaters	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>2599</td> <td>Water Heaters / Schedule ALL</td> </tr> <tr> <td>8020</td> <td>Exhibit Hall E - Water Heater</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>134-8</td> <td>Master Water Heaters - Mtg. Rooms</td> </tr> </tbody> </table>	Phone Codes		2599	Water Heaters / Schedule ALL	8020	Exhibit Hall E - Water Heater	Switch Codes		134-8	Master Water Heaters - Mtg. Rooms												
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45	35H2DB-3	ENTRANCE LIGHTING +0 SW	Blink			<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>500</td> <td>Exhibit Hall E - 100 %</td> </tr> <tr> <td>501</td> <td>Exhibit Hall E - 87.5%</td> </tr> <tr> <td>502</td> <td>Exhibit Hall E - 75 %</td> </tr> <tr> <td>503</td> <td>Exhibit Hall E - 62.5%</td> </tr> <tr> <td>504</td> <td>Exhibit Hall E - 50 %</td> </tr> <tr> <td>513</td> <td>Exhibit Hall E 17' Ceiling 100% Front</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>113-10</td> <td>Master E Hall Step 2 (Front 17')</td> </tr> </tbody> </table>	Phone Codes		500	Exhibit Hall E - 100 %	501	Exhibit Hall E - 87.5%	502	Exhibit Hall E - 75 %	503	Exhibit Hall E - 62.5%	504	Exhibit Hall E - 50 %	513	Exhibit Hall E 17' Ceiling 100% Front	Switch Codes		113-10	Master E Hall Step 2 (Front 17')				
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46	35H2DB-1	ENTRANCE CANOPY +0 SW			1 Sunset - Sunrise	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>150</td> <td>Canopy All</td> </tr> <tr> <td>155</td> <td>Canopy E</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>115-15</td> <td>Master Canopy E</td> </tr> </tbody> </table>	Phone Codes		150	Canopy All	155	Canopy E	Switch Codes		115-15	Master Canopy E												
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Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit																						
Rly	Circuit	Description	Settings	Timeout	Schedule	References																						
48	35H2DB-2	SIGN LIGHTING +0 SW			10 Sunset on - Midnight off	<table border="1"> <thead> <tr><th colspan="2">Phone Codes</th></tr> </thead> <tbody> <tr><td>150</td><td>Canopy All</td></tr> <tr><td>155</td><td>Canopy E</td></tr> <tr><th colspan="2">Switch Codes</th></tr> <tr><td>115-15</td><td>Master Canopy E</td></tr> </tbody> </table>	Phone Codes		150	Canopy All	155	Canopy E	Switch Codes		115-15	Master Canopy E												
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212	LCP-35RPC-1 - Rear Hall E		CC	48/48 Surface	115/277	<table border="1"> <thead> <tr><th colspan="2">Phone Codes</th></tr> </thead> <tbody> <tr><td>75</td><td>Sign Lights + 0 SW HallE</td></tr> <tr><th colspan="2">Switch Codes</th></tr> <tr><td>128-2</td><td>Master Sign Lighting Hall E</td></tr> </tbody> </table>	Phone Codes		75	Sign Lights + 0 SW HallE	Switch Codes		128-2	Master Sign Lighting Hall E														
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1	35H2C-1	EXHIBIT HALL (LARGE STAGE) GROUP A +0 SE				<table border="1"> <thead> <tr><th colspan="2">Phone Codes</th></tr> </thead> <tbody> <tr><td>500</td><td>Exhibit Hall E - 100 %</td></tr> <tr><td>501</td><td>Exhibit Hall E - 87.5%</td></tr> <tr><td>502</td><td>Exhibit Hall E - 75 %</td></tr> <tr><td>504</td><td>Exhibit Hall E - 50 %</td></tr> <tr><td>505</td><td>Exhibit Hall E - 38% Work Lights</td></tr> <tr><td>506</td><td>Exhibit Hall E - 25 %</td></tr> <tr><th colspan="2">Switch Codes</th></tr> <tr><td>114-10</td><td>Master E Hall Step 2 - South Stage</td></tr> </tbody> </table>	Phone Codes		500	Exhibit Hall E - 100 %	501	Exhibit Hall E - 87.5%	502	Exhibit Hall E - 75 %	504	Exhibit Hall E - 50 %	505	Exhibit Hall E - 38% Work Lights	506	Exhibit Hall E - 25 %	Switch Codes		114-10	Master E Hall Step 2 - South Stage				
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2	35H2C-3	EXHIBIT HALL (LARGE STAGE) GROUP B +0 SE				<table border="1"> <thead> <tr><th colspan="2">Phone Codes</th></tr> </thead> <tbody> <tr><td>500</td><td>Exhibit Hall E - 100 %</td></tr> <tr><td>501</td><td>Exhibit Hall E - 87.5%</td></tr> <tr><td>502</td><td>Exhibit Hall E - 75 %</td></tr> <tr><td>503</td><td>Exhibit Hall E - 62.5%</td></tr> <tr><td>504</td><td>Exhibit Hall E - 50 %</td></tr> <tr><td>505</td><td>Exhibit Hall E - 38% Work Lights</td></tr> <tr><th colspan="2">Switch Codes</th></tr> <tr><td>114-11</td><td>Master E Hall Step 3 - South Stage</td></tr> </tbody> </table>	Phone Codes		500	Exhibit Hall E - 100 %	501	Exhibit Hall E - 87.5%	502	Exhibit Hall E - 75 %	503	Exhibit Hall E - 62.5%	504	Exhibit Hall E - 50 %	505	Exhibit Hall E - 38% Work Lights	Switch Codes		114-11	Master E Hall Step 3 - South Stage				
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3	35EH2C-11	EXHIBIT HALL (STAGE EMERG) GROUP C +0 SE				<table border="1"> <thead> <tr><th colspan="2">Phone Codes</th></tr> </thead> <tbody> <tr><td>500</td><td>Exhibit Hall E - 100 %</td></tr> <tr><td>501</td><td>Exhibit Hall E - 87.5%</td></tr> <tr><td>502</td><td>Exhibit Hall E - 75 %</td></tr> <tr><td>504</td><td>Exhibit Hall E - 50 %</td></tr> <tr><td>505</td><td>Exhibit Hall E - 38% Work Lights</td></tr> <tr><td>506</td><td>Exhibit Hall E - 25 %</td></tr> <tr><td>507</td><td>Exhibit Hall E - 12.5%</td></tr> <tr><th colspan="2">Switch Codes</th></tr> <tr><td>114-9</td><td>Master E Hall Step 1 - South Stage</td></tr> <tr><td>115-9</td><td>Master SACSCOC 2019 Hall E (CC-4 Brenda)</td></tr> </tbody> </table>	Phone Codes		500	Exhibit Hall E - 100 %	501	Exhibit Hall E - 87.5%	502	Exhibit Hall E - 75 %	504	Exhibit Hall E - 50 %	505	Exhibit Hall E - 38% Work Lights	506	Exhibit Hall E - 25 %	507	Exhibit Hall E - 12.5%	Switch Codes		114-9	Master E Hall Step 1 - South Stage	115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)
Phone Codes																												
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Switch Codes																												
114-9	Master E Hall Step 1 - South Stage																											
115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)																											
4	35H2C-5	EXHIBIT HALL (LARGE STAGE) GROUP D +0 SE				<table border="1"> <thead> <tr><th colspan="2">Phone Codes</th></tr> </thead> <tbody> <tr><td>500</td><td>Exhibit Hall E - 100 %</td></tr> <tr><td>501</td><td>Exhibit Hall E - 87.5%</td></tr> <tr><td>502</td><td>Exhibit Hall E - 75 %</td></tr> <tr><td>503</td><td>Exhibit Hall E - 62.5%</td></tr> <tr><td>504</td><td>Exhibit Hall E - 50 %</td></tr> <tr><th colspan="2">Switch Codes</th></tr> <tr><td>114-12</td><td>Master E Hall Step 4 - South Stage</td></tr> <tr><td>115-9</td><td>Master SACSCOC 2019 Hall E (CC-4 Brenda)</td></tr> </tbody> </table>	Phone Codes		500	Exhibit Hall E - 100 %	501	Exhibit Hall E - 87.5%	502	Exhibit Hall E - 75 %	503	Exhibit Hall E - 62.5%	504	Exhibit Hall E - 50 %	Switch Codes		114-12	Master E Hall Step 4 - South Stage	115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)				
Phone Codes																												
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503	Exhibit Hall E - 62.5%																											
504	Exhibit Hall E - 50 %																											
Switch Codes																												
114-12	Master E Hall Step 4 - South Stage																											
115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)																											
5	35H2C-2	EXHIBIT HALL (LARGE STAGE) GROUP E +0 SE				<table border="1"> <thead> <tr><th colspan="2">Phone Codes</th></tr> </thead> <tbody> <tr><td>500</td><td>Exhibit Hall E - 100 %</td></tr> <tr><td>501</td><td>Exhibit Hall E - 87.5%</td></tr> <tr><td>502</td><td>Exhibit Hall E - 75 %</td></tr> <tr><td>503</td><td>Exhibit Hall E - 62.5%</td></tr> <tr><th colspan="2">Switch Codes</th></tr> <tr><td>114-13</td><td>Master E Hall Step 5 - South Stage</td></tr> <tr><td>115-9</td><td>Master SACSCOC 2019 Hall E (CC-4 Brenda)</td></tr> </tbody> </table>	Phone Codes		500	Exhibit Hall E - 100 %	501	Exhibit Hall E - 87.5%	502	Exhibit Hall E - 75 %	503	Exhibit Hall E - 62.5%	Switch Codes		114-13	Master E Hall Step 5 - South Stage	115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)						
Phone Codes																												
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Switch Codes																												
114-13	Master E Hall Step 5 - South Stage																											
115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)																											
6	35H2C-4	EXHIBIT HALL (LARGE STAGE) GROUP F +0 SE				<table border="1"> <thead> <tr><th colspan="2">Phone Codes</th></tr> </thead> <tbody> <tr><td>500</td><td>Exhibit Hall E - 100 %</td></tr> </tbody> </table>	Phone Codes		500	Exhibit Hall E - 100 %																		
Phone Codes																												
500	Exhibit Hall E - 100 %																											

						501	Exhibit Hall E - 87.5%
						502	Exhibit Hall E - 75 %
						<b>Switch Codes</b>	
					114-14	Master	E Hall Step 6 - South Stage
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					501		Exhibit Hall E - 87.5%
						<b>Switch Codes</b>	
					114-15	Master	E Hall Step 7 - South Stage
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
						<b>Switch Codes</b>	
					114-16	Master	E Hall Step 8 - South Stage
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
7	35H2C-6	EXHIBIT HALL (LARGE STAGE) GROUP G +0 SE				<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					501		Exhibit Hall E - 87.5%
						<b>Switch Codes</b>	
					114-15	Master	E Hall Step 7 - South Stage
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					501		Exhibit Hall E - 87.5%
					502		Exhibit Hall E - 75 %
					504		Exhibit Hall E - 50 %
					505		Exhibit Hall E - 38% Work Lights
					506		Exhibit Hall E - 25 %
						<b>Switch Codes</b>	
					114-10	Master	E Hall Step 2 - South Stage
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					501		Exhibit Hall E - 87.5%
					502		Exhibit Hall E - 75 %
					503		Exhibit Hall E - 62.5%
					504		Exhibit Hall E - 50 %
					505		Exhibit Hall E - 38% Work Lights
						<b>Switch Codes</b>	
					114-11	Master	E Hall Step 3 - South Stage
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					501		Exhibit Hall E - 87.5%
					502		Exhibit Hall E - 75 %
					504		Exhibit Hall E - 50 %
					505		Exhibit Hall E - 38% Work Lights
					506		Exhibit Hall E - 25 %
					507		Exhibit Hall E - 12.5%
						<b>Switch Codes</b>	
					114-9	Master	E Hall Step 1 - South Stage
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					501		Exhibit Hall E - 87.5%
					502		Exhibit Hall E - 75 %
					503		Exhibit Hall E - 62.5%
					504		Exhibit Hall E - 50 %
						<b>Switch Codes</b>	
					114-12	Master	E Hall Step 4 - South Stage
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					501		Exhibit Hall E - 87.5%
					502		Exhibit Hall E - 75 %
13	35H2C-10	EXHIBIT HALL (SMALL STAGE) GROUP E +0 SE				<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					501		Exhibit Hall E - 87.5%
					502		Exhibit Hall E - 75 %

14	35H2C-10	EXHIBIT HALL (SMALL STAGE) GROUP F +0 SE				503	Exhibit Hall E - 62.5%
						<b>Switch Codes</b>	
						115-5	Master E Hall Step 5 - East Stage
						115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)
						<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						501	Exhibit Hall E - 87.5%
						502	Exhibit Hall E - 75 %
						<b>Switch Codes</b>	
						115-6	Master E Hall Step 6 - East Stage
						115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)
						<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						501	Exhibit Hall E - 87.5%
						<b>Switch Codes</b>	
						115-7	Master E Hall Step 7 - East Stage
						115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)
						<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						<b>Switch Codes</b>	
						115-8	Master E Hall Step 8 - East Stage
						<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						501	Exhibit Hall E - 87.5%
						502	Exhibit Hall E - 75 %
						504	Exhibit Hall E - 50 %
						505	Exhibit Hall E - 38% Work Lights
						506	Exhibit Hall E - 25 %
						<b>Switch Codes</b>	
						115-2	Master E Hall Step 2 - East Stage
						115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)
						<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						501	Exhibit Hall E - 87.5%
						502	Exhibit Hall E - 75 %
						503	Exhibit Hall E - 62.5%
						504	Exhibit Hall E - 50 %
						505	Exhibit Hall E - 38% Work Lights
						<b>Switch Codes</b>	
						115-3	Master E Hall Step 3 - East Stage
						115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)
						<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						501	Exhibit Hall E - 87.5%
						502	Exhibit Hall E - 75 %
						504	Exhibit Hall E - 50 %
						505	Exhibit Hall E - 38% Work Lights
						506	Exhibit Hall E - 25 %
						<b>Switch Codes</b>	
						113-2	Master E Hall Step 2 (35')
						115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)
						<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						501	Exhibit Hall E - 87.5%
						502	Exhibit Hall E - 75 %
						503	Exhibit Hall E - 62.5%
						504	Exhibit Hall E - 50 %
						505	Exhibit Hall E - 38% Work Lights
						<b>Switch Codes</b>	
						113-3	Master E Hall Step 3 (35')



21	35EH2C-15	EXHIBIT HALL (EMERG) GROUP C +0 SE				115-9 Master SACSCOC 2019 Hall E (CC-4 Brenda)
<b>Phone Codes</b>						
500	Exhibit Hall E - 100 %					
501	Exhibit Hall E - 87.5%					
502	Exhibit Hall E - 75 %					
504	Exhibit Hall E - 50 %					
505	Exhibit Hall E - 38% Work Lights					
506	Exhibit Hall E - 25 %					
507	Exhibit Hall E - 12.5%					
<b>Switch Codes</b>						
113-1 Master	E Hall Step 1 (35')					
115-9 Master	SACSCOC 2019 Hall E (CC-4 Brenda)					
22	35H2C-14	EXHIBIT HALL GROUP D +0 SE				
<b>Phone Codes</b>						
500	Exhibit Hall E - 100 %					
501	Exhibit Hall E - 87.5%					
502	Exhibit Hall E - 75 %					
503	Exhibit Hall E - 62.5%					
504	Exhibit Hall E - 50 %					
<b>Switch Codes</b>						
113-4 Master	E Hall Step 4 (35')					
115-9 Master	SACSCOC 2019 Hall E (CC-4 Brenda)					
23	35H2C-16	EXHIBIT HALL GROUP E +0 SE				
<b>Phone Codes</b>						
500	Exhibit Hall E - 100 %					
501	Exhibit Hall E - 87.5%					
502	Exhibit Hall E - 75 %					
503	Exhibit Hall E - 62.5%					
<b>Switch Codes</b>						
113-5 Master	E Hall Step 5 (35')					
115-9 Master	SACSCOC 2019 Hall E (CC-4 Brenda)					
24	35H2C-18	EXHIBIT HALL GROUP F +0 SE				
<b>Phone Codes</b>						
500	Exhibit Hall E - 100 %					
501	Exhibit Hall E - 87.5%					
502	Exhibit Hall E - 75 %					
<b>Switch Codes</b>						
113-6 Master	E Hall Step 6 (35')					
115-9 Master	SACSCOC 2019 Hall E (CC-4 Brenda)					
25	35H2C-20	EXHIBIT HALL GROUP G +0 SE				
<b>Phone Codes</b>						
500	Exhibit Hall E - 100 %					
501	Exhibit Hall E - 87.5%					
<b>Switch Codes</b>						
113-7 Master	E Hall Step 7 (35')					
115-9 Master	SACSCOC 2019 Hall E (CC-4 Brenda)					
26	35H2C-22	EXHIBIT HALL GROUP H +0 SE				
<b>Phone Codes</b>						
500	Exhibit Hall E - 100 %					
<b>Switch Codes</b>						
113-8 Master	E Hall Step 8 (35')					
115-9 Master	SACSCOC 2019 Hall E (CC-4 Brenda)					
27	35H2C-24	EXHIBIT HALL GROUP A +0 SE				
<b>Phone Codes</b>						
500	Exhibit Hall E - 100 %					
501	Exhibit Hall E - 87.5%					
502	Exhibit Hall E - 75 %					
504	Exhibit Hall E - 50 %					
505	Exhibit Hall E - 38% Work Lights					
506	Exhibit Hall E - 25 %					
<b>Switch Codes</b>						
113-2 Master	E Hall Step 2 (35')					
115-9 Master	SACSCOC 2019 Hall E (CC-4 Brenda)					
28	35H2C-19	EXHIBIT HALL GROUP B +0 SE				
<b>Phone Codes</b>						
500	Exhibit Hall E - 100 %					

						501	Exhibit Hall E - 87.5%
						502	Exhibit Hall E - 75 %
						503	Exhibit Hall E - 62.5%
						504	Exhibit Hall E - 50 %
						505	Exhibit Hall E - 38% Work Lights
						<b>Switch Codes</b>	
					113-3	Master	E Hall Step 3 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
29	35EH2C-15	EXHIBIT HALL (EMERG) GROUP C +0 SE				<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						501	Exhibit Hall E - 87.5%
						502	Exhibit Hall E - 75 %
						504	Exhibit Hall E - 50 %
						505	Exhibit Hall E - 38% Work Lights
						506	Exhibit Hall E - 25 %
						507	Exhibit Hall E - 12.5%
						<b>Switch Codes</b>	
					113-1	Master	E Hall Step 1 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
30	35H2C-21	EXHIBIT HALL GROUP D +0 SE				<b>Phone Codes</b>	
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						501	Exhibit Hall E - 87.5%
						502	Exhibit Hall E - 75 %
						503	Exhibit Hall E - 62.5%
						504	Exhibit Hall E - 50 %
						<b>Switch Codes</b>	
					113-4	Master	E Hall Step 4 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
31	35H2C-23	EXHIBIT HALL GROUP E +0 SE				<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						501	Exhibit Hall E - 87.5%
						502	Exhibit Hall E - 75 %
						503	Exhibit Hall E - 62.5%
						<b>Switch Codes</b>	
					113-5	Master	E Hall Step 5 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
32	35H2C-26	EXHIBIT HALL GROUP F +0 SE				<b>Phone Codes</b>	
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						501	Exhibit Hall E - 87.5%
						502	Exhibit Hall E - 75 %
						<b>Switch Codes</b>	
					113-6	Master	E Hall Step 6 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
33	35H2C-28	EXHIBIT HALL GROUP G +0 SE				<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						501	Exhibit Hall E - 87.5%
						<b>Switch Codes</b>	
					113-7	Master	E Hall Step 7 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
34	35H2C-30	EXHIBIT HALL GROUP H +0 SE				<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						<b>Switch Codes</b>	
					113-8	Master	E Hall Step 8 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
35	35H2C-25	EXHIBIT HALL GROUP A +0 SE				<b>Phone Codes</b>	
						500	Exhibit Hall E - 100 %
						501	Exhibit Hall E - 87.5%
						502	Exhibit Hall E - 75 %
						504	Exhibit Hall E - 50 %
						505	Exhibit Hall E - 38% Work Lights

						506	Exhibit Hall E - 25 %
						<b>Switch Codes</b>	
					113-2	Master	E Hall Step 2 (35')
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					501		Exhibit Hall E - 87.5%
					502		Exhibit Hall E - 75 %
					503		Exhibit Hall E - 62.5%
					504		Exhibit Hall E - 50 %
					505		Exhibit Hall E - 38% Work Lights
						<b>Switch Codes</b>	
					113-3	Master	E Hall Step 3 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					501		Exhibit Hall E - 87.5%
					502		Exhibit Hall E - 75 %
					504		Exhibit Hall E - 50 %
					505		Exhibit Hall E - 38% Work Lights
					506		Exhibit Hall E - 25 %
					507		Exhibit Hall E - 12.5%
						<b>Switch Codes</b>	
					113-1	Master	E Hall Step 1 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					501		Exhibit Hall E - 87.5%
					502		Exhibit Hall E - 75 %
					503		Exhibit Hall E - 62.5%
					504		Exhibit Hall E - 50 %
						<b>Switch Codes</b>	
					113-4	Master	E Hall Step 4 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					501		Exhibit Hall E - 87.5%
					502		Exhibit Hall E - 75 %
					503		Exhibit Hall E - 62.5%
						<b>Switch Codes</b>	
					113-5	Master	E Hall Step 5 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					501		Exhibit Hall E - 87.5%
					502		Exhibit Hall E - 75 %
						<b>Switch Codes</b>	
					113-6	Master	E Hall Step 6 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
					501		Exhibit Hall E - 87.5%
						<b>Switch Codes</b>	
					113-7	Master	E Hall Step 7 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
						<b>Phone Codes</b>	
					500		Exhibit Hall E - 100 %
						<b>Switch Codes</b>	
					113-8	Master	E Hall Step 8 (35')
					115-9	Master	SACSCOC 2019 Hall E (CC-4 Brenda)
36	35H2C-27	EXHIBIT HALL GROUP B +0 SE					
37	35EH2C-17	EXHIBIT HALL (EMERG) GROUP C +0 SE					
38	35H2C-29	EXHIBIT HALL GROUP D +0 SE					
39	35H2C-32	EXHIBIT HALL GROUP E +0 SE					
40	35H2C-34	EXHIBIT HALL GROUP F +0 SE					
41	35H2C-36	EXHIBIT HALL GROUP G +0 SE					
42	35H2C-31	EXHIBIT HALL GROUP H +0 SE					
43	35EH2C-7	EXHIBIT HALL (EMERG) GROUP C +0 SE					

Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit
44	35H2C-27	EXHIBIT HALL GROUP D +0 SE				
45	35H2C-33	EXHIBIT HALL EXIT DOOR +0 SE				
46	35H2CA-7	EXHIBIT HALL EXIT DOOR +0 SE				
47	35H2CA-9	EXHIBIT HALL EXIT DOOR +0 SE				
48	35H2C-42	RESTROOM LIGHTING +0 SE	Blink			
213	LCP-35RPC-2 - Rear Hall E		CC	24/24 Surface	115/277	
1	35H2C-35	EXHIBIT HALL REAR GROUP M +0 SE				
2	35H2CA-11	EXHIBIT HALL REAR GROUP N +0 SE				

  

Phone Codes	Switch Codes
500	Exhibit Hall E - 100 %
501	Exhibit Hall E - 87.5%
502	Exhibit Hall E - 75 %
504	Exhibit Hall E - 50 %
505	Exhibit Hall E - 38% Work Lights
506	Exhibit Hall E - 25 %
507	Exhibit Hall E - 12.5%
113-1	Master E Hall Step 1 (35')
115-1	Master E Hall Step 1 - East Stage
115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)

  

Phone Codes	Switch Codes
500	Exhibit Hall E - 100 %
501	Exhibit Hall E - 87.5%
502	Exhibit Hall E - 75 %
503	Exhibit Hall E - 62.5%
504	Exhibit Hall E - 50 %
113-4	Master E Hall Step 4 (35')
115-4	Master E Hall Step 4 - East Stage
115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)

  

Phone Codes	Switch Codes
500	Exhibit Hall E - 100 %
501	Exhibit Hall E - 87.5%
503	Exhibit Hall E - 62.5%
504	Exhibit Hall E - 50 %
505	Exhibit Hall E - 38% Work Lights
115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)
115-12	Master E Hall South Exit Lights - Partial

  

Phone Codes	Switch Codes
500	Exhibit Hall E - 100 %
501	Exhibit Hall E - 87.5%
502	Exhibit Hall E - 75 %
115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)
115-13	Master E Hall South Exit Lights - Main

  

Phone Codes	Switch Codes
500	Exhibit Hall E - 100 %
501	Exhibit Hall E - 87.5%
502	Exhibit Hall E - 75 %
115-9	Master SACSCOC 2019 Hall E (CC-4 Brenda)
115-13	Master E Hall South Exit Lights - Main

  

Phone Codes	Switch Codes
2	Restrooms - 1st Level
15	Restrooms - ALL
8096	Exhibit Hall E - Restrm Ltq + 0 SE
128-4	Master Restrooms - E Hall Rear

  

Phone Codes	Switch Codes
500	Exhibit Hall E - 100 %
515	Exhibit Hall E 17" Ceiling 100% Rear
516	Exhibit Hall E 17" Ceiling 50% Rear
113-16	Master E Hall Step 4 (Rear 17')

						<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>500</td> <td>Exhibit Hall E - 100 %</td> </tr> <tr> <td>515</td> <td>Exhibit Hall E 17' Ceiling 100% Rear</td> </tr> <tr> <td>516</td> <td>Exhibit Hall E 17" Ceiling 50% Rear</td> </tr> <tr> <td>517</td> <td>Exhibit Hall E 17' Ceiling 25% Rear</td> </tr> <tr> <td>518</td> <td>Exhibit Hall E 17' Ceiling 12.5% Rear</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>113-14</td> <td>Master E Hall Step 2 (Rear 17')</td> </tr> </tbody> </table>	Phone Codes		500	Exhibit Hall E - 100 %	515	Exhibit Hall E 17' Ceiling 100% Rear	516	Exhibit Hall E 17" Ceiling 50% Rear	517	Exhibit Hall E 17' Ceiling 25% Rear	518	Exhibit Hall E 17' Ceiling 12.5% Rear	Switch Codes		113-14	Master E Hall Step 2 (Rear 17')
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3	35EH2C-8	EXHIBIT HALL REAR (EMERG) GROUP P +0 SE					<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>500</td> <td>Exhibit Hall E - 100 %</td> </tr> <tr> <td>515</td> <td>Exhibit Hall E 17' Ceiling 100% Rear</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>113-13</td> <td>Master E Hall Step 1 (Rear 17')</td> </tr> </tbody> </table>	Phone Codes		500	Exhibit Hall E - 100 %	515	Exhibit Hall E 17' Ceiling 100% Rear	Switch Codes		113-13	Master E Hall Step 1 (Rear 17')					
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4	35H2C-35	EXHIBIT HALL REAR GROUP Q +0 SE	Blink				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>500</td> <td>Exhibit Hall E - 100 %</td> </tr> <tr> <td>515</td> <td>Exhibit Hall E 17' Ceiling 100% Rear</td> </tr> <tr> <td>516</td> <td>Exhibit Hall E 17" Ceiling 50% Rear</td> </tr> <tr> <td>517</td> <td>Exhibit Hall E 17' Ceiling 25% Rear</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>113-15</td> <td>Master E Hall Step 3 (Rear 17')</td> </tr> </tbody> </table>	Phone Codes		500	Exhibit Hall E - 100 %	515	Exhibit Hall E 17' Ceiling 100% Rear	516	Exhibit Hall E 17" Ceiling 50% Rear	517	Exhibit Hall E 17' Ceiling 25% Rear	Switch Codes		113-15	Master E Hall Step 3 (Rear 17')	
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5	35EH2C-9	LOADING DOCK LIGHTING (EMERG) +0 SE	Blink		1	Sunset - Sunrise	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>30</td> <td>Loading Dock - All</td> </tr> <tr> <td>35</td> <td>Loading Dock - Hall E</td> </tr> <tr> <td>42</td> <td>Partial Dock Lighting</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>130-9</td> <td>Master Dock E (Partial)</td> </tr> </tbody> </table>	Phone Codes		30	Loading Dock - All	35	Loading Dock - Hall E	42	Partial Dock Lighting	Switch Codes		130-9	Master Dock E (Partial)			
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8	35H2CA-5	Storage/Exit Lighting SE	Blink				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>8060</td> <td>Exhibit Hall E - Exit &amp; Storage Ltg</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>128-5</td> <td>Master Storage/Exit Lighting SE/Aramark</td> </tr> </tbody> </table>	Phone Codes		8060	Exhibit Hall E - Exit & Storage Ltg	Switch Codes		128-5	Master Storage/Exit Lighting SE/Aramark							
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10	35H2CA-4	MECHANICAL RM LIGHTING					<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>80</td> <td>ELECTRICAL&amp;MECHANICAL ROOMS</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>135-7</td> <td>Master Elec/Mech Rms - S +35</td> </tr> </tbody> </table>	Phone Codes		80	ELECTRICAL&MECHANICAL ROOMS	Switch Codes		135-7	Master Elec/Mech Rms - S +35							
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11	35H2CA-10	WATER HEATER			5	Water Heaters	<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>2599</td> <td>Water Heaters / Schedule ALL</td> </tr> <tr> <td>8075</td> <td>Exhibit Hall E - Water Heater</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>134-8</td> <td>Master Water Heaters - Mtg. Rooms</td> </tr> </tbody> </table>	Phone Codes		2599	Water Heaters / Schedule ALL	8075	Exhibit Hall E - Water Heater	Switch Codes		134-8	Master Water Heaters - Mtg. Rooms					
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12	35H2C-13	LEVEL +25 LIGHTING ELECTRICAL ROOM SE					<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> <tbody> <tr> <td>80</td> <td>ELECTRICAL&amp;MECHANICAL ROOMS</td> </tr> <tr> <td>8085</td> <td>Lvl 25 Ltg Storage SE 2/R WAREHOUSE</td> </tr> <tr> <th colspan="2">Switch Codes</th> </tr> <tr> <td>135-6</td> <td>Master Elec/Mech Rms - S +25</td> </tr> </tbody> </table>	Phone Codes		80	ELECTRICAL&MECHANICAL ROOMS	8085	Lvl 25 Ltg Storage SE 2/R WAREHOUSE	Switch Codes		135-6	Master Elec/Mech Rms - S +25					
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13	35H2C-13	LEVEL +25 LIGHTING STORAGE SE	Blink				<table border="1"> <thead> <tr> <th colspan="2">Phone Codes</th> </tr> </thead> </table>	Phone Codes														
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Panel ID	Description	Location	Type	Interior/Enclosure	Power Supply	Circuit												
214	LCP-83RPC - Mtg. Rms Rear		CC	24/24 Surface	115/277													
Rly	Circuit	Description	Settings	Timeout	Schedule	References												
1	83H2C-1	CORRIDOR LIGHTING LVL 51 SE	Blink		14 3rd Level public lights on	<table border="1"> <tr><th colspan="2">Phone Codes</th></tr> <tr><td>26</td><td>3rd Level Meeting Rooms - Corridor Lts</td></tr> <tr><td>9800</td><td>Lvl + 51 Corridor Ltg - 83RPC&amp;D Relays 1,3</td></tr> <tr><th colspan="2">Switch Codes</th></tr> <tr><td>134-3</td><td>Master Meeting Room Halls - East</td></tr> </table>	Phone Codes		26	3rd Level Meeting Rooms - Corridor Lts	9800	Lvl + 51 Corridor Ltg - 83RPC&D Relays 1,3	Switch Codes		134-3	Master Meeting Room Halls - East		
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134-3	Master Meeting Room Halls - East																	
3	83H2C-7	CORRIDOR LIGHTING LVL 51 SE	Blink		14 3rd Level public lights on	<table border="1"> <tr><th colspan="2">Phone Codes</th></tr> <tr><td>26</td><td>3rd Level Meeting Rooms - Corridor Lts</td></tr> <tr><td>9800</td><td>Lvl + 51 Corridor Ltg - 83RPC&amp;D Relays 1,3</td></tr> <tr><th colspan="2">Switch Codes</th></tr> <tr><td>134-3</td><td>Master Meeting Room Halls - East</td></tr> </table>	Phone Codes		26	3rd Level Meeting Rooms - Corridor Lts	9800	Lvl + 51 Corridor Ltg - 83RPC&D Relays 1,3	Switch Codes		134-3	Master Meeting Room Halls - East		
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4	83H2C-5	CORRIDOR LIGHTING LVL 51 SE	Blink		14 3rd Level public lights on	<table border="1"> <tr><th colspan="2">Phone Codes</th></tr> <tr><td>27</td><td>3rd Level Meeting Rooms - Corridor Lts</td></tr> <tr><td>9900</td><td>Lvl + 51 Corridor Ltg - 83RPC&amp;D - Relays 2,4</td></tr> <tr><th colspan="2">Switch Codes</th></tr> <tr><td>134-3</td><td>Master Meeting Room Halls - East</td></tr> </table>	Phone Codes		27	3rd Level Meeting Rooms - Corridor Lts	9900	Lvl + 51 Corridor Ltg - 83RPC&D - Relays 2,4	Switch Codes		134-3	Master Meeting Room Halls - East		
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134-3	Master Meeting Room Halls - East																	
5	83H2C-9	DOCK LIGHTING LVL 51 SE	Blink		1 Sunset - Sunrise	<table border="1"> <tr><th colspan="2">Phone Codes</th></tr> <tr><td>30</td><td>Loading Dock - All</td></tr> <tr><td>40</td><td>Loading Dock - Warehouse 3 (+51 SE)</td></tr> <tr><td>42</td><td>Partial Dock Lighting</td></tr> <tr><th colspan="2">Switch Codes</th></tr> <tr><td>131-3</td><td>Master WH3 Dock</td></tr> </table>	Phone Codes		30	Loading Dock - All	40	Loading Dock - Warehouse 3 (+51 SE)	42	Partial Dock Lighting	Switch Codes		131-3	Master WH3 Dock
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42	Partial Dock Lighting																	
Switch Codes																		
131-3	Master WH3 Dock																	
6	83H2C-4	RESTROOM LIGHTING LVL 51 SE	Blink			<table border="1"> <tr><th colspan="2">Phone Codes</th></tr> <tr><td>15</td><td>Restrooms - ALL</td></tr> <tr><td>9905</td><td>Pnl 83RPC - Restroom Ltg Lvl 51 SE</td></tr> <tr><th colspan="2">Switch Codes</th></tr> </table>	Phone Codes		15	Restrooms - ALL	9905	Pnl 83RPC - Restroom Ltg Lvl 51 SE	Switch Codes					
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15	Restrooms - ALL																	
9905	Pnl 83RPC - Restroom Ltg Lvl 51 SE																	
Switch Codes																		

7	83L2C-33	ROOF TOP LIGHTING VIA CONTACTOR				134-5 Master Restrooms - East
<b>Phone Codes</b>						
	9910	Pnl 83RPC - Roof Top Lights Via Contactor				
<b>Switch Codes</b>						
129-4	Master	Christmas Lights - North				
129-5	Master	Christmas Lights - South				
8	83L2C-37	GRBCC NEON SIGN LIGHTS South End			12 Building Signs	
<b>Phone Codes</b>						
	78	GBBCC Neon Sign -South End				
<b>Switch Codes</b>						
129-3	Master	South GRBCC Sign				
9	83EH2C-5	MECHANICAL RM LTG LVL 83	Blink			
<b>Phone Codes</b>						
	80	ELECTRICAL&MECHANICAL ROOMS				
<b>Switch Codes</b>						
135-8	Master	Elec/Mech Rms - S +83				
10	83H2CA-2	MECHANICAL RM LTG LVL 83	Blink			
<b>Phone Codes</b>						
	80	ELECTRICAL&MECHANICAL ROOMS				
<b>Switch Codes</b>						
135-8	Master	Elec/Mech Rms - S +83				
11	83H2CA-6	PANTRY LIGHTING LVL +51	Blink			
<b>Phone Codes</b>						
	9925	Pnl 83RPC - Pantry Ltg Lvl + 51				
<b>Switch Codes</b>						
134-6	Master	Pantry				
12	83H2CA-4	STORAGE LVL +51 LIGHTING	Blink			
<b>Phone Codes</b>						
	9930	Pnl 83RPC - Storage Lvl + 51 Lighting				
<b>Switch Codes</b>						
134-7	Master	WH3/Storage				
13	83H2CA-8	STORAGE LVL +51 LIGHTING	Blink			
<b>Phone Codes</b>						
	9930	Pnl 83RPC - Storage Lvl + 51 Lighting				
<b>Switch Codes</b>						
134-7	Master	WH3/Storage				
14		SPARE				
15		SPARE				
16		SPARE				
17		SPARE				
18		SPARE				
19		SPARE				
20		SPARE				
21		SPARE				
22		SPARE				
23		SPARE				
24		SPARE				
<b>Panel ID</b>	<b>Description</b>	<b>Location</b>	<b>Type</b>	<b>Interior/Enclosure</b>	<b>Power Supply</b>	<b>Circuit</b>
215	LCP-83RPD - Mtg. Rms. Front		CC	24/24 Surface	115/277	
<b>Rly</b>	<b>Circuit</b>	<b>Description</b>	<b>Settings</b>	<b>Timeout</b>	<b>Schedule</b>	<b>References</b>
1	83H2D-1	CORRIDOR LIGHTING LVL 51 SW	Blink		14 3rd Level public lights on	
<b>Phone Codes</b>						
	26	3rd Level Meeting Rooms - Corridor Lts				
	9800	Lvl + 51 Corridor Ltg - 83RPC&D Relays 1,3				
<b>Switch Codes</b>						

2	83H2D-3	CORRIDOR LIGHTING LVL 51 SW	Blink		14 3rd Level public lights on	134-2 Master Meeting Room Halls - West
						<b>Phone Codes</b>
						27 3rd Level Meeting Rooms - Corridor Lts
						9900 Lvl + 51 Corridor Ltg - 83RPC&D - Relays 2,4
						<b>Switch Codes</b>
						134-2 Master Meeting Room Halls - West
3	83H2D-5	CORRIDOR LIGHTING LVL 51 SW	Blink		14 3rd Level public lights on	134-2 Master Meeting Room Halls - West
						<b>Phone Codes</b>
						26 3rd Level Meeting Rooms - Corridor Lts
						9800 Lvl + 51 Corridor Ltg - 83RPC&D Relays 1,3
						<b>Switch Codes</b>
						134-2 Master Meeting Room Halls - West
4	83H2D-7	CORRIDOR LIGHTING LVL 51 SW	Blink		14 3rd Level public lights on	134-2 Master Meeting Room Halls - West
						<b>Phone Codes</b>
						27 3rd Level Meeting Rooms - Corridor Lts
						9900 Lvl + 51 Corridor Ltg - 83RPC&D - Relays 2,4
						<b>Switch Codes</b>
						134-2 Master Meeting Room Halls - West
5	83H2D-2	PUBLIC AREA LIGHTING LVL 51 SW	Blink		14 3rd Level public lights on	134-2 Master Meeting Room Halls - West
						<b>Phone Codes</b>
						25 Level 3 Public Area SW - New Bldg
						<b>Switch Codes</b>
						134-1 Master Meeting Rooms Foyer
6	83H2D-4	PUBLIC AREA LIGHTING LVL 51 SW	Blink		14 3rd Level public lights on	134-1 Master Meeting Rooms Foyer
						<b>Phone Codes</b>
						25 Level 3 Public Area SW - New Bldg
						<b>Switch Codes</b>
						134-1 Master Meeting Rooms Foyer
7	83H2D-6	PUBLIC AREA LIGHTING LVL 51 SW	Blink		14 3rd Level public lights on	134-1 Master Meeting Rooms Foyer
						<b>Phone Codes</b>
						25 Level 3 Public Area SW - New Bldg
						<b>Switch Codes</b>
						134-1 Master Meeting Rooms Foyer
8	83H2D-8	TRUSS E LIGHTING LVL 51 SW	Blink		7 Truss Lights (morning)	134-1 Master Meeting Rooms Foyer
						<b>Phone Codes</b>
						857 Truss Lights - Escalators E
						<b>Switch Codes</b>
						127-4 Master Truss E Lighting
9	83H2D-10	TRUSS E LIGHTING LVL 51 SW	Blink		7 Truss Lights (morning)	127-4 Master Truss E Lighting
						<b>Phone Codes</b>
						857 Truss Lights - Escalators E
						<b>Switch Codes</b>
						127-4 Master Truss E Lighting
10	83H2D-12	TRUSS E LIGHTING LVL 51 SW	Blink		7 Truss Lights (morning)	127-4 Master Truss E Lighting
						<b>Phone Codes</b>
						857 Truss Lights - Escalators E
						<b>Switch Codes</b>
						127-4 Master Truss E Lighting
11	83H2D-14	TRUSS E LIGHTING LVL 51 SW-over Skybridge	Blink		7 Truss Lights (morning)	127-4 Master Truss E Lighting
						<b>Phone Codes</b>
						857 Truss Lights - Escalators E
						<b>Switch Codes</b>
						127-4 Master Truss E Lighting
12	83H2D-9	RESTROOM LIGHTING LVL 51 SW	Blink			127-4 Master Truss E Lighting
						<b>Phone Codes</b>
						15 Restrooms - ALL
						9906 Pnl 83RPD- Restroom Ltg Lvl 51 SW
						<b>Switch Codes</b>
						134-4 Master Restrooms - West
13		SPARE				
14	83H2D-16	LIGHTING MECHANICAL +83 SW	Blink			
						<b>Phone Codes</b>
						80 ELECTRICAL&MECHANICAL ROOMS
						<b>Switch Codes</b>
						135-8 Master Elec/Mech Rms - S +83



15		SPARE				
16		SPARE				
17		SPACE				
18		SPACE				
19		Space				
20		Space				
21		Space				
22		Space				
23		Space				
24		Space				