JUMPER CARTER SEASE/ARCHITECTS, P.A.
JCSarchitects.com / 412 Meeting Street, West Columbia, SC 29169
P (803) 791-1020 / F (803) 791-1022

1600 HAMPTON ANNEX – RENOVATION (DLES)

PROJECT NO: H27-I997
USC PROJECT NO: CP00345233
JCS PROJECT NO: 12113

ADDENDUM 01
March 26, 2014

GENERAL:

1. The meeting minutes from the non-mandatory Pre-Bid Conference on March 26, 2014, are included in this addendum.

2. See attached for list of attendees present at the non-mandatory Pre-Bid Conference on March 26, 2014.

3. See attached for Pre-Bid Conference Site Map & Site Tour Meeting Times.

4. See Mechanical Design Inc. Addendum No. 1 included in this addendum for plumbing / fire protection drawing and specification additions.

5. See Sims Group Addendum No. 1 included in this addendum for electrical drawing and specification additions.

SPECIFICATIONS:

1. **Section 000010, Table of Contents:** **REVISE** Division 26 ELECTRICAL table of contents as follows:

DIVISION 26	**ELECTRICAL**
26 05 00	Electrical Basic Materials and Methods
26 05 29	Hangers and Supports for Electrical Systems
26 43 13	Surge Protection Device (SPD)

2. **SE-330, Lump Sum Bid – Bid Form:** **REPLACE** entire form with the attached revised form.

Jumper Carter Sease ARCHITECTS

3. **Section 012300, Alternates, Paragraph 1.01 E:** **ADD** the following:

   Alternate No. 2:
   Rework the existing electrical service as noted on Sheets E201, E600, and E601. Work under this alternate includes addition of a 1200A fused main disconnect switch, rerouting of the 1200A main feeder from the 1200A main disconnect switch to ATS1 located at rear of building, and from ATS1 to existing Main Panel MP. ATS1 to be furnished and installed under a separate contract.

4. **Section 018000, List of Drawings:** **REPLACE** entire section with the attached revised section, which includes updated electrical drawings.

DRAWINGS:

1. **Sheet T101, Index of Drawings:** **REVISE** electrical sheets as follows:

E001	ELECTRICAL SYMBOLS & NOTES
E002	LIGHTING FIXTURE SCHEDULE & NOTES
E101	LIGHTING - BASEMENT LEVEL
E102	LIGHTING - FIRST FLOOR
E103	LIGHTING - SECOND AND THIRD FLOOR
E201	POWER - BASEMENT LEVEL
E202	POWER - FIRST FLOOR
E203	POWER - SECOND AND THIRD FLOOR
E401	COMMUNICATIONS - BASEMENT LEVEL
E402	COMMUNICATIONS - FIRST FLOOR
E403	COMMUNICATIONS - SECOND AND THIRD FLOOR
E600	POWER RISER DIAGRAM - DEMOLITION
E601	POWER RISER DIAGRAM
E602	ELECTRICAL DETAILS
E603	LIGHTING DETAILS
E604	COMMUNICATION DETAILS
E605	PANEL SCHEDULES
E606	PANEL SCHEDULES

END OF ADDENDUM

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1600 HAMPTON ANNEX – RENOVATION (DLES)

PROJECT NO: H27-I997
USC PROJECT NO: CP00345233
JCS PROJECT NO: 12113

PRE-BID CONFERENCE MINUTES
March 26, 2014, 10:00 am

1. The pre-bid conference is non-mandatory. Additional bidders besides those in attendance and listed on the attached sign-in sheet may elect to bid the project.

2. A brief description of the project scope, schedule, and bid requirements was given by Juaquana Brookins, Procurement, USC, and Christian Mergner, Project Manager, USC. Further description was given by Darryn Bouknight, Jumper Carter Sease Architects. Refer to contract documents and addenda for complete scope.

3. The only official construction documents may be obtained from the USC Purchasing website.

4. Bids will be due **Tuesday, April 8, 2014, at 2:00 pm**, and received at USC Facilities (743 Greene St, Columbia). Bids received after that time will not be accepted.

5. Bidders are advised that office hours at USC Facilities are 8:00 am – 5:00 pm, Monday – Friday. If bids are mailed, FedEx'ed, or otherwise delivered, they must arrive during office hours. USC will not pick up bids from carrier's holding facilities. Bids may not be faxed.

6. All bids must include the bidder's name and project name on the front of the envelope.

7. Bids will be accepted from prime contractors only.

8. A bid security will be required.

9. All bids must be submitted on the SE-310 form included in the project manual, or as amended by addendum. Bids must be signed, type of bid security indicated, addenda acknowledged, bid amounts given in numerical format only, and contractor's license number provided as listed with LLR. Failure to include this information will result in the bid being non-responsive.

10. Subcontractor listing is required on the bid form. Failure to include the designated subcontractors will result in the bid being non-responsive.

11. A Performance Bond and Labor and Material Payment Bond will be required of the successful bidder.

12. Proof of insurance will be required of the successful bidder, as stipulated in the project manual.

13. There is currently a single base bid and one alternate. Addendum 01 will include a second alternate.

14. The project must be completed within the 60-day time period stated in the project manual. (Substantial completion by July 1, 2014.) There are no working hours restrictions.

15. Liquidated Damages will be assessed at $250 per calendar day as stipulated in the project manual.

16. Hazardous materials reports for lead based paint and asbestos are included in the project manual for reference. All asbestos abatement, which is believed to be limited to floor mastic, will be performed by USC prior to construction.

17. Project lay-down area will be available on the south side of the building in the parking area.

18. A site visit was conducted immediately after the meeting to clarify the work area. The following items were discussed on site:

    a. All existing systems furniture (cubicle walls), other furniture, boxes, trash, etc. will be removed by USC prior to start of construction.
    b. The existing elevator walls and ceiling must be protected if used by the contractor.

19. A second, and final, opportunity to visit the site is scheduled for Monday, March 31, 2014, at 9:00 am. Representatives from USC will be present.

20. Contractors must send any questions to the Architect in writing by close of business Tuesday, April 1, 2014 (Attn: Darryn Bouknight, Jumper Carter Sease Architects, dbouknight@jcsarchitects.com).

21. At least one addendum will be issued to include these meeting minutes, the pre-bid conference sign-in sheet, and any additional changes or clarifications to the contract documents, including the electrical and fire protection drawings and specifications.

22. The last addendum will be issued by Thursday, April 3, 2014.

23. The separate Deferred Maintenance project, previously advertised and bid, has not yet been awarded. Information regarding this award will be made available to the bidders as it becomes available.

END OF MINUTES

University of South Carolina

Columbia, South Carolina

Project Name: 1600 Hampton Annex - Renovations (DLES)
Project Number: H27-I997
Pre Bid Date & Time: March 26, 2014 @ 10 am

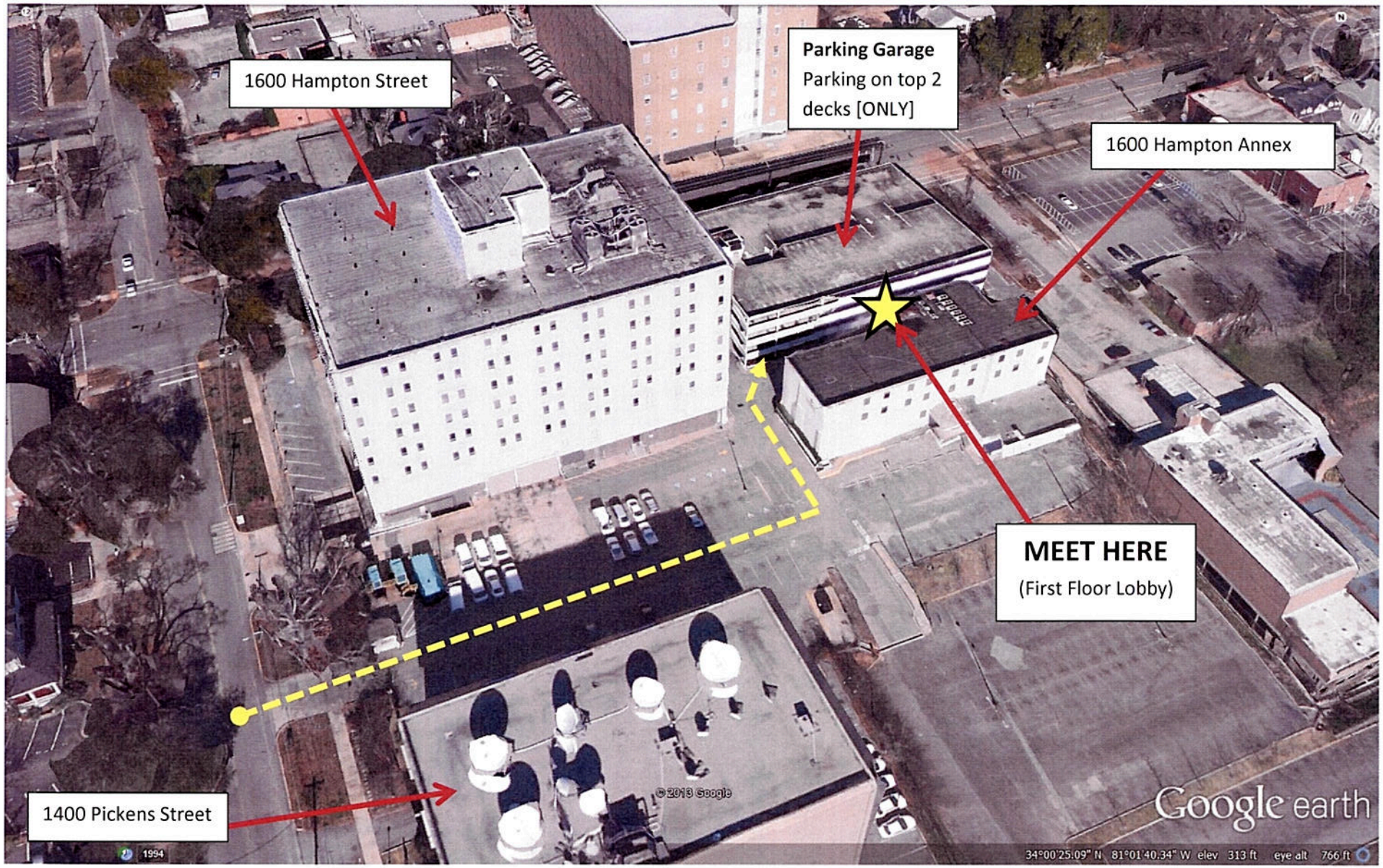
Name	Company Name	Address	Phone #	Email
Bobby Alexander Wade Boreman	Pyramid Contracting	1108-A Lyles Ln. Irmo, SC	803.732.2050	pyramidcontracting.com wade@pyramidcontracting.com
DARRYN BOUKNIGHT	JUMPER CARTER SEASE	412 MEETING ST WEST COLA. SC 29169	803-791-1020	dbouknight@jcsarchitects.com
Charlie White	FBi Construction	P.O. Box 4501 Florence, SC	843-250-9956	charlie.white@fbiconstruction.com
Jim McFarland	Solid Structures	2548 Morningside Dr W. Cola, S.C	806-9260298	jnoah@solidstructures.info
DAN HUST	DANS HEATING AIR ~~CONSTRUCTION~~ LLC	521 OLD ORANGEBURG RD LEX 29073	803-520-7575	DANS HEATING AIR @ MSN.COM
NICK D. PIZZUTI	PIZZUTI BUILDERS INC	1901 Augusta Hwy Lex, S.C. 29072	803-957-5522	pbinick@windstream.net
JASON PROWSE	HAMMER CONSTRUCTION	785 Hammer Creek Way COLUMBIA 29209	803-783-7033	JASON@HAMMERLLC.COM
CHUCK SENAR	PENN CONTRACTING LLC	P.O. BOX 204 Ballentine SC 29002	803 4079724 fax 7814142	BOB@PENNCONTRACTING.COM
Lee Bedenbaugh	Core Construction	PO Box 2156 West Columbia, SC 29171	803-791-8788	lee@coreconstructionsc.com

University of South Carolina

Columbia, South Carolina

Project Name: 1600 Hampton Annex - Renovations (DLES)
Project Number: H27-I997
Pre Bid Date & Time: March 26, 2014 @ 10 am

Name	Company Name	Address	Phone #	Email
Ben Lindler	Lindler Construction	P.O. Box 5446 Cola. SC, 29250.	803 252-9948	HOS1@Bellsouth.Net
Darrell Russell	South Eastern Construction of the Midlands	2680 South Lake Dr. Lexington SC 29073	803 764-4002	darrellr@seconstructionofm.com
LAN POWERS	HUSS, INC.	PO BOX 12339 CHARLESTON, SC 29412	(843) 937-0023	RICHARD HUSS@HUSSINC.com
Jared Rikard	Capital Construction of the Carolinas	704 Ramsgate Drive Spartanburg SC, 29301	864 809-7628	Jared@CapitalConstruction.us
JESSICA HUGHES	HESTER DRYWALL		803-518-4813	JESSICA@HESTERDRYWALL.COM
Christian Mergner	USC	743 Greene St.	777-4569	cmergner@fmc.sc.edu
JUAQUANA BROOKINS	USC	" "	803 777-3596	jbrookin@fmc.sc.edu



Re: 1600 Hampton Annex – DLES Renovation

PRE-BID MTG_26-MAR-2014_10:00 am to 10:30 am_**FREE Parking @ Facilities [743 Greene Street]**

1st SITE TOUR_26-MAR-2014_10:45 am to 11:30 am_**FREE Parking @ TOP 2 levels of Parking Garage [ONLY]**

2st SITE TOUR_31-MAR-2014_9:00 am to 10:00 am_**FREE Parking @ TOP 2 levels of Parking Garage [ONLY]**

SE-330 – LUMP SUM BID
BID FORM (Addendum 01)

Bidders shall submit bids on only Bid Form SE-330.

BID SUBMITTED BY:_____
(Bidder's Name)

BID SUBMITTED TO: University of South Carolina
(Owner's Name)

FOR PROJECT: **PROJECT NAME** 1600 Hampton Annex - Renovation (DLES)

PROJECT NUMBER H27-I997

OFFER

§ 1. In response to the Invitation for Construction Bids and in compliance with the Instructions to Bidders for the above-named Project, the undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into a Contract with the Owner on the terms included in the Bidding Documents, and to perform all Work as specified or indicated in the Bidding Documents, for the prices and within the time frames indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

§ 2. Pursuant to Section 11-32-3030(1) of the SC Code of Laws, as amended, Bidder has submitted Bid Security as follows in the amount and form required by the Bidding Documents:

☐ Bid Bond with Power of Attorney ☐ Electronic Bid Bond ☐ Cashier's Check
(Bidder check one)

§ 3. Bidder acknowledges the receipt of the following Addenda to the Bidding Documents and has incorporated the effects of said Addenda into this Bid:

ADDENDUM No:_____

§ 4. Bidder accepts all terms and conditions of the Invitation for Bids, including, without limitation, those dealing with the disposition of Bid Security. Bidder agrees that this Bid, including all Bid Alternates, if any, may not be revoked or withdrawn after the opening of bids, and shall remain open for acceptance for a period of 60 Days following the Bid Date, or for such longer period of time that Bidder may agree to in writing upon request of the Owner.

§ 5. Bidder herewith offers to provide all labor, materials, equipment, tools of trades and labor, accessories, appliances, warranties and guarantees, and to pay all royalties, fees, permits, licenses and applicable taxes necessary to complete the following items of construction work:

§ 6.1 BASE BID WORK ***(as indicated in the Bidding Documents and generally described as follows)*****:** Installation of new systems for tenant upfit, including architectural (drywall partitions, lay-in ceilings, casework), plumbing, mechanical, electrical, and modification of sprinkler system. Small and minority business participation is encouraged.,

_____, which sum is hereafter called the Base Bid.
(Bidder - insert Base Bid Amount on line above)

SE-330 – LUMP SUM BID
BID FORM (Addendum 01)

§ 6.2 BID ALTERNATES - as indicated in the Bidding Documents and generally described as follows:

ALTERNATE # 1 *(Brief Description)*: Remove existing mechanical system serving Room 107 and replace with new, as indicated in the mechanical drawings.

☐ **ADD TO** or ☐ **DEDUCT FROM BASE BID:**_____

(Bidder to Mark appropriate box to clearly indicate the price adjustment offered for each alternate)

ALTERNATE # 2 *(Brief Description)*: Rework the existing electrical service as noted on Sheets E201, E600, and E601. Work under this alternate includes addition of a 1200A fused main disconnect switch, rerouting of the 1200A main feeder from the 1200A main disconnect switch to ATS1 located at rear of building, and from ATS1 to existing Main Panel MP. ATS1 to be furnished and installed under a separate contract.

☐ **ADD TO** or ☐ **DEDUCT FROM BASE BID:**_____

(Bidder to Mark appropriate box to clearly indicate the price adjustment offered for each alternate)

ALTERNATE # 3 *(Brief Description)*: N/A

☐ **ADD TO** or ☐ **DEDUCT FROM BASE BID:**_____

(Bidder to Mark appropriate box to clearly indicate the price adjustment offered for each alternate)

SE-330 – LUMP SUM BID

Rev. 9/21/2011

BID FORM (Addendum 01)

§ 7. LISTING OF PROPOSED SUBCONTRACTORS PURSUANT TO SECTION 3020(b)(i), CHAPTER 35, TITLE 11 OF THE SOUTH CAROLINA CODE OF LAWS, AS AMENDED – ***(See Instructions on the following page BF-2A)***

Bidder shall use the below-listed Subcontractors in the performance of the Subcontractor Specialty work listed:

SUBCONTRACTOR SPECIALTY By License Classification and/or Subclassification (Completed by Owner)	**SUBCONTRACTOR'S PRIME CONTRACTOR'S NAME** (Must be completed by Bidder) **BASE BID**	**SUBCONTRACTOR'S PRIME CONTRACTOR'S SC LICENSE NUMBER**
PL		
HT		
AC		
EL		
ALTERNATE 1		
HT		
AC		
ALTERNATE 2		
EL		
ALTERNATE 3		

If a Bid Alternate is accepted, Subcontractors listed for the Bid Alternate shall be used for the work of both the Alternate and the Base Bid work.

SE-330 – LUMP SUM BID
BID FORM (Addendum 01)

INSTRUCTIONS FOR SUBCONTRACTOR LISTING

1. Section 7 of the Bid Form sets forth a list of subcontractor specialties for which bidder is required to identify by name the subcontractor(s)Bidder will use to perform the work of each listed specialty. Bidder must identify only the subcontractor(s) who will perform the work and no others.

2. For purposes of subcontractor listing, a Subcontractor is an entity who will perform work or render service to the prime contractor to or about the construction site. Material suppliers, manufacturers, and fabricators that will not perform physical work at the site of the project but will only supply materials or equipment to the bidder or proposed subcontractor(s) are not subcontractors and Bidder should not insert their names in the spaces provided on the bid form. Likewise, Bidder should not insert the names of sub-subcontractors in the spaces provided on the bid form but only the names of those entities with which bidder will contract directly.

3. Bidder must only insert the names of subcontractors who are qualified to perform the work of the listed specialties as specified in the Bidding Documents and South Carolina Licensing Laws.

4. If under the terms of the Bidding Documents, Bidder is qualified to perform the work of a specialty listed and Bidder does not intend to subcontract such work but to use Bidder's own employees to perform such work, the Bidder must insert its own name in the space provided for that specialty.

5. If Bidder intends to use multiple subcontractors to perform the work of a single specialty listing, Bidder must insert the name of each subcontractor Bidder will use, preferably separating the name of each by the word **"and"**. If Bidder intends to use both his own employees to perform a part of the work of a single specialty listing and to use one or more subcontractors to perform the remaining work for that specialty listing, bidder must insert his own name and the name of each subcontractor, preferably separating the name of each with the word **"and"**.

6. Bidder may not list subcontractors in the alternative nor in a form that may be reasonably construed at the time of bid opening as a listing in the alternative. A listing that requires subsequent explanation to determine whether or not it is a listing in the alternative is non-responsive. If bidder intends to use multiple entities to perform the work for a single specialty listing, bidder must clearly set forth on the bid form such intent. Bidder may accomplish this by simply inserting the word "**and**" between the name of each entity listed for that specialty. Owner will reject as non-responsive a listing that contains the names of multiple subcontractors separated by a blank space, the word "or", a virgule (that is a /), or any separator that the Owner may reasonably interpret as a listing in the alternative.

7. If Bidder is awarded the contract, bidder must, except with the approval of the owner for good cause shown, use the listed entities to perform the work for which they are listed.

8. If bidder is awarded the contract, bidder will not be allowed to substitute another entity as subcontractor in place of a subcontractor listed in Section 7 of the Bid except for one or more of the reasons allowed by the SC Code of Laws.

9. Bidder's failure to insert a name for each listed specialty subcontractor will render the Bid non-responsive.

SE-330 – LUMP SUM BID
BID FORM (Addendum 01)

§ 8. LIST OF MANUFACTURERS, MATERIAL SUPPLIERS, AND SUBCONTRACTORS OTHER THAN SUBCONTRACTORS LISTED IN SECTION 7 ABOVE *(FOR INFORMATION ONLY):* Pursuant to instructions in the Invitation for Bids, if any, Bidder will provide to Owner upon the Owner's request and within 24 hours of such request, a listing of manufacturers, material suppliers, and subcontractors, other than those listed in Section 7 above, that Bidder intends to use on the project. Bidder acknowledges and agrees that this list is provided for purposes of determining responsibility and not pursuant to the subcontractor listing requirements of SC Code Ann § 11-35-3020(b)(i).

§ 9. TIME OF CONTRACT PERFORMANCE AND LIQUIDATED DAMAGES

a. CONTRACT TIME: Bidder agrees that the Date of Commencement of the Work shall be established in a Notice to Proceed to be issued by the Owner. Bidder agrees to substantially complete the Work within **60** calendar days from the Date of Commencement, subject to adjustments as provided in the Contract Documents.

b. LIQUIDATED DAMAGES: Bidder further agrees that from the compensation to be paid, the Owner shall retain as Liquidated Damages the sum of $250.00 for each calendar day the actual construction time required to achieve Substantial Completion exceeds the specified or adjusted time for Substantial Completion as provided in the Contract Documents. This sum is intended by the parties as the predetermined measure of compensation for actual damages, not as a penalty for nonperformance.

§ 10. AGREEMENTS

a. Bidder agrees that this bid is subject to the requirements of the law of the State of South Carolina.

b. Bidder agrees that at any time prior to the issuance of the Notice to Proceed for this Project, this Project may be canceled for the convenience of, and without cost to, the State.

c. Bidder agrees that neither the State of South Carolina nor any of its agencies, employees or agents shall be responsible for any bid preparation costs, or any costs or charges of any type, should all bids be rejected or the Project canceled for any reason prior to the issuance of the Notice to Proceed.

§ 11. ELECTRONIC BID BOND

By signing below, the Principal is affirming that the identified electronic bid bond has been executed and that the Principal and Surety are firmly bound unto the State of South Carolina under the terms and conditions of the AIA Document A310, Bid Bond, included in the Bidding Documents.

Electronic Bid Bond Number: _____

Signature and Title: _____

SE-330 – LUMP SUM BID
BID FORM (Addendum 01)

Rev. 9/21/2011

BIDDER'S TAXPAYER IDENTIFICATION

FEDERAL EMPLOYER'S IDENTIFICATION NUMBER:_____

OR

SOCIAL SECURITY NUMBER:_____

CONTRACTOR'S CLASSIFICATIONS AND SUBCLASSIFICATIONS WITH LIMITATIONS

Classification(s)& Limits: _____

Subclassification(s) & Limits:_____

SC Contractor's License Number(s):_____

BY SIGNING THIS BID, THE PERSON SIGNING REAFFIRMS ALL REPRESENTATIONS AND CERTIFICATIONS MADE BY BOTH THE PERSON SIGNING AND THE BIDDER, INCLUDING WITHOUT LIMITATION, THOSE APPEARING IN ARTICLE 2 OF THE INSTRUCTIONS TO BIDDER. THE INVITATION FOR BIDS, AS DEFINED IN THE INSTRUCTIONS TO BIDDERS, IS EXPRESSLY INCORPORATE BY REFERENCE.

SIGNATURE

BIDDER'S LEGAL NAME: _____

ADRESS: _____

_____

BY:_____ **DATE:**_____
(Signature)

TITLE:_____

TELEPHONE:_____

EMAIL: _____

LIST OF DRAWINGS:

DRAWING	DESCRIPTION
T101	TITLE, INDEX & ABBREVIATIONS
D100	DEMOLITION PLAN BASEMENT
D101	DEMOLITION PLAN 1ST FLOOR
D102	DEMOLITION PLAN 2ND & 3RD FLOOR
A100	FLOOR PLAN BASEMENT
A101	FLOOR PLAN 1ST FLOOR
A102	FLOOR PLAN 2ND & 3RD FLOOR
A501	FINISH SCHEDULE
A502	DOOR SCHEDULE / DOOR & FRAME TYPES & DETAILS
A601	CASEWORK ELEVATIONS & DETAILS
A900	REFLECTED CEILING PLAN BASEMENT
A901	REFLECTED CEILING PLAN 1ST FLOOR
A902	REFLECTED CEILING PLAN 2ND & 3RD FLOOR
P001	PLUMBING DETAILS & SCHEDULES
P002	PLUMBING BASEMENT FLOOR PLANS
P003	PLUMBING 2ND & 3RD FLOOR PLANS
M001	HVAC NOTES, SYMBOLS, DETAILS & SCHEDULES
M101	PARTIAL 1ST FLOOR HVAC DEMOLITION FLOOR PLAN
M201	BASEMENT & 1ST FLOOR HVAC RENOVATION FLOOR PLANS
M202	2ND FLOOR & ROOF HVAC RENOVATION FLOOR PLANS
E001	ELECTRICAL SYMBOLS & NOTES
E002	LIGHTING FIXTURE SCHEDULE & NOTES
E101	LIGHTING - BASEMENT LEVEL
E102	LIGHTING - FIRST FLOOR
E103	LIGHTING - SECOND AND THIRD FLOOR
E201	POWER - BASEMENT LEVEL
E202	POWER - FIRST FLOOR
E203	POWER - SECOND AND THIRD FLOOR
E401	COMMUNICATIONS - BASEMENT LEVEL
E402	COMMUNICATIONS - FIRST FLOOR
E403	COMMUNICATIONS - SECOND AND THIRD FLOOR
E600	POWER RISER DIAGRAM - DEMOLITION
E601	POWER RISER DIAGRAM
E602	ELECTRICAL DETAILS
E603	LIGHTING DETAILS
E604	COMMUNICATION DETAILS
E605	PANEL SCHEDULES
E606	PANEL SCHEDULES

END OF SECTION 01 80 00

MECHANICAL DESIGN Inc.

4403 Broad River Road
Columbia, S.C. 29210
Phone: 731-9834
Fax: 731-9837

ADDENDUM NO. 1

To: **Jumper, Carter, Sease, Architects**

Attn: Darryn Bouknight, AIA

Date: Mar. 26, 2014

Project: **1600 Hampton Annex - Renovations (DLES)** **MDI Comm. No. 122998b**
University of South Carolina

To All Bidders:

Please include the following items in your bid for this project:

ITEMS PERTAINING TO FIRE PROTECTION SPECIFICATIONS

1. Section 21 13 00: Add the following specifications section Mechanical, Automatic Sprinkler System to this project.

ITEMS PERTAINING TO THE FIRE PROTECTION DRAWINGS

1. Refer to the attached 8-1/2" x 11" sketches FP1, FP2 and FP3 for drawing scope related to the modifications to the existing wet-pipe sprinkler systems presently installed in the basement areas and 1st floor elevator lobby.

2. Provide all piping modifications and work for all areas of the basement and 1st floor elevator lobby as indicated. (See specifications included with this addendum.)

ITEMS PERTAINING TO PLUMBING DRAWINGS

1. Provide pipe insulation and install on existing 2-1/2" domestic cold water line located above ceiling at Mech 013 and Elect 012. Rework pipe hangers as applicable for the installation of pipe insulation. (Approx 30 l.f.)

2. Provide gate valve on 1-1/4"cw supply connection to the existing cw line above ceiling at Corr H001.

End of Plumbing / Fire Protection Addendum

SECTION 21 13 00 - MECHANICAL, AUTOMATIC SPRINKLER SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Section 23 00 00, MECHANICAL, GENERAL applies to work of this section of these specifications. Refer to Automatic Sprinkler System drawings *(Shts FP1 thru FP3)* for work and materials for this section of the specifications.

1. All work shall be accomplished by a Fire Sprinkler Contractor certified and licensed as a qualified Fire Protection Contractor regularly engaged in the design and installation of fire sprinkler systems under the Laws of the State of South Carolina.

1.2 SCOPE

A. All work and materials shall be in accordance with National Fire Protection Association NFPA 13 - 2010, NFPA 25 - 2008, IBC International Building Code - 2009, and all applicable codes and standards. Installation shall be in accordance with the requirements of Seismic of the IBC International Building Code.

B. Sprinkler equipment and installation shall be in strict accordance with recommendations of the University of South Carolina Fire Marshal for the project including the local authority having jurisdiction.

C. Sprinkler System Design: Sprinkler system design shall be based on occupancy classifications for renovated areas of the building where indicated on drawings and in accordance with NFPA 13.

Note: Systems modifications are to be provided in accordance with NFPA 25 Standard for the Inspection, Testing, and Maintenance of Water Based Fire Protection Systems.

D. Provide modifications to the existing wet pipe automatic fire protection sprinkler system as required to provide coverages in all basement areas and 1st floor elevator lobby as noted on drawings. This shall include the connection to and modification of the existing sprinkler piping, the installation of all piping, sprinkler heads, materials and equipment for sprinkler system coverage for renovated areas where indicated on drawings. This shall include the following:

- *Shop Drawings*
- Sprinkler Piping
- Sprinkler Heads
- Seismic Plates
- Sprinkler Guards
- Pipe Sleeves and Supports
- Fire Caulking Materials
- Submittals
- Tests Including Materials and Test Certificates

E. Fees for construction permits shall be included.

F. FIRE FLOW TEST DATA:

1. Contractor shall refer to the attached FSSSS for existing flow test data.

1.3 **SHOP DRAWINGS**

A. Contractor shall prepare *preliminary shop drawings* of the installation and shall submit (1) set of drawings with calculations and product data sheets via email to the Engineer for preliminary review by the Engineer. The *preliminary shop drawings* shall be furnished as soon as possible after award of contract as required to expedite the review process. Refer to IBC Standard Building Code Section 106 para. 106.1.1.1 for shop drawing review requirements. Shop drawing review is required prior to start of system installation.

B. Existing shop drawings for this building are not available. Contractor shall provide shop drawings for the existing sprinkler system and indicate locations for all components, sprinkler head locations, spacing, line locations, pipe sizes, hangers, seismic restraints, drains, devices, etc. prior to indicating systems modifications for renovations.

C. Review of contractor's drawings shall not relieve him from the responsibility for errors, omissions or deviations from plans and specifications, unless the contractor has called the Owner's attention to such deviations in writing at time of submittal.

D. Contractor shall coordinate all existing pipe locations with all applicable trades prior to modifications and shall modify any piping or sprinkler system components as required to avoid mechanical ductwork, piping, lights, conduits, etc.

PART 2 - PRODUCTS

2.1 **SPRINKLER PIPING**

A. Piping for sprinkler systems shall be UL listed metallic pipe and materials in accordance with NFPA 13, paragraph 6.3 and as specified below.

1. Piping 2" and smaller shall be minimum sch 40 black steel, rolled-groove or threaded.

B. All sprinkler system piping and materials shall be run concealed above ceilings, in furred spaces and in chases where possible. Coordinate all finishes and space requirements with existing conditions, Architectural drawings and specifications as required prior to installation.

1. Review of shop drawings for sprinkler systems will require coordination of locations of piping and sprinkler heads as required to maintain a concealed system whenever possible.

C. Piping shall meet the requirements of NFPA 13 for Identification of Pipe. Piping which does not meet this requirement will not be permitted for use.

D. Maintain flexible couplings on both sides of rated wall penetrations. Flexible couplings shall meet requirements for seismic at all rated penetrations.

E. UL/FM listed flexible sprinkler head drops may be used in lieu of pipe for all sprinkler head drops. Manufacturer of these products shall provide drops with type 304 stainless steel braided hose for all flexible drops to maintain integrity of installation and to prevent unnecessary crimping or bending of drops during or after installation.

A. Provide seismic clips and install in accordance with manufacturer's instructions.

B. Maintain equivalent lengths in calculations for manufacturer product used to comply with State Fire Marshal requirements.

C. Flexible sprinkler head drops as manufactured by Flexhead Industries or Victaulic VicFlex will be accepted.

2.2 ALARM VALVE AND TRIM

A. *Water-flow alarm valve and all associated trim for this project is existing.* Scope of this work does not require modifications to the existing alarm valve or electrical devices.

2.3 FIRE DEPARTMENT CONNECTION

A. *Fire department connection for this project is existing.*

2.4 SPRINKLER HEADS

A. Sprinkler heads shall be UL/FM approved for intended service. Sprinkler heads as manufactured by Reliable, Star, Victaulic, Gem or Viking Sprinkler Corporation will be accepted.

1. Coordinate all finishes with Architectural drawings and specifications as required.

2. Extended 2-piece pot metal escutcheons will not be permitted for sprinkler heads.

3. Sprinkler types and coverages (hazard classifications) shall be as required by NFPA 13 and as indicated on drawings.

4. Provide flush mounted seismic plates for sprinkler heads as required. Seismic plates shall be white.

5. Contractor shall center sprinkler heads in ceiling tiles.

6. Provide brass upright sprinkler heads for all areas where sprinkler system installation is exposed. Provide sprinkler guards for all exposed upright sprinkler heads as follows:

   - Heads located below 8'-0" above finished floor.

7. Provide semi-recessed pendent sprinkler heads for installation in finished ceilings throughout renovated areas of this project where noted on drgs.

C. Provide spare sprinkler heads and remove existing sprinkler heads at the existing cabinet at main sprinkler riser location in accordance with NFPA-13, 2010.

2.5 PIPE SUPPORTS

A. Pipe supports shall be Factory Mutual approved for fire sprinkler systems and shall be in accordance with NFPA 13, Chapter 9. Provide additional brackets, angles and bracing as may be required to install piping per NFPA standards.

B. See para. 3.2 of these specifications for seismic calculations.

2.6 PIPE SLEEVES AND ESCUTCHEONS

A. Core holes where all pipes pass through block wall construction, sized to allow clearance entirely around the passing pipe in accordance with seismic requirements of NFPA-13.

1. Sleeves in bearing walls and floors shall be made of Sch 40 steel pipe. Extend vertical sleeves a minimum of 1" above finished floor. Install all pipe sleeves in a waterproof manner.

2. Sleeves in other walls shall be made of 20 gauge galvanized steel.

3. Maintain openings in all walls as required to meet seismic penetration guidelines.

B. See Architectural drawings for locations of fire rated assemblies. Provide pipe sleeves where pipes pass through fire-rated walls or floors. The space between the pipe and the pipe sleeve shall be filled with a UL rated through wall penetration system fire proofing material. Installation of fire stopping and sealing of all penetrations is included in this section of these specifications.

1. Submit data sheets for caulking materials for Engineer review. See Architectural drawings for wall ratings and locations.

2. Maintain flexible couplings on both sides of wall penetrations. Flexible couplings shall meet requirements for seismic at all rated penetrations.

3. *Sleeves may be omitted in rated walls provided that penetration is completed in accordance with specific manufacturer requirements and installation details for a thru-wall penetration assembly.*

4. Openings shall not be excessively large and/or irregular for efficient fire stopping details.

2.7 BACKFLOW PREVENTER

A. *Backflow preventer for this project is existing.* Provide test and certification with test certificate for the existing backflow preventer at substantial completion. Notify Architect/Engineer immediately if test certification is not accepted.

PART 3 - EXECUTION

3.1 SUBMITTALS

A. Submit detailed shop drawings, equipment and material cut sheets, and product data for all items.

1. All product data shall be submitted at one time in complete detail. Partial submission will not be accepted.

2. Contractor shall submit seismic design calculations complete with shop drawings and materials for engineer review in accordance with NFPA 13 requirements.

B. Submit data sheets for the following items with shop drawings for *preliminary review*:

- Sprinkler Heads
- Pipe Materials
- Grooved Fittings
- Fire Caulking Materials
- Preliminary shop drawings
- Calculations including data sheets with current information
- Seismic Calculations

3.2 SEISMIC RESTRAINT OF PIPING

A. Seismically restrain all piping in accordance with NFPA 13 for requirements for Seismic of the IBC International Building Code.

B. Indicate locations for all seismic straining devices on sprinkler shop drawings.

C. Provide seismic calculations on sprinkler shop drawings.

3.3 CERTIFICATE OF APPROVAL

A. Upon completion of all work, furnish the owner a *Certificate of Approval* from the local fire department, including materials and properly witnessed test certifications.

3.4 ENGINEER SITE VISIT REPORTS

A. Engineer site visit reports will be furnished during construction as requested by the Architect.

B. Contractor is responsible for correcting all construction items as noted and to respond in writing to all deficiencies as directed. Contractor shall contact Engineer immediately if there are any questions or conflicts after receipt of written site visit reports.

C. Furnish response to all punchlist items within 10 days of receipt of report indicating completion status to maintain timely, planned construction progress without delays or problems.

3.5 FINAL CLOSEOUT PROCEDURES

A. Contractor shall provide the following items at substantial completion of this project and furnish to the University of SC Fire Marshal, Engineer or Architect as directed:

1. Preliminary sprinkler systems test for all manual alarm devices and electrical devices with Division 26 Electrical prior to schedule of final walk-through and testing of systems.

2. Notify Architect / Engineer immediately if any problems exist with the existing alarm components operation at substantial completion.

END OF SECTION 21 13 00

Fire Sprinkler System Specification Sheet

(Per §40-10-250)

Project Data			
Project name: 1600 Hampton Annex – Renovations (DLES) – University of South Carolina			
Location in South Carolina:	Address (street # & street name): 1600 Hampton St.		State project: ☐Yes ■ No
	City: Columbia, S.C. 29208	County: Richland	State project #: n/a

Water Supply Information (flow test data must be less than 1 year old per §40-10-250(A)(1))			
Date test conducted: 04/22/13	Static pressure (psi): 59	Residual pressure (psi): 38	Flow (gpm): 1155
Distances of test gauges relative to the base of the riser:	Horizontal (ft): 250	Vertical (elevation difference in ft): 5 ft	
Source of water supply:	☐ Municipal dead-end ■ Municipal circulation ☐ Other:		Pipe Size (in.): 10”
Test data by/from:	Name: Jason Shaw, P.E.	Title: Water Engineer	
	Organization: City of Columbia – Dept. of Utilities and Engineering		Telephone #: 803-545-3400
Fire pump: ☐ Yes ■ No ☐ New ☐ Existing	Pump Capacity (gpm):	Churn Pressure (psi):	
	Rated Pressure (psi):	Pressure @ 150% flow (psi):	
On-site storage tank: ☐ Yes ■ No	☐ New ☐ Existing	Tank capacity (gallons):	

NFPA Hazard Classification
(attach continuation page when necessary)

Area #	Class or Code Reference	Description of Hazard Protected (commodity description, storage height, and arrangement as applicable.)
1	Light Hazard	All areas where identified on drgs unless noted otherwise
2	Ordinary Group 1	Mechanical, Storage and Electrical Rooms

Design Parameters
(attach continuation page when necessary)

Area #	System Type	Density (gpm/ft^2) / Area (ft^2) or Other (reference code section)	Inside Hose (gpm)	Outside Hose (gpm)
1	Wet	0.10 / 1500	---	100
2	Wet	0.15 / 1500	---	250

Seismic Design Data: S_S= 0.553

Codes and Standards
(attach continuation page when necessary)

Applicable Codes, Standards & Editions (i.e. "2006 IBC", "2007 NFPA 13", etc.) **for the Scope of Work on the Sprinkler System**

NFPA 13 - 2010, NFPA 25 -2008 Edition

International Building Code, 2009 Edition

International Fire Code, 2009 Edition

Scope of work (such as sprinkler system A.G. from 1'-0" A.F.F., U.G. from tap to 5'-0" outside, etc.) and notes (attach continuation page when necessary):
Connection to existing sprk piping mains

Specifier's Information

Name: Danny Wilds, P.E. (Reg. No. 11155)

Engineering services provided through a firm: ■ Yes ☐ No

Firm name: Mechanical Design, Inc.

Address: 4403 Broad River Road

City: Columbia

State: SC Zip: 29210

Phone #: 803.731.9834 Fax #: 803.731.9837

E-mail: manuel@mdi9834.com

Certificate of Authorization

Professional Engineer’s Seal

Revision No.: _____ Page _____ of _____ Signature: _____

Date: _____

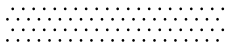
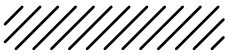
SPRINKLER DEMOLITION NOTES

GENERAL:
REFER TO ARCHITECTURAL DRAWINGS AND PROVIDE DEMOLITION OF ALL EXIST SPRINKLER HEADS AND HANGERS AS REQUIRED FOR MODIFICATIONS TO THE EXIST SPRINKLER SYSTEM FOR BASEMENT RENOVATION.

D1. CONTRACTOR SHALL FIELD COORDINATE AND VERIFY EXIST CONDITIONS PRIOR TO START OF DEMOLITION WORK FOR SPRINKLER SYSTEMS. (SEE SPECIFICATIONS)

D2. REFER TO ARCHITECTURAL DEMOLITION PLANS FOR EXIST CEILINGS.

SPRINKLER SYSTEM HATCH KEY

SYMBOL	DESCRIPTION
	LIGHT HAZARD CONCEALED PENDENT HEADS
	ORDINARY HAZARD GROUP 1 CONCEALED PENDENT HEADS
	ORDINARY HAZARD GROUP 1 UPRIGHT EXPOSED HEADS

SPRINKLER SYSTEM NOTES

F1. DO NOT SCALE DRAWINGS. ROUGH FROM ARCHITECTURAL DRAWINGS AND EXIST CONDITIONS. COORDINATE CEILING FINISHES AND HEIGHTS AS AS APPLICABLE.

F2. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH NFPA-13, 25, 2008 AND ALL APPLICABLE LOCAL CODES AND ORDINANCES

F3. COORDINATE SPRINKLER SYSTEMS WITH ALL TRADES TO AVOID INTERFERENCE AND CONFLICTS PRIOR TO INSTALLATION OF PIPING AND SPRINKLER HEADS.

F4. LOCATE VALVES TO PERMIT EASY ACCESS AND IN ACCRODANCE WITH NFPA-13.

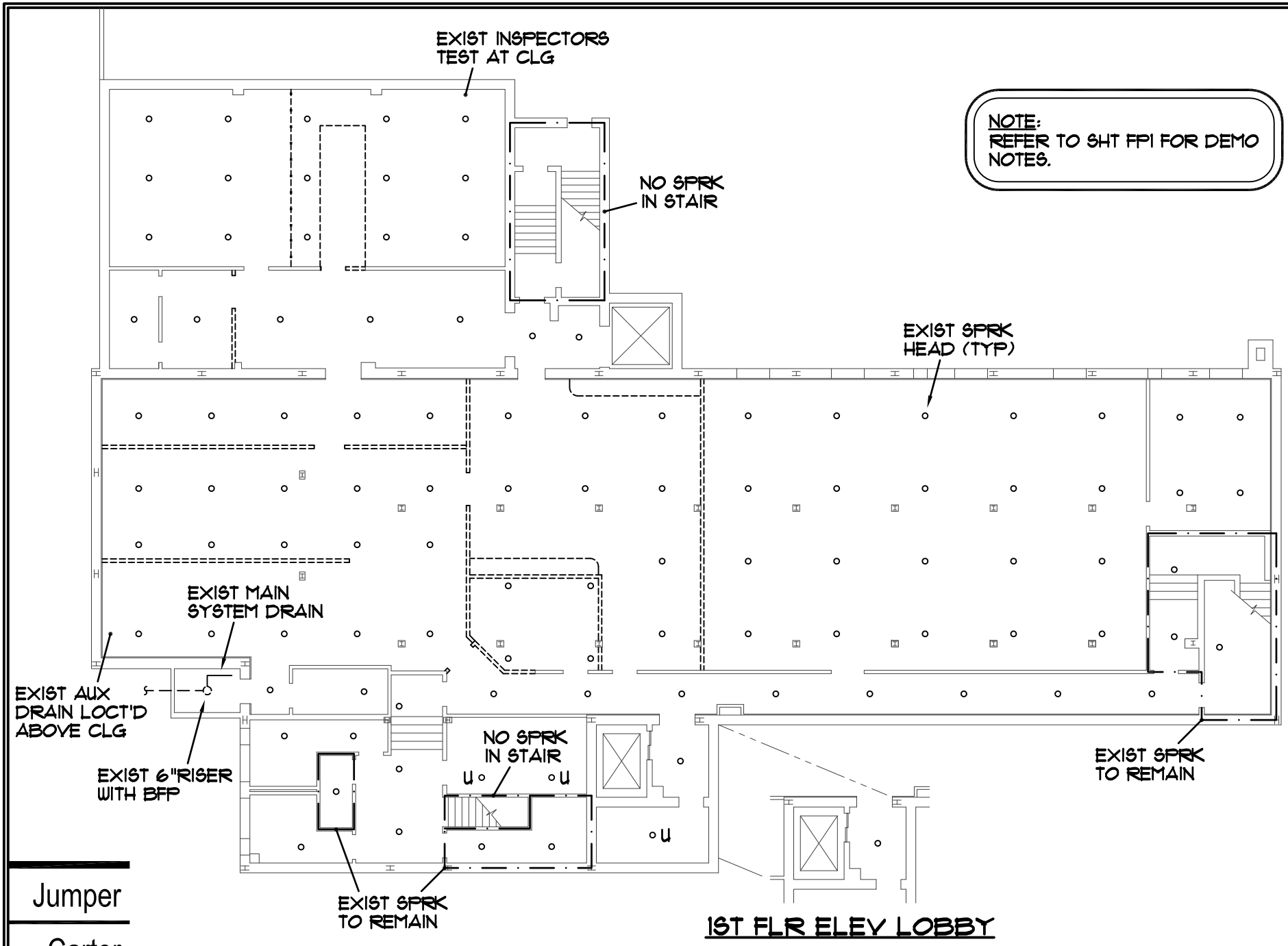
F5. PROVIDE SPRINKLER COVERAGE THROUGHOUT BAEMENT AREAS IN ACCORDANCE WITH SPECIFICATIONS AND SPRINKLER SPECIFICATION SHEET.

F6. COORDINATE LOCATION OF SUPPLY PIPING FOR SPRINKLER SYSTEM WITH ARCHITECTURAL DRAWINGS, SECTIONS AND DETAILS TO MAINTAIN CONCEALED PIPING AS REQUIRED.

F7. PROVIDE SEISMIC CALCULATIONS ON SPRINKLER SHOP DRAWINGS IN ACCORDANCE WITH STATE FIRE MARSHAL REQUIREMENTS. IDENTIFICATION OF ALL SEISMIC COMPONENTS SHALL BE CLEARLY INDICATED AND NOTED ON DRAWINGS INCLUDING RISER ASSEMBLIES.

Jumper
Carter
Sease

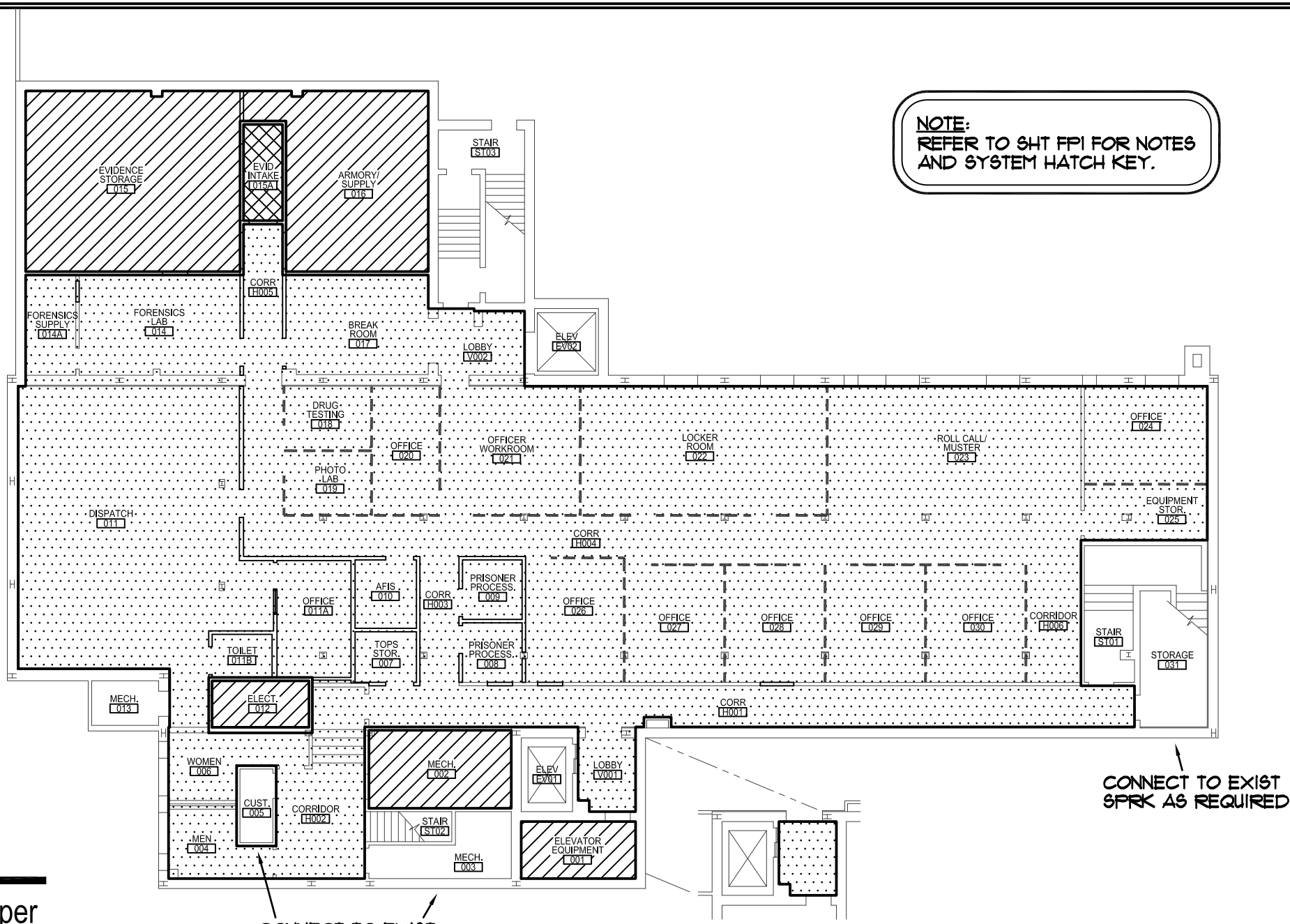
DATE:	TITLE:	REFERENCE SHEET:	JOB:	ADD#01
3/18/2014	Sprinkler Notes	FP1	1600 Hampton Annex-Renovation (DLES)	SHEET NO.: FP1



NOTE:
REFER TO SHT FP1 FOR DEMO NOTES.

Jumper
Carter
Sease

DATE:	TITLE:	REFERENCE SHEET:	JOB:	ADD#01
3/18/2014	Sprinkler Demolition Plan - Basement	FP2	1600 Hampton Annex-Renovation (DLES)	SHEET NO.: FP2



Jumper

Carter

Sease

DATE:	TITLE:	REFERENCE SHEET:	JOB:	ADD#01
3/18/2014	Sprinkler Upfit Plan - Basement	FP3	1600 Hampton Annex- Renovation (DLES)	SHEET NO.: FP3

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1600 HAMPTON ANNEX – RENOVATION (DLES)
UNIVERSITY OF SOUTH CAROLINA
ELECTRICAL ITEMS - ADDENDUM NO. 1
March 26, 2014

This addendum modifies the Contract Documents only in the manner and to the extent stated herein and shown on any accompanying drawings and will become a part of the Contract Documents. Except as specified or otherwise indicated by this addendum, all work shall be in accordance with the basic requirements of the Contract Documents.

SPECIFICATIONS

1. **The following Electrical Specifications Sections are being issues as part of this Addendum:**

- Section 26 05 00 – Electrical Basic Materials and Methods
- Section 26 05 29 – Hangers And Supports For Electrical Systems
- Section 26 43 13 – Surge Protection Device (SPD)

DRAWINGS:

2. **The following Electrical Drawings are being issues as part of this Addendum:**

- E001 – ELECTRICAL SYMBOLS & NOTES
- E002 – LIGHTING FIXTURE SCHEDULE & NOTES
- E101 – LIGHTING - BASEMENT LEVEL
- E102 – LIGHTING - FIRST FLOOR
- E103 – LIGHTING - SECOND AND THIRD FLOOR
- E201 – POWER - BASEMENT LEVEL
- E202 – POWER - FIRST FLOOR
- E203 – POWER - SECOND AND THIRD FLOOR
- E401 – COMMUNICATIONS - BASEMENT LEVEL
- E402 – COMMUNICATIONS - FIRST FLOOR
- E403 – COMMUNICATIONS - SECOND AND THIRD FLOOR
- E600 – POWER RISER DIAGRAM - DEMOLITION
- E601 – POWER RISER DIAGRAM
- E602 – ELECTRICAL DETAILS
- E603 – LIGHTING DETAILS
- E604 – COMMUNICATIONS DETAILS
- E605 – PANEL SCHEDULES
- E606 – PANEL SCHEDULES

Each Bidder shall acknowledge receipt of this Addendum and all other Addenda on his bid form.

PART 1 - GENERAL REQUIREMENTS

1-01 SCOPE OF WORK

WORK INCLUDED: Furnish all necessary labor, material, plant and equipment, including materials and equipment not specifically mentioned but necessary to complete the work in a neat, correct, and workmanlike manner, to include:

1) Electrical service, complete to the point of connection with the utility company's facilities.
2) Service entrance equipment.
3) Feeders, panelboards, and distribution equipment.
4) Complete branch circuit wiring system for lighting, receptacles, equipment, and outlets.
5) Lighting fixtures, wall switches, receptacles and outlets.
6) Line voltage connections to equipment furnished under other Sections of these specifications, including disconnects, where indicated.
7) Hangers and Supports for Electrical Systems, see Section 260529.
8) Emergency Power System, see Section 263213.
9) Surge Suppression Device (SPD), see Section 264313.

SPECIAL NOTE: The provisions of the Instructions to Bidders, General Conditions, Supplementary General Conditions and all applicable requirements of Division 1 shall govern the work under this Division the same as if incorporated herein.

1-02 EQUIPMENT WIRING

Furnish and install power circuits to and line voltage connections to all equipment furnished and installed by other trades, including disconnects, where indicated.

Furnish and install receptacles for equipment furnished with cord and plug, such as electric water coolers, kitchen equipment with cord and plug, computer and data processing equipment, portable welders, shop equipment, and other equipment indicated on the drawings.

CONTROL WIRING: Raceways, wiring, and control devices (thermostats, pressure switches, program clocks, etc) for low voltage HVAC control systems and other mechanical and plumbing systems shall be furnished and installed under Division 23, unless otherwise indicated on the drawings or specified in this Division.

ROOFTOP HVAC UNITS: Power circuits for rooftop HVAC units shall rise thru the inside of the HVAC unit curb into the bottom of the unit and out to the disconnect switch mounted on the unit. The Electrical Contractor shall coordinate this work closely with the Mechanical Contractor in the field to avoid conflicts with ductwork.

All Motor Starters and Variable Frequency Drives (VFDs) for HVAC-related equipment that are not factory-mounted and prewired shall be furnished by the Mechanical Contractor, installed and power wired by the Electrical Contractor unless noted otherwise on the design documents. Refer to Mechanical Drawings for locations and quantities of Motor Starters and VFDs.

VOLTAGE: The Electrical Contractor shall supply power to equipment at the voltage indicated on the electrical drawings. The Electrical Contractor and the other applicable trades will be held responsible for coordinating the equipment voltages, the control equipment wiring, and the location and type of disconnect required to comply with the equipment manufacturer's requirements, the National Electric Code, and applicable local building codes. IF EQUIPMENT IS SUPPLIED AT A VOLTAGE OTHER THAN THAT PROVIDED, THE GENERAL CONTRACTOR AND SUBCONTRACTORS WILL BE HELD RESPONSIBLE FOR MAKING ANY NECESSARY ADJUSTMENTS TO CORRECT THE CONFLICT, AT NO COST TO THE OWNER, TO THE SATISFACTION OF THE ELECTRICAL ENGINEER.

1-03 EXISTING CONDITIONS

The Contractor will be held responsible for having visited the site and having familiarized himself with the existing conditions prior to submitting his bid.

1-04 COORDINATION

OTHER TRADES: All work under this Section shall be coordinated with other trades to insure proper location of outlets and equipment connections, and to minimize conflicts with structural members, duct work, piping, etc. Conflicts between equipment and/or material locations shall be corrected as directed by the Architect-Engineer at no additional cost to the Owner.

UTILITIES: The service locations, arrangement and metering for electrical and telephone service entrances shall be coordinated in detail with those utilities. All provisions necessary for these services shall be provided in the Electrical Contractor's bid, unless otherwise indicated.

1-05 CODES AND PERMITS

Installation and materials shall be in accordance with the applicable versions of the National Electrical Code, the International Building Code, and all local codes. Apply and pay for all permits and fees required for this construction.

1-06 DRAWINGS

The drawings and specifications shall be considered as complementary, one to the other, so that materials and labor indicated, called for, or implied by either shall be furnished and installed as if required by both. Where a disagreement exists between the plans and specifications, the item or arrangements of better quality, greater quantity, or higher cost shall be included in the base bid. Any discrepancies between the drawings, specifications, and field conditions shall be resolved with the Engineer prior to commencing work. All agreements shall be verified in writing.

RECORD DRAWINGS: The Contractor shall maintain one set of clean blueprints for "RECORD" drawings. All changes, revisions, or modifications to the project shall be recorded daily on these drawings with redline pencil. Upon completion of the project, these redline drawings shall be turned over to the Engineer for preparation of final Record Drawings.

1-07 MAINTENANCE AND OPERATING MANUALS

The Contractor shall furnish the Owner two (2) complete maintenance and operating manuals for each piece of equipment and material furnished under this project. These manuals shall be bound in hard cover binders with tabs for each section item or piece of equipment. The manuals shall be furnished to the Engineer prior to the final observation, and final acceptance shall not be given until the Owner's maintenance personnel are instructed in maintenance and operation of all systems.

1-08 GUARANTEE

All materials and labor furnished under this Section of the specifications shall be guaranteed by the Contractor to be free from defects for a period of one year from the date of acceptance. The Contractor shall repair or replace any deficiencies reported in the guarantee period promptly after notification, without any additional compensation from the Owner. Lamps are excluded from this warranty, except that all lamps shall be operational on the date of acceptance.

1-09 MATERIALS

UL LISTING: All materials shall be listed by Underwriter's Laboratories, or an approved equal testing laboratory, and shall bear the "UL" Label, where applicable.

SUBSTITUTIONS: Specific reference in the specifications to any article, device, product, material, fixture, form or type of construction, etc., by name, make or catalog number, with or without the words "or equal" shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition and the Contractor in such cases may, at his option, use any article, device, product, material, fixture, form or type of construction, which in the judgement of the Architect-Engineer, expressed in writing prior to bidding as specified below, is equal to that herein named.

Requests to substitute materials or equipment considered by the Contractor as equal to those specified shall be submitted for review to the Architect-Engineer ten (10) days before bids are taken. Requests shall be accompanied by samples, descriptive literature, and engineering information, as necessary to fully identify and appraise the product. No increase in the contract sum will be considered when requests are not accepted. If the item is found to be equal, the Architect-Engineer will issue an Addendum making it a part of the Contract Documents prior to bidding.

1-10 SUBMITTALS

Electrical shop drawings shall be submitted in one complete package containing all items required by this specification and all other Division 26-28 specifications. Partial shop drawing submittals may be rejected by the Architect-Engineer.

Exceptions: Fire Alarm System CAD drawings, Lighting Control System CAD drawings, and Allowanced Light Fixtures may be submitted separately if additional time is needed to prepare these shop drawings.

Within 30 days after award of contract and before any materials are delivered to the site, submit one (1) digital set in pdf format to the Architect-Engineer on the following materials (partial/incomplete submittals may be rejected):

1) Section 260500 - Raceways, Fittings, and Surface Wiring Systems.
2) Section 260500 - Wire and Cable.
3) Section 260500 - Boxes and Wireways.
4) Section 260500 - Wiring Devices.
5) Section 260500 - Lighting Fixtures (Including Lamps and Ballasts).
6) Section 260500 - Allowanced Lighting Fixtures.
7) Section 260500 - Lighting Control Equipment (Contactors, Photocells, Time Clocks, Occupancy Sensors, Lighting Control Panels).
8) Section 260500 - Disconnect Switches, Panelboards, Switchboard, and Transformers.
9) Section 260500 - Floor Boxes.
10) Section 260500 - Cable Management.
11) Section 260500 - Fire Wall Penetration Assembly.
12) Section 260529 - Hangers and Supports for Electrical Systems (Including Engineer's calculations where required)..
13) Section 260548 - Vibration and Seismic Controls for Electrical Systems.
14) Section 263213 - Emergency Power System Equipment.
15) Section 264313 - Surge Protection Device (SPD) Equipment.

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. Electrical submittal to include a separate transmittal letter indicating project name and address, date, contractor name and address, construction manager name and address (if applicable), list of submittals, and remarks,

and signature of transmitter. Failure to comply with the above criteria my result in rejection of the submittal by the Architect-Engineer. Refer to Division 1 for additional Submittal requirements.

PART 2 - MATERIALS

2-01 RACEWAYS AND FITTINGS

GALVANIZED RIGID CONDUIT (GRC): UL 6 and ASA C80.1 with full weight screwed fittings. Bushings shall be malleable iron. Bushings 1 1/4" and larger shall have insulated throat and grounding lug.

INTERMEDIATE GRADE METALLIC CONDUIT (IMC): UL 1242, galvanized, with full weight screwed fittings. Bushings shall be as specified above.

ELECTRICAL METALLIC TUBING (EMT): UL 797 and ASA C80.3 with steel compression or set-screw type fittings. Die-cast fittings are not acceptable. Fittings 1 1/4" and larger shall have nylon insulated throat. Indented or drive-on fittings are not acceptable. Conduit used for Fire Alarm System wiring shall be red, similar to Allied Fire Alarm EMT.

FLEXIBLE STEEL CONDUIT (GREENFIELD): UL 1. Fittings shall be steel.

LIQUIDTIGHT FLEXIBLE STEEL CONDUIT (SEALTITE): UL 360. Fittings shall be steel compression type.

PLASTIC CONDUIT (PVC): Schedule 40 polyvinylchloride. NEMA Standard TC-2 and TC-3 and UL Standards. Conduit, solvent, and fittings shall all be supplied by the same manufacturer. PVC is not permitted above grade.

SURFACE METAL RACEWAY (INDOOR): Wiremold V700 ivory surface metal raceway, or approved equal. Straps, boxes, elbows, etc. shall all be supplied by the same manufacturer.

2-02 WIRE AND CABLE

UL STANDARDS: UL 44 and UL 83.

CONDUCTOR: Copper, soft drawn, per ASTM B3. Sizes No. 12 and 10 shall be solid conductor. Sizes No. 8 and larger shall have Class B concentric stranding per ASTM B8. Stranded conductors may not be used on No. 12 and No. 10 circuits.

INSULATION: 600 Volt, 75 Deg C rated. Type THHN-THWN-MTW, unless noted otherwise.

SPLICING MATERIALS:

No. 10 and smaller:	Acceptable wire nuts or insulated crimped splice caps.
No. 8 and larger:	Bronze or copper split bolts, or tinned compression connectors. (Polaris insulated splice blocks may not be used on this project).

Insulation shall be Scotch No. 23 rubber tape and Scotch No. 33 plastic tape, or approved equivalent method.

2-03 BOXES AND WIREWAYS

OUTLET BOXES: Galvanized sheet steel per UL 514. "Through-wall" boxes SHALL NOT BE USED. Back-to-back mounting of boxes is not permitted. All outlet boxes 4"x4" or smaller located on opposite sides of a rated wall shall have a minimum of 24" horizontal spacing or shall be

protected with listed putty pads. All outlet boxes larger than 4"x4" (communications outlets, etc.) located in rated walls shall be protected with listed putty pads.

Box sizes shall be as follows:

1) Wall Receptacle Outlets: 4" square by 2 1/8" deep with plaster ring as required.
2) Wall Communications and Computer Outlets: 4 11/16" square by 2 1/8" deep with one gang plaster ring. Provide box with 1 ¼" conduit knockouts.
3) TV Wall Outlets: 4 11/16" square by 2 1/8" deep with one gang plaster ring. Provide box with 1 ¼" conduit knockouts.
4) Ceiling outlets: 4" square or octagonal by 1 1/2" or 2 1/8" deep with stud or ears where required for fixture support.
5) Indoor Surface Mounted Outlets: Wiremold V5744S-2 surface metal box unless noted otherwise on the drawings (steel boxes and EMT conduit may be used in equipment rooms, janitor's closets, storage rooms).
6) Exposed Outlets: Malleable iron or heavy duty cast aluminum with threaded hubs, Type FS, FD, or GS. Manufactured by Crouse Hinds, Appleton, Killark, or approved equal. Die cast boxes are not acceptable.

WIREWAYS, PULL BOXES AND JUNCTION BOXES: UL 50. Code gage galvanized sheet steel, aluminum, or steel primed and painted after fabrication. Manufactured by Square D, Austin Berryhill, Hoffman Engineering, B-Line Systems, or approved equal. Wireways shall have hinged covers.

2-04 WIRING DEVICES

MANUFACTURERS: All wiring devices shall be Hubbell Extra Heavy-Duty Specification Grade Series or equivalent of Arrow Hart Premium Industrial Spec Grade, Pass and Seymour Heavy-Duty Spec Grade, or Leviton Industrial Spec Grade, unless specifically noted otherwise. If devices not meeting the specifications are supplied, they shall be removed, discarded, and new devices meeting the specification shall be furnished & installed by the Electrical Contractor at no cost to the Owner or the Engineer.

RECEPTACLES: 20A, 125V, 3 wire grounding, NEMA 5-20R, side and back wired, with impact resistant nylon face and standard color as selected by Architect.

- "TR" denotes Tamper-Resistant receptacle. Tamper Resistant receptacles shall be listed Tamper-Resistant receptacles per NEC Article 406.11, typical for receptacles in Dwelling Units, Kindergartens, and Childcare Areas.
- "CR" denotes indoor Corrosion Resistant receptacle. Indoor Corrosion Resistant receptacles shall be listed Weather/Corrosion Resistant receptacles per NEC Article 406.8.
- "WP" denotes weatherproof receptacle. Weatherproof receptacles shall be listed Weather/Corrosion Resistant receptacles per NEC Article 406.8 and shall include a wet location cover.

1) Duplex Receptacle: Hubbell HBL-5362-X
2) Duplex Receptacle, Tamper Resistant (NEC 406.11): Hubbell HBL-5362-X-TR
3) Duplex Receptacle, Corrosion Resistant (NEC 406.8): Hubbell HBL-5362-X-WR
4) Single Receptacle: Hubbell HBL-5361-X
5) Isolated Ground Duplex Receptacle: Hubbell IG-5362-X

GFCI RECEPTACLES: Feed Thru type, 20A, 125V, NEMA 5-20R, standard color as selected by Architect. All GFCI Receptacles shall be listed Tamper Resistant (NEC 406.11) and Weather Resistant (NEC 406.8).

1) GFCI Duplex Receptacle: Hubbell GFR-5362-X-TR

2) Faceless GFCI: Hubbell GFBF20-X-L

SWITCHES: 20A, 120/277V, side and back wired, ivory color. Single pole, double pole, three way, or four way, as indicated on the drawings. Standard color as selected by Architect.

1) Single Pole Switch: Hubbell HBL-1221-X
2) Double Pole Switch: Hubbell HBL-1222-X
3) Three Way Switch: Hubbell HBL-1223-X
4) Four Way Switch: Hubbell HBL-1224-X

SPECIAL RECEPTACLES: Specification grade, rating as specified on the drawings.

COVER PLATES: Provide plates to suit the devices.

1) Finished interior walls: Jumbo Stainless Steel.
   - Receptacles noted on drawings as dedicated for computers shall include a factory engraved jumbo stainless steel coverplate labeled “COMPUTER”. See Electrical Symbols and Power Plans on drawings to identify dedicated computer receptacle.
2) Exposed outlets: Galvanized steel.
3) Wet locations: Weatherproof “In Use” type for wet location areas, hinged weatherproof type for damp location covered areas.

2-05 INTERIOR LIGHTING

FIXTURE SCHEDULE: See Drawings.

PRE-PAINTED STEEL: Fixture bodies manufactured from pre-painted steel shall be painted after fabrication, unless noted otherwise on the drawings.

ELECTRONIC FLUORESCENT BALLASTS: As manufactured by Universal Lighting Technologies, or approved equal. See drawings for ballasts specifications. All fluorescent ballast shall include a disconnect plug designed in accordance with NEC 410.73(G).

T8 FLUORESCENT LAMPS: Low Mercury, high CRI, high lumen output, 95% lumen maintenance. Phillips ALTO II Series or approved equal. See drawings for lamp specifications.

HID BALLASTS: Electronic, low-noise, pulse-start compatible with pulse-start and ceramic metal halide lamps as specified on the drawings. Manufactured by Venture, Advance, Universal, or approved equal. Ballasts containing PCB oils are not acceptable. All HID ballast shall include a positive locking disconnect plug. HID ballasts shall be mated to the lamp furnished and the lamp/ballast combination shall include the manufacturer's extended warranty for using like lamp/ballast manufacturers (Venture lamps with Venture ballasts, Philips lamps with Philips/Advance Ballasts, GE lamps with GE ballasts, etc.).

HID LAMPS: As manufactured by Philips, Venture, or approved equal. See drawings for lamp specifications.

LED LAMPS AND DRIVERS: Refer to Lighting Fixture Schedule and Lighting Fixture Schedule Notes on Drawings.

LENSES: Virgin acrylic plastic. Nominal thickness of fluorescent fixture lenses shall be 0.125" unless noted otherwise.

EMERGENCY LIGHTING (Standby Generator): Facility is provided with an emergency standby generator. Emergency lighting in common areas is wired to emergency generator panelboards via relay panel. The relay panel shall be programmed so that all relays serving emergency circuits turn

"ON" upon loss of normal power regardless of switch or clock setting. Generator transfer devices (GTDs) are provided for single fixtures in classrooms requiring emergency lighting. Verify wiring requirements of relay panel and GTDs prior to starting work and install accordingly. Refer to details on drawings and to manufacturer's installation instructions. Furnish and install all relays, emergency force on contactors, and/or other relay panel hardware necessary for operation of emergency lighting upon loss of normal power.

2-06 LIGHTING CONTROLS

OCCUPANCY SENSORS: **See details and notes on drawings.** Occupancy sensors shall be as specified on the drawings, as manufactured by Wattstopper, Sensor Switch (Acuity), acceptable equivalent manufacturer. Provide all power packs and mounting hardware necessary to provide a complete and operable system. If a sensor other than that specified is used, furnish and install any additional sensors necessary to provide comparable coverage. Verify spacing requirements with sensor manufacturer and install accordingly. Provide commissioning of occupancy sensors as noted on the drawings.

1) It shall be the Contractor's responsibility to locate and aim sensory in the correct location required for complete and proper volumetric coverage within the range of coverage(s) of controlled areas per the manufacturer's recommendations. Proper judgment must be exercised in executing the installation so as to ensure the best possible installation in the available space and to overcome local difficulties due to space limitations or interference of structural components. It shall be the Contractor's responsibility to make all proper adjustments to assure owner's satisfaction with the occupancy system.
2) It shall be the manufacturer's responsibility to verify all proper adjustments and train owner's personnel to ensure owners satisfaction with the occupancy system. This service shall be provided at no additional cost to the owner or the Architect/Engineer.
3) Upon completion of the installation, the system shall be completely commissioned by the manufacturer's factory authorized technician who will verify all adjustments and sensor placement to ensure a trouble-free occupancy-based lighting control system. This service is provided at no additional cost to the owner. The Electrical Contractor shall provide both the manufacturer and the electrical engineer with ten working days written notice of the scheduled commissioning date. Upon completion of the system fine tuning the factory authorized technician shall provide the proper training to the owner's personnel in the adjustment and maintenance of the sensors.
4) The Contract Documents are diagrammatic and only establish the minimum number and type of sensor required in each space. The Contractor shall furnish additional sensors as necessary to provide the required coverage. The Contractor may not reduce the number of sensors in a space or change the sensor type in a space without written permission from the Engineer and the Owner. In order to provide coverage for the controlled area and accommodate all Owner occupancy requirements, all rooms/spaces shall have between ninety (90) and one hundred (100) percent coverage. Layout of occupancy sensors on the Contract Documents represents the basis of design. The occupancy sensor supplier shall furnish shop drawings and printed material indicating layout of sensors, raceway, and wiring required to control the lighting indicated on the contract drawings. No change order will be allowed for additional sensors, raceway, wiring, power supplies, satellite relays, etc., required on shop drawings by the occupancy sensor supplier. Where power supplies are required for operation of the occupancy sensors, but are not shown on the lighting plans, the power supplies must be included as part of the base bid for this project.

LINE VOLTAGE PHOTOCELLS: Rated 1800 volt-amps 120V, 208V-277V, or 480V as noted on the drawings, adjustable slide gate, Precision Type "T", or equal of Intermatic, Paragon, or Tork.

WALL BOX DIMMERS: Dimmers shall be slide type wall box dimmers with on/off operation, Lutron Nova T series or equivalent. Dimmer wiring shown on the Drawings is for information purposes only. The Contractor shall verify the dimmer wiring requirements with the dimmer manufacturer

prior to start of work and install accordingly. Provide all wiring and power packs required to provide specified dimming and on/off operation, including additional low voltage wiring, whether indicated on the drawings or not.

1) 0-10V LED Dimmers: Slide-to-off type wall box dimmers with on/off operation. Lutron Nova T NTFTV series with Lutron PP Power Pack for on/off operation, or equivalent.
2) 3-Wire LED Dimmers: Slide-to-off type wall box dimmers with on/off operation. Lutron Nova T NTF series, or equivalent.

LED Dimmers must be compatible with LED drivers provided with LED light fixtures. Dimmers and drivers provided must provide a minimum of 5% dimming, Lutron Eco System-5 Series or equivalent.

2-07 SAFETY SWITCHES AND FUSES

SWITCHES: NEMA Standard HD, heavy-duty type, 3 pole, 480 or 240 volt, as indicated, with Class R fuse clips. Manufactured by Square D, General Electric, Cutler Hammer, or Siemens.

FUSES: Time delay type, UL Class RK5. Bussman Fusetrons, or approved equal of Chase-Shawmut or General Electric.

NAMEPLATE: Provide engraved nameplate for each safety switch identifying load served, voltage, and fed-from identification. Example:

AHU-1, 208-3-60
FED FROM BA-15

2-08 PANELBOARDS

STANDARDS: UL 67 and NEMA PB-1.

MANUFACTURERS: Square D, General Electric, Cutler Hammer, or Siemens.

CONSTRUCTION: Code gage cabinet with clamping trim cover and locking doors, keyed alike. Cabinets shall be minimum 20" wide. Busses shall be for bolt-in breakers with full sized neutral bus. Provide ground bus in each panelboard.

ENCLOSURE: Flush or surface mounted, NEMA 1, NEMA 3R, or NEMA 4X as indicated on drawings.

1) Front: Surface-mounted fronts, match box dimensions; Flush-mounted fronts, overlap box.
2) Directory Card: Inside panelboard door, mounted in metal frame with transparent protective cover. Provide typewritten circuit directory for each panel identifying load served and room location. Identify spares in pencil.
3) Panels and Trim Finishes: Galvanized steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two (2) coat, baked-on finish consisting of prime coat and thermosetting topcoat.

CIRCUIT BREAKERS: Molded case bolt in type. Breakers shall be rated for the specified panelboard interrupting capacity rating in RMS symmetrical amperes. Two and three pole breakers shall have common internal trip. Branch mounted main breakers are not permitted unless specifically noted on the drawings.

BREAKER COORDINATION: Manufacturer shall provide coordination between feeder breakers and upstream devices. These coordination settings shall be made in the field by a manufacturer's field technician and documented. Manufacturer shall provide selective

coordination of the emergency system overcurrent devices in accordance with NEC 700.27 and 701.27. A letter confirming the setting and providing the setting information shall be provided prior to energization of the switchboard.

NAMEPLATE: Provide engraved nameplate for each panel (existing and new) identifying panel name, voltage, phase, and fed-from identification. Example:

PANEL BC
208/120, 3PH
FED FROM MP-6

2-09 FLOOR BOXES

POKE-THRU FLOOR OUTLETS: On above-grade floors with a shallow slab, poke-thru devices shall be used provided each poke-thru is capable of accepting the specified number of receptacles plus a minimum of (4) Category 6 jacks. Wiremold RC4 Series, or equivalent, finish as selected by Architect.

2-10 CABLE MANAGEMENT

CABLE TRAYS: Cable trays shall be run above ceiling in corridors and attached and/or supported from wall per the manufacturer's requirements. Furnish and install 12" wide wire mesh type cable trays with 4" loading depth, as manufactured by Mono-Systems, B-Line Systems, Cablofil, or Atlas. Trays shall be furnished in maximum lengths of 12 ft and shall have rounded edges and smooth surfaces. Trays shall be furnished with all fittings, spacers, and supports necessary for a complete system, and shall comply with NEMA Standard VE-1. 2" loading depth may be used in low clearance areas where cable tray crosses duct work or structural members.

CABLE HOOKS: Cable hooks may be installed above ceiling in existing corridors where installation of cable tray is not practical. Cable hooks shall be attached and/or supported from wall per the manufacturer's requirements. Space hooks per the manufacturer's recommendations, but no more than 36". Furnish & install a minimum of one row of 9" x 6" hooks and one row of 6" x 6" hooks for for data cables. Hooks shall be aluminum with smooth ends free of sharp edges. Mono-Systems H-966-A and H-664-A hooks, or equivalent.

FIRE RATED WALL PENETRATIONS: Where cable trays and/or signal cables penetrate rated walls the Electrical Contractor shall furnish and install a UL Listed rated assembly, Specified Technology, Inc. (STI) EZ-Path Triple Cable Pathway System, or equivalent system by Wiremold. See details on drawings.

2-11 NAMEPLATES

NAMEPLATE: Provide engraved 3-ply laminated plastic nameplates for each panelboard, safety switch, transformer, enclosed circuit breaker, contactor, and lighting control panel. Attach to equipment cover using metal screws, rivets, or industrial epoxy cement. Manufacturer's sticky-back adhesive is not acceptable. Use 1/4" white letters on red field for normal emergency power items (generator). Use 1/4" white letters on yellow field for UPS power items (generator + UPS).

PART 3 - EXECUTION

3-01 GENERAL REQUIREMENTS

WORKMANSHIP: All work shall be installed in a neat and orderly manner. Devices, cabinets, covers, fixtures, exposed raceways, etc., shall be aligned parallel or perpendicular to the building

walls, ceiling, and floor. Wiring in panelboards and cabinets shall be neatly looped and laced, and not wadded. The Owner reserves the right to require repair or replacement of defective workmanship and material without additional compensation to the Contractor.

SUPPORTS: Conduits, boxes, cabinets, enclosures, lighting fixtures, etc., shall be securely supported by structural members or structural walls at intervals required by the NEC or as recommended by the manufacturer. Plaster, gypsum board, acoustical tile, and other ceiling and wall finish materials shall not be used for support.

Recessed fluorescent, incandescent, and H.I.D. fixtures and recessed ceiling speakers shall be independently supported by two (2) or four (4) #12 steel hanger wires. Hanger wires shall be hung within 10 degrees of plumb, and shall be securely tied to structural members such as steel joists or beams, or to steel angles or tubing which bridge structural members. All wiring located above fire rated assemblies must comply with 300.11 (A) 1 of the 2011 NEC.

CUTTING, PATCHING, AND PAINTING: The Electrical Contractor shall perform all boring, drilling, and cutting of walls, ceilings, and floors as required to install and support his raceways and equipment. Provide rough patching to seal penetrations through walls, ceilings, and floors. Finish patching and painting will be performed by the General Contractor.

FIRE WALL PENETRATIONS: Penetrations through fire rated walls and floors shall be sealed to maintain the integrity of the fire rating. Raceways through penetrations shall be in metal raceways. Penetration openings shall be sealed after the installation of the raceway with UL-49 listed fire retardant material, as manufactured by Chase Technology, 3M, Hilti, or approved equal. Penetrations shall be sealed in accordance with UL-49 requirements and the manufacturer's instructions. Coordinate manufacturer with the General Contractor so that all trades on the project use the same manufacturer.

Through penetrations of conduits and cables of fire resistance rated walls must comply with Section 714.3.1 of the IBC. Through penetrations of fire resistance ceiling assemblies must comply with section 714.4.1.1 of the IBC.

Where cable trays and/or signal cables penetrate rated walls the Electrical Contractor shall furnish and install a UL Listed rated assembly, Specified Technology, Inc. (STI) EZ-Path Triple Cable Pathway System, or equivalent system by Wiremold or Cooper. See details on drawings.

ROOF PENETRATIONS: Do not penetrate roof or flashing unless permitted, in writing, by the Architect-Engineer.

TRENCHING AND BACKFILL: The Electrical Contractor shall perform all excavation, trenching, and backfilling necessary to install his work. Trenches shall be run after final grades are established, and shall be run at 24 inches minimum depth from finished grades. Contact all underground utilities (electric, telephone, cable TV, gas, water, sewer) and establish locations of underground utilities prior to digging. Damages to underground utilities will be repaired by the Owner of the line, and the Contractor responsible for such damage will pay all costs of repairs. After completion of backfilling operations, restore the disturbed areas to their original condition by leveling, raking, seeding and mulching.

3-02 GROUNDING

CODE: Entire system shall be grounded and bonded in accordance with the requirements of Article 250 of the National Electrical Code.

MAIN SERVICE: Electrical service shall be grounded to the building structural steel, to the main cold water pipe within 5-feet of entrance to the building (or to the nearest indoor metal water piping

when the main is PVC), and to driven ground rods as required by the National Electrical Code. Grounding point shall be inside the Main service equipment.

FEEDERS AND BRANCH CIRCUITS: Each feeder raceway shall be bonded to every cabinet, pull box, etc., to which it is connected by grounding bushings and bonding jumpers sized per NEC Table 250.122. Each branch circuit raceway must be connected to every cabinet, pull box, outlet box, etc., with double locknuts. Separate grounding conductors shall be installed on all feeders and on all lighting, receptacle and equipment branch circuits, whether indicated on the drawings or not. Size per NEC 250.122.

RECEPTACLES AND FIXTURES: Bond grounding terminal of each receptacle and fluorescent fixture to its outlet box with No. 12 green ground wire. Self-grounding receptacles are not acceptable as a substitute for this requirement.

DRY-TYPE TRANSFORMERS: Bond transformer secondary to building steel with full sized equipment grounding conductor per NEC Table 250.66.

3-03 RACEWAYS

WIRING: All wiring shall be installed in raceways, unless noted. Raceways shall be run concealed, unless noted.

UNDERGROUND FEEDER CONDUIT, COMMUNICATIONS CONDUIT, AND DUCT BANKS:

1) Use GRC or PVC schedule 40 for underground conduit and duct bank installations.
2) Where required concrete encasement shall be either 2000 psi or 3000 psi.
3) Red colored concrete encasement, where required, shall use a red pigment integrally mixed into the concrete. Dry shake or broadcast coloring agents are not to be used.
4) For concrete encased conduits use manufactured PVC spacers and mounts for support and spacing of the conduits. Do not use concrete blocks, pipes, or other means to support and space conduits that are to receive concrete encasement.
5) A metallic backed marking tape shall be installed 12” above all underground feeder conduits, service entrance communications conduit, and duct banks.

MAIN SERVICE:

1) Main Service shall be run in GRC where run exposed or concealed in walls or ceilings.
2) Main Service shall be run in GRC or Schedule 40 PVC encased in concrete with 2-inches minimum concrete encasement on all sides where run underground (Schedule 40 PVC is not required to be encased in conduit where run under the concrete floor slab).
3) Where PVC is used, elbows for turn-outs and risers shall be GRC.
4) PVC is not permitted above grade.
5) Metal conduits installed in contact with earth shall be painted with 2 coats Rustoleum paint or other acceptable preservative.

FEEDERS:

1) Feeders shall be run in GRC or IMC where run exposed.
2) Feeders shall be run in GRC, IMC, or EMT where run concealed in walls or ceilings
3) Feeders shall be run in GRC or concrete encased PVC with 2-inches minimum concrete encasement where run underground (Schedule 40 PVC is not required to be encased in conduit where run under the concrete floor slab).
4) Where PVC is used, elbows for turn-outs and risers shall be GRC.
5) PVC is not permitted above grade.
6) Metal conduits installed in contact with earth shall be painted with 2 coats Rustoleum paint or other acceptable preservative.

BRANCH CIRCUITS:

1) Branch circuits shall be run concealed where practical.
2) Branch circuits run concealed in walls or ceilings shall be run in EMT, GRC, or IMC.
3) Branch circuits run exposed to weather on exterior walls or on roofs shall be run in GRC or IMC with screwed fittings.
4) Branch circuits run exposed in dry, finished spaces shall be run in Wiremold surface metal raceway.
5) Branch circuits run exposed in damp locations, unfinished spaces (attics), and unoccupied spaces (storage room, equipment rooms, janitor's closet) may be run in EMT in lieu of Wiremold.
6) Branch circuits run underground shall be run in GRC, IMC, or Schedule 40 PVC plastic conduit.
7) All interior conduit homeruns to panelboards shall be run overhead in EMT, GRC, or IMC unless noted otherwise on the drawings.
8) Underground conduits shall be run 24" minimum below grade.
9) Metal conduits installed in contact with earth shall be painted with 2 coats Rustoleum paint or other acceptable preservative.
10) Where plastic conduits are indicated, transition from plastic to GRC or IMC below grade or slab and rise with GRC or IMC. PVC is not permitted above grade. EXCEPTION: Plastic conduit may enter floor mounted switchboards.

FIRE ALARM SYSTEM CONDUIT: Conduit used for Fire Alarm System wiring shall be red, similar to Allied Fire Alarm EMT.

FLEXIBLE CONDUITS: Recessed fluorescent and incandescent fixtures located in accessible ceilings may be connected to an outlet box above the ceiling thru flexible conduit "whips". Run a separate ground wire in all conduit, including flexible fixture whips. DO NOT loop flexible conduit from one fixture to another. Metal-clad cable fixture whips shall be permitted for light fixture whips provided they do not exceed 6-feet in length and are provided by the light fixture manufacturer.

Final connections to motors, motor driven equipment, transformers, and vibrating equipment shall be made thru flexible conduit, 36" maximum length. "Sealtite" flexible metal conduit shall be installed outdoors, in equipment rooms, and in wet locations.

PULL WIRES: Raceways for wiring by others or for future shall contain a No. 14 galvanized steel pull wire or equivalent plastic cord with 200 lb. tensile strength.

INSTALLATION: Ream raceways, butt ends into couplings, 3 quarter bends per run maximum, plug raceways until wiring is pulled in place. Exposed conduits shall be run parallel and perpendicular to walls, floor, and ceiling. Multiple conduit runs shall be racked using Unistrut or Kindorf channels and pipe clamps. Install conduits in concrete slabs between the top and bottom layers of reinforcing steel. Maximum size of conduits in slabs is 1 inch. Crossing of conduits in slabs shall be avoided, if possible.

PULL BOXES: Maximum length between pull points shall be 200 ft. for pulls with two 90 degree bends, and 100 ft for pulls with three 90 degree bends. Furnish and install pullboxes, junction boxes, handholes, or conduit bodies where bends or pulling lengths exceed these specifications.

EXPANSION JOINTS: Furnish and install expansion joints where conduit crosses building expansion joints and for straight runs exceeding 100 ft. in length.

PLASTIC CONDUIT: Do not damage conduit while making field bends and offsets, cutting and joining conduit. Use GRC elbows where length between pulls exceeds 100 ft. Clean conduit prior to applying solvent. Insure that conduit extends fully into coupling or fitting when making joints.

MINIMUM SIZE: Home runs to panelboards shall be 3/4" minimum, otherwise raceways shall be 1/2" minimum, except that flexible conduit shall be 3/8" minimum.

3-04 WIRE AND CABLE

MINIMUM SIZE: No. 12 for power circuits, No. 14 for control circuits, unless noted. Where home run exceeds 75 ft. length on 120 volt circuits, use No. 10 minimum.

COLOR CODE: No. 12 and No. 10 shall have color-coded insulation. No. 8 and larger shall be marked at all terminals and joints with color-coded tape. Color code as follows:

Voltage	Phase A	Phase B	Phase C	Neutral	Grounding
240/120	Black	Orange	Blue	White	Green
208/120	Black	Red	Blue	White	Green
480/277	Brown	Orange	Yellow	Gray	Green

INSTALLATION: Insure that raceway system is complete and that conductors will be free from moisture or physical damage prior to installing conductors. Install all conductors at the same time. Do not exceed cable manufacturer's recommended pulling tension for conductors. Where required, lubricate cables with Ideal Yellow 77, Burndy Slikon, or other acceptable cable lubricant. Do not use lubricants that are not acceptable to the Architect-Engineer.

SPLICING: Splices on Sizes No. 10 and smaller shall be made with wire nuts. Splices on Sizes No. 8 and larger shall be made with split bolt connectors, compression connectors, or solderless lugs. Splices shall be insulated with two or more layers of Scotch 23 rubber tape covered with two or more layers of Scotch 33 plastic tape, or acceptable equivalent method.

MULTIWIRE BRANCH CIRCUITS: Shared or common neutrals are not permitted on this project for multiwire branch circuits. The Contractor shall pull a separate neutral for all 120V & 277V circuits.

3-05 BOXES

WALL OUTLETS: Flush mounted, unless noted. Boxes shall be securely mounted to wall studs or be grouted in masonry. Boxes shall have single or multi-gang plaster rings, as required. "Through-wall" boxes SHALL NOT BE USED. Back-to-back mounting of boxes is not permitted. Boxes on opposite sides of a rated wall shall have a minimum of 24" horizontal spacing or shall be protected with listed putty pads.

CEILING OUTLETS: Flush mounted or concealed above ceiling. Boxes for fixture support shall have studs or ears as required and shall be securely supported by adjustable bar hangers or steel angle.

JUNCTION BOXES, PULL BOXES, AND WIREWAYS: Shall be sized and installed as indicated on the drawings or where required by NEC for pulling or splicing wiring. All junction boxes and pull boxes shall be accessible. Junction boxes and pull boxes shall not be located above inaccessible ceilings.

LOCATIONS: Verify door swings and mount switches on strike side, 6" from jamb. Verify counter heights and arrangement prior to setting boxes. The Owner reserves the right to move any outlet by as much as 10 ft. from its indicated location at no additional cost, provided the Contractor is notified prior to roughing in.

3-06 WIRING DEVICES

INSTALLATION: Devices shall be installed as indicated on the drawings and wired in accordance with the manufacturer's instructions.

MASKING: Devices shall be masked to prevent painting of faces and handles during construction. Do not install cover plates until clean up has been completed.

COVER PLATES: Cover plates shall be installed on all wiring devices, telephone and computer outlets, junction boxes, and outlet connections.

3-07 PANELBOARDS

INSTALLATION: Mount top of panelboards 6'-6" above floor. Connect circuits as indicated on the drawings, observing correct color code and numbering. Mark all wires in panelboard with circuit number.

DIRECTORY: Provide typewritten circuit directory for each panel identifying load served and room location. Identify spares in pencil. Panelboard schedules must comply with NEC 408.4, including listing room description and room number for each load. Turn all spare breakers off.

3-08 SAFETY SWITCHES

LOCATION: Mount switches where shown on drawings and within sight of equipment served. Mount in a readily accessible location unless noted. Verify fuse sizes with equipment manufacturer's requirements.

3-09 INTERIOR LIGHTING

LOCATION: Install fixtures symmetrically on ceiling or ceiling grid as indicated on the drawings and as directed on the job.

MOUNTING: Support all fixtures securely from structural or framing members with adjustable bars, metal angles, threaded rods or other acceptable methods. Installation shall comply with NEC 314.27. Support recessed fixtures as specified in paragraph 3-01.

Suspended linear fluorescent direct/indirect fixtures in classrooms, offices, conference rooms, and other finished interior spaces shall be suspended using aircraft cable as indicated on the drawings, unless noted otherwise.

Suspended industrial fixtures, high-bay fixtures, low-bay fixtures, etc. located in gymnasiums, warehouses, industrial facilities, and other larger spaces with exposed ceilings shall be suspended using threaded rods and the Electrical Contractor shall furnish and install unistrut or other structural member as required to support fixtures. Mount so bottom of fixture is as close to bottom of beam or truss as possible, unless noted otherwise.

3-10 TELEPHONE AND COMPUTER SYSTEMS

REQUIREMENTS: Verify telephone and computer equipment space requirements and outlet locations with Owner prior to roughing in. Telephone and computer service conduits, equipment mounting boards, grounding, and convenience outlets shall be provided as indicated on the drawings.

WIRING: Provide telephone and computer conduit with pull wires as indicated on the drawings. Minimum size conduit is 1" unless noted otherwise on the drawings.

3-11 GROUND ROD TESTS

Prior to connecting ground rods to ground ring or grounding conductor, each ground rod shall be tested for earth resistance. Test method shall be Biddle fall of potential method, or approved equivalent method. Notify Engineer seven (7) calendar days prior to performing testing. Tests shall not be performed within seven (7) days of measurable rainfall (greater than 0.01 inches). Should the resistance of any ground rod exceed 25 ohms, or lesser value when specified, notify Engineer for further action. Furnish to the Engineer a written certification of the testing, listing each ground rod as identified in the Drawings, and the resulting value of resistance, and any further corrective action taken.

3-12 COMPLETION OF WORK

TESTS AND FINAL REVIEW: Upon completion of work, the entire system shall be completely operational and tested to conform with these specifications and drawings, and shall be reviewed by the Architect-Engineer. All defects in workmanship and material shall be immediately corrected without additional compensation to the Contractor.

The final review of the electrical installation by the Engineer cannot be provided until the following items have been submitted to the Engineer for review:

1) Letter from the Electrical Contractor on company letterhead indicating that the installation is complete and ready for a final review.
2) Written documentation that the Occupancy Sensor Commissioning has been provided in accordance with the design documents.
3) Written confirmation that the Occupancy Sensor Training has been provided or at a minimum has been scheduled in accordance with the design documents.
4) Breaker Coordination letter confirming the setting and providing the setting information of circuit breakers in accordance with the design documents, including selective coordination of emergency systems.
5) Written certification of the ground rod testing, listing each ground rod as identified in the Drawings, and the resulting value of resistance, and any further corrective action taken.
6) Provide documentation of required standby generator testing.

Failure to submit the above documentation prior to requesting the Engineer's Final Review of the project may result in delays in providing the final review. The Engineer assumes no liability for delays in the project resulting from failure to provide the proper documentation.

The system will not be considered complete until Record Documents are provided and training of facility personnel on the system operation is complete. This facet of the services to be provided by the Contractor is deemed very important to the satisfactory completion of the contract and the installation cannot be deemed complete until these services have been provided in accordance with the Contract Documents.

CLEAN UP: Upon completion of all installations and prior to final acceptance by the Owner, remove all debris from the site. Clean and touch up paint on fixture lenses and trims, cabinets, enclosures, cover plates, etc.

END OF SECTION 260500

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL REQUIREMENTS

1-01 SUMMARY

SECTION INCLUDES:

1) Hangers and supports for electrical equipment and systems.
2) Construction requirements for concrete bases.

1-02 PERFORMANCE REQUIREMENTS

1) Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
2) Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
3) Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
4) Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1-03 SUBMITTALS

1) Product Data: For steel slotted support systems.
2) Shop Drawings: Shop Drawings shall show fabrication and installation details and include calculations for the following:

    a. Trapeze hangers. Include Product Data for components.
    b. Steel slotted channel systems. Include Product Data for components.
    c. Equipment supports.

3) Welding Certificates.

1-04 QUALITY ASSURANCE

1) Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2) Comply with NFPA 70.

PART 2 - PRODUCTS

2-01 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

1) Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.

    a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

b. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   i. Allied Tube & Conduit.
   ii. Cooper B-Line, Inc.; a division of Cooper Industries.
   iii. ERICO International Corporation.
   iv. GS Metals Corp.
   v. Thomas & Betts Corporation.
   vi. Unistrut; Tyco International, Ltd.
   vii. Wesanco, Inc.
c. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
d. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
e. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
f. Channel Dimensions: Selected for applicable load criteria.

2) Raceway and Cable Supports: As described in NECA 1 and NECA 101.
3) Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
4) Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored 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 malleable iron.
5) Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
6) Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

   a. 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.
      i. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      ii. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
         - Hilti Inc.
         - ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
         - MKT Fastening, LLC.
         - Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.
   b. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel or stainless steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
      i. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      ii. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
         - Cooper B-Line, Inc.; a division of Cooper Industries.
         - Empire Tool and Manufacturing Co., Inc.
         - Hilti Inc.
         - ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
         - MKT Fastening, LLC.
   c. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.

d. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
e. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
f. Toggle Bolts: All-steel springhead type.
g. Hanger Rods: Threaded steel.

2-02 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

1) Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
2) Materials: Comply with requirements in Division 05 Section "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3-01 APPLICATION

1) Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
2) Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.
3) Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
   a. Secure raceways and cables to these supports with two-bolt conduit clamps.
4) Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch (38-mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3-02 SUPPORT INSTALLATION

1) Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
2) Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.
3) 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 (90 kg).
4) 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:

   a. To Wood: Fasten with lag screws or through bolts.
   b. To New Concrete: Bolt to concrete inserts.
   c. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
   d. To Existing Concrete: Expansion anchor fasteners.
   e. 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 (100 mm) thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches (100 mm) thick.

f. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts; beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69; or spring-tension clamps.
g. To Light Steel: Sheet metal screws.
h. 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 by means that meet seismic-restraint strength and anchorage requirements.

5) Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3-03 INSTALLATION OF FABRICATED METAL SUPPORTS

1) Comply with installation requirements in Division 05 Section "Metal Fabrications" for site-fabricated metal supports.
2) Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
3) Field Welding: Comply with AWS D1.1/D1.1M.

3-04 CONCRETE BASES

1) Construct concrete bases of dimensions indicated but not less than 4 inches (100 mm) larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
2) Use 3000-psi, 28-day compressive-strength concrete.
3) Anchor equipment to concrete base.
   a. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   b. Install anchor bolts to elevations required for proper attachment to supported equipment.
   c. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3-05 PAINTING

1) 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. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
2) Touchup: Comply with requirements in Division 09 for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
3) Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 260529

SECTION 264313 – SURGE PROTECTION DEVICE (SPD)

PART 1 - GENERAL REQUIREMENTS

1-01 SCOPE OF WORK

WORK INCLUDED: Furnish all necessary labor, material, plant and equipment, including materials and equipment not specifically mentioned but necessary to complete the work in a neat, correct, and workmanlike manner, to include:

1) Main Electrical Service Surge Suppressor.
2) Computer Panelboard Surge Suppressors.

1-02 CODES AND STANDARDS

All work shall comply with the requirements of Section 260500 – Electrical Basic Materials and Methods. Each surge suppressor shall be UL 1449-Third Edition and UL 1283 listed.

1-03 WARRANTY

Each surge suppressor shall have a minimum 5-year warranty.

1-04 SUBMITTALS

Within thirty (30) days after the award of the contract, submit six (6) sets of shop drawings and equipment specifications to the Architect-Engineer for review. Shop drawings shall include specification sheets on all surge suppressors to be furnished.

PART 2 - PRODUCTS

2-01 SURGE SUPPRESSOR FOR MAIN ELECTRICAL SERVICE

MANUFACTURERS: Innovative Technology, EFI, Square D, Cutler Hammer, Liebert, or APT.

120/208V, 3PH DESIGN: Suppressor shall be Innovative Technology PTE160-3Y101-D, or approved equal and shall meet the following minimum criteria: 120/208 Volt, 3 Phase, 4 Wire (plus ground) parallel configured, hard wire Multi-Circuit Surge Protection Device with true sine wave tracking, direct protection of all modes (L-N, L-L, L-G & N-G), diagnostic LED indicators (one per phase), minimum of 5 year warranty, integral disconnect switch, and alarm contact. The total unit shall be UL 1449, Third Edition and UL 1283 listed. The response time of the components of the unit shall be less than or equal to 5 nanoseconds. The unit shall have a peak surge current of no less than 160KA per phase, 8 X 20 microsecond, single impulse. The unit shall have a minimum EMI/RFI attenuation of 40dB (normal mode and common mode). The manufacturer's test data for let-thru voltage for B3/C1 bi-wave and C3 bi-wave shall be comparable to the following test data (6 inch lead length used to simulate actual installation):

	L-N	L-L	L-G	N-G
B3/C1 Bi-wave, 6000V, 3000A, 90°	270V	740V	270V	380V
C3 Bi-wave, 20000V, 10000A, 90°	660V	1100V	710V	840V

LEADS: 18" maximum, #10 THHN. For optimum performance, mount surge arrestor close to the panel so that leads are kept as short as possible, straight, and tightly taped.

ENCLOSURE: NEMA 4 or NEMA 12 steel enclosure, locknut and washer included.

2-02 SURGE SUPPRESSOR FOR COMPUTER PANELBOARDS

MANUFACTURERS: Innovative Technology, EFI, Square D, Cutler Hammer, Liebert, or APT.

120/208V, 3PH DESIGN: Suppressor shall be Innovative Technology PTE080-3Y201, or approved equal and shall meet the following minimum criteria: 120/208 Volt, 3 Phase, 4 Wire (plus ground) parallel configured, hard wired Multi-Circuit Surge Protection Device with true sine wave tracking, direct protection of all modes (L-N, L-L, L-G & N-G), diagnostic LED indicators (one per phase), minimum of 5 year replacement warranty, and alarm contact. The total unit shall be UL 1449, Third Edition and UL 1283 listed. The response time of the components of the unit shall be less than or equal to 5 nanoseconds. The unit shall have a peak surge current of no less than 80KA/phase, 8 X 20 microsecond, single impulse. The unit shall have a minimum EMI/RFI attenuation of 40dB (normal mode and common mode). The manufacturer's test data for let-thru voltage for A1 ring wave, B3/C1 bi-wave, and C3 bi-wave shall be comparable to the following test data (6 inch lead length used to simulate actual installation):

	L-N	L-L	L-G	N-G
A1 Ring wave, 2000V, 67A, 180°	70V	80V	90V	90V
B3/C1 Bi-wave, 6000V, 3000A, 90°	270V	740V	270V	380V
C3 Bi-wave, 20000V, 10000A, 90°	660V	1100V	710V	840V

LEADS: 12" maximum, #10 THHN. For optimum performance, mount surge arrestor adjacent to the panel so that leads are kept as short as possible, straight, and tightly taped.

ENCLOSURE: NEMA 4 or NEMA 12 steel enclosure, locknut and washer included.

PART 3 - EXECUTION

3-01 INSTALLATION

Furnish and install systems in accordance with the plans and specifications, all applicable codes and the manufacturer's recommendations. All wiring shall be installed in strict compliance with all the provisions of Section 260500.

3-02 CONDUIT AND WIRING

See Section 260500, Basic Materials and Methods. All wiring shall be run in raceways.

3-03 COMPLETION OF WORK

Upon completion of work, the entire system shall be completely operational and tested to conform to these specifications and drawings, and shall be reviewed by the Architect-Engineer. All defects in workmanship and material shall be immediately corrected without additional compensation to the Contractor.

END OF SECTION 264313

ELECTRICAL SYMBOLS

	DUPLEX RECEPTACLE, 20A, 120V, NEMA 5/20R, 16" AFF TO BOTTOM OF OUTLET BOX. "TR" DENOTES TAMPER-RESISTANT RECEPTACLE, SEE 260500. "CR" DENOTES CORROSION-RESISTANT RECEPTACLE, SEE 260500. "WP" DENOTES WEATHERPROOF RECEPTACLE WITH WEATHERPROOF COVER PLATE, SEE 260500.
	SAME, EXCEPT MOUNTED 3" TO BOTTOM OF OUTLET FROM COUNTER BACKSPLASH, OR 48" AFF TO TOP OF OUTLET, OR AS DETAILED ON DRAWINGS., SEE ELEVATION ON E604.
	SAME, EXCEPT CEILING MOUNTED RECEPTACLE.
	QUADRAPLEX RECEPTACLE, (2) HUBBELL 5362 RECEPTACLES WITH 2-GANG COVERPLATE, 16" AFF.
	GFCI RECEPTACLE, MOUNTING HEIGHTS AS ABOVE, "WP" DENOTES WEATHERPROOF COVER PLATE.
	SAME AS ABOVE, EXCEPT SURFACE MOUNTED RECEPTACLE, 20A RECEPTACLE IN WIREMOLD V5748 BOX. MOUNTING HEIGHTS AS ABOVE. RUN WIREMOLD V700 VERTICAL ON WALL TO J-BOX ABOVE LAY-IN CEILING OR HIGH ON WALL IN EXPOSED CEILING APPLICATIONS AND HOMERUN OR EXTEND CONDUIT AND WIRING TO NEXT DEVICE AS NOTED ON THE DRAWINGS. PROVIDE STAINLESS STEEL COVERPLATE SIZED FOR WIREMOLD BOX.
F F F F	SAME, EXCEPT "F" DENOTES RECEPTACLE TO BE MOUNTED IN EXISTING STUD WALL. CUT AND PATCH EXISTING WALL AS REQUIRED TO INSTALL BOX. FISH EXISTING WALL AS REQUIRED TO RUN CONDUIT AND WIRE TO BOX, MOUNTING HEIGHTS AS ABOVE.
D D	DENOTES RECEPTACLE LOCATED IN PREASSEMBLED DEMOUNTABLE WALL. WALL TO BE PROVIDED WITH RECEPTACLE, RACEWAY, AND WIRING ALREADY INSTALLED. DEMOUNTABLE WALL RECEPTACLE LOCATIONS SHOWN ON ELECTRICAL DRAWINGS FOR INFORMATION PURPOSED ONLY.
PD	DEMOUNTABLE WALL POWER CONNECTION POINT FOR RECEPTACLES. MOUNT 4"X4" JUNCTION BOX ABOVE LAY-IN CEILING AT CONNECTION POINT. TIE IN DEMOUNTABLE WALL POWER CIRCUIT(S) TO JUNCTION BOX AND HOMERUN TO NOTED PANEL AS INDICATED ON THE DRAWINGS. DEMOUNTABLE WALL POWER CONNECTION POINTS SHOWN ON DRAWINGS ARE FOR BIDDING PURPOSES ONLY, FIELD VERIFY ACTUAL LOCATIONS AND REQUIREMENTS WITH DEMOUNTABLE WALL MANUFACTURER PRIOR TO
CD	MODULAR CUBICLE POWER CONNECTION POINT FOR RECEPTACLES. MOUNT 4"X4" JUNCTION BOX ABOVE LAY-IN CEILING AT CONNECTION POINT. TIE IN CUBICLE POWER CIRCUIT(S) TO JUNCTION BOX AND HOMERUN TO NOTED PANEL AS INDICATED ON THE DRAWINGS. CUBICLE POWER CONNECTION POINTS SHOWN ON DRAWINGS ARE FOR BIDDING PURPOSES ONLY, FIELD VERIFY ACTUAL LOCATIONS AND REQUIREMENTS WITH CUBICLE MANUFACTURER PRIOR TO STARTING WORK. CUBICLE RECEPTACLE LOCATIONS ARE NOT INDICATED ON THE ELECTRICAL DRAWINGS, RECEPTACLES TO BE PREINSTALLED AND PREWIRED BY THE CUBICLE MANUFACTURER.
HG	REMOTE FACELESS GFCI TEST SWITCH, 48" AFF TO TOP OF BOX OR 3" TO BOTTOM OF OUTLET BOX FROM COUNTER BACKSPLASH. GROUP TEST SWITCH WITH GFCI RECEPTACLE WIRED TO A SEPARATE CIRCUIT. SEE DETAIL ON E604 FOR MOUNTING AND CIRCUITING.
H A	WALL OR FLOOR MOUNTED SPECIAL POWER OUTLET, SEE PLANS FOR DESCRIPTION.
H J	WALL OR CEILING MOUNTED JUNCTION BOX.
	TELEPHONE BOARD.
	PANELBOARD.
H 30/25 WP	SAFETY SWITCH, 3 POLE, 240 VOLT RATED. NUMBER ABOVE BAR DENOTES SWITCH RATING, NUMBER BELOW BAR DENOTES FUSE RATING. "WP" DENOTES NEMA 3R ENCLOSURE.
HP 2 HP 1 2.5	HVAC UNIT ID TAG. TAG CORRESPONDS TO UNIT ID ON MECHANICAL DRAWINGS. SEE MECHANICAL EQUIPMENT SCHEDULE AND MECHANICAL EQUIPMENT NOTES ON ELECTRICAL DRAWINGS.
A-1,3	BRANCH CIRCUIT WIRING RUN CONCEALED IN WALLS OR CEILING, 1#12G, 2#12 UNLESS NOTED OTHERWISE. ARROW DENOTES HOME RUN AND NUMERAL DENOTES CIRCUIT NUMBER. WHERE MORE THAN TWO CONDUCTORS ARE REQUIRED, SLASH MARKS INDICATE NUMBER OF #12 CONDUCTORS: SHORT SLASH DENOTES HOT OR SWITCH LEG, LONG SLASH DENOTES NEUTRAL, "L" DENOTES GROUNDING WIRE MULTIWIRE BRANCH CIRCUITS USING A SHARED OR COMMON NEUTRAL ARE NOT PERMITTED ON THIS PROJECT. THE CONTRACTOR SHALL PULL A SEPARATE NEUTRAL FOR ALL 120V AND 277V CIRCUITS. CONDUIT HOMERUNS TO PANELBOARDS SHALL BE 3/4" MINIMUM, OTHERWISE RACEWAYS SHALL BE 1/2" MINIMUM, EXCEPT THAT FLEXIBLE CONDUIT SHALL BE 3/8" MINIMUM.
	SAME, EXCEPT RUN UNDERGROUND OR UNDERFLOOR.
	SAME, EXCEPT RUN EXPOSED.
P,C	FLOOR OUTLET, SEE PLANS AND SPECIFICATIONS FOR DESCRIPTION. "P" DENOTES POWER, "C" DENOTES COMMUNICATIONS, "P,C" DENOTES 2-GANG BOX, "P,C,C" DENOTES 3-GANG BOX, "P,P,C DENOTES 3-GANG BOX, "P,P,C,C DENOTES 4-GANG BOX, ETC. EACH COMMUNICATIONS GANG MUST BE CAPABLE OF ACCEPTING A MINIMUM OF (4) CATEGORY 6 JACKS. PROVIDE BOX WITH CONDUIT TAPPING TO MATCH CONDUIT FEEDING BOX, SEE SPECIFICATIONS.
HTV	TV OUTLET. 2 GANG BOX, 4 11/16" SQUARE, 2 1/8" DEEP, WITH 1 GANG PLASTER RING, MOUNTING HEIGHT AS INDICATED ON DRAWINGS. PROVIDE DUPLEX RECEPTACLE 84" AFF WITHIN 8" OF TV OUTLET. HOMERUN 1" EMPTY CONDUIT WITH PULL WIRE TO CABLE TRAY OR MDF/IDF ROOM. CONDUIT TO BE EMT RUN OVERHEAD CONCEALED IN WALLS OR CEILING UNLESS NOTED OTHERWISE.
HTVW	SURFACE MOUNTED TV OUTLET, WIREMOLD V5748-2 DEVICE BOX, 4 3/4" SQUARE, 1 3/4" DEEP, MOUNTING HEIGHT AS INDICATED ON DRAWINGS. PROVIDE DUPLEX RECEPTACLE WITHIN 8" OF TV OUTLET. RUN WIREMOLD V700 SURFACE RACEWAY ON WALL TO J-BOX ABOVE CEILING AND HOMERUN TO CABLE TRAY OR MDF/IDF ROOM AS INDICATED ON THE DRAWINGS.
	COMMUNICATIONS OUTLET, 2 GANG BOX, 4 11/16" SQUARE, 2 1/8" DEEP, WITH 1 GANG PLASTER RING, 16" AFF TO BOTTOM OF OUTLET BOX UNLESS NOTED. HOMERUN 1" EMPTY CONDUIT WITH PULL WIRE TO CABLE TRAY OR MDF/IDF ROOM. CONDUIT TO BE EMT RUN OVERHEAD CONCEALED IN WALLS OR CEILING UNLESS NOTED OTHERWISE.
	SAME, EXCEPT MOUNTED 4" ABOVE COUNTER BACKSPLASH OR AS INDICATED ON THE DRAWINGS. TOP OF OUTLET, OR AS DETAILED ON DRAWINGS., SEE ELEVATION ON E604.
F F	SAME, EXCEPT "F" DENOTES OUTLET TO BE MOUNTED IN EXISTING STUD WALL. CUT AND PATCH EXISTING WALL AS REQUIRED TO INSTALL BOX. FISH EXISTING WALL AS REQUIRED TO RUN CONDUIT TO BOX, MOUNTING HEIGHTS AS ABOVE.
W W	SURFACE MOUNTED COMMUNICATIONS OUTLET, WIREMOLD V5748-2 DEVICE BOX, 4 3/4" SQUARE, 1 3/4" DEEP, WITH 1 GANG PLASTER RING, 16" AFF TO BOTTOM OF OUTLET BOX UNLESS NOTED. RUN WIREMOLD V700 SURFACE RACEWAY ON WALL TO J-BOX ABOVE CEILING AND HOMERUN TO CABLE TRAY OR MDF/IDF ROOM AS INDICATED ON THE DRAWINGS.
D	COMMUNICATIONS OUTLET LOCATED IN PREASSEMBLED DEMOUNTABLE WALL. WALL TO BE PROVIDED WITH OUTLET AND RACEWAY ALREADY INSTALLED. DEMOUNTABLE WALL COMMUNICATIONS OUTLET LOCATIONS SHOWN ON ELECTRICAL DRAWINGS FOR INFORMATION PURPOSED ONLY.
D	DEMOUNTABLE WALL CONDUIT CONNECTION POINT FOR COMMUNICATIONS OUTLETS. MOUNT 4"X4" JUNCTION BOX ABOVE LAY-IN CEILING AT CONNECTION POINT. TIE IN DEMOUNTABLE WALL CONDUIT TO JUNCTION BOX AND HOMERUN TO CABLE TRAY OR MDF/IDF ROOM AS INDICATED ON THE DRAWINGS. DEMOUNTABLE WALL CONNECTION POINTS SHOWN ON DRAWINGS ARE FOR BIDDING PURPOSES ONLY, FIELD VERIFY ACTUAL LOCATIONS AND REQUIREMENTS WITH DEMOUNTABLE WALL MANUFACTURER PRIOR TO STARTING WORK.
	COMMUNICATIONS OUTLET LOCATED IN PREASSEMBLED MODULAR CUBICLE. CUBICLES TO BE PROVIDED WITH OULET AND RACEWAY ALREADY INSTALLED. CUBICLE COMMUNICATIONS OUTLET LOCATIONS SHOWN ON ELECTRICAL DRAWINGS FOR INFORMATION PURPOSED ONLY.
C	MODULAR CUBICLE CONDUIT CONNECTION POINT FOR COMMUNICATIONS OUTLETS. MOUNT 4"X4" JUNCTION BOX ABOVE LAY-IN CEILING AT CONNECTION POINT. TIE IN CUBICLE CONDUIT TO JUNCTION BOX AND HOMERUN TO CABLE TRAY OR MDF/IDF ROOM AS INDICATED ON THE DRAWINGS. CUBICLE CONNECTION POINTS SHOWN ON DRAWINGS ARE FOR BIDDING PURPOSES ONLY, FIELD VERIFY ACTUAL LOCATIONS AND REQUIREMENTS WITH CUBICLE MANUFACTURER PRIOR TO STARTING WORK.
	CABLE TRAY RUN ABOVE ACCESSIBLE LAY-IN CEILINGS, SEE SPECIFICATIONS AND DETAILS ON E603.
	RATED TRIPLE CABLE PATHWAY SYSTEM, SEE DETAIL ON E603. A NON-RATED WALL SLEEVE ASSEMBLY MAY BE USED IN NON-RATED WALLS.
HK	SECURITY SYSTEM KEYPAD OUTLET, 2 GANG BOX, 4" SQUARE, 2 1/8" DEEP, WITH 1 GANG PLASTER RING, 48" AFF TO TOP OF OUTLET BOX UNLESS NOTED. HOMERUN 3/4" EMPTY CONDUIT WITH PULL WIRE TO CABLE TRAY OR MDF/IDF ROOM. CONDUIT TO BE EMT RUN OVERHEAD CONCEALED IN WALLS OR CEILING UNLESS NOTED OTHERWISE.

SCOPE OF WORK

THE WORK OF THIS SECTION SHALL PROVIDE COMPLETE ELECTRICAL SYSTEMS WHICH SHALL INCLUDE THE PROVIDING OF ALL CONDUCTORS, RACEWAYS, FITTINGS, CIRCUIT PROTECTIVE DEVICES, LIGHT FIXTURES, BOXES, SUPPORTS, AND ALL ASSOCIATED APPURTENANCES AND MISCELLANEOUS EQUIPMENT NECESSARY, ALL OF WHICH SHALL BE COMPLETELY CONNECTED, TESTED, ADJUSTED AND LEFT IN PROPER OPERATING CONDITION. THE ELECTRICAL SYSTEM TO BE PROVIDED SHALL INCLUDE SERVICE AND DISTRIBUTION FACILITIES POWER FOR MOTOR OPERATED EQUIPMENT, LIGHTING SYSTEMS, AND ALL OUTLETS AS COVERED HEREINAFTER.

GENERAL NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE 2011 NATIONAL ELECTRICAL CODE (NEC), THE 2012 INTERNATIONAL BUILDING CODE (IBC), AND ANY LOCAL CODES, LAWS AND ORDINANCES WHICH MAY APPLY. WHERE DIFFERENCES EXIST BETWEEN THE CODES, THE STRICTER CODE SHALL APPLY.
2. ALL CONDUITS SHALL CONTAIN A GROUNDING CONDUCTOR REGARDLESS OF USE.
3. THE CONTRACTOR FOR THE WORK UNDER THIS SECTION SHALL PROCURE AND PAY FOR ALL PERMITS, FEES, AND LICENSES REQUIRED FOR THE EXECUTION OF THIS WORK. SATISFACTORY EVIDENCE OF COMPLIANCE WITH THE REQUIREMENT AND ALL CERTIFICATES OF INSPECTION SHALL BE DELIVERED TO THE OWNER PROMPTLY UPON REQUEST.
4. TYPE MC CABLE MAY NOT BE USED ON THIS PROJECT, EXCEPT THAT METAL CLAD CABLE SHALL BE PERMITTED FOR LIGHT FIXTURE WHIPS PROVIDED THEY DO NOT EXCEED 6-FEET IN LENGTH AND ARE PROVIDED BY THE LIGHT FIXTURE MANUFACTURER.
5. UNLESS OTHERWISE NOTED FOR 120-VOLT, 20-AMP CKTS:
   #10 AWG SHALL BE USED FOR HOMERUNS LONGER THAN 75 FEET
   #12 AWG SHALL BE USED FOR HOMERUNS 75 FEET OR SHORTER
6. MULTIWIRE BRANCH CIRCUITS USING A SHARED OR COMMON NEUTRAL ARE NOT PERMITTED ON THIS PROJECT. THE CONTRACTOR SHALL PULL A SEPARATE NEUTRAL FOR ALL 120V CIRCUITS.
7. MOUNT RECEPTACLES 16" AFF UNLESS OTHERWISE NOTED.
8. ALL LIGHT SWITCHES AND RECEPTACLES SHALL BE BY THE SAME MANUFACTURER. COVER PLATES SHALL BE JUMBO STAINLESS STEEL. DEVICE COLOR TO BE SELECTED BY THE ARCHITECT UNLESS STATED WITH THE DEVICE SYMBOL.
9. ELECTRICAL METALLIC TUBING AND RIGID GALVANIZED STEEL CONDUIT SHALL BE THE ONLY TYPES OF CONDUIT INSTALLED WITHIN THE BUILDING. PVC IS PERMITTED UNDERGROUND.
10. BRANCH CIRCUITS SHALL BE RUN CONCEALED WHERE PRACTICAL. BRANCH CIRCUITS RUN EXPOSED TO WEATHER ON EXTERIOR WALLS OR ON ROOFS SHALL BE RUN IN GRC OR IMC WITH SCREWED FITTINGS. BRANCH CIRCUITS RUN CONCEALED IN WALLS OR CEILINGS SHALL BE RUN IN EMT, GRC, OR IMC. BRANCH CIRCUITS RUN EXPOSED IN DRY, FINISHED SPACES SHALL BE RUN IN WIREMOLD SURFACE METAL RACEWAY. BRANCH CIRCUITS RUN EXPOSED IN DAMP LOCATIONS, UNFINISHED SPACES (ATTICS), AND UNOCCUPIED SPACES (STORAGE ROOM, EQUIPMENT ROOMS, JANITOR'S CLOSET, ETC.) MAY BE RUN IN EMT IN LIEU OF WIREMOLD.
11. CONDUIT HOMERUNS TO PANELBOARDS AND CONDUITS SHOWN WITH MULTIPLE CIRCUITS SHALL BE 3/4" MINIMUM, OTHERWISE RACEWAYS SHALL BE 1/2" MINIMUM, EXCEPT THAT FLEXIBLE CONDUIT SHALL BE 3/8" MINIMUM.
12. INTERIOR CONDUIT HOMERUNS TO PANELBOARDS SHALL BE RUN OVERHEAD IN EMT, GRC, OR IMC UNLESS NOTED OTHERWISE ON THE DRAWINGS.
13. ALL FIRE RATED WALLS, FLOORS, ETC WHICH HAVE A CONDUIT OR OTHER ELECTRICAL PENETRATION SHALL BE SEALED TO EQUAL THE RATING OF THE WALL, FLOOR, ETC. THAT IS PENETRATED. CONTRACTOR SHALL USE A U.L. RATED AND LISTED ASSEMBLY FOR THE SEALING MATERIAL AND METHOD. COORDINATE MANUFACTURER WITH THE GENERAL CONTRACTOR SO THAT ALL TRADES ON THE PROJECT USE THE SAME MANUFACTURER. THROUGH PENETRATIONS OF CONDUITS AND CABLES OF FIRE RESISTANCE RATED WALLS MUST COMPLY WITH SECTION 714.3.1 OF THE IBC. THROUGH PENETRATIONS OF FIRE RESISTANCE CEILING ASSEMBLIES MUST COMPLY WITH SECTION 714.4.1.1 OF THE IBC.
14. ALL OUTLET BOXES 4"x4" OR SMALLER LOCATED ON OPPOSITE SIDES OF A RATED WALL SHALL HAVE A MINIMUM OF 24" HORIZONTAL SPACING OR SHALL BE PROTECTED WITH LISTED PUTTY PADS. ALL OUTLET BOXES LARGER THAN 4"x4" (COMMUNICATIONS OUTLETS, ETC.) LOCATED IN RATED WALLS SHALL BE PROTECTED WITH LISTED PUTTY PADS.
15. METALLIC WATER PIPING SHALL BE BONDED TO THE GROUNDING ELECTRODE SYSTEM (SEE NEC 250-104).
16. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS, LOCATIONS, CABINETS, ETC.
17. CONCEAL ALL CONDUIT AND FITTINGS EXCEPT WHERE THE ARCHITECT GRANTS SPECIFIC PERMISSION.
18. ALL WORK AND MATERIALS SHALL BE GUARANTEED FOR ONE YEAR FROM DATE OF ACCEPTANCE.
19. PROVIDE ONE COMPLETE SET OF ELECTRICAL DRAWINGS MARKED UP FOR RECORD DRAWINGS. SHOW ALL LOCATIONS OF EQUIPMENT AND MATERIALS.
20. INSTALL ALL MATERIALS PER MANUFACTURER'S INSTRUCTIONS.
21. IDENTIFY MAJOR EQUIPMENT INSTALLED WITH LAMICOR LABELS.
22. VISIT SITE TO DETERMINE EXISTING CONDITIONS PRIOR TO SUBMITTING BID.
23. ALL RACEWAYS, FIXTURES, WIRING, DEVICES, AND EQUIPMENT RENDERED USELESS BY THIS WORK SHALL BE REMOVED AND DELIVERED TO THE OWNER'S STORAGE FACILITY AS DIRECTED. ANY MATERIAL NOT WANTED BY THE OWNER SHALL BE DISPOSED OF BY THE CONTRACTOR.
24. ELECTRICAL CONTRACTOR SHALL DO ALL CUTTING AND PATCHING AS REQUIRED TO INSTALL HIS WORK. FINISH PATCHING AND PAINTING WILL BE DONE BY THE GENERAL CONTRACTOR.
25. WHERE DISAGREEMENTS EXISTS ON THE DESIGN DOCUMENTS, THE ITEM OR ARRANGEMENTS OF BETTER QUALITY, GREATER QUANTITY, OR HIGHER COST SHALL BE INCLUDED IN THE BASE BID. ANY DISCREPANCIES BETWEEN THE DRAWINGS, SPECIFICATIONS, AND FIELD CONDITIONS SHALL BE RESOLVED WITH THE ENGINEER PRIOR TO COMMENCING WORK. ALL AGREEMENTS SHALL BE VERIFIED IN WRITING.
26. ALL WORK UNDER THIS SECTION SHALL BE COORDINATED WITH OTHER TRADES TO INSURE PROPER LOCATION OF OUTLETS AND EQUIPMENT CONNECTIONS, AND TO MINIMIZE CONFLICTS WITH STRUCTURAL MEMBERS, DUCT WORK, PIPING, ETC. CONFLICTS BETWEEN EQUIPMENT AND/OR MATERIAL LOCATIONS SHALL BE CORRECTED AS DIRECTED BY THE ARCHITECT-ENGINEER AT NO ADDITIONAL COST TO THE OWNER.

LIGHTING SYMBOLS

	WALL OR CEILING MOUNTED FIXTURE.
	RECESSED FIXTURE, WIRE THRU GREENFIELD FROM OUTLET BOX ABOVE CEILING. "NL" DENOTES FIXTURE WIRED TO A SEPARATE 24/7 NIGHT LIGHT CIRCUIT.
	SURFACE MOUNTED OR RECESSED CEILING MOUNTED FIXTURE.
H	WALL MOUNTED FIXTURE.
H	WALL OR CEILING MOUNTED LED EXIT LIGHT, SHADED AREA DENOTES FACE.
	OUTDOOR RATED WALL MOUNTED EMERGENCY LIGHTING FIXTURE. PROVIDE AS SCHEDULED.
S	SINGLE POLE SWITCH, 20A, 120/277V, 48" AFF TO TOP OF OUTLET BOX. SUBSCRIPT DENOTES OUTLETS CONTROLLED.
S_3	SAME, EXCEPT THREE WAY.
S_4	SAME, EXCEPT FOUR WAY.
W_{20}	DUAL TECHNOLOGY WALL SWITCH OCCUPANCY SENSOR, WATTSTOPPER PART #DW-100 OR EQUIVALENT BY ACUITY CONTROLS.
T_{15}	DIGITAL TIME SWITCH, WATTSTOPPER PART #TS-400
W S_a S_b F S_a S_b	FOR SWITCHES, WALL SWITCH SENSORS, AND DIGITAL TIME SWITCHES THE FOLLOWING APPLY: - "F" DENOTES SWITCH TO BE MOUNTED IN EXISTING STUD WALL. CUT AND PATCH EXISTING WALL AS REQUIRED TO INSTALL BOX. FISH EXISTING WALL AS REQUIRED TO RUN CONDUIT SWITCH. - "W" DENOTES SURFACE MOUNTED, RUN WIREMOLD V700 ON WALL TO J-BOX ABOVE CEILING. - DENOTES SWITCH LOCATED IN PREASSEMBLED DEMOUNTABLE WALL. WALL TO BE PROVIDED WITH OUTLET BOX AND RACEWAY ALREADY INSTALLED. DEMOUNTABLE WALL SWITCH LOCATIONS SHOWN ON ELECTRICAL DRAWINGS FOR INFORMATION PURPOSED ONLY.
	DUAL TECHNOLOGY CEILING/WALL OCCUPANCY SENSOR, WATTSTOPPER PART #DT-200 OR EQUIVALENT BY ACUITY CONTROLS.
DT	DUAL TECHNOLOGY CEILING OCCUPANCY SENSOR, WATTSTOPPER PART #DT-300 OR EQUIVALENT BY ACUITY CONTROLS.
PS	UNIVERSAL VOLTAGE POWER PACK, WATTSTOPPER PART #BZ-150 OR EQUIVALENT BY ACUITY CONTROLS.
GTD20A	EMERGENCY LIGHTING RELAY CONTROL DEVICE, BODINE GTD20A OR EQUIVALENT. WIRE PER MANUFACTURER'S INSTRUCTIONS, SEE DETAIL ON E602.

EXISTING SWITCH LOCATIONS MAY BE REUSED WHERE PRACTICAL. IN UTILITY TYPE SPACES WHERE EXISTING SWITCH LOCATIONS ARE NOT AVAILABLE, USE SURFACE MOUNTED OUTLET BOX AND EMT.

ALTERNATE #1: STATE THE LUMP SUM AMOUNT TO BE ADDED TO THE BASE BID FOR ELECTRICAL WORK ASSOCIATED WITH ADDING HP-1 AND AH-1 AS NOTED ON E002, E302, AND E303.

ALTERNATE #2: STATE THE LUMP SUM AMOUNT TO BE ADDED TO THE BASE BID TO REWORK THE EXISTING ELECTRICAL SERVICE AS NOTED ON SHEETS E201, E600, AND E601. WORK UNDER THIS ALTERNATE INCLUDES ADDITION OF A 1200A FUSED MAIN DISCONNECT SWITCH, REROUTING OF THE 1200A MAIN FEEDER FROM THE 1200A MAIN DISCONNECT SWITCH TO ATS1 LOCATED AT REAR OF BUILDING, AND FROM ATS1 TO EXISTING MAIN PANEL MP. ATS1 TO BE FURNISHED AND INSTALLED UNDER A SEPARATE CONTRACT.

ELECTRICAL SHEET LIST

ELECTRICAL SUBMITTALS

ELECTRICAL SHOP DRAWINGS SHALL BE SUBMITTED IN ONE COMPLETE PACKAGE CONTAINING ALL ITEMS REQUIRED BY THE ELECTRICAL DRAWINGS AND THE DIVISION 26-28 SPECIFICATIONS. PARTIAL SHOP DRAWING SUBMITTALS MAY BE REJECTED BY THE ARCHITECT-ENGINEER. REFER TO SECTION 260500 OF THE ELECTRICAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

ABBREVIATIONS

A	AMPERES	LTG	LIGHTING
AFF	ABOVE FINISHED FLOOR	MLO	MAIN LUGS ONLY
AFG	ABOVE FINISHED GRADE	NEC	NATIONAL ELECTRICAL CODE
AWG	AMERICAN WIRE GAUGE	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
CKT	CIRCUIT	NIC	NOT IN CONTRACT
CU	COPPER	PH,Ø	PHASE
EC	EMPTY CONDUIT	RCPT	RECEPTACLE
EQPT	EQUIPMENT	RE:	REFER TO
EXST	EXISTING	TYP	TYPICAL
FWE	FURNISHED WITH EQUIPMENT	UNO	UNLESS NOTED OTHERWISE
GFI	GROUND FAULT INTERRUPTER	V	VOLTS
IAW	IN ACCORDANCE WITH	W	WIRE OR WATTS
KVA	KILOVOLTAMPERES	WP	WEATHERPROOF
KW	KILOWATTS		

ELECTRICAL DEMOLITION NOTES

A. THE BULK OF THE ELECTRICAL DEMOLITION IS UNDER A SEPARATE CONTRACT. REFER TO ELECTRICAL DRAWINGS AND SPECIFICATIONS AND TO NOTES BELOW FOR ELECTRICAL DEMOLITION UNDER THIS CONTRACT.

B. THE ELECTRICAL CONTRACTOR SHALL ASSIST THE MECHANICAL AND GENERAL CONTRACTORS IN REMOVAL OF EQUIPMENT WITH ELECTRICAL CONNECTIONS BEING REMOVED BY THESE CONTRACTORS.

C. PRIOR TO SUBMITTING BID, THE CONTRACTOR SHALL SURVEY THE EXISTING BUILDING AND MAKE NOTE OF ANY ADDITIONAL DEMOLITION AND/OR ANY ADDITIONAL REMOVAL AND RELOCATION WHICH MAY BE REQ'D IN ORDER TO ACCOMPLISH RENOVATIONS INDICATED IN CONTRACT DOCUMENTS. NO CHANGE ORDER WILL BE ISSUED FOR ADDITIONAL WORK REQUIRED FOR DEMOLITION, REMOVAL, OR RELOCATION WORK NOT INDICATED ON THESE DRAWINGS BUT NECESSARY TO COMPLETE WORK.

D. ALL DEMOLITION MUST BE COORDINATED WITH THE ARCHITECT AND WITH ALL OTHER TRADES TO AVOID CONFLICTS. REFER TO THE ARCHITECTURAL DEMOLITION PLAN.

E. NO EXISTING ELECTRICAL MATERIALS, EQUIPMENT, WIRING, OR CONDUIT BEING REMOVED MAY BE REUSED ON THIS PROJECT UNLESS SPECIFICALLY NOTED OTHERWISE ON THESE DRAWINGS. ALL EXISTING ELECTRICAL MATERIALS AND EQUIPMENT NOT BEING REUSED SHALL BE DISPOSED OF AS INDICATED IN GENERAL NOTES.

F. THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE REMOVAL AND/OR REWORKING OF ANY AND ALL EXISTING ELECTRICAL AND TELEPHONE SERVICES FEEDING THE BUILDING WITH THE APPROPRIATE UTILITIES. ALL ASSOCIATED MATERIALS AND EQUIPMENT NOT BEING REUSED OR NOT BEING REMOVED BY THE UTILITIES SHALL BE REMOVED BY THE ELECTRICAL CONTRACTOR. PROVIDE NEW SERVICES AS INDICATED ON THE DRAWINGS.

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SHEET TITLE:
ELECTRICAL SYMBOLS & NOTES

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FIXTURE SCHEDULE NOTES

1. FIXTURE BODIES MANUFACTURED FROM PRE-PAINTED STEEL SHALL BE PAINTED AFTER FABRICATION, UNLESS NOTED.
2. LINEAR FLUORESCENT ELECTRONIC BALLASTS SHALL HAVE A MINIMUM POWER FACTOR OF 0.90 AND A THD < 10%, AS MANUFACTURED BY UNIVERSAL LIGHTING TECHNOLOGIES (TRIAD FOR NON-DIMMED & BALLASTAR FOR STEPPED DIMMING). ALL FLUORESCENT BALLAST SHALL BE WIRED USING A DISCONNECT PLUG DESIGNED IN ACCORDANCE WITH NEC 410.130(G). EQUIVALENT BALLASTS BY ADVANCE, GE, OR OSRAM-SYLVANIA ARE ACCEPTABLE PROVIDED THE PERFORMANCE IS EQUAL TO OR BETTER THAN THE SPECIFIED BALLAST.
3. ALL LINEAR FLUORESCENT LAMPS SHALL BE PHILIPS EXTRA-LONG LIFE T8 LAMPS WITH ALTO II TECHNOLOGY, LOW MERCURY (1.7MG), 95% LUMEN MAINTENANCE, 85 CRI, 4100K COLOR TEMPERATURE, AND SHALL HAVE A MINIMUM INITIAL LIGHT OUTPUT RATING OF 2950 LUMENS T8 LAMPS TO HAVE AN AVERAGE LIFE RATING OF 40,000 HOURS WHEN OPERATED ON A PROGRAMMED START BALLAST AND 36,000 HOURS WHEN STARTED ON AN INSTANT START BALLAST, BASED ON 3-HOURS PER START. EQUIVALENT LAMPS BY GE OR OSRAM-SYLVANIA ARE ACCEPTABLE PROVIDED THE PERFORMANCE IS EQUAL TO OR BETTER THAN THE SPECIFIED LAMP.
4. NOMINAL THICKNESS OF FLUORESCENT FIXTURE LENSES SHALL BE 0.125", UNLESS NOTED OTHERWISE.
5. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING SCHEDULE AND/OR REFLECTED CEILING PLAN.
6. WIRE RECESSED FLUORESCENT FIXTURES THRU GREENFIELD FROM OUTLET BOX ABOVE CEILING.
7. FOR FIXTURES PROVIDED WITH GENERATOR TRANSFER DEVICE (GTD), WIRE BALLAST THRU GTD AS NOTED ON THE DRAWINGS AND PER THE MFR's INSTRUCTIONS. PULL ALL WIRING REQUIRED FOR PROPER OPERATION. PULL UNSWITCHED HOT LEG TO ALL EXIT LIGHTS, EXTERIOR EMERGENCY EGRESS LIGHTS, AND GTD LIGHTS AS REQUIRED. GTDs TO BE BODINE GTD SERIES OR EQUIVALENT BY IOTA, DUALLITE, OR CHLORIDE.
8. OCCUPANCY SENSORS – PROVIDE ALL POWER PACKS AND MOUNTING HARDWARE NECESSARY TO PROVIDE A COMPLETE AND OPERABLE SYSTEM. SEE SPECIFICATIONS AND DETAILS ON DRAWINGS.
9. FIXTURE MOUNTING HEIGHTS – REFER TO ARCHITECTURAL DRAWINGS & ELEVATIONS FOR MOUNTING HEIGHTS OF WALL MOUNTED LIGHT FIXTURES. FIELD VERIFY ALL MOUNTING HEIGHTS WITH ARCHITECT PRIOR TO ROUGH-IN.

SPARE LAMPS AND BALLASTS

IN ADDITION TO THE LAMPS REQUIRED FOR THIS PROJECT, PROVIDE THE OWNER WITH THE FOLLOWING SPARE LAMPS, TO BE TURNED OVER TO THE OWNER AT CLOSEOUT OF THE PROJECT:

- (2) CASES (25-LAMPS PER CASE) OF THE F32T8/TL841/PLUS/ALTO LAMPS
- (1) CASE (25-LAMPS PER CASE) OF THE F17T8/TL841/PLUS/ALTO LAMPS

IN ADDITION TO THE BALLASTS REQUIRED FOR THIS PROJECT, PROVIDE THE OWNER WITH THE FOLLOWING SPARE BALLASTS, TO BE TURNED OVER TO THE OWNER AT CLOSEOUT OF THE PROJECT:

- (1) CASE (12-BALLASTS PER CASE) OF THE B232PUS50-A BALLAST
- (1) CASE (12-BALLASTS PER CASE) OF THE B232PU104S50A BALLAST

HVAC POWER EQUIPMENT SCHEDULE – USC DLES TENANT UPFIT

ITEM	CIRCUIT	VOLTAGE	MCA	MOCP	CONDUIT	WIRING	DISCONNECT A/V/FUSE/ENCLOSURE	NOTES
AH-13	BD-23/25	208-1-60	0.6	15	3/4"	1#12 G, 2#12	30A/240V/10A/NEMA 1	3
AH-13 RECIRC. PUMP	BD-8	120-1-60	5.5	20	3/4"	1#12 G, 2#12	20A/120V/NF/NEMA 1	2,3
AH-14	3A-40/42	208-1-60	0.5	15	3/4"	1#12 G, 2#12	30A/240V/10A/NEMA 1	3
AH-14 RECIRC. PUMP		120-1-60	5.5	20	3/4"	1#12 G, 2#12	20A/120V/NF/NEMA 1	2,3
AH-15	3A-40/42	208-1-60	0.5	15	3/4"	1#12 G, 2#12	30A/240V/10A/NEMA 1	3
AH-15 RECIRC. PUMP		120-1-60	5.5	20	3/4"	1#12 G, 2#12	20A/120V/NF/NEMA 1	2,3
AH-16	1B-18/20	208-1-60	36.0	40	3/4"	1#10 G, 2#8	60A/240V/40A/NEMA 1	1,3
AH-16 RECIRC. PUMP		120-1-60	5.5	20	3/4"	1#12 G, 2#12	20A/120V/NF/NEMA 1	1,2,3
HP-13	BD-27/29	208-1-60	16.5	20	3/4"	1#10 G, 2#10	30A/240V/20A/NEMA 3R	
HP-14	3A-32/34	208-1-60	16.5	20	3/4"	1#10 G, 2#10	30A/240V/20A/NEMA 3R	
HP-15	3A-36/38	208-1-60	16.5	20	3/4"	1#10 G, 2#10	30A/240V/20A/NEMA 3R	
HP-16	1B-14/16	208-1-60	16.5	20	3/4"	1#10 G, 2#10	30A/240V/20A/NEMA 3R	1

HVAC POWER SYMBOLS AND NOTES

(CU 2) DENOTES HVAC UNIT ID TAG, TAG CORRESPONDS TO UNIT ID ON MECHANICAL DRAWINGS. TAG SHOWN IS FOR HVAC UNIT CU-2. CU = CONDENSING UNIT, 2 = UNIT NUMBER. REFER TO MECHANICAL EQUIPMENT SCHEDULE ABOVE FOR CONDUIT, WIRING, & DISCONNECT TYPES/SIZES. LOCATE DISCONNECTS ADJACENT TO EQUIPMENT IN AN ACCESSIBLE LOCATION, FIELD VERIFY.

(P) CONDENSATE PUMP TIED TO AH UNITS, PROVIDE 120V CIRCUIT AND DISCONNECT AS NOTED ON THE DRAWINGS.

DUPLEX GFCI RECEPTACLE, 20A, 120V, NEMA 5/20R. MOUNT ADJACENT TO EQUIPMENT IN ACCESSIBLE LOCATION. "WP" DENOTES WEATHERPROOF RECEPTACLE WITH WEATHERPROOF COVER PLATE, SEE 260500.

COORDINATE VOLTAGES WITH MECHANICAL CONTRACTOR PRIOR TO START OF WORK. IF EQUIPMENT IS SUPPLIED AT A VOLTAGE OTHER THAN THAT PROVIDED, THE GENERAL CONTRACTOR AND SUBCONTRACTORS WILL BE HELD RESPONSIBLE FOR MAKING ANY NECESSARY ADJUSTMENTS TO CORRECT THE CONFLICT, AT NO COST TO THE OWNER, TO THE SATISFACTION OF THE ELECTRICAL ENGINEER. REFER TO MECHANICAL DRAWINGS FOR EQUIPMENT LOCATIONS, SUBJECT TO FIELD VERIFICATION.

INFORMATION SHOWN IN SCHEDULE WAS TAKEN FROM DRAWINGS FURNISHED BY THE MECHANICAL ENGINEER. PRIOR TO STARTING WORK AND BEFORE ORDERING ANY EQUIPMENT, THE ELECTRICAL CONTRACTOR SHALL REVIEW THE HVAC SHOP DRAWINGS AND SHALL VERIFY ALL EQUIPMENT FOR CONFORMANCE WITH THE INFORMATION SHOWN IN THE SCHEDULE (VOLTAGE, MCA, MOCP), AND SHALL NOTIFY THE ENGINEER AND THE ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES BETWEEN THE MECHANICAL SHOP DRAWINGS AND THIS SCHEDULE.

ALL MOTOR STARTERS AND VARIABLE FREQUENCY DRIVES (VFDs) FOR HVAC-RELATED EQUIPMENT THAT ARE NOT FACTORY-MOUNTED AND PREWIRED SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR, INSTALLED AND POWER WIRED BY THE ELECTRICAL CONTRACTOR UNLESS NOTED OTHERWISE ON THE DESIGN DOCUMENTS. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS AND QUANTITIES OF MOTOR STARTERS AND VFDs.

USE HACR TYPE CIRCUIT BREAKERS FOR ALL HVAC UNITS.

1. HP-16 AND AH-16 TO BE BID AS PART OF ALTERNATE 1.
2. IF UNIT SUPPLIED WITH CORD & PLUG, PROVIDE RECEPTACLE TO MATCH PLUG IN LIEU OF DISCONNECT. ELIMINATE DISCONNECT IF UNIT SUPPLIED WITH BUILT-IN DISCONNECT, VERIFY VOLTAGE.
3. PROVIDE SEPARATE 120V CIRCUIT FOR CONDENSATE PUMP.

LIGHTING FIXTURE SCHEDULE

TYPE	VOLTAGE	DESCRIPTION	MANUFACTURERS	LAMP	WATTS
A1	UNV	1'x4' 1-LAMP SPEC GRADE T8 GRID TROFFER WITH 0.125" A12 LENS AND UNIVERSAL B132PUNVHP-A (BF=0.88, 55W) BALLAST.	H.E. WILLIAMS EPG-S14-132-RA12125 LITHONIA SP8G-132-A12125-PAF OR EQUIVALENT OF METALUX	1/F32T8/TL841/PLUS/ALTO (2950 LUMENS)	31
A2	UNV	2'x4' 2-LAMP SPEC GRADE T8 GRID TROFFER WITH 0.125" A12 LENS AND UNIVERSAL B232PUNVHE-B (BF=0.88, 55W) BALLAST.	H.E. WILLIAMS LPT-24-232-SA12125 LITHONIA 2SP8G-232-A12125-PAF METALUX 2GC8-232A125-UNV-PAF	2/F32T8/TL841/PLUS/ALTO (2950 LUMENS)	55
A2,GTD	UNV	SAME AS TYPE A2 EXCEPT FIXTURE TO INCLUDE A GENERATOR TRANSFER DEVICE, SEE DETAIL ON SHEET E604.	ADJUST CATALOG NUMBERS TO ADD BODINE GTD OR EQUIVALENT BY IOTA	2/F32T8/TL841/PLUS/ALTO (2950 LUMENS)	55
AA2	UNV	2'x4' 2-LAMP SPEC GRADE T8 GRID TROFFER WITH 0.125" A12 LENS UNIVERSAL BALLASTAR B232PUS50A (BF=.88, 57W) STEPPED BALLAST FOR DUAL SWITCHING.	H.E. WILLIAMS LPT-24-232-SA12125 LITHONIA 2SP8G-232-A12125-PAF METALUX 2GC8-232A125-UNV-PAF	2/F32T8/TL841/PLUS/ALTO (2950 LUMENS)	57
AA2,GTD	UNV	SAME AS TYPE AA2 EXCEPT FIXTURE TO INCLUDE A GENERATOR TRANSFER DEVICE, SEE DETAIL ON SHEET E604.	ADJUST CATALOG NUMBERS TO ADD BODINE GTD OR EQUIVALENT BY IOTA (ONLY ONE SWITCH LEG REQUIRES GTD)	2/F32T8/TL841/PLUS/ALTO (2950 LUMENS)	57
AA3		2'x4' 3-LAMP SPEC GRADE T8 GRID TROFFER WITH 0.125" A12 LENS, (1) UNIVERSAL B132PUNVHE-A (BF=.88, 28W) AND (1) UNIVERSAL B232PUNVHE-B (BF=.88, 54W) BALLASTS FOR DUAL SWITCHING	H.E. WILLIAMS LPT-24-332-SA12125 LITHONIA 2SP8G-332-A12125-PAF METALUX 2GC8-332A125-UNV-PAF	3/F32T8/TL841/PLUS/ALTO (2950 LUMENS)	82
AA4	UNV	2'x4' 2-LAMP SPEC GRADE T8 GRID TROFFER WITH 0.125" A12 LENS UNIVERSAL BALLASTAR BALLASTAR B232PU104S50A (BF=1.04, 65W) STEPPED BALLAST FOR DUAL SWITCHING.	H.E. WILLIAMS LPT-24-332-SA12125 LITHONIA 2SP8G-332-A12125-PAF METALUX 2GC8-332A125-UNV-PAF	2/F32T8/TL841/PLUS/ALTO (2950 LUMENS)	65
AA4,GTD	UNV	SAME AS TYPE AA4 EXCEPT FIXTURE TO INCLUDE A GENERATOR TRANSFER DEVICE, SEE DETAIL ON SHEET E604.	ADJUST CATALOG NUMBERS TO ADD BODINE GTD OR EQUIVALENT BY IOTA (ONLY ONE SWITCH LEG REQUIRES GTD)	2/F32T8/TL841/PLUS/ALTO (2950 LUMENS)	65
B1		4', 1-LAMP SURFACE MOUNT WRAP-AROUND FIXTURE WITH ACRYLIC LENS AND UNIVERSAL B132PUNVHP-A (BF=0.88, 55W) BALLAST. PROVIDE MOUNTING HARDWARE AS REQUIRED FOR CEILING AND/OR SUSPENSION REQUIREMENTS.	H.E. WILLIAMS 20-4-132-A LITHONIA LITHONIA CA-132 OR EQUIVALENT OF METALUX	1/F32T8/TL841/PLUS/ALTO (2950 LUMENS)	31
B2	UNV	4', 2-LAMP SURFACE MOUNT WRAP-AROUND FIXTURE WITH ACRYLIC LENS AND UNIVERSAL B232PUNVHE-A (BF=.88, 55W) BALLAST . PROVIDE MOUNTING HARDWARE AS REQUIRED FOR CEILING AND/OR SUSPENSION REQUIREMENTS.	H.E. WILLIAMS 17-4-232-A LITHONIA LITHONIA LB-232 OR EQUIVALENT OF METALUX	2/F32T8/TL841/PLUS/ALTO (2950 LUMENS)	55
B2,GTD	UNV	SAME AS TYPE B2 EXCEPT FIXTURE TO INCLUDE A GENERATOR TRANSFER DEVICE, SEE DETAIL ON SHEET E604.	ADJUST CATALOG NUMBERS TO ADD BODINE GTD OR EQUIVALENT BY IOTA	2/F32T8/TL841/PLUS/ALTO (2950 LUMENS)	55
C2	120V	2'x2' SPEC GRADE LED GRID HIGH EFFICIENCY TROFFER WITH ACRYLIC LENS, INTEGRAL HEAT SINK AND SOLID STATE ELECTRONIC LED DRIVER WITH 0-10V ANALOG DIMMING CAPABILITY, LUTRON ECOSYSTEM ENABLED TO 5%	CREE CR22-32L-40K-LES OR EQUIVALENT OF WILLIAMS, COOPER, OR LITHONIA	INCLUDED	32
C3	UNV	2'x2' 3-LAMP SPEC GRADE T8 GRID TROFFER WITH 0.125" A12 LENS AND UNIVERSAL B332PUNVHE-A (BF=0.88, 44W) BALLAST.	H.E. WILLIAMS LPT-24-232-SA12125 LITHONIA 2SP8G-232-A12125-PAF METALUX 2GC8-232A125-UNV-PAF	3/F17T8/TL841/PLUS/ALTO (2950 LUMENS)	44
CC3	UNV	2'x2' 3-LAMP SPEC GRADE T8 GRID TROFFER WITH 0.125" A12 LENS, (1) UNIVERSAL B132PUNVHE-A (BF=.88, 17W) AND (1) UNIVERSAL B232PUNVHE-B (BF=.88, 30W) BALLASTS FOR DUAL SWITCHING	H.E. WILLIAMS LPT-2-317-SA12125 LITHONIA 2SP8G-317-A12125-PAF METALUX 2GC8-317A125-UNV-PAF	3/F17T8/TL841/PLUS/ALTO (2950 LUMENS)	47
C4	UNV	2'x2' 4-LAMP SPEC GRADE T8 GRID TROFFER WITH 0.125" A12 LENS AND UNIVERSAL B432PUNVHE-A (BF=0.88, 59W) BALLAST.	H.E. WILLIAMS LPT-22-417-SA12125 LITHONIA 2SP8G-417-A12125-PAF METALUX 2GC8-417A125-UNV-PAF	4/F17T8/TL841/PLUS/ALTO (2950 LUMENS)	59
D1	UNV	6" SPEC GRADE LED OPEN DOWNLIGHT WITH INTEGRAL HEAT SINK AND SOLID STATE ELECTRONIC LED DRIVER WITH 0-10V 10% ANALOG DIMMING CAPABILITY. 1000 LUMEN	GOTHAM EVO-41/10-6AR PATHWAY 6VLED-1100-6VLEDMD-SCLPF OR EQUIVALENT OF PORTFOLIO LD6A SERIES OR CREE	INCLUDED	15
D2	UNV	6/8" SPEC GRADE OPEN LED CYLINDER WITH ADJUSTABLE AIRCRAFT CABLE MOUNTING KIT, INTEGRAL HEAT SINK, SOLID STATE ELECTRONIC LED DRIVER AND 0-10V ANALOG DIMMING CAPABILITY. COORDINATE MOUNTING HEIGHT WITH ARCHITECT. 1000 LUMEN	PATHWAY C65SLED-1100-4K-D6-6VLEDMD-SCLPF PORTFOLIO LCR6A-10-DE010-P-ERCM6A-10-9-40-6LMO-H-LAC48 OR EQUIVALENT OF GOTHAM OR CREE	INCLUDED	15
D3	UNV	12" ROUND LED SURFACE MOUNT WITH ALUMINUM BACKPLATE, POLYCARBONATE LENS/HOUSING, SOLID STATE ELECTRONIC LED DRIVER . 1000 LUMEN OUTPUT.	LITHONIA OLCFM-15-XX OR EQUIVALENT OF KENALL OR FAILSAFE XX=STANDARD COLOR (WHITE, DARK BRONZE)	INCLUDED	15
W1	UNV	WALL MOUNT OUTDOOR LED EMERGENCY LIGHT WITH CAST ALUMINUM HOUSING, WIDE DISTRIBUTION, BUILT-IN PHOTOCELL, STANDARD COLOR AS SELECTED BY ARCHITECT, RATED FOR OUTDOOR/COLD WEATHER OPERATION	EMERGILITE XX-LUX-AC-P OR EQUIVALENT OF SIGNTEX, OR CHLORIDE XX=STANDARD COLOR (BLACK, DARK BRONZE, WHITE, GRAY)	INCLUDED	5
W2	UNV	SAME AS TYPE W1, EXCEPT WITH FORWARD THROW DISTRIBUTION	EMERGILITE XX-LUX-AC-FT-P OR EQUIVALENT OF SIGNTEX, OR CHLORIDE XX=STANDARD COLOR (BLACK, DARK BRONZE, WHITE, GRAY)	INCLUDED	5
X1	UNV	CEILING MOUNT SINGLE FACE LED EXIT SIGN WITH EVEN ILLUMINATION RED DIFFUSER, WHITE THERMOPLASTIC HOUSING AND WHITE FACE.	LITHONIA LQM-S-W-3-R-120/277 EMERG-LITE W-PREM-AC-R SURE-LITES LPX6	INCLUDED	4
X2	UNV	SAME AS TYPE X1, EXCEPT DOUBLE FACE	ADJUST CATALOG NUMBERS FOR DOUBLE FACE	INCLUDED	4
X3	UNV	SAME AS TYPE X1, EXCEPT FLAT WALL MOUNTED	ADJUST CATALOG NUMBERS FOR WALL MOUNT	INCLUDED	4
Y	UNV	OUTDOOR HIGH ABUSE DUAL SEALED BEAM EMERGENCY BATTERY LIGHT WITH WHITE POLYCARBONATE HOUSING, ADJUSTABLE HEADS, COLD WEATHER NICAD BATTERY, SELF DIAGNOSTICS, WET LOCATION LISTING.	EMERGILITE W-12SV24N-2-MK-CW4-PMKE OR EQUIVALENT OF LITHONIA, KENALL, CHLORIDE, OR SURELITES.	INCLUDED	4

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LIGHTING FIXTURE SCHEDULE AND NOTES

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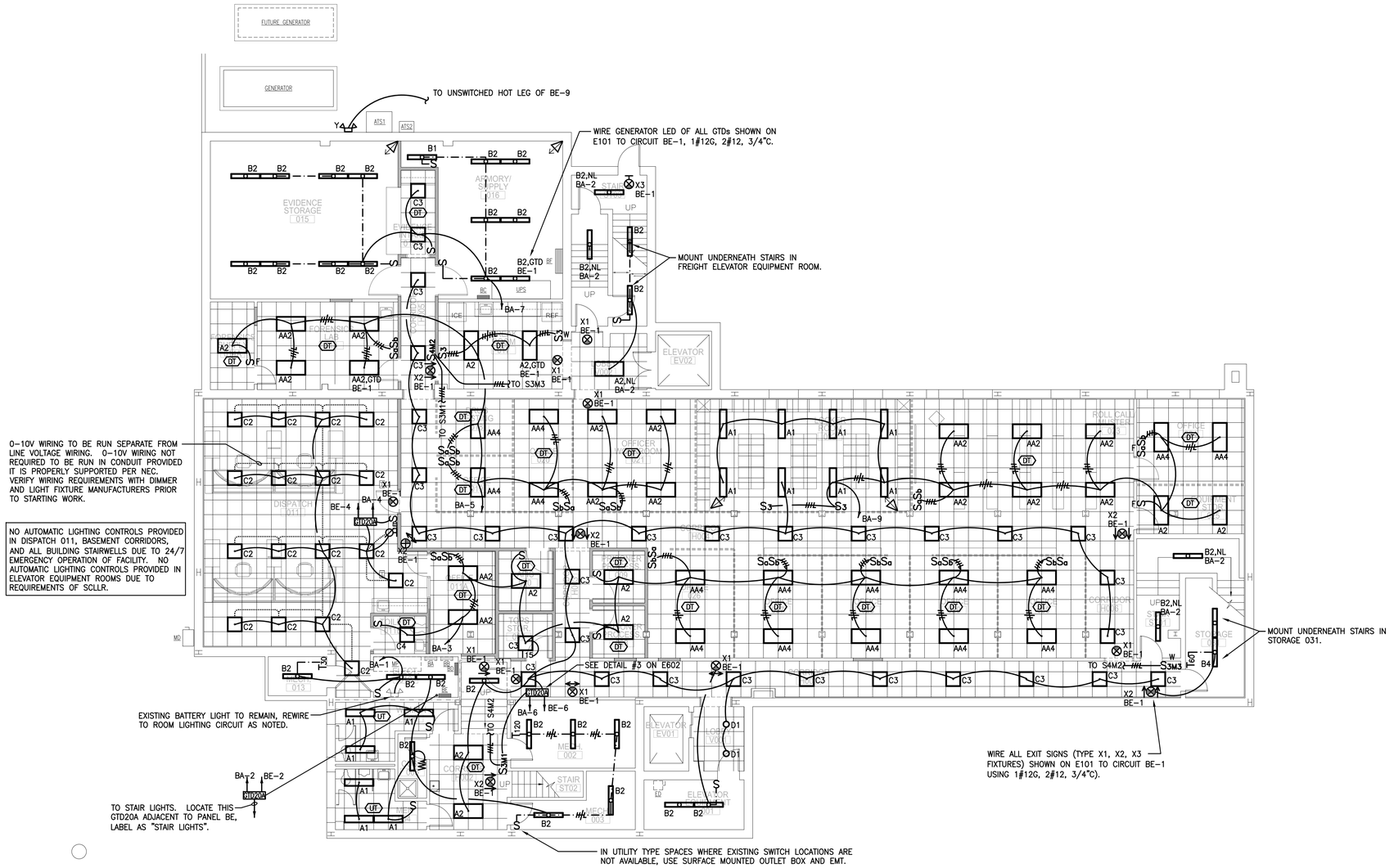

1 LIGHTING PLAN - BASEMENT

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

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DATE: 3/13/2014

SHEET TITLE: LIGHTING PLAN- BASEMENT

BID SET C14003

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SHEET NO: E101

SHEET E102 ULTRASONIC OCCUPANCY SENSOR WIRING NOTES

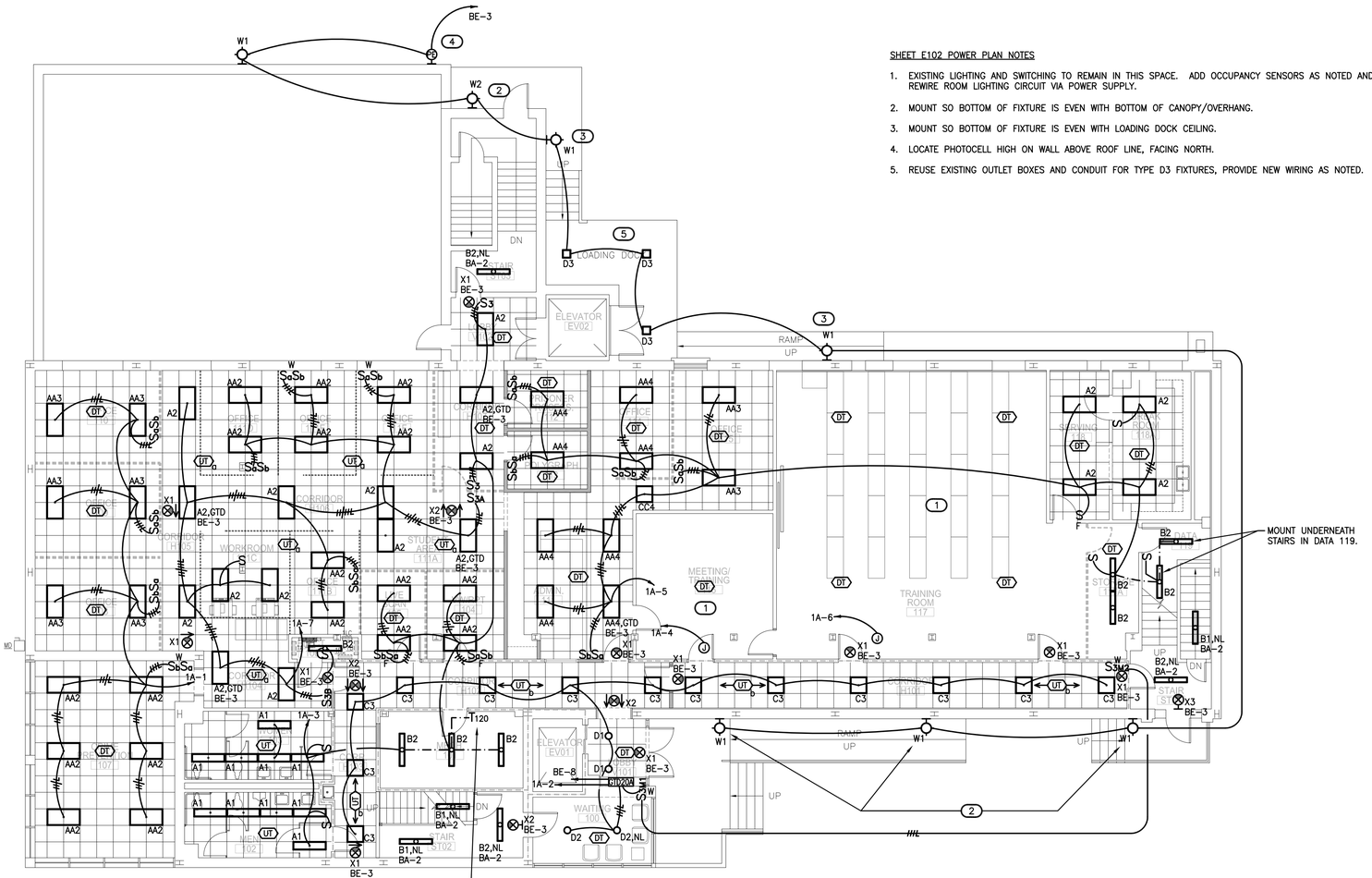
UT a. WIRE SO NOTED ULTRASONIC SENSORS AND S3A AND S3B SWITCHES CONTROL CIRCUIT 1A–7. WIRE IN SERIES SO BOTH MUST BE "ON" FOR THE CIRCUIT TO BE "ON". WIRE SO SENSORS AND S3A AND S3B SWITCHES OVERRIDE ALL LOCAL SWITCHING.

UT b. WIRE SO NOTED ULTRASONIC CORRIDOR SENSORS CONTROL CIRCUIT 1A–2. WIRE SO SENSORS OVERRIDE LOCAL SWITCHING, SEE DETAIL #3 ON E602.

PROVIDE ALL POWER PACKS AND RELAY PACKS REQUIRED TO PROVIDE CONTROL OF LIGHTING AS DESCRIBED ABOVE. SET DELAY FOR ABOVE SENSORS TO 30 MINUTES.

SHEET E102 POWER PLAN NOTES

1. EXISTING LIGHTING AND SWITCHING TO REMAIN IN THIS SPACE. ADD OCCUPANCY SENSORS AS NOTED AND REWIRE ROOM LIGHTING CIRCUIT VIA POWER SUPPLY.
2. MOUNT SO BOTTOM OF FIXTURE IS EVEN WITH BOTTOM OF CANOPY/OVERHANG.
3. MOUNT SO BOTTOM OF FIXTURE IS EVEN WITH LOADING DOCK CEILING.
4. LOCATE PHOTOCELL HIGH ON WALL ABOVE ROOF LINE, FACING NORTH.
5. REUSE EXISTING OUTLET BOXES AND CONDUIT FOR TYPE D3 FIXTURES, PROVIDE NEW WIRING AS NOTED.



1 LIGHTING PLAN - 1st FLOOR
SCALE: 1/8" = 1'-0"

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No. 18744
CHRIS PARTRICH
3/20/2014

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DRAWN BY:

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DATE: 3/13/2014

SHEET TITLE:
LIGHTING PLAN-
1st FLOOR

SHEET NO: E102

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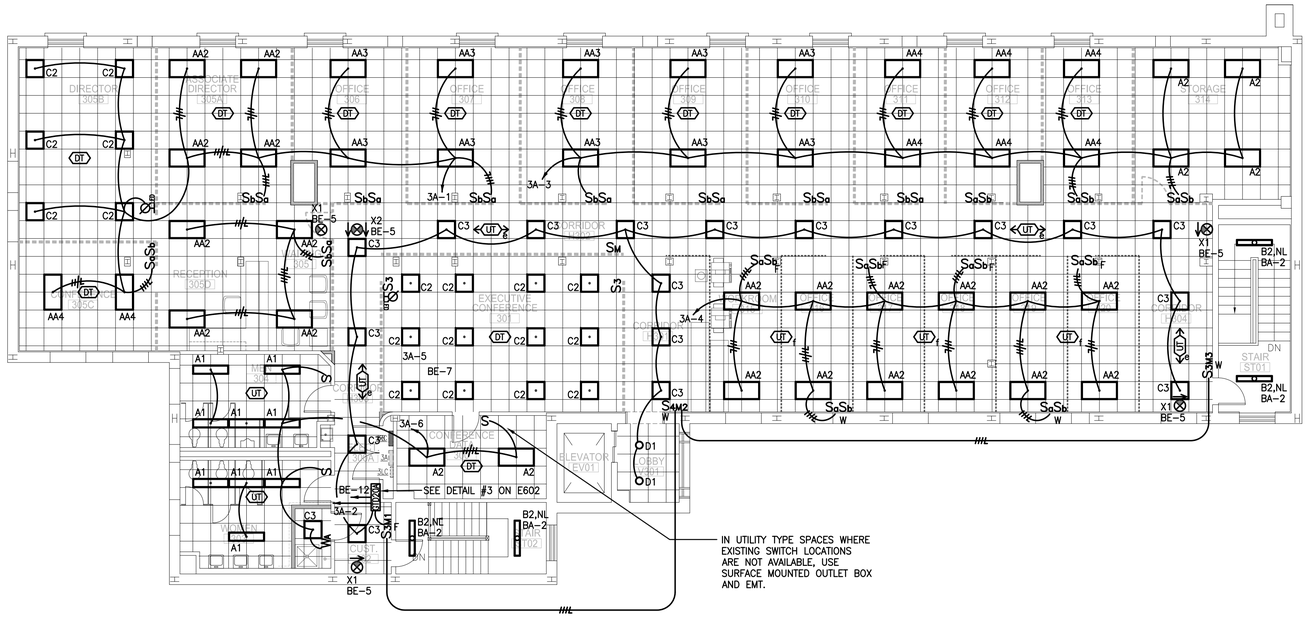

2 LIGHTING PLAN - 3rd FLOOR
SCALE: 1/8"=1'-0"

1 LIGHTING PLAN - 2nd FLOOR
SCALE: 1/8"=1'-0"

SHEET E103 ULTRASONIC OCCUPANCY SENSOR WIRING NOTES

(UT)a. WIRE SO NOTED ULTRASONIC SENSOR CONTROLS LIGHTS IN OFFICES 219 & 220. WIRE SO SENSOR OVERRIDES LOCAL SWITCHING.

(UT)b. WIRE SO NOTED ULTRASONIC SENSORS CONTROL CIRCUIT 2A-2. WIRE SO SENSORS OVERRIDE LOCAL SWITCHING.

(UT)c. WIRE SO NOTED ULTRASONIC SENSORS CONTROL CIRCUIT 2A-4. WIRE SO SENSORS OVERRIDE LOCAL SWITCHING.

(UT)d. WIRE SO NOTED ULTRASONIC CORRIDOR SENSORS CONTROL CIRCUIT 2A-1. WIRE SO SENSORS OVERRIDE LOCAL SWITCHING, SEE DETAIL #3 ON E602.

(UT)e. WIRE SO NOTED ULTRASONIC CORRIDOR SENSORS CONTROL CIRCUIT 3A-1. WIRE SO SENSORS OVERRIDE LOCAL SWITCHING, SEE DETAIL #3 ON E602.

(UT)f. WIRE SO NOTED ULTRASONIC SENSORS CONTROL CIRCUIT 3A-4. WIRE SO SENSORS OVERRIDE LOCAL SWITCHING.

PROVIDE ALL POWER PACKS AND RELAY PACKS REQUIRED TO PROVIDE CONTROL OF LIGHTING AS DESCRIBED ABOVE. SET DELAY FOR ABOVE SENSORS TO 30 MINUTES.

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SHEET TITLE:
LIGHTING PLAN-
2ND & 3RD FLOOR

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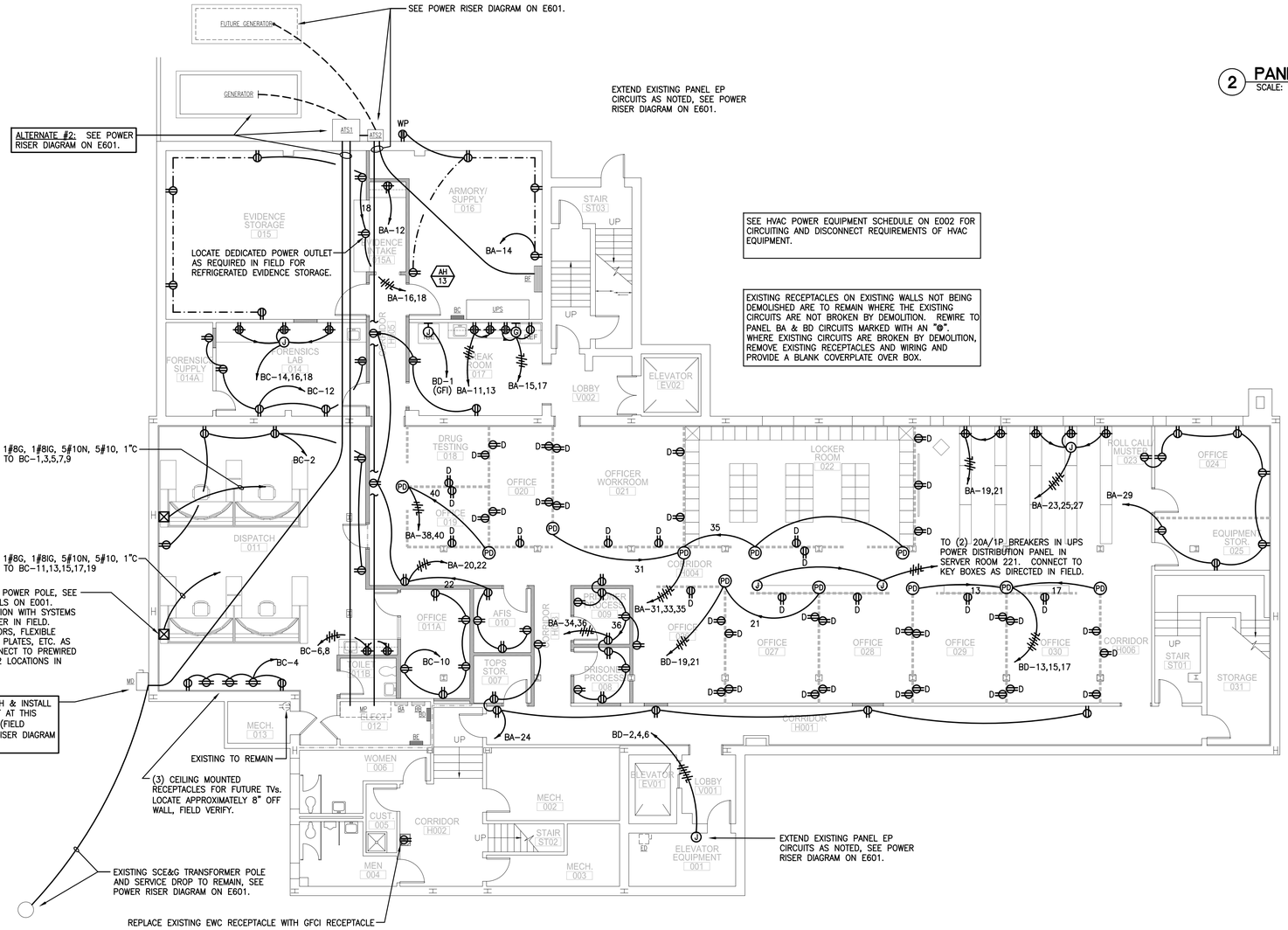
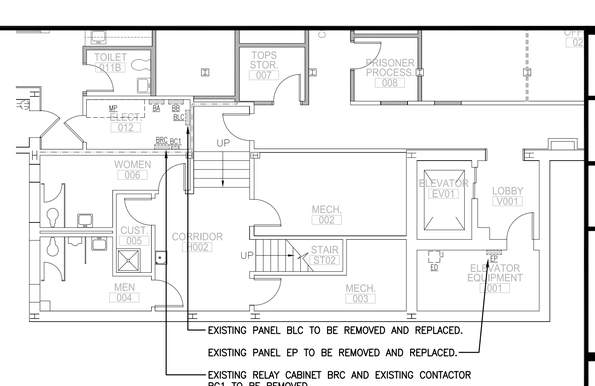
SHEET NO: E103



1 POWER PLAN - BASEMENT
SCALE: 1/8"=1'-0"



2 PANEL DEMOLITION PLAN - BASEMENT
SCALE: 1/8"=1'-0"

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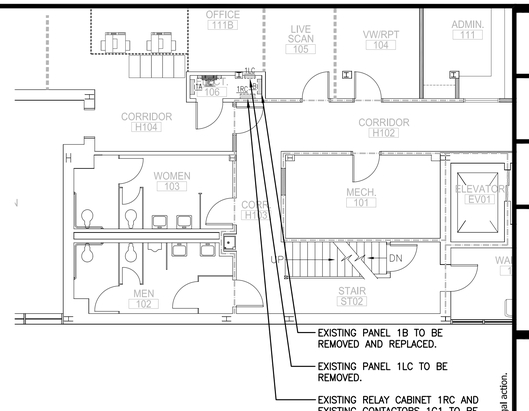
SHEET NO: E201



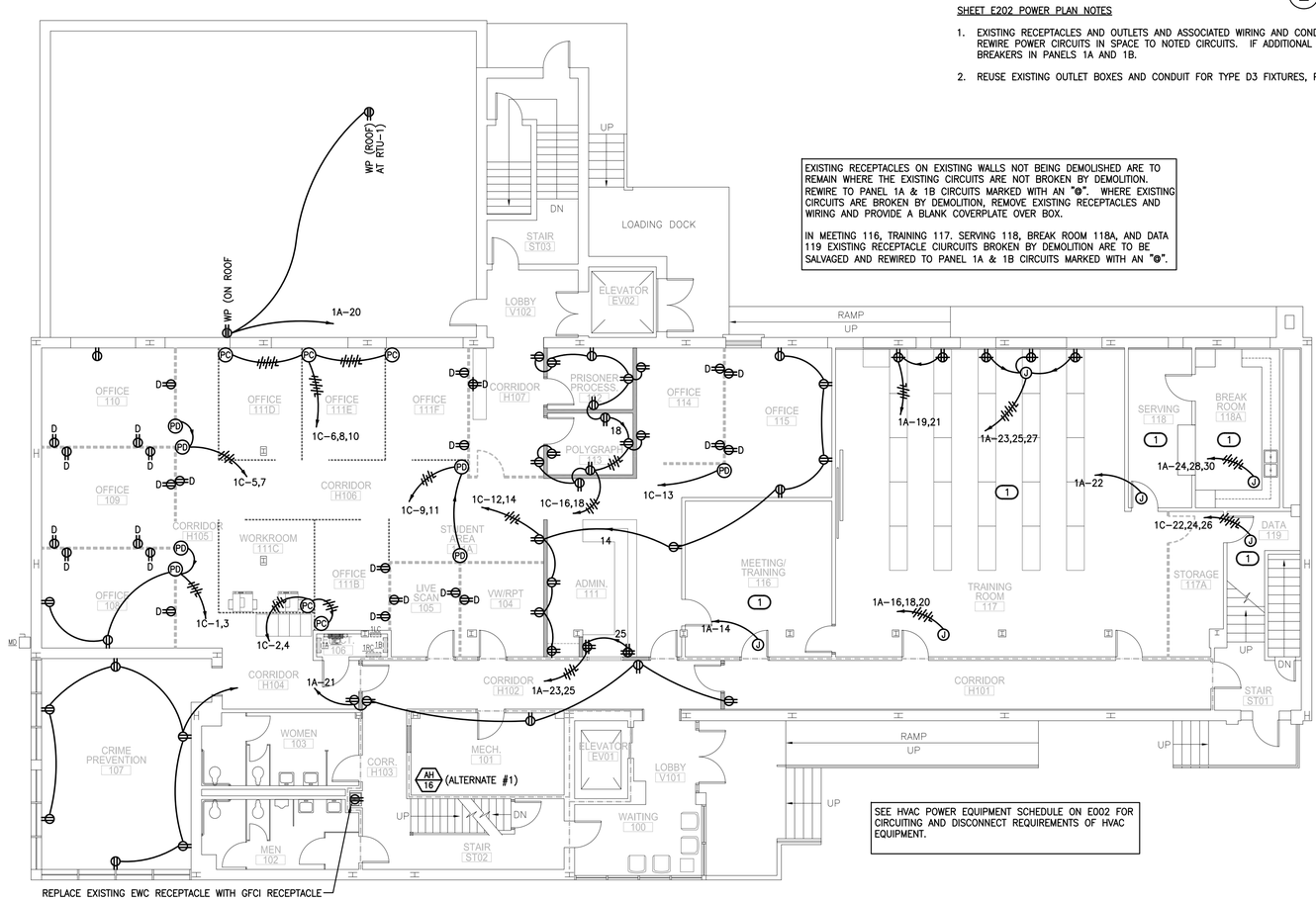
2 PANEL DEMOLITION PLAN - 1st FLOOR
SCALE: 1/8"=1'-0"

SHEET E202 POWER PLAN NOTES

1. EXISTING RECEPTACLES AND OUTLETS AND ASSOCIATED WIRING AND CONDUIT TO REMAIN IN THIS SPACE. REWIRE POWER CIRCUITS IN SPACE TO NOTED CIRCUITS. IF ADDITIONAL CIRCUITS ARE NEEDED USE SPARE BREAKERS IN PANELS 1A AND 1B.
2. REUSE EXISTING OUTLET BOXES AND CONDUIT FOR TYPE D3 FIXTURES, PROVIDE NEW WIRING AS NOTED.

EXISTING RECEPTACLES ON EXISTING WALLS NOT BEING DEMOLISHED ARE TO REMAIN WHERE THE EXISTING CIRCUITS ARE NOT BROKEN BY DEMOLITION. REWIRE TO PANEL 1A & 1B CIRCUITS MARKED WITH AN "@". WHERE EXISTING CIRCUITS ARE BROKEN BY DEMOLITION, REMOVE EXISTING RECEPTACLES AND WIRING AND PROVIDE A BLANK COVERPLATE OVER BOX.

IN MEETING 116, TRAINING 117. SERVING 118, BREAK ROOM 118A, AND DATA 119 EXISTING RECEPTACLE CIURCUITS BROKEN BY DEMOLITION ARE TO BE SALVAGED AND REWIRED TO PANEL 1A & 1B CIRCUITS MARKED WITH AN "@".



SEE HVAC POWER EQUIPMENT SCHEDULE ON E002 FOR CIRCUITING AND DISCONNECT REQUIREMENTS OF HVAC EQUIPMENT.

1 POWER PLAN - 1st FLOOR
SCALE: 1/8"=1'-0"

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SHEET TITLE: POWER PLAN- 1st FLOOR

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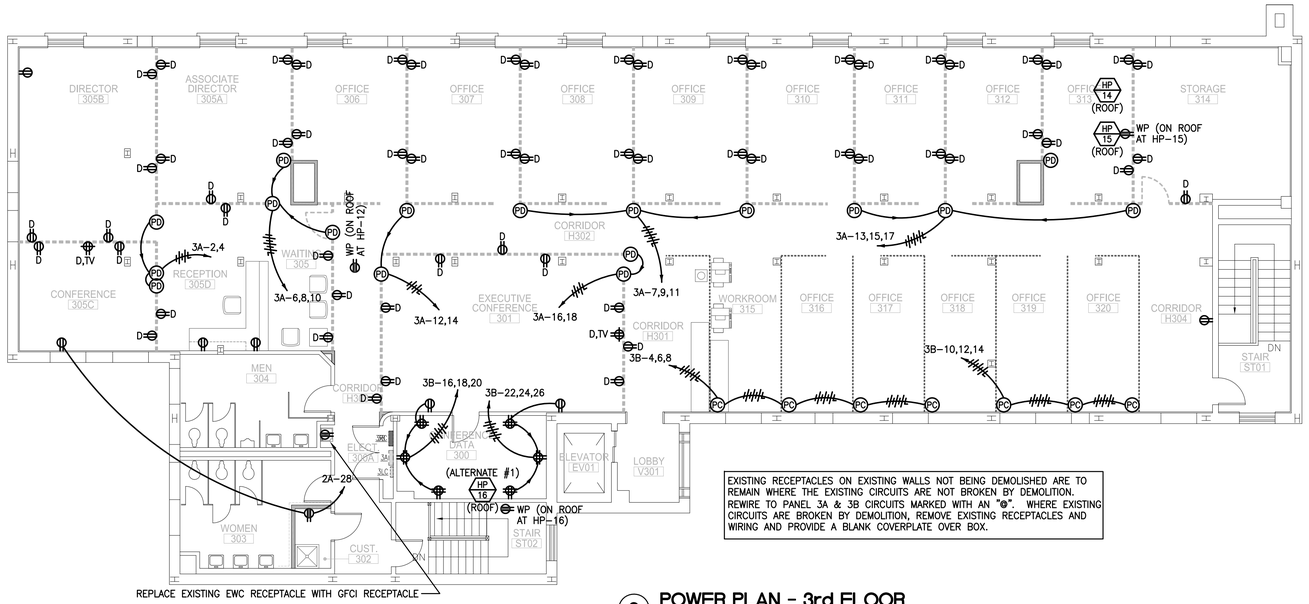
SHEET NO: E202



EXISTING RECEPTACLES ON EXISTING WALLS NOT BEING DEMOLISHED ARE TO REMAIN WHERE THE EXISTING CIRCUITS ARE NOT BROKEN BY DEMOLITION. REWIRE TO PANEL 3A & 3B CIRCUITS MARKED WITH AN "@". WHERE EXISTING CIRCUITS ARE BROKEN BY DEMOLITION, REMOVE EXISTING RECEPTACLES AND WIRING AND PROVIDE A BLANK COVERPLATE OVER BOX.

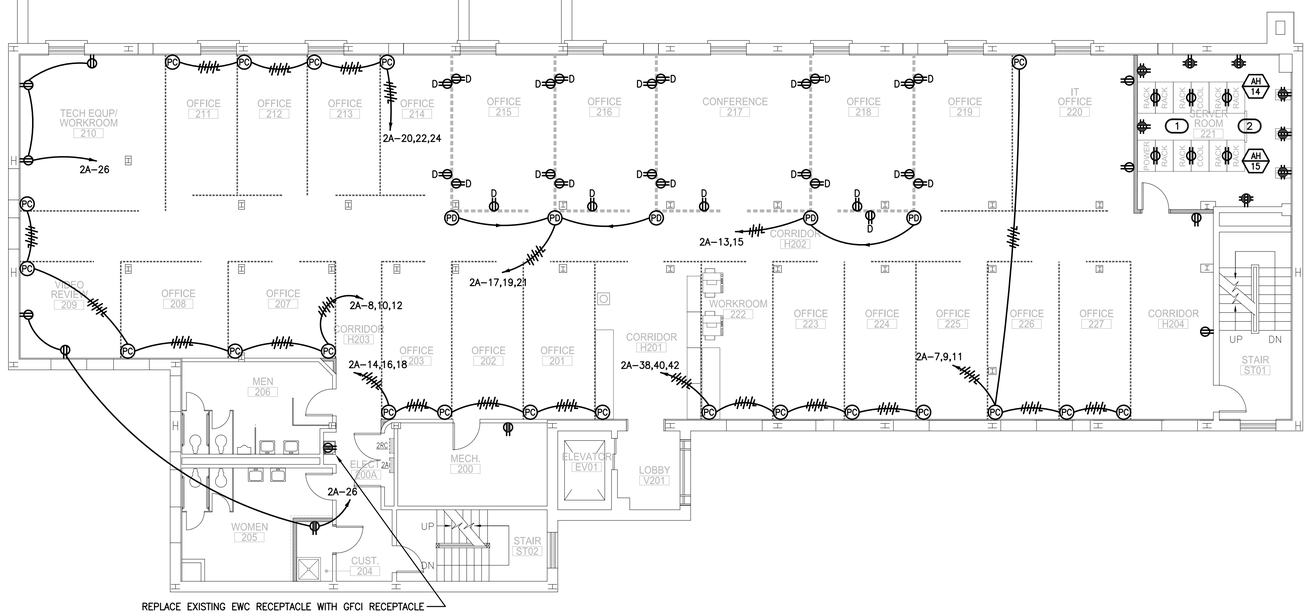
3 POWER PLAN - 3rd FLOOR
SCALE: 1/8"=1'-0"

SHEET E202 POWER PLAN NOTES

1. ALL RECEPTACLES IN SERVER ROOM 221 TO BE ISOLATED GROUND TYPE. EACH RECEPTACLE IN SERVER ROOM 221 TO BE WIRED TO A DEDICATED CIRCUIT IN UPS PANEL PD1 LOCATED IN SERVER RACKS, COORDINATE WITH OWNER'S UPS SUPPLIER.
2. SEE DETAIL #6 ON E604 FOR DROPPED RECEPTACLE.

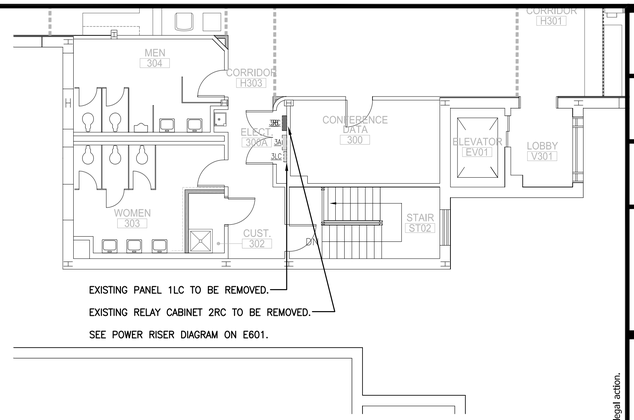
SEE HVAC POWER EQUIPMENT SCHEDULE ON E002 FOR CIRCUITING AND DISCONNECT REQUIREMENTS OF HVAC EQUIPMENT.

EXISTING RECEPTACLES ON EXISTING WALLS NOT BEING DEMOLISHED ARE TO REMAIN WHERE THE EXISTING CIRCUITS ARE NOT BROKEN BY DEMOLITION. REWIRE TO PANEL 2A CIRCUITS MARKED WITH AN "@". WHERE EXISTING CIRCUITS ARE BROKEN BY DEMOLITION, REMOVE EXISTING RECEPTACLES AND WIRING AND PROVIDE A BLANK COVERPLATE OVER BOX.

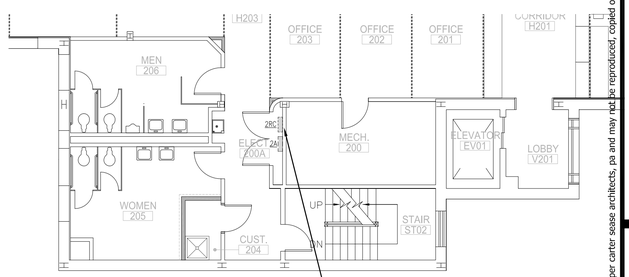


HOMERUN RECEPTACLES TO (14) 20A/1P BREAKERS IN UPS POWER DISTRIBUTION PANEL IN SERVER ROOM 221, SEE NOTE 1 THIS SHEET.

1 POWER PLAN - 2nd FLOOR
SCALE: 1/8"=1'-0"



4 PANEL DEMOLITION PLAN - 3rd FLOOR
SCALE: 1/8"=1'-0"



2 PANEL DEMOLITION PLAN - 2nd FLOOR
SCALE: 1/8"=1'-0"

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SHEET TITLE:
POWER PLAN-
2ND & 3RD FLOOR

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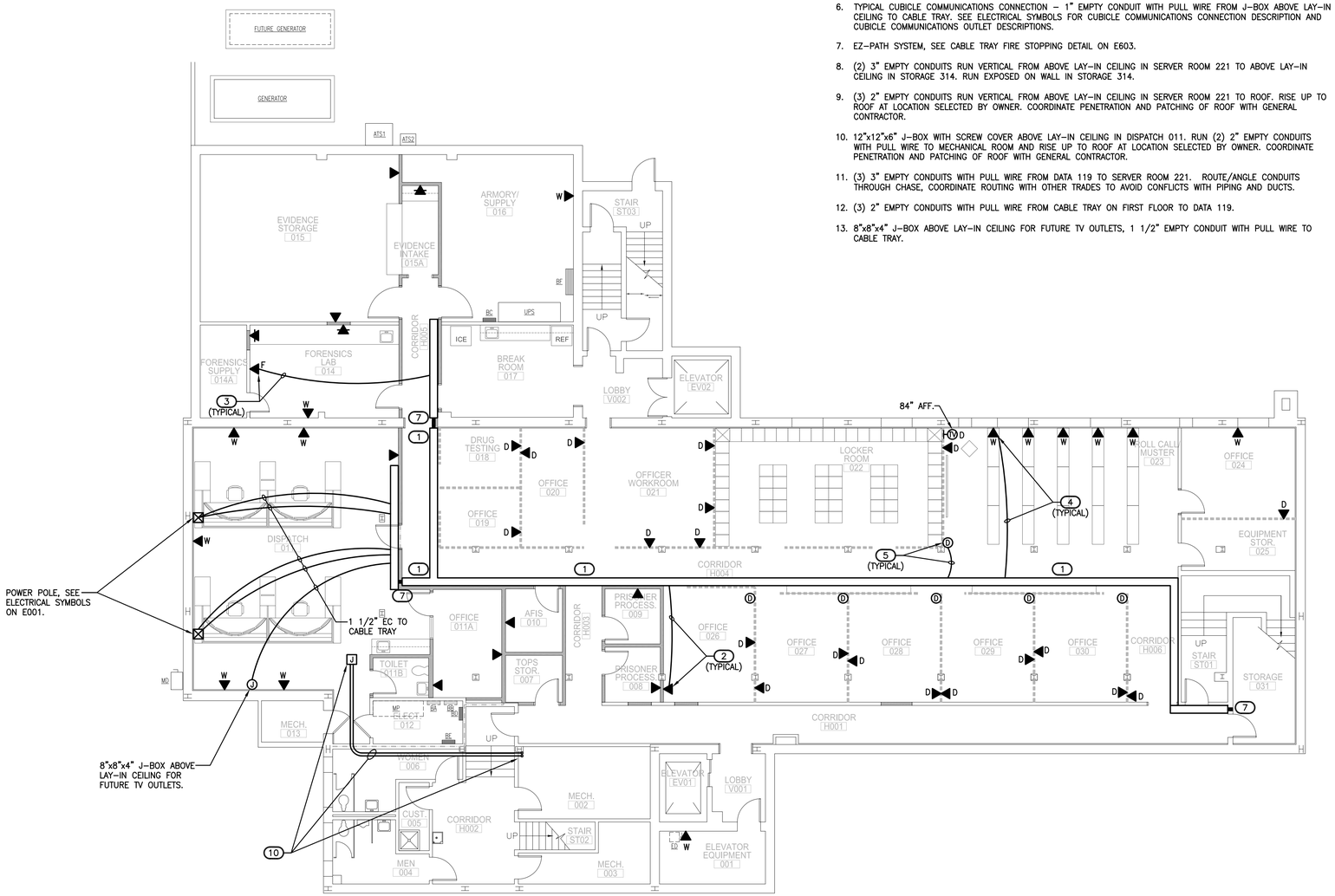
SHEET NO: E203



1 **COMMUNICATIONS PLAN - BASEMENT**
SCALE: 1/8"=1'-0"

COMMUNICATIONS PLAN NOTES:

1. DENOTES APPROXIMATE LOCATION WHERE CABLE TRAY CROSSES HVAC DUCT. PROVIDE OFFSETS FOR CABLE TRAY AS REQUIRED TO AVOID DUCT AND STILL PROVIDE ACCESS TO THE CABLE TRAY. 2" DEEP CABLE TRAY MAY BE USED WHERE CABLE TRAY CROSSES HVAC DUCT.
2. TYPICAL COMMUNICATIONS OUTLET OR TV OUTLET IN NEW WALL – 1" EMPTY CONDUIT WITH PULL WIRE FROM OUTLET TO CABLE TRAY. FISH EXISTING WALL AS REQUIRED. SEE ELECTRICAL SYMBOLS FOR DESCRIPTION.
3. TYPICAL COMMUNICATIONS OUTLET OR TV OUTLET IN EXISTING STUD WALL – 1" EMPTY CONDUIT WITH PULL WIRE FROM OUTLET TO CABLE TRAY, FISH EXISTING WALL AS REQUIRED. SEE ELECTRICAL SYMBOLS FOR DESCRIPTION.
4. TYPICAL SURFACE MOUNTED COMMUNICATIONS OUTLET OR TV OUTLET – 1" EMPTY CONDUIT WITH PULL WIRE FROM J-BOX ABOVE LAY-IN CEILING TO CABLE TRAY. RUN WIREMOLD FROM OUTLET TO J-BOX, SEE ELECTRICAL SYMBOLS FOR DESCRIPTION.
5. TYPICAL DEMOUNTABLE WALL COMMUNICATIONS CONNECTION – 1" EMPTY CONDUIT WITH PULL WIRE FROM J-BOX ABOVE LAY-IN CEILING TO CABLE TRAY. SEE ELECTRICAL SYMBOLS FOR DEMOUNTABLE WALL COMMUNICATIONS CONNECTION DESCRIPTION AND DEMOUNTABLE WALL COMMUNICATIONS AND TV OUTLET DESCRIPTIONS.
6. TYPICAL CUBICLE COMMUNICATIONS CONNECTION – 1" EMPTY CONDUIT WITH PULL WIRE FROM J-BOX ABOVE LAY-IN CEILING TO CABLE TRAY. SEE ELECTRICAL SYMBOLS FOR CUBICLE COMMUNICATIONS CONNECTION DESCRIPTION AND CUBICLE COMMUNICATIONS OUTLET DESCRIPTIONS.
7. EZ-PATH SYSTEM, SEE CABLE TRAY FIRE STOPPING DETAIL ON E603.
8. (2) 3" EMPTY CONDUITS RUN VERTICAL FROM ABOVE LAY-IN CEILING IN SERVER ROOM 221 TO ABOVE LAY-IN CEILING IN STORAGE 314. RUN EXPOSED ON WALL IN STORAGE 314.
9. (3) 2" EMPTY CONDUITS RUN VERTICAL FROM ABOVE LAY-IN CEILING IN SERVER ROOM 221 TO ROOF. RISE UP TO ROOF AT LOCATION SELECTED BY OWNER. COORDINATE PENETRATION AND PATCHING OF ROOF WITH GENERAL CONTRACTOR.
10. 12"x12"x6" J-BOX WITH SCREW COVER ABOVE LAY-IN CEILING IN DISPATCH 011. RUN (2) 2" EMPTY CONDUITS WITH PULL WIRE TO MECHANICAL ROOM AND RISE UP TO ROOF AT LOCATION SELECTED BY OWNER. COORDINATE PENETRATION AND PATCHING OF ROOF WITH GENERAL CONTRACTOR.
11. (3) 3" EMPTY CONDUITS WITH PULL WIRE FROM DATA 119 TO SERVER ROOM 221. ROUTE/ANGLE CONDUITS THROUGH CHASE, COORDINATE ROUTING WITH OTHER TRADES TO AVOID CONFLICTS WITH PIPING AND DUCTS.
12. (3) 2" EMPTY CONDUITS WITH PULL WIRE FROM CABLE TRAY ON FIRST FLOOR TO DATA 119.
13. 8"x8"x4" J-BOX ABOVE LAY-IN CEILING FOR FUTURE TV OUTLETS, 1 1/2" EMPTY CONDUIT WITH PULL WIRE TO CABLE TRAY.

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COMMUNICATIONS PLAN - BASEMENT

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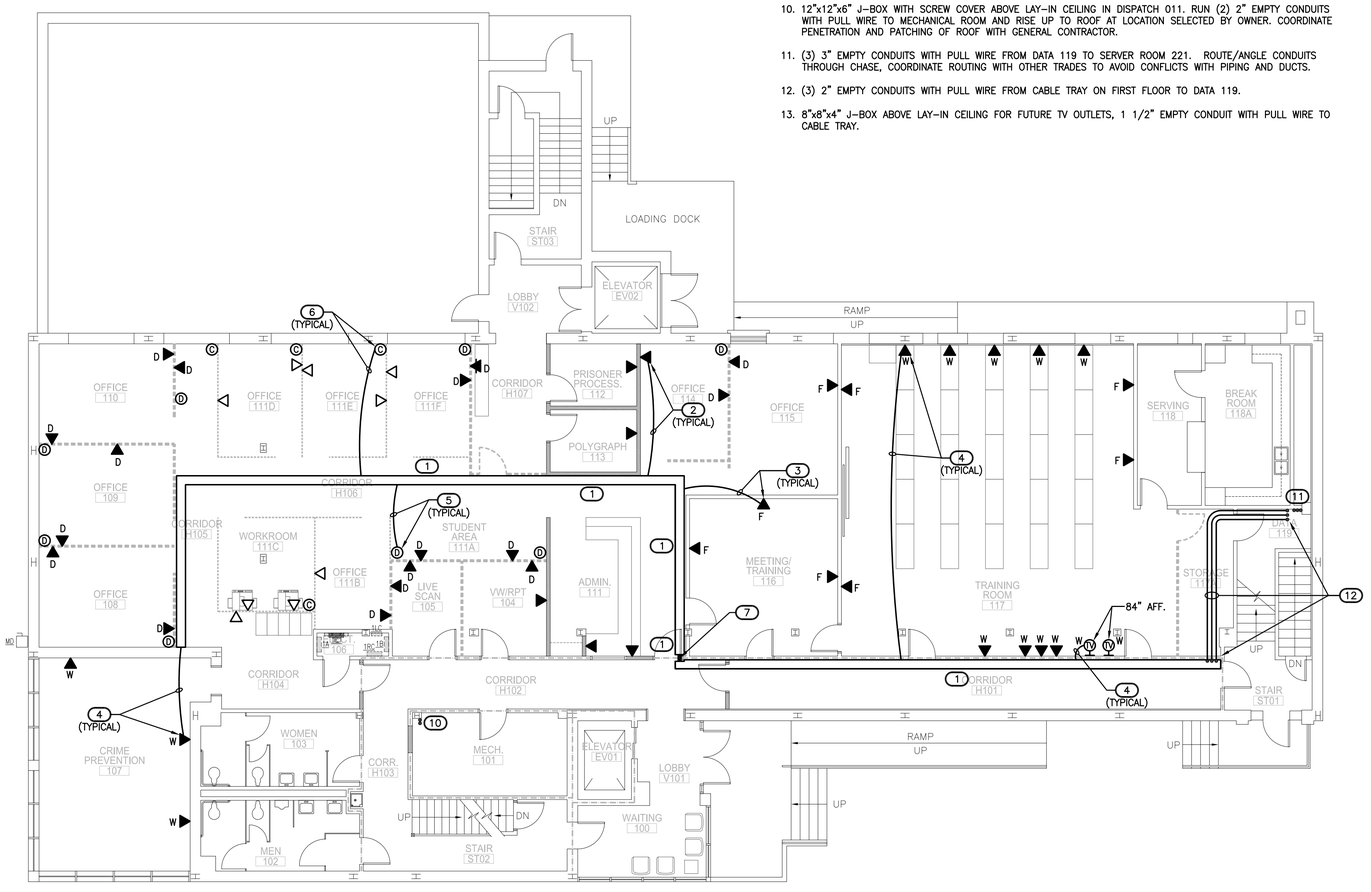
SHEET NO: E401

COMMUNICATIONS PLAN NOTES:

1. DENOTES APPROXIMATE LOCATION WHERE CABLE TRAY CROSSES HVAC DUCT. PROVIDE OFFSETS FOR CABLE TRAY AS REQUIRED TO AVOID DUCT AND STILL PROVIDE ACCESS TO THE CABLE TRAY. 2" DEEP CABLE TRAY MAY BE USED WHERE CABLE TRAY CROSSES HVAC DUCT.
2. TYPICAL COMMUNICATIONS OUTLET OR TV OUTLET IN NEW WALL – 1" EMPTY CONDUIT WITH PULL WIRE FROM OUTLET TO CABLE TRAY. FISH EXISTING WALL AS REQUIRED. SEE ELECTRICAL SYMBOLS FOR DESCRIPTION.
3. TYPICAL COMMUNICATIONS OUTLET OR TV OUTLET IN EXISTING STUD WALL – 1" EMPTY CONDUIT WITH PULL WIRE FROM OUTLET TO CABLE TRAY, FISH EXISTING WALL AS REQUIRED. SEE ELECTRICAL SYMBOLS FOR DESCRIPTION.
4. TYPICAL SURFACE MOUNTED COMMUNICATIONS OUTLET OR TV OUTLET – 1" EMPTY CONDUIT WITH PULL WIRE FROM J–BOX ABOVE LAY–IN CEILING TO CABLE TRAY. RUN WIREMOLD FROM OUTLET TO J–BOX, SEE ELECTRICAL SYMBOLS FOR DESCRIPTION.
5. TYPICAL DEMOUNTABLE WALL COMMUNICATIONS CONNECTION – 1" EMPTY CONDUIT WITH PULL WIRE FROM J–BOX ABOVE LAY–IN CEILING TO CABLE TRAY. SEE ELECTRICAL SYMBOLS FOR DEMOUNTABLE WALL COMMUNICATIONS CONNECTION DESCRIPTION AND DEMOUNTABLE WALL COMMUNICATIONS AND TV OUTLET DESCRIPTIONS.
6. TYPICAL CUBICLE COMMUNICATIONS CONNECTION – 1" EMPTY CONDUIT WITH PULL WIRE FROM J–BOX ABOVE LAY–IN CEILING TO CABLE TRAY. SEE ELECTRICAL SYMBOLS FOR CUBICLE COMMUNICATIONS CONNECTION DESCRIPTION AND CUBICLE COMMUNICATIONS OUTLET DESCRIPTIONS.
7. EZ–PATH SYSTEM, SEE CABLE TRAY FIRE STOPPING DETAIL ON E603.
8. (2) 3" EMPTY CONDUITS RUN VERTICAL FROM ABOVE LAY–IN CEILING IN SERVER ROOM 221 TO ABOVE LAY–IN CEILING IN STORAGE 314. RUN EXPOSED ON WALL IN STORAGE 314.
9. (3) 2" EMPTY CONDUITS RUN VERTICAL FROM ABOVE LAY–IN CEILING IN SERVER ROOM 221 TO ROOF. RISE UP TO ROOF AT LOCATION SELECTED BY OWNER. COORDINATE PENETRATION AND PATCHING OF ROOF WITH GENERAL CONTRACTOR.
10. 12"x12"x6" J–BOX WITH SCREW COVER ABOVE LAY–IN CEILING IN DISPATCH 011. RUN (2) 2" EMPTY CONDUITS WITH PULL WIRE TO MECHANICAL ROOM AND RISE UP TO ROOF AT LOCATION SELECTED BY OWNER. COORDINATE PENETRATION AND PATCHING OF ROOF WITH GENERAL CONTRACTOR.
11. (3) 3" EMPTY CONDUITS WITH PULL WIRE FROM DATA 119 TO SERVER ROOM 221. ROUTE/ANGLE CONDUITS THROUGH CHASE, COORDINATE ROUTING WITH OTHER TRADES TO AVOID CONFLICTS WITH PIPING AND DUCTS.
12. (3) 2" EMPTY CONDUITS WITH PULL WIRE FROM CABLE TRAY ON FIRST FLOOR TO DATA 119.
13. 8"x8"x4" J–BOX ABOVE LAY–IN CEILING FOR FUTURE TV OUTLETS, 1 1/2" EMPTY CONDUIT WITH PULL WIRE TO CABLE TRAY.



1 COMMUNICATIONS PLAN – 1st FLOOR
SCALE: 1/8"=1'–0"

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COMMUNICATIONS PLAN - 1st FLOOR

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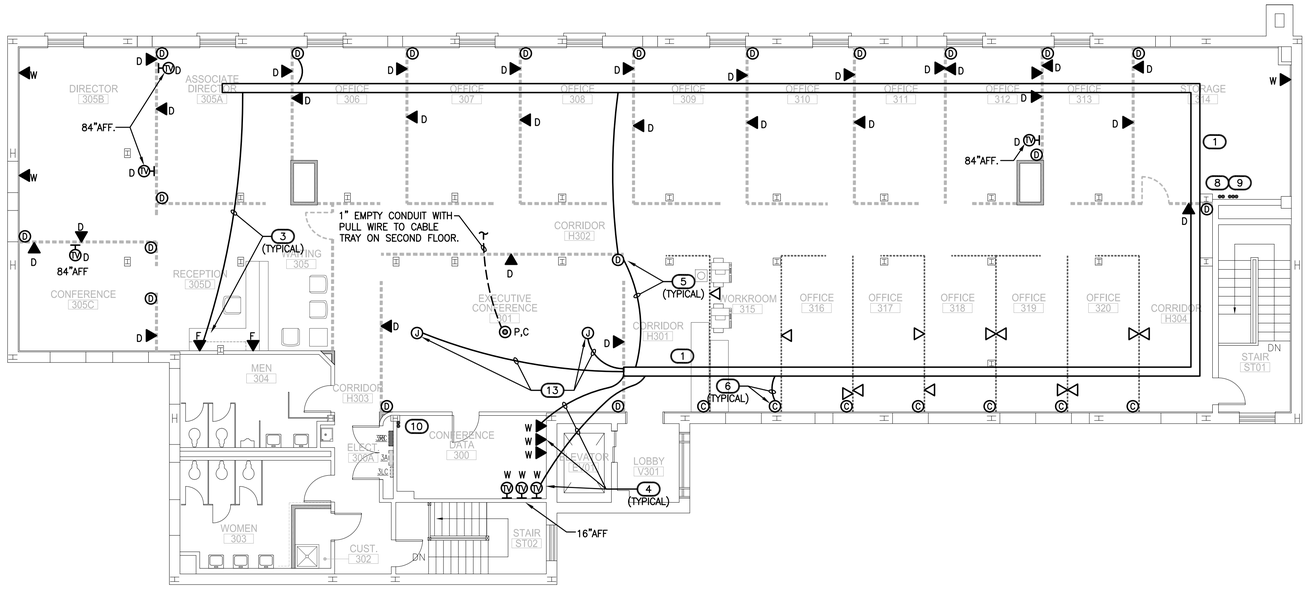
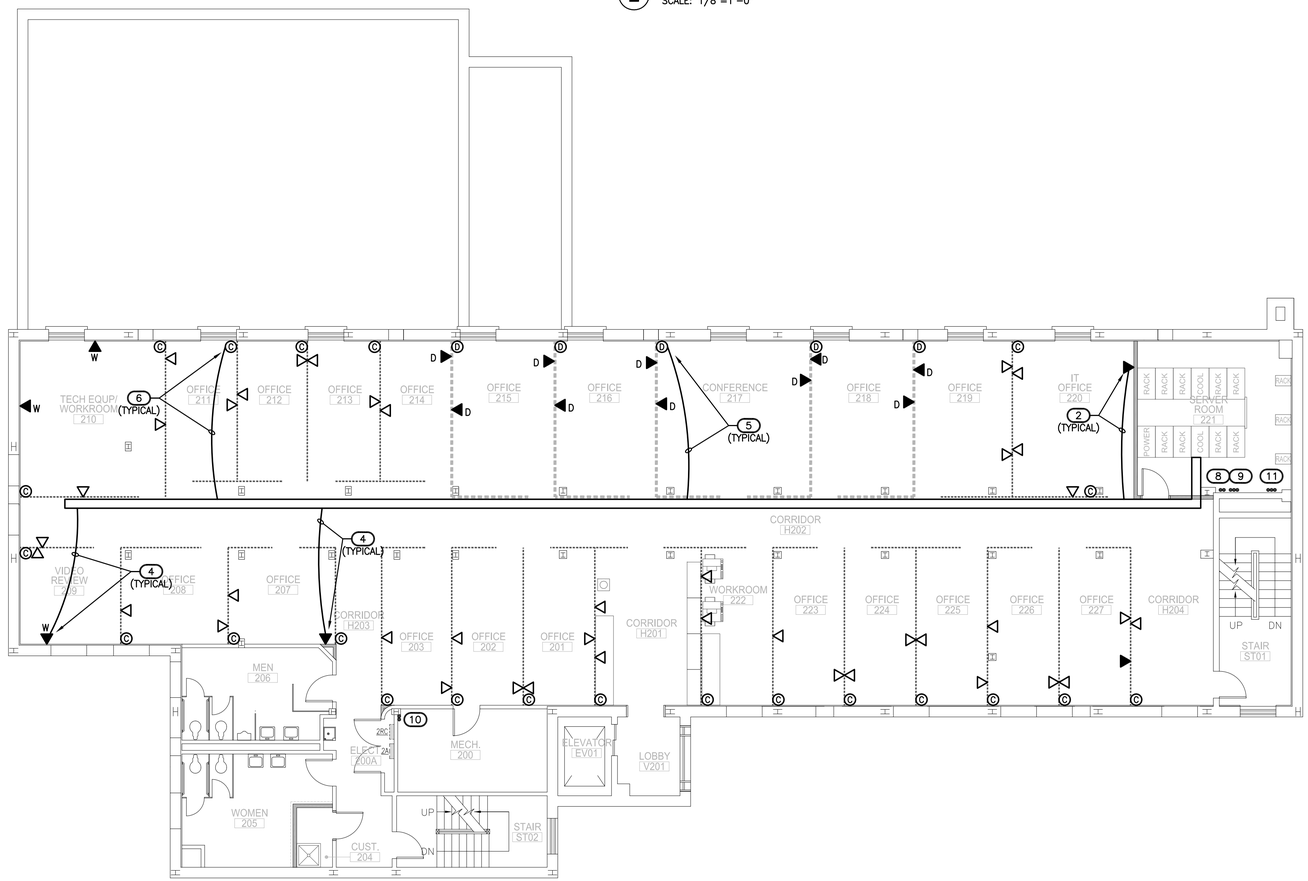
SHEET NO: E402



2 **COMMUNICATIONS PLAN - 3rd FLOOR**
SCALE: 1/8"=1'-0"



1 **COMMUNICATIONS PLAN - 2nd FLOOR**
SCALE: 1/8"=1'-0"

COMMUNICATIONS PLAN NOTES:

1. DENOTES APPROXIMATE LOCATION WHERE CABLE TRAY CROSSES HVAC DUCT. PROVIDE OFFSETS FOR CABLE TRAY AS REQUIRED TO AVOID DUCT AND STILL PROVIDE ACCESS TO THE CABLE TRAY. 2" DEEP CABLE TRAY MAY BE USED WHERE CABLE TRAY CROSSES HVAC DUCT.
2. TYPICAL COMMUNICATIONS OUTLET OR TV OUTLET IN NEW WALL – 1" EMPTY CONDUIT WITH PULL WIRE FROM OUTLET TO CABLE TRAY. FISH EXISTING WALL AS REQUIRED. SEE ELECTRICAL SYMBOLS FOR DESCRIPTION.
3. TYPICAL COMMUNICATIONS OUTLET OR TV OUTLET IN EXISTING STUD WALL – 1" EMPTY CONDUIT WITH PULL WIRE FROM OUTLET TO CABLE TRAY, FISH EXISTING WALL AS REQUIRED. SEE ELECTRICAL SYMBOLS FOR DESCRIPTION.
4. TYPICAL SURFACE MOUNTED COMMUNICATIONS OUTLET OR TV OUTLET – 1" EMPTY CONDUIT WITH PULL WIRE FROM J-BOX ABOVE LAY-IN CEILING TO CABLE TRAY. RUN WIREMOLD FROM OUTLET TO J-BOX, SEE ELECTRICAL SYMBOLS FOR DESCRIPTION.
5. TYPICAL DEMOUNTABLE WALL COMMUNICATIONS CONNECTION – 1" EMPTY CONDUIT WITH PULL WIRE FROM J-BOX ABOVE LAY-IN CEILING TO CABLE TRAY. SEE ELECTRICAL SYMBOLS FOR DEMOUNTABLE WALL COMMUNICATIONS CONNECTION DESCRIPTION AND DEMOUNTABLE WALL COMMUNICATIONS AND TV OUTLET DESCRIPTIONS.
6. TYPICAL CUBICLE COMMUNICATIONS CONNECTION – 1" EMPTY CONDUIT WITH PULL WIRE FROM J-BOX ABOVE LAY-IN CEILING TO CABLE TRAY. SEE ELECTRICAL SYMBOLS FOR CUBICLE COMMUNICATIONS CONNECTION DESCRIPTION AND CUBICLE COMMUNICATIONS OUTLET DESCRIPTIONS.
7. EZ-PATH SYSTEM, SEE CABLE TRAY FIRE STOPPING DETAIL ON E603.
8. (2) 3" EMPTY CONDUITS RUN VERTICAL FROM ABOVE LAY-IN CEILING IN SERVER ROOM 221 TO ABOVE LAY-IN CEILING IN STORAGE 314. RUN EXPOSED ON WALL IN STORAGE 314.
9. (3) 2" EMPTY CONDUITS RUN VERTICAL FROM ABOVE LAY-IN CEILING IN SERVER ROOM 221 TO ROOF. RISE UP TO ROOF AT LOCATION SELECTED BY OWNER. COORDINATE PENETRATION AND PATCHING OF ROOF WITH GENERAL CONTRACTOR.
10. 12"x12"x6" J-BOX WITH SCREW COVER ABOVE LAY-IN CEILING IN DISPATCH 011. RUN (2) 2" EMPTY CONDUITS WITH PULL WIRE TO MECHANICAL ROOM AND RISE UP TO ROOF AT LOCATION SELECTED BY OWNER. COORDINATE PENETRATION AND PATCHING OF ROOF WITH GENERAL CONTRACTOR.
11. (3) 3" EMPTY CONDUITS WITH PULL WIRE FROM DATA 119 TO SERVER ROOM 221. ROUTE/ANGLE CONDUITS THROUGH CHASE, COORDINATE ROUTING WITH OTHER TRADES TO AVOID CONFLICTS WITH PIPING AND DUCTS.
12. (3) 2" EMPTY CONDUITS WITH PULL WIRE FROM CABLE TRAY ON FIRST FLOOR TO DATA 119.
13. 8"x8"x4" J-BOX ABOVE LAY-IN CEILING FOR FUTURE TV OUTLETS, 1 1/2" EMPTY CONDUIT WITH PULL WIRE TO CABLE TRAY.

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SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION
SIMS GROUP ENGINEERS, INC. No. C03104

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER
No. 18744
CHRIS PARTRICK
3/20/2014

1600 HAMPTON ST. ANNEX RENOVATION
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DIVISION OF LAW ENFORCEMENT & SAFETY (DLES)
UNIVERSITY OF SOUTH CAROLINA

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DATE: 3/13/2014

SHEET TITLE:
COMMUNICATIONS PLANS - 2ND & 3RD FLOOR

SHEET NO: E403

BID SET C14003

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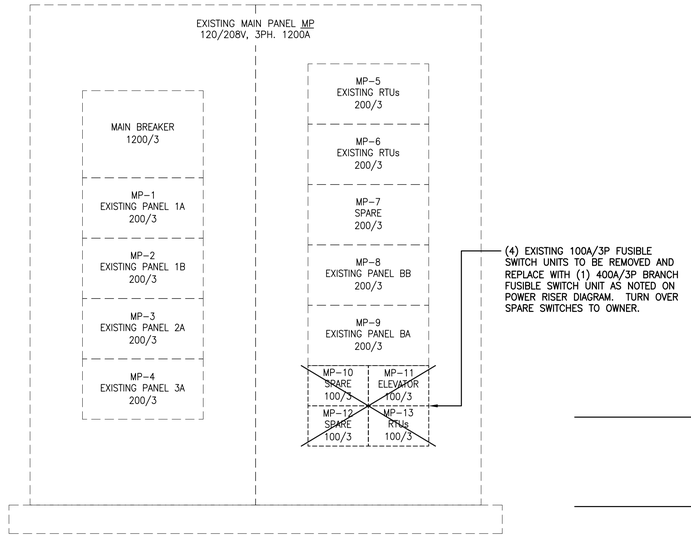
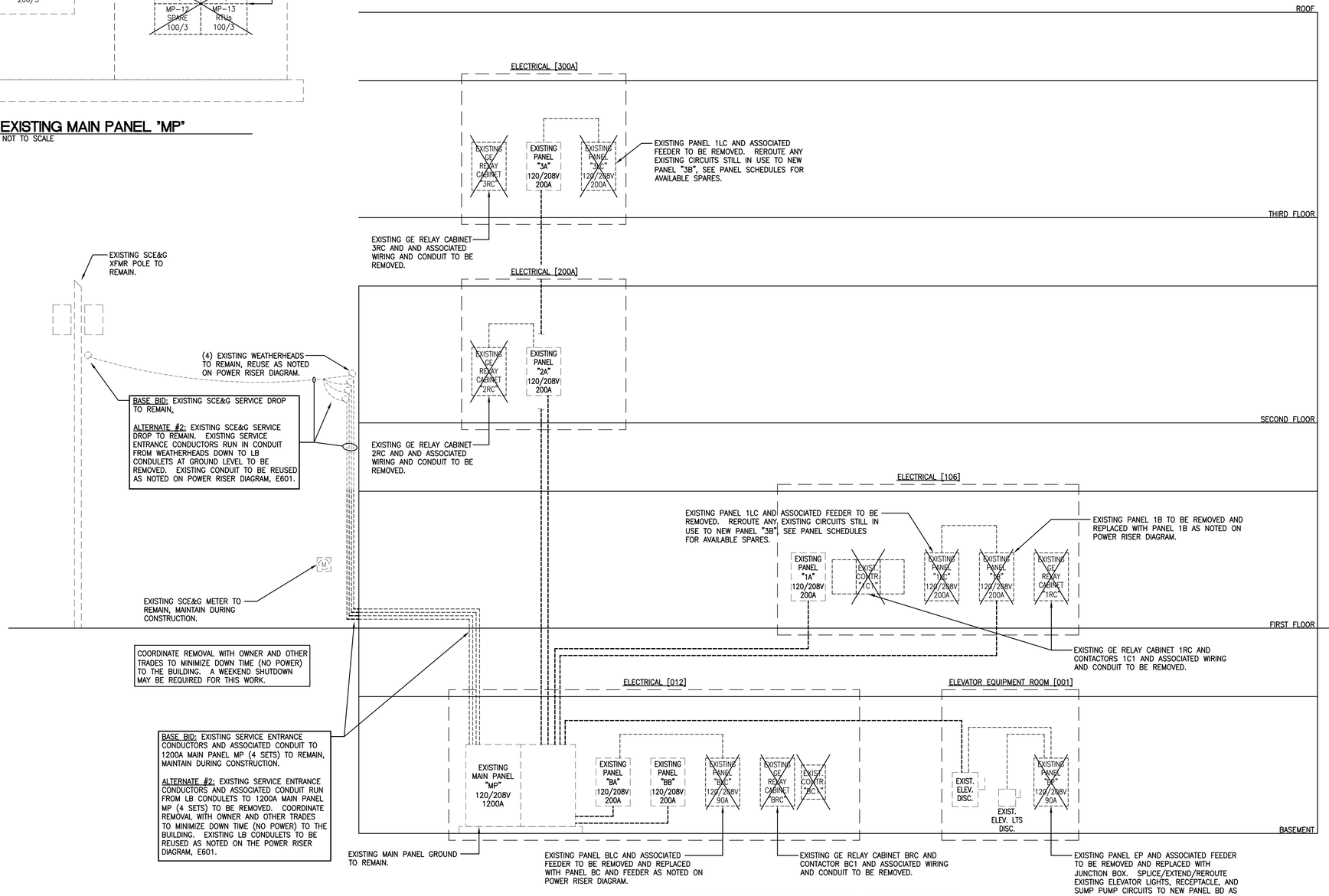


2 EXISTING MAIN PANEL "MP"
NOT TO SCALE



1 POWER RISER DIAGRAM - DEMOLITION
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SHEET TITLE:
POWER RISER DIAGRAM DEMOLITION

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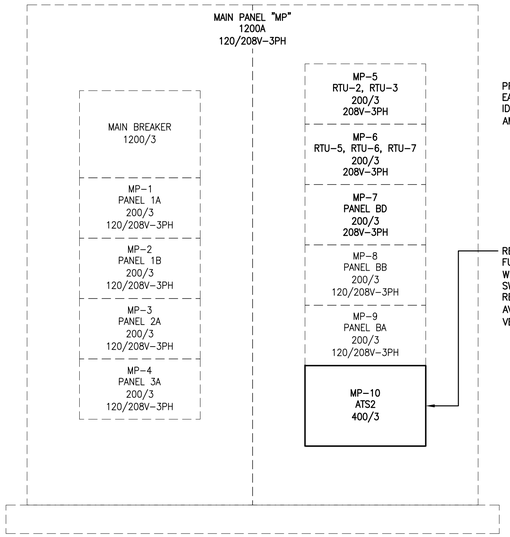
SHEET NO: E600



PROVIDE ENGRAVED NAMEPLATES FOR EACH SWITCH UNIT IN PANEL MP IDENTIFYING CIRCUIT, LOAD SERVED, AMPS/POLE, AND VOLTAGE, PHASE.

REMOVE (4) EXISTING 100A/3P FUSIBLE SWITCH UNITS AND REPLACE WITH (1) 400A/3P BRANCH FUSIBLE SWITCH UNIT FUSED AT 400A AS REQUIRED TO FEED ATS2. GE AV-LINE SWITCHBOARD (FIELD VERIFY).

2 EXISTING MAIN PANEL "MP"
NOT TO SCALE

PROTECTIVE DEVICE COORDINATION STUDY

A. PREPARE COORDINATION TIME-CURRENT CHARACTERISTIC CURVES TO DETERMINE THE REQUIRED SETTINGS/SIZES OF THE PROTECTIVE DEVICES TO MAXIMIZE SELECTIVITY. THE UTILITY UPSTREAM PROTECTIVE DEVICE FEEDING THE FACILITY SHALL BE MAINTAINED AS THE UPPER LIMIT FOR COORDINATION. THESE SETTINGS SHALL BE OBTAINED BY THE PREPARER, ALONG WITH ANY OTHER PROTECTIVE DEVICE SETTING REQUIREMENTS. THE COORDINATION CURVES SHALL BE PREPARED ON LOG-LOG PAPER AND ILLUSTRATE ADEQUATE CLEARING TIMES BETWEEN SERIES DEVICES. THE CURVES SHALL BE CREATED THROUGH THE USE OF THE STUDY SOFTWARE PACKAGE, BUT MUST REFLECT ACTUAL PROTECTIVE DEVICES TO BE INSTALLED. ADEQUATE TIME-CURRENT CURVES SHALL BE GENERATED TO DEPICT COORDINATION. IN ADDITION, PROTECTIVE DEVICE CHARACTERISTICS SHALL BE SUITABLY DETERMINED TO REFLECT CALCULATED SHORT-CIRCUIT LEVELS AT THE LOCATION.

B. THE FOLLOWING INFORMATION SHALL BE PROVIDED ON ALL CURVE SHEETS.
1. DEVICE IDENTIFICATION AND ASSOCIATED SETTINGS/SIZE.
2. VOLTAGE AT WHICH CURVES ARE PLOTTED.
3. CURRENT MULTIPLIER.
4. ANSI FREQUENT FAULT DAMAGE CURVE.
5. CABLE INSULATION DAMAGE CURVES.
6. TRANSFORMER INRUSH POINT.
7. SINGLE-LINE FOR THE PORTION OF THE SYSTEM.
8. MOTOR STARTING PROFILES (WHERE APPLICABLE).

C. THE STUDY SHALL BE PREPARED IN ACCORDANCE WITH THE LATEST EDITION OF NETA STD. ATS, NFPA 70B, THE 'NATIONAL ELECTRICAL CODE', ANSI C2 'NATIONAL ELECTRICAL SAFETY CODE', AND ANSI/IEEE GUIDELINES, AS WELL AS MANUFACTURER'S RECOMMENDATIONS.

D. MANUFACTURER SHALL PROVIDE SELECTIVE COORDINATION OF THE EMERGENCY SYSTEM OVERCURRENT DEVICES IN ACCORDANCE WITH NEC 700.27 AND 701.27.

MAIN FEEDER SCHEDULE:

(M1) 1200A MAIN FEEDER: 4 SETS OF 1#350KCMIL N, 3#350KCMIL, 3" C

PANELBOARD FEEDER SCHEDULE:

(P1) 60A/80A PANEL FEEDER: 1#8 G, 4#4 1 1/4" C

(P2) 60A/80A IG PANEL FEEDER: 1#8 G, 1#8 IG, 4#4, 1 1/4" C

(P3) 100A PANEL FEEDER: 1#8 G, 4#3, 1 1/4" C

(P4) 200A PANEL FEEDER: 1#6 G, 4#3/0, 2" C

(P5) 225A IG PANEL FEEDER: 1#2 G, 1#2 IG, 4#4/0, 2 1/2" C

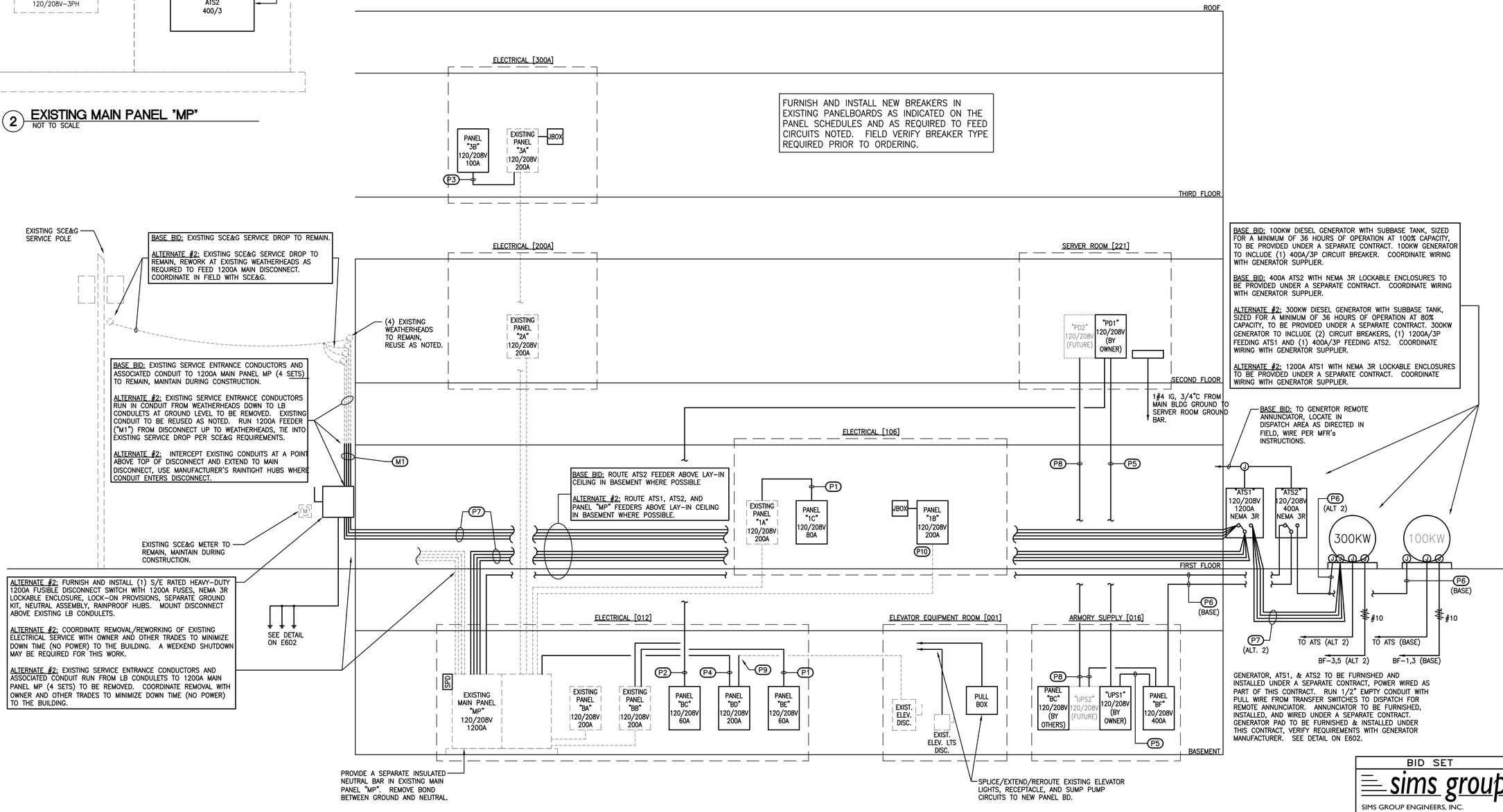
(P6) 400A PANEL FEEDER: 1#3 G, 4#500KCMIL, 3 1/2" C

(P7) 1200A PANEL FEEDER: 4 SETS OF 1#3/0 G, 4#350KCMIL, 3" C

(P8) 225A FUTURE PD FEEDER: 2 1/2" EMPTY CONDUIT WITH PULL WIRE

(P9) 100A ELEVATOR FEEDER: 1#8 G, 4#3, 1 1/4" C
INTERCEPT EXISTING ELEVATOR FEEDER AND EXTEND TO PANEL "BD".

(P10) RECONNECT TO EXISTING 200A PANEL FEEDER.



1 POWER RISER DIAGRAM
NOT TO SCALE

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SHEET TITLE: POWER RISER DIAGRAM

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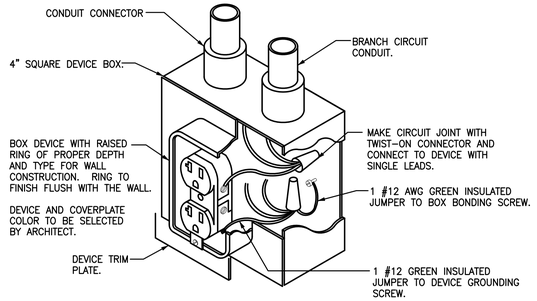
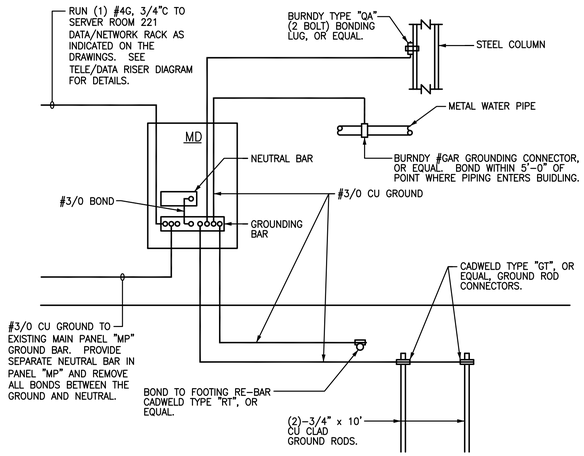
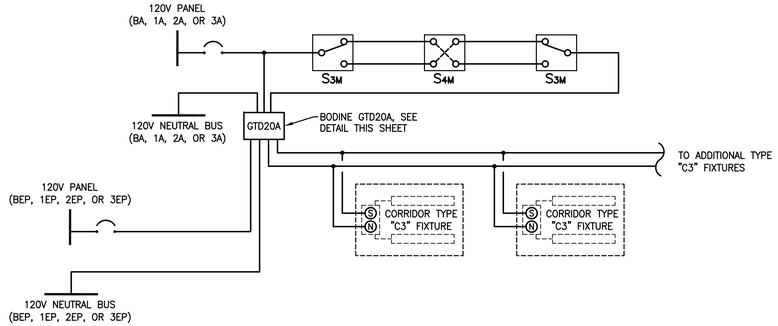
SHEET NO: E601



1 TYPICAL DUPLEX RECEPTACLE INSTALLATION
NOT TO SCALE

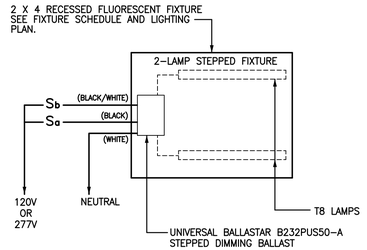


2 MAIN SERVICE GROUNDING DETAIL
NOT TO SCALE



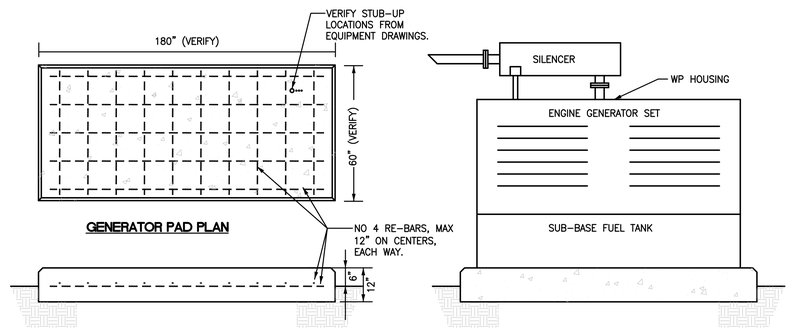
3 PARTIAL CORRIDOR SWITCHING/WIRING DIAGRAM - 3-WAY / 4-WAY SWITCHING
NOT TO SCALE

SWITCHING SCHEME		
S_a	S_b	MODE
OFF	OFF	ALL LTS OFF
ON	OFF	50%
OFF	ON	50%
ON	ON	ALL LTS 100%



NOTE:
SEE MANUFACTURER WIRING DIAGRAM FOR INTERNAL WIRING OF LAMPS TO BALLAST.

4 2-LAMP STEPPED BALLAST TYPICAL WIRING DIAGRAM
NOT TO SCALE



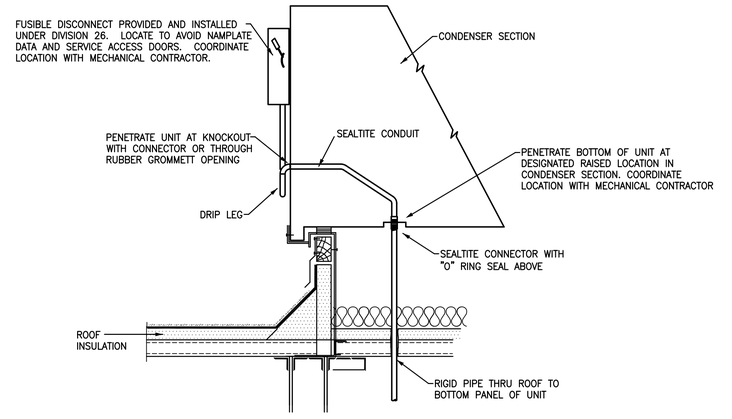
GENERATOR PAD PLAN

GENERATOR PAD SECTION

GENERATOR ELEVATION

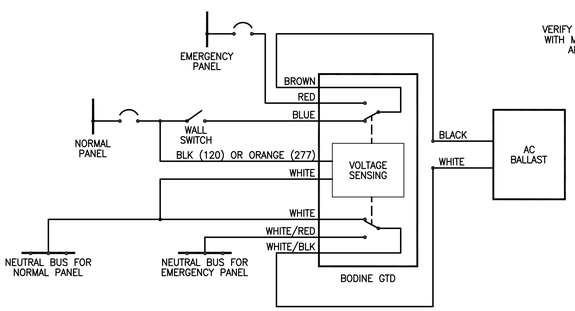
GENERATOR TO BE FURNISHED AND INSTALLED UNDER A SEPARATE CONTRACT. ATS1 AND ATS2 AND ASSOCIATED WIRING AND CONDUIT TO BE FURNISHED AND INSTALLED UNDER THIS CONTRACT. PAD TO BE FURNISHED AND INSTALLED UNDER THIS CONTRACT, COORDINATE DIMENSIONS AND REQUIREMENTS WITH GENERATOR MANUFACTURER.

5 GENERATOR DETAILS
NOT TO SCALE



6 ROOF MOUNTED UNIT POWER WIRING DETAIL
NOT TO SCALE

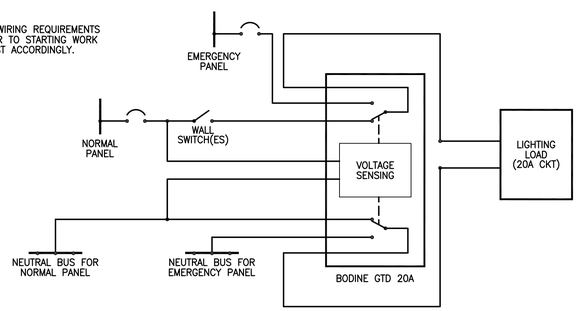
VERIFY ACTUAL WIRING REQUIREMENTS WITH MFR PRIOR TO STARTING WORK AND ADJUST ACCORDINGLY.



NORMAL OPERATION – AC BALLAST SUPPLIED BY NORMAL PANEL & CONTROLLED BY WALL SWITCH

EMERGENCY OPERATION – AC BALLAST SUPPLIED BY EMERGENCY GENERATOR THRU EMERGENCY PANEL AND INDEPENDENT OF WALL SWITCH POSITION

7 EMERGENCY LIGHTING GENERATOR TRANSFER DEVICE
NOT TO SCALE



NORMAL OPERATION – LIGHTING LOAD CONTROLLED BY LOCAL SWITCHING MEANS

EMERGENCY OPERATION – LIGHTING LOAD IS INDEPENDENT OF LOCAL SWITCHING MEANS

8 EMERGENCY LIGHTING RELAY CONTROL DEVICE
NOT TO SCALE

POWER RISER DIAGRAM NOTES:
PROVIDE ENGRAVED NAMEPLATES FOR EACH PANELBOARD, SAFETY SWITCH, ENCLOSED CIRCUIT BREAKER, TRANSFORMER, CONTACTOR, AND LIGHTING CONTROL PANEL AS INDICATED IN THE SPECIFICATIONS. ATTACH TO EQUIPMENT COVER USING METAL SCREWS, RIVETS, OR INDUSTRIAL EPOXY CEMENT. THE MANUFACTURER'S STICKY-BACK ADHESIVE IS NOT ACCEPTABLE. USE WHITE LETTERS ON BLACK FIELD FOR NORMAL POWER ITEMS, USE WHITE LETTERS ON RED FIELD FOR EMERGENCY POWER ITEMS.
ALL CIRCUIT BREAKERS SHALL BE FULLY RATED; SERIES RATINGS PROHIBITED.
PROVIDE HACR-RATED CIRCUIT BREAKERS FOR ALL HVAC & REFRIGERATION EQUIPMENT.
BRANCH MOUNTED MAIN CIRCUIT BREAKERS ARE PROHIBITED.
EQUIPMENT CIRCUITS: VERIFY WIRE SIZE AND C/B RATING WITH EQUIPMENT NAMEPLATE DATA. NOTIFY ENGINEER OF ANY DISCREPANCY.
REFER TO CIVIL DRAWINGS FOR UTILITY LOCATIONS. FIELD VERIFY FINAL LOCATIONS PRIOR TO ROUGH-IN.
COORDINATE SERVICE & METERING REQ'Ts WITH THE POWER COMPANY AND INSTALL ACCORDINGLY.
PANEL NUMBERING AND CIRCUIT BREAKER LAYOUT MUST MATCH SCHEDULES ON DESIGN DOCUMENTS. SUBMITTALS WHERE NUMBERING AND/OR BREAKER LAYOUT IS DIFFERENT WILL BE REJECTED.
BREAKER COORDINATION: MANUFACTURER SHALL PROVIDE COORDINATION BETWEEN FEEDER BREAKERS AND UPSTREAM DEVICES. THESE COORDINATION SETTINGS SHALL BE MADE IN THE FIELD BY A MANUFACTURER'S FIELD TECHNICIAN AND DOCUMENTED. A LETTER CONFIRMING THE SETTING AND PROVIDING THE SETTING INFORMATION SHALL BE PROVIDED PRIOR TO ENERGIZATION OF THE SWITCHBOARD.
SHOP DRAWING SUBMITTALS: SUBMIT AN ELECTRICAL ROOM LAYOUT DRAWING FOR EACH ELECTRICAL ROOM REFLECTING DIMENSIONS OF ACTUAL EQUIPMENT PROVIDED. PROVIDE CLEARANCES PER TABLE 110.26(A)(1) OF THE NEC.

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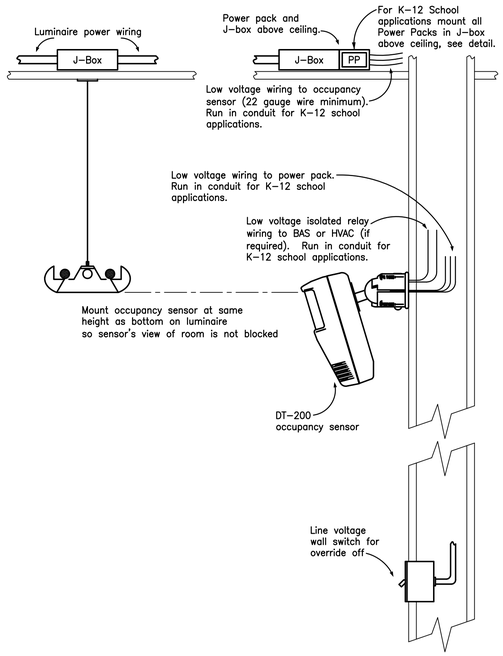
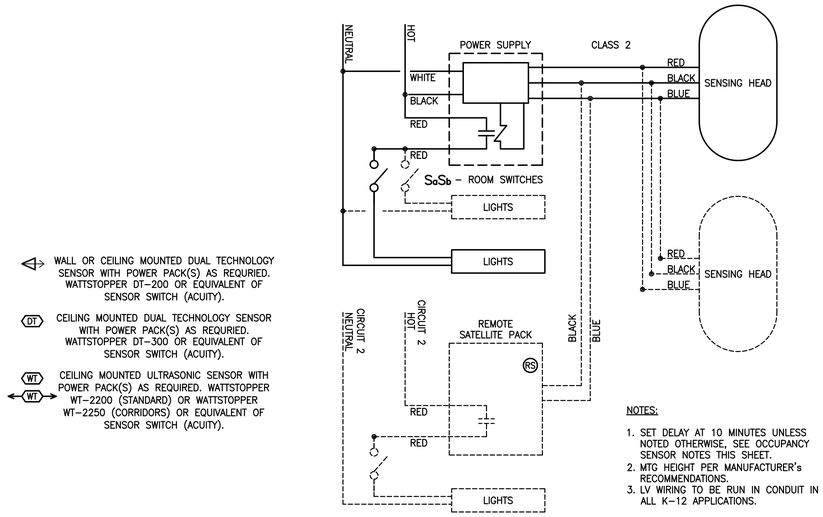
SHEET TITLE: ELECTRICAL DETAILS

SHEET NO: E602



1 DT-200 OCCUPANCY SENSOR INSTALLATION DROP CORDS FROM CEILING

NOT TO SCALE



2 LOW VOLTAGE CEILING AND WALL MOUNTED OCCUPANCY SENSOR DETAIL

NOT TO SCALE

OCCUPANCY SENSOR NOTES:

MANUFACTURER: PRODUCTS SUPPLIED SHALL BE FROM A SINGLE MANUFACTURING THAT HAS BEEN CONTINUOUSLY INVOLVED IN THE MANUFACTURING OF OCCUPANCY SENSORS FOR A MINIMUM OF FIVE (5) YEARS. MIXING OF MANUFACTURERS SHALL NOT BE ALLOWED. FURNISH AND INSTALL SENSORS AS MANUFACTURED BY WATTSTOPPER, OR SENSOR SWITCH (ACUITY).

WARRANTY: ALL COMPONENTS SHALL BE U.L. LISTED, OFFER A MINIMUM FIVE (5) YEAR WARRANTY AND MEET ALL STATE AND LOCAL APPLICABLE CODE REQUIREMENTS. CONTRACTOR SHALL WARRANT ALL EQUIPMENT FURNISHED IN ACCORDANCE TO THIS SPECIFICATION TO BE UNDAMAGED, FREE OF DEFECTS IN MATERIALS AND WORKMANSHIP, AND IN CONFORMANCE WITH THE SPECIFICATIONS. THE SUPPLIER'S OBLIGATION SHALL INCLUDE REPAIR OR REPLACEMENT, AND TESTING WITHOUT CHARGE TO THE OWNER, ALL OR ANY PARTS OF EQUIPMENT WHICH ARE FOUND TO BE DAMAGED, DEFECTIVE OR NON-CONFORMING AND RETURNED TO THE SUPPLIER. THE WARRANTY SHALL COMMENCE UPON THE OWNER'S ACCEPTANCE OF THE PROJECT. WARRANTY ON LABOR SHALL BE FOR A MINIMUM PERIOD OF ONE (1) YEAR.

SUBMITTALS AND DOCUMENTATION: MANUFACTURER SHALL SUBSTANTIATE CONFORMANCE TO THIS SPECIFICATION BY SUPPLYING THE NECESSARY DOCUMENTS, PERFORMANCE DATA AND WIRING DIAGRAMS. SUBMIT A LIGHTING PLAN CLEARLY MARKED BY MANUFACTURER SHOWING PROPER PRODUCT, LOCATION, WIRING, AND ORIENTATION OF EACH SENSOR. SUBMIT STANDARD CATALOG LITERATURE WHICH INCLUDES PERFORMANCE SPECIFICATIONS INDICATING COMPLIANCE TO THE SPECIFICATION.

THE CONTRACT DOCUMENTS ARE DIAGRAMMATIC AND ONLY ESTABLISH THE MINIMUM NUMBER AND TYPE OF SENSOR REQUIRED IN EACH SPACE. THE CONTRACTOR SHALL FURNISH ADDITIONAL SENSORS AS NECESSARY TO PROVIDE THE REQUIRED COVERAGE. THE CONTRACTOR MAY NOT REDUCE THE NUMBER OF SENSORS IN A SPACE OR CHANGE THE SENSOR TYPE IN A SPACE WITHOUT WRITTEN PERMISSION FROM THE ENGINEER AND THE OWNER. IN ORDER TO PROVIDE COVERAGE FOR THE CONTROLLED AREA AND ACCOMMODATE ALL OWNER OCCUPANCY REQUIREMENTS, ALL ROOMS/SPACES SHALL HAVE BETWEEN NINETY (90) AND ONE HUNDRED (100) PERCENT COVERAGE.

LAYOUT OF OCCUPANCY SENSORS ON THE CONTRACT DOCUMENTS REPRESENTS THE BASIS OF DESIGN. THE OCCUPANCY SENSOR SUPPLIER SHALL FURNISH SHOP DRAWINGS AND PRINTED MATERIAL INDICATING LAYOUT OF SENSORS, RACEWAY, AND WIRING REQUIRED TO CONTROL THE LIGHTING INDICATED ON THE CONTRACT DRAWINGS. NO CHANGE ORDER WILL BE ALLOWED FOR ADDITIONAL SENSORS, RACEWAY, WIRING, POWER SUPPLIES, SATELLITE RELAYS, ETC., REQUIRED ON SHOP DRAWINGS BY THE OCCUPANCY SENSOR SUPPLIER. WHERE POWER SUPPLIES ARE REQUIRED FOR OPERATION OF THE OCCUPANCY SENSORS, BUT ARE NOT SHOWN ON THE LIGHTING PLANS, THE POWER SUPPLIES MUST BE INCLUDED AS PART OF THE BASE BID FOR THIS PROJECT. SEE OCCUPANCY SENSOR DETAILS THIS SHEET.

INSTALLATION: IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND AIM SENSORS IN THE CORRECT LOCATION REQUIRED FOR COMPLETE AND PROPER VOLUMETRIC COVERAGE WITHIN THE RANGE OF COVERAGE(S) OF CONTROLLED AREAS PER THE MANUFACTURER'S RECOMMENDATIONS. PROPER JUDGMENT MUST BE EXERCISED IN EXECUTING THE INSTALLATION SO AS TO ENSURE THE BEST POSSIBLE INSTALLATION IN THE AVAILABLE SPACE AND TO OVERCOME LOCAL DIFFICULTIES DUE TO SPACE LIMITATIONS OR INTERFERENCE OF STRUCTURAL COMPONENTS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAKE ALL PROPER ADJUSTMENTS TO ASSURE OWNER'S SATISFACTION WITH THE OCCUPANCY SYSTEM. PROVIDE ALL POWER PACKS AND MOUNTING HARDWARE NECESSARY FOR A COMPLETE AND OPERABLE SYSTEM.

OCCUPANCY SENSOR TIME DELAY SETTINGS: FIELD VERIFY DELAY SETTINGS FOR ALL OCCUPANCY SENSORS WITH THE OWNER PRIOR TO FINAL SETUP. RECOMMENDED DELAY SETTINGS ARE AS FOLLOWS:

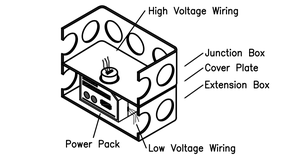
- SET DELAY FOR ALL OCCUPANCY SENSORS LOCATED IN CORRIDORS, GROUP TOILETS, LOCKER ROOMS, SHOWER ROOMS, AND LABORATORIES TO 30 MINUTES UNLESS NOTED OTHERWISE ON THE DRAWINGS (FIELD VERIFY WITH OWNER).
- SET DELAY FOR OCCUPANCY SENSOR LOCATED IN ELECTRICAL ROOMS AND MECHANICAL ROOMS TO 30 MINUTES UNLESS NOTED OTHERWISE ON THE DRAWINGS (FIELD VERIFY WITH OWNER).
- SET DELAY FOR ALL OTHER OCCUPANCY SENSORS TO 15 MINUTES UNLESS NOTED OTHERWISE ON THE DRAWINGS (FIELD VERIFY WITH OWNER).

DUAL TECHNOLOGY SENSORS: SET TRIGGER FOR DUAL TECHNOLOGY SENSORS SO BOTH TECHNOLOGIES ARE REQUIRED TO TRIGGER ON, EITHER TECHNOLOGY IS REQUIRED TO HOLD ON, AND EITHER TECHNOLOGY IS REQUIRED TO RETRIGGER ON (5 SECOND DURATION).

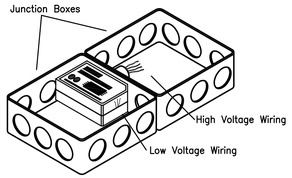
VERIFICATION AND TRAINING: IT SHALL BE THE MANUFACTURER'S RESPONSIBILITY TO VERIFY ALL PROPER ADJUSTMENTS AND TRAIN OWNER'S PERSONNEL TO ENSURE OWNERS SATISFACTION WITH THE OCCUPANCY SYSTEM. THIS SERVICE SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER OR THE ARCHITECT/ENGINEER. TRAINING SESSION TO INCLUDE REPRESENTATIVES FROM THE END USER, THE OWNER, THE ENGINEER, AND THE OWNER'S MAINTENANCE PERSONNEL. THE TRAINING SESSION SHALL NOT BE SCHEDULED UNTIL AFTER COMMISSIONING HAS BEEN COMPLETED AND HAS BEEN REVIEWED IN WRITING BY THE ENGINEER. THE TRAINING SESSION MUST BE SCHEDULED IN WRITING A MINIMUM OF TEN DAYS IN ADVANCE – FAILURE TO DO SO MAY RENDER THE TRAINING NULL & VOID AND REQUIRE RE-TRAINING AT NO ADDITIONAL COST TO THE OWNER OR THE ARCHITECT/ENGINEER.

COMMISSIONING: UPON COMPLETION OF THE INSTALLATION, THE OCCUPANCY SENSORS SHALL BE COMPLETELY COMMISSIONED BY THE MANUFACTURER'S FACTORY AUTHORIZED TECHNICIAN WHO WILL VERIFY ALL ADJUSTMENTS AND SENSOR PLACEMENT TO ENSURE A TROUBLE-FREE OCCUPANCY-BASED LIGHTING CONTROL SYSTEM. THIS SERVICE IS PROVIDED AT NO ADDITIONAL COST TO THE OWNER. THE ELECTRICAL CONTRACTOR SHALL PROVIDE BOTH THE MANUFACTURER AND THE ELECTRICAL ENGINEER WITH TEN WORKING DAYS WRITTEN NOTICE OF THE SCHEDULED COMMISSIONING DATE – FAILURE TO DO SO MAY RENDER THE COMMISSIONING NULL & VOID AND REQUIRE RE-COMMISSIONING AT NO ADDITIONAL COST TO THE OWNER. UPON COMPLETION OF THE SYSTEM FINE TUNING THE FACTORY AUTHORIZED TECHNICIAN SHALL PROVIDE THE PROPER TRAINING TO THE OWNER'S PERSONNEL IN THE ADJUSTMENT AND MAINTENANCE OF THE SENSORS (SEE ABOVE). COMMISSIONING AND TRAINING SHALL NOT BE PROVIDED UNTIL INSTALLATION IS COMPLETE. SEE LOW VOLTAGE SWITCHING SYSTEM SPECIFICATIONS AND NOTES FOR ADDITIONAL LIGHTING CONTROLS COMMISSIONING REQUIREMENTS.

FINAL REVIEW: A FINAL REVIEW OF THE ELECTRICAL INSTALLATION BY THE ENGINEER CANNOT BE PROVIDED UNTIL THE OCCUPANCY SENSOR INSTALLATION HAS BEEN PROPERLY COMMISSIONED. THE CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO THE ENGINEER THAT THE OCCUPANCY SENSOR COMMISSIONING AND TRAINING HAS BEEN PROVIDED PRIOR TO REQUESTING A FINAL REVIEW.



STACKED JUNCTION BOXES

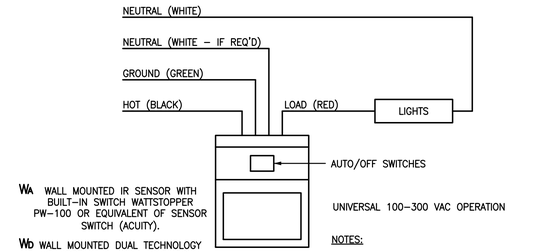


SIDE BY SIDE JUNCTION BOXES

NOTE: DO NOT MOUNT POWER PACKS CLOSER THAN 6-12 INCHES FROM SENSOR.

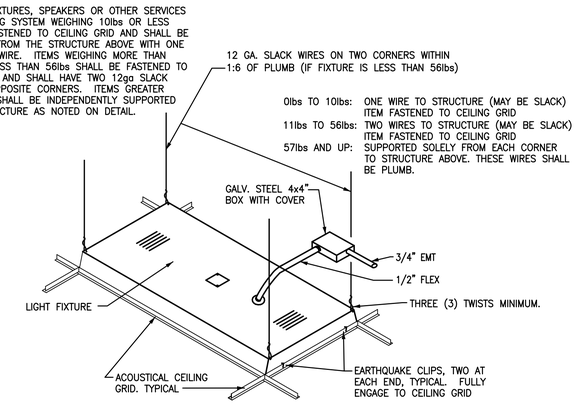
3 OCCUPANCY SENSOR POWER PACK INSTALLATION FOR EXPOSED CEILINGS

NOT TO SCALE



4 WALL MOUNTED OCCUPANCY SENSOR SWITCH AND TIME SWITCH DETAILS

NOT TO SCALE



5 TYPICAL LIGHT FIXTURE SUPPORT

NOT TO SCALE

BID SET C14003

sims group
SIMS GROUP ENGINEERS, INC.
800 Columbiana Drive, Suite 208
Irmo, South Carolina 29063
Phone: (803) 765-1007 Fax: (803) 765-1030
www.simsgroupusa.com

Jumper
Carter
Sease
Architects
PA
412 Meeting Street
West Columbia
South Carolina

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION SIMS GROUP ENGINEERS, INC. No. C03104

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 18744 CHRIS PARTRICH 3/20/2014

1600 HAMPTON ST. ANNEX RENOVATION
[TENANT UPFIT PACKAGE]
DIVISION OF LAW ENFORCEMENT & SAFETY (DLES)
UNIVERSITY OF SOUTH CAROLINA

REVISIONS:

DRAWN BY:

CHECKED BY: CLP

COMM NO: 12113

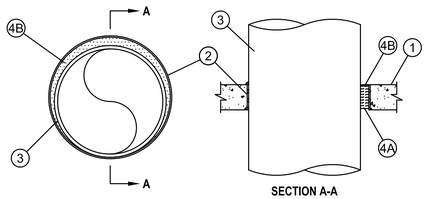
DATE: 3/13/2014

SHEET TITLE: LIGHTING DETAILS

SHEET NO: E603

System No. C-AJ-1226

F Rating — 3 Hr
T Rating — 0 Hr
L Rating At Ambient — Less Than 1 CFM/Sq Ft
L Rating At 400 F — 4 CFM/Sq Ft



1. Floor or Wall Assembly — Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 32 in.
2. Metallic Sleeve — (Optional) Nom 32 in. diam (or smaller) Schedule 40 (or heavier) steel sleeve cast or grouted into floor or wall assembly, flush with floor or wall surfaces or extending a max of 3 in. above floor or beyond both surfaces of wall.
2A. Sheet Metal Sleeve — (Optional) Max 6 in. diam, min 26 ga galv steel provided with a 26 ga galv steel square flange spot welded to the sleeve at approx mid-height, or flush with bottom of sleeve in floors, and sized to be a min of 2 in. larger than the sleeve diam. The sleeve is to be cast in place and may extend a max of 4 in. below the bottom of the deck and a max of 1 in. above the top surface of the concrete floor.
2B. Sheet Metal Sleeve — (Optional) - Max 12 in. diam, min 24 ga galv steel provided with a 24 ga galv steel square flange spot welded to the sleeve at approx mid-height, or flush with bottom of sleeve in floors, and sized to be a min of 2 in. larger than the sleeve diam. The sleeve is to be cast in place and may extend a max of 4 in. below the bottom of the deck and a max of 1 in. above the top surface of the concrete floor.
3. Through-Penetrant — One metallic pipe, tube or conduit to be installed either concentrically or eccentrically within the firestop system. The annular space between penetrant and periphery of opening shall be min 0 in. (point contact) to max 1-7/8 in. Penetrant may be installed with continuous point contact. Penetrant to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic penetrants may be used:
A. Steel Pipe — Nom 30 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.
B. Iron Pipe — Nom 30 in. diam (or smaller) cast or ductile iron pipe.
C. Copper Pipe — Nom 6 in. diam (or smaller) Regular (or heavier) copper pipe.
D. Copper Tubing — Nom 6 in. diam (or smaller) Type L (or heavier) copper tubing.
E. Conduit — Nom 6 in. diam (or smaller) steel conduit.
F. Conduit — Nom 4 in. diam (or smaller) steel electrical metallic tubing (EMT).
4. Firestop System — The firestop system shall consist of the following:
A. Packing Material — Min 4 in. thickness of min 4 pcf mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or sleeve or from both surfaces of wall or sleeve as required to accommodate the required thickness of fill material.
B. Fill, Void or Cavity Material* — Sealant — Min 1/4 in. thickness of fill material applied within the annulus, flush with top surface of floor or sleeve or with both surfaces of wall or sleeve. At the point or continuous contact locations between penetrant and concrete or sleeve, a min 1/4 in. diam bead of fill material shall be applied at the concrete or sleeve/ pipe penetrant interface on the top surface of floor and on both surfaces of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant
*Bearing the UL Classification Mark

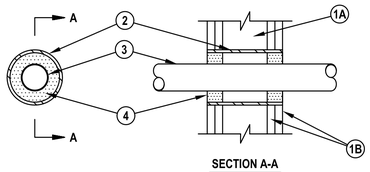
Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. June 27, 2007

C UL US

System No. W-L-2075

F Ratings - 1 & 2 Hr (See Item 4)
T Ratings - 0 and 2 Hr (see Item 4)
L Rating At Ambient - Less Than 1 CFM/Sq Ft
L Rating At 400 F - 4 CFM/Sq Ft



1. Floor or Wall Assembly -- The fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
A. Studs -- Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. wide and spaced max 24 in. OC.
B. Gypsum Board* -- Nom 5/8 in. thick gypsum wallboard, as specified in the individual Wall and Partition Design. Max diam of opening is 4 in.
2. Metallic Sleeve -- (Optional) -- Nom 4 in. diam (or smaller) Schedule 40 (or thinner) steel pipe cast into wall assembly with joint compound and installed flush with wall surfaces.
3. Electrical Nonmetallic Tubing+ -- Nom 2 in. diam (or smaller) corrugated wall electrical nonmetallic tubing (ENT) constructed of polyvinyl chloride (PVC). Tubing to be rigidly supported on both sides of wall assembly. A nom annular space of 3/4 in. is required within the firestop system.
See Electrical Nonmetallic Tubing (FKHU) category in the Electrical Construction Materials Directory for names of manufacturers.
4. Fill, Void or Cavity Material* -- Sealant -- Installed symmetrically on both sides of the wall. The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed. Fill material applied within the annulus, flush with each end of the steel sleeve at the thickness shown in the table below:

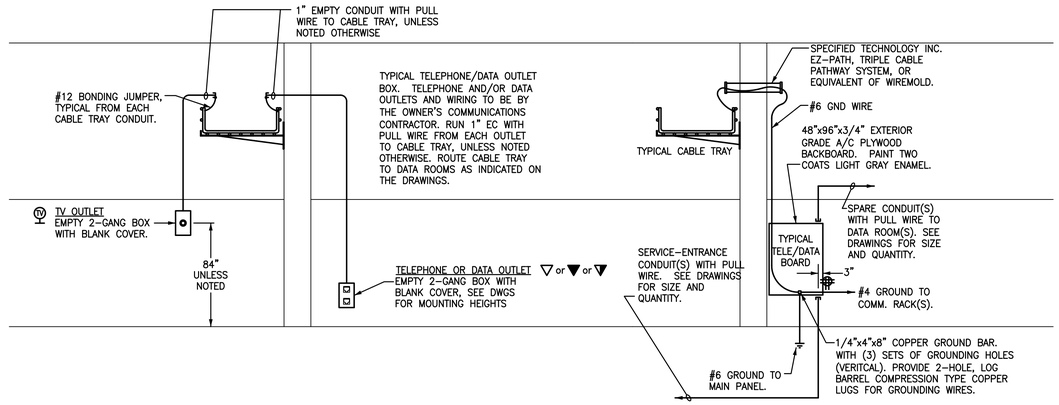
F Rating Hr	T Rating Hr	Fill Mtl Depth In.
1	0	5/8
2	2	1-1/4

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- FS-One Sealant
+Bearing the UL Listing Mark
*Bearing the UL Classification Marking

Hilti Firestop Systems

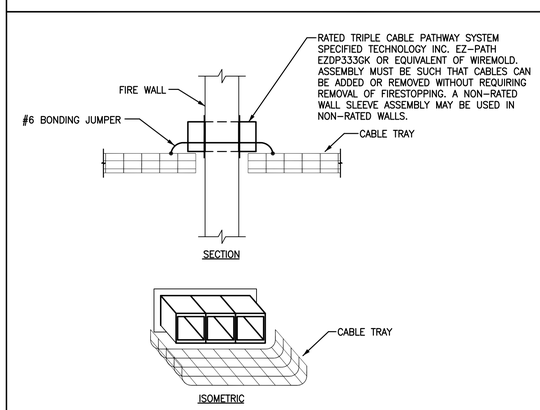
Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. January 9, 2003

C UL US

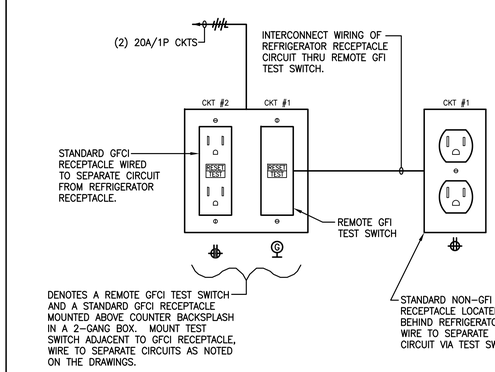


2 TYPICAL COMMUNICATIONS OUTLET DETAIL
NOT TO SCALE

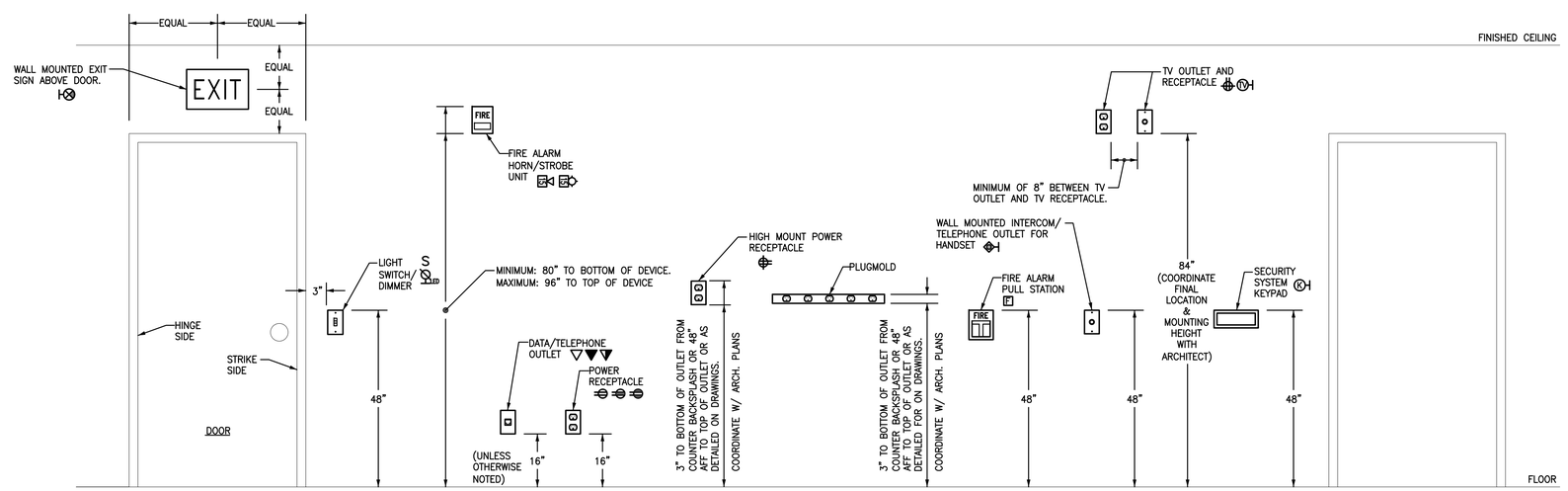
3 TYPICAL CABLE TRAY RISER DIAGRAM FOR IDF, MDF, AND OTHER TELE/DATA ROOMS
NOT TO SCALE



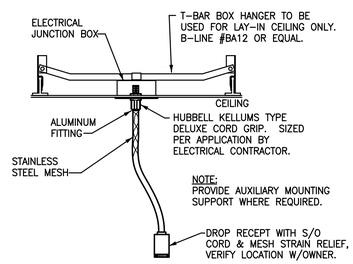
4 CABLE TRAY FIRE STOPPING DETAIL
NOT TO SCALE



5 TYPICAL REFRIGERATOR RECEPTACLE DETAIL
NOT TO SCALE



1 TYPICAL MOUNTING HEIGHTS FOR WALL MOUNTED DEVICES
NOT TO SCALE



TYPICAL STRAIN RELIEF FOR ALL DROP CORDS FROM CEILING
6 NOT TO SCALE

Jumper
Carter
Sease
Architects PA
412 Meeting Street
West Columbia
South Carolina

SOUTH CAROLINA — SIMS GROUP ENGINEERS, INC. No. C03104 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA — REGISTERED PROFESSIONAL ENGINEER — No. 18744 — CHRIS PARTRICH — 3/20/2014

1600 HAMPTON ST. ANNEX RENOVATION
[TENANT UPFIT PACKAGE]
DIVISION OF LAW ENFORCEMENT & SAFETY (DLES)
UNIVERSITY OF SOUTH CAROLINA

REVISIONS:

DRAWN BY:

CHECKED BY: CLP

COMM NO: 12113

DATE: 3/13/2014

SHEET TITLE:
COMMUNICATIONS DETAILS

BID SET C14003

sims group
SIMS GROUP ENGINEERS, INC.
800 Columbiana Drive, Suite 208
Irmo, South Carolina 29063
Phone: (803) 765-1007 Fax: (803) 765-1030
www.simsgroupusa.com

SHEET NO: E604

EXISTING PANEL "BA" — MAIN ELECTRICAL 012

SQUARE D TYPE: AMPS: **200** MAIN: **MAIN LUGS ONLY (BOTTOM)** No. of Ckts **42**
VOLTS (L–L): **208** L–N: **120** GND: **GROUND BUS** MOUNTING: **SURFACE**
PHASE: **3** WIRE: **4** AIC: ENCLOSURE: **NEMA 1**
OPTIONS: ———— | ———— | ————

CKT No.	CKT BKR	BKR TYPE	LOAD TYPE	LOAD DESCRIPTION	LOAD KVA	PH	LOAD KVA	LOAD DESCRIPTION	LOAD TYPE	BKR TYPE	CKT BKR	CKT No.
1	20/1	EXIST	LTG	LIGHTS	0.68	A	1.08	LIGHTS – STAIRS	LTG	EXIST	20/1	2
3		EXIST	LTG	LIGHTS	1.03	B	0.54	LIGHTS – DISPATCH	LTG	EXIST		4
5		EXIST	LTG	LIGHTS	0.88	C	1.57	LIGHTS – CORR.	LTG	EXIST		6
7		EXIST	LTG	LIGHTS	0.80	A	5.00	RTU–4	HP	EXIST	90/2	8
9		EXIST	LTG	LIGHTS	0.58	B	9.00		2nd HT	EXIST		10
11		EXIST	REC	RECEPTACLES	0.20	C	0.20	RECEPTACLES	REC	EXIST	20/1	12
13		EXIST	REC	RECEPTACLES	0.20	A	1.00	RECEPTACLES	REC	EXIST		14
15		EXIST	REC	RECEPTACLES	0.20	B	1.00	RECEPT – EVIDENCE	REC	EXIST		16
17		EXIST	REC	RECEPT – REFRIG.	0.50	C	1.00	RECEPTACLES	REC	EXIST		18
19		EXIST	REC	RECEPTACLES	0.20	A	1.00	RECEPTACLES	REC	EXIST		20
21		EXIST	REC	RECEPTACLES	0.20	B	0.80	RECEPTACLES	REC	EXIST		22
23		EXIST	REC	RECEPTACLES	0.20	C	1.20	RECEPTACLES	REC	EXIST		24
25		EXIST	REC	RECEPTACLES	0.20	A	0.50	RECEPT – EXIST EWC @	REC	EXIST		26
27		EXIST	REC	RECEPTACLES	0.20	B	0.40	RECEPT – EXIST TELE @	REC	EXIST		28
29		EXIST	REC	RECEPTACLES	1.60	C	0.80	RECEPT – EXISTING @	REC	EXIST		30
31		EXIST	REC	RECEPT – DEM. WALLS	0.80	A	0.40	EXIST SUMP PUMP @	MISC	EXIST		32
33		EXIST	REC	RECEPT – DEM. WALLS	0.80	B	1.00	RECEPTACLES	REC	EXIST		34
35		EXIST	REC	RECEPT – DEM. WALLS	1.00	C	1.00	RECEPTACLES	REC	EXIST		36
37		EXIST	---	SPARE		A	0.40	RECEPT – DEM. WALLS	REC	EXIST		38
39		EXIST	---			B	1.20	RECEPT – DEM. WALLS	REC	NEW	20/1	40
41		EXIST	---			C		SPARE	---	NEW		42

TOTAL KVA: **39.36** | LTG 7.16 | AC 0.00 | 2nd HT 9.00 | MISC 0.40
TOTAL AMPS: **109.25** | REC 17.80 | AH 0.00 | KIT 0.00 | MTR1 0.00
HP 5.00 | PR HT 0.00 | WH 0.00 | MTR2 0.00

GFI=Ground Fault Breaker
AFI=Arc Fault Breaker
S/T=Shunt Trip Breaker
VH=High Interrupting Breaker

@ Denotes Circuit reserved for existing load to remain. If circuit is unused, label as "SPARE"

NEW PANEL BD — MAIN ELECTRICAL 012

SQUARE D TYPE: **NQ** AMPS: **200** MAIN: **MAIN LUGS ONLY (TOP)** No. of Ckts **42**
VOLTS (L–L): **208** L–N: **120** GND: **GROUND BUS** MOUNTING: **SURFACE**
PHASE: **3** WIRE: **4** AIC: **10K** ENCLOSURE: **NEMA 1**
OPTIONS: **HINGED TRIM** | ———— | ————

CKT No.	CKT BKR	BKR TYPE	LOAD TYPE	LOAD DESCRIPTION	LOAD KVA	PH	LOAD KVA	LOAD DESCRIPTION	LOAD TYPE	BKR TYPE	CKT BKR	CKT No.
1	20/1	GFI	MISC	ICE MACHINE	1.00	A	0.40	EXISTING EP LOAD @	MISC		20/1	2
3			REC	RECEPT – EXISTING @	0.80	B	0.40	EXISTING EP LOAD @	MISC			4
5			REC	RECEPT – EXISTING @	0.80	C	0.40	EXISTING EP LOAD @	MISC			6
7			REC	RECEPT – EXISTING @	0.80	A	0.25	AH–13 RECIRC PUMP	MISC			8
9			REC	RECEPT – EXISTING @	0.80	B		SPARE	---			10
11			REC	RECEPT – EXISTING @	0.80	C			---			12
13			REC	RECEPT – DEM. WALLS	0.80	A			---			14
15			REC	RECEPT – DEM. WALLS	1.20	B			---			16
17			REC	RECEPT – DEM. WALLS	0.60	C			---			18
19			REC	RECEPT – DEM. WALLS	1.00	A			---			20
21			REC	RECEPT – DEM. WALLS	1.20	B			---			22
23	15/2		AH	AH–13	0.10	C			---			24
25			---			A			---			26
27	20/2		HP	HP–13	2.75	B			---			28
29			---			C			---			30
31	80/3		HP	RTU–1	8.67	A			---			32
33			2nd HT		13.10	B			---			34
35			---			C			---			36
37	100/3		MTR1	ELEVATOR	25.00	A			---			38
39			---			B			---			40
41			---			C			---			42

TOTAL KVA: **60.87** | LTG 0.00 | AC 0.00 | 2nd HT 13.10 | MISC 2.45
TOTAL AMPS: **168.96** | REC 8.80 | AH 0.10 | KIT 0.00 | MTR1 25.00
HP 11.42 | PR HT 0.00 | WH 0.00 | MTR2 0.00

GFI=Ground Fault Breaker
AFI=Arc Fault Breaker
S/T=Shunt Trip Breaker
VH=High Interrupting Breaker

@ Denotes Circuit reserved for existing load to remain. If circuit is unused, label as "SPARE"

EXISTING PANEL "1A" — ELECTRICAL ROOM 106

SQUARE D TYPE: AMPS: **200** MAIN: **MAIN LUGS ONLY (BOTTOM)** No. of Ckts **42**
VOLTS (L–L): **208** L–N: **120** GND: **GROUND BUS** MOUNTING: **SURFACE**
PHASE: **3** WIRE: **4** AIC: ENCLOSURE: **NEMA 1**
OPTIONS: ———— | ———— | ————

CKT No.	CKT BKR	BKR TYPE	LOAD TYPE	LOAD DESCRIPTION	LOAD KVA	PH	LOAD KVA	LOAD DESCRIPTION	LOAD TYPE	BKR TYPE	CKT BKR	CKT No.
1	20/1	EXIST	LTG	LIGHTS	0.83	A	0.63	LIGHTS – CORR (1)	LTG	EXIST	20/1	2
3		EXIST	LTG	LIGHTS	0.48	B	0.50	LIGHTS	LTG	EXIST		4
5		EXIST	LTG	LIGHTS	0.83	C	1.00	LIGHTS	LTG	EXIST		6
7		EXIST	LTG	LIGHTS	1.06	A		SPARE	---	EXIST		8
9		EXIST	REC	SPARE		B	0.50	EXISTING LOAD @	REC	EXIST		10
11		EXIST	REC			C	0.50	EXISTING LOAD @	REC	EXIST		12
13		EXIST	REC			A	1.00	RECEPTACLES	REC	EXIST		14
15		EXIST	REC			B	1.00	RECEPTACLES	REC	EXIST		16
17		EXIST	REC			C	1.00	RECEPTACLES	REC	EXIST		18
19		EXIST	REC			A	1.00	RECEPTACLES	REC	EXIST		20
21		EXIST	REC	RECEPTACLES	1.00	B	1.00	RECEPTACLES	REC	EXIST		22
23		EXIST	REC	RECEPTACLES	0.40	C	1.00	RECEPTACLES	REC	EXIST		24
25		EXIST	REC	RECEPTACLES	0.40	A	0.50	RECEPT – EWC	REC	EXIST		26
27		EXIST	REC	EXISTING LOAD @	0.50	B	1.00	RECEPT – REFRIG.	REC	EXIST		28
29		EXIST	MISC	EXISTING LOAD @	0.50	C		RANGE	KIT	EXIST		30
31		EXIST	REC	EXISTING LOAD @	0.50	A	1.04	**AH–4**	AH	**NEW**	45/3	32
33		EXIST	MISC	EXISTING LOAD @	0.50	B	11.53		2nd HT			34
35		EXIST	MISC	EXISTING LOAD @	0.50	C			---			36
37	80/3	NEW	---	PANEL 1C	16.00	A	0.76	**AH–5**	AH	**NEW**	45/3	38
39			---			B	11.53		2nd HT			40
41			---			C			---			42

TOTAL KVA: **58.99** | LTG 5.33 | AC 0.00 | 2nd HT 23.06 | MISC 1.50
TOTAL AMPS: **163.74** | REC 11.30 | AH 1.80 | KIT 0.00 | MTR1 0.00
HP 0.00 | PR HT 0.00 | WH 0.00 | MTR2 0.00

GFI=Ground Fault Breaker
AFI=Arc Fault Breaker
S/T=Shunt Trip Breaker
VH=High Interrupting Breaker

@ Denotes Circuit reserved for existing load to remain. If circuit is unused, label as "SPARE"

EXISTING PANEL "BB" — MAIN ELECTRICAL 012

SQUARE D TYPE: AMPS: **200** MAIN: **MAIN LUGS ONLY (BOTTOM)** No. of Ckts **42**
VOLTS (L–L): **208** L–N: **120** GND: **GROUND BUS** MOUNTING: **SURFACE**
PHASE: **3** WIRE: **4** AIC: ENCLOSURE: **NEMA 1**
OPTIONS: ———— | ———— | ————

CKT No.	CKT BKR	BKR TYPE	LOAD TYPE	LOAD DESCRIPTION	LOAD KVA	PH	LOAD KVA	LOAD DESCRIPTION	LOAD TYPE	BKR TYPE	CKT BKR	CKT No.
1	30/3	EXIST	MISC	EXISTING LIFT @	5.00	A	2.00	EXISTING EWH–EX @	PR HT	EXIST	20/2	2
3			---			B			---			4
5			---			C	2.00	EXISTING EWH–EX @	PR HT	EXIST	20/2	6
7	45/3	**NEW**	AH	AH–1	1.43	A			---			8
9			2nd HT		11.53	B	2.00	EXISTING EWH–EX @	PR HT	EXIST	20/2	10
11			---			C			---			12
13	60/3	EXIST	WH	WH–1	9.00	A	2.00	EXISTING EWH–EX @	PR HT	EXIST	20/2	14
15			---			B			---			16
17			---			C	0.50	EXISTING LOAD @	MISC	EXIST	20/1	18
19	40/3	**NEW**	HP	HP–1	6.90	A	8.00	PANEL BE	---	EXIST	60/3	20
21			---			B			---			22
23			---			C			---			24
25	40/3	EXIST	HP	HP–2	6.90	A	1.43	AH–2	AH	**NEW**	45/3	26
27			---			B	11.53		2nd HT			28
29			---			C			---			30
31			---			A			---			32
33			---			B			---			34
35			---			C			---			36
37			---			A			---			38
39			---			B			---			40
41			---			C			---			42

TOTAL KVA: **70.22** | LTG 0.00 | AC 0.00 | 2nd HT 23.06 | MISC 5.50
TOTAL AMPS: **194.91** | REC 0.00 | AH 2.86 | KIT 0.00 | MTR1 0.00
HP 13.80 | PR HT 8.00 | WH 9.00 | MTR2 0.00

GFI=Ground Fault Breaker
AFI=Arc Fault Breaker
S/T=Shunt Trip Breaker
VH=High Interrupting Breaker

@ Denotes Circuit reserved for existing load to remain. If circuit is unused, label as "SPARE"

NEW PANEL BE — MAIN ELECTRICAL 012

SQUARE D TYPE: **NQ** AMPS: **60** MAIN: **MAIN LUGS ONLY (TOP)** No. of Ckts **30**
VOLTS (L–L): **208** L–N: **120** GND: **GROUND BUS** MOUNTING: **SURFACE**
PHASE: **3** WIRE: **4** AIC: **10K** ENCLOSURE: **NEMA 1**
OPTIONS: **HINGED TRIM** | ———— | ————

CKT No.	CKT BKR	BKR TYPE	LOAD TYPE	LOAD DESCRIPTION	LOAD KVA	PH	LOAD KVA	LOAD DESCRIPTION	LOAD TYPE	BKR TYPE	CKT BKR	CKT No.
1	20/1		LTG	EXIT LIGHTS & GTDs (B)	0.80	A	1.08	LIGHTS – STAIRS	LTG		20/1	2
3			LTG	EXIT LIGHTS & GTDs (1)	0.80	B	0.54	LIGHTS – DISPATCH	LTG			4
5			LTG	EXIT LIGHTS (2&3)	0.20	C	1.57	LIGHTS – CORR (B)	LTG			6
7			LTG	LIGHTS – EXEC CONF (3)	0.40	A	0.63	LIGHTS – CORR (1)	LTG			8
9			LTG	BLDG MTD LIGHTS	0.30	B	1.04	LIGHTS – CORR (2)	LTG			10
11			MISC	FAC	0.10	C	0.82	LIGHTS – CORR (3)	LTG			12
13			MISC	FAC	0.10	A		SPARE	---			14
15			---	SPARE		B			---			16
17			---			C			---			18
19			---			A			---			20
21			---			B			---			22
23			---			C			---			24
25			---			A			---			26
27			---			B			---			28
29			---			C			---			30
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TOTAL KVA: **8.38** | LTG 8.18 | AC 0.00 | 2nd HT 0.00 | MISC 0.20
TOTAL AMPS: **23.26** | REC 0.00 | AH 0.00 | KIT 0.00 | MTR1 0.00
HP 0.00 | PR HT 0.00 | WH 0.00 | MTR2 0.00

GFI=Ground Fault Breaker
AFI=Arc Fault Breaker
S/T=Shunt Trip Breaker
VH=High Interrupting Breaker

NEW PANEL "1B" — ELECTRICAL ROOM 106

SQUARE D TYPE: **NQ** AMPS: **200** MAIN: **MAIN LUGS ONLY (BOTTOM)** No. of Ckts **42**
VOLTS (L–L): **208** L–N: **120** GND: **GROUND BUS** MOUNTING: **SURFACE**
PHASE: **3** WIRE: **4** AIC: **10K** ENCLOSURE: **NEMA 1**
OPTIONS: **HINGED TRIM** | ———— | ————

CKT No.	CKT BKR	BKR TYPE	LOAD TYPE	LOAD DESCRIPTION	LOAD KVA	PH	LOAD KVA	LOAD DESCRIPTION	LOAD TYPE	BKR TYPE	CKT BKR	CKT No.
1	20/1		MISC	EXISTING LOADS @	0.50	A	3.00	EWH–EX @	PR HT		20/2	2
3			MISC	EXISTING LOADS @	0.50	B			---			4
5			MISC	EXISTING LOADS @	0.50	C	4.00	EWH–EX @	PR HT		30/2	6
7			MISC	EXISTING LOADS @	0.50	A			---			8
9			MISC	RECIRC PUMPS	0.50	B	4.00	EWH–EX @	PR HT		30/2	10
11			MISC	ILF–5	0.30	C			---			12
13			---	SPARE		A	2.83	EXISTING HP (BASE)	HP	***	25/2	14
15			---			B		HP–16 (ALTERNATE)	---			16
17			---			C	0.23	AH–16 ##	AH		40/2	18
19			---			A	5.76		2nd HT			20
21	15/2		AH	AH–11	0.40	B	4.50	HP–11	HP		30/2	22
23			---			C			---			24
25	45/3		AH	AH–3	0.76	A	6.00	HP–3	HP		35/3	26
27			2nd HT		11.53	B			---			28
29			---			C			---			30
31	50/3		---	SPARE		A	6.90	HP–4	HP		40/3	32
33			---			B			---			34
35			---			C			---			36
37	SPC		---	SPACE		A	6.00	HP–5	HP		35/3	38
39			---			B			---			40
41			---			C			---			42

TOTAL KVA: **58.71** | LTG 0.00 | AC 0.00 | 2nd HT 17.29 | MISC 2.80
TOTAL AMPS: **162.96** | REC 0.00 | AH 1.39 | KIT 0.00 | MTR1 0.00
HP 26.23 | PR HT 11.00 | WH 0.00 | MTR2 0.00

GFI=Ground Fault Breaker
AFI=Arc Fault Breaker
S/T=Shunt Trip Breaker
VH=High Interrupting Breaker

@ Denotes Circuit reserved for existing load to remain. If circuit is unused, label as "SPARE"
*** Breaker to be 50/2 under Base Bid (verify with existing unit), 25/2 under Altnerante
1B–18 to be Spare under Base Bid

NEW PANEL "BC" – PROVIDED BY UPS SUPPLIER — MAIN ELECTRICAL 012

SQUARE D TYPE: **NQ** AMPS: **80** MAIN: **MAIN LUGS ONLY (TOP)** No. of Ckts **30**
VOLTS (L–L): **208** L–N: **120** GND: **GROUND BUS** MOUNTING: **SURFACE**
PHASE: **3** WIRE: **4** AIC: **10K** ENCLOSURE: **NEMA 1**
OPTIONS: **HINGED TRIM** | **SEP INSULATED GND BUS** | ————

CKT No.	CKT BKR	BKR TYPE	LOAD TYPE	LOAD DESCRIPTION	LOAD KVA	PH	LOAD KVA	LOAD DESCRIPTION	LOAD TYPE	BKR TYPE	CKT BKR	CKT No.
1	20/1		---	RECEPT – POWER POLE	0.40	A	1.00	RECEPT – DISPATCH	REC		20/1	2
3			---	RECEPT – POWER POLE	0.40	B	1.00	RECEPT – DISPATCH	REC			4
5			---	RECEPT – POWER POLE	0.40	C	0.20	RECEPT – DISPATCH	REC			6
7			---	RECEPT – POWER POLE	0.40	A	0.20	RECEPT – DISPATCH	REC			8
9			---	DESK LIFT	0.20	B	1.00	RECEPT – OFFICE	REC			10
11			---	RECEPT – POWER POLE	0.40	C	1.00	RECEPT – FORENSICS	REC			12
13			---	RECEPT – POWER POLE	0.40	A	0.20	RECEPT – FORENSICS	REC			14
15			---	RECEPT – POWER POLE	0.40	B	0.20	RECEPT – FORENSICS	REC			16
17			---	RECEPT – POWER POLE	0.40	C	0.20	RECEPT – FORENSICS	REC			18
19			---	DESK LIFT	0.20	A		SPARE	---			20
21			---	SPARE		B			---			22
23			---			C			---			24
25			---			A			---			26
27			---			B			---			28
29			---			C			---			30
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TOTAL KVA: **8.60** | LTG 0.00 | AC 0.00 | 2nd HT 0.00 | MISC 0.00
TOTAL AMPS: **23.87** | REC 5.00 | AH 0.00 | KIT 0.00 | MTR1 0.00
HP 0.00 | PR HT 0.00 | WH 0.00 | MTR2 0.00

GFI=Ground Fault Breaker
AFI=Arc Fault Breaker
S/T=Shunt Trip Breaker
VH=High Interrupting Breaker

PANEL "BF" — ARMORY/SUPPLY 016

SQUARE D TYPE: **I–LINE** AMPS: **400** MAIN: **MAIN CKT BKR (TOP)** No. of Ckts **48**
VOLTS (L–L): **208** L–N: **120** GND: **GROUND BUS** MOUNTING: **SURFACE**
PHASE: **3** WIRE: **4** AIC: **10K** ENCLOSURE: **NEMA 1**
OPTIONS: ———— | **SEP INSULATED GND BUS** | ————

CKT No.	CKT BKR	BKR TYPE	LOAD TYPE	LOAD DESCRIPTION	LOAD KVA	PH	LOAD KVA	LOAD DESCRIPTION	LOAD TYPE	BKR TYPE	CKT BKR	CKT No.
1	20/1		MISC	GEN. BATT'Y CHARGER	0.50	A	1.00	RECIRC. PUMPS	MISC		20/1	2
3			MISC	GEN. HEATER	0.50	B	0.50	RECIRC. PUMP	MISC			4
5			---	SPARE		C	0.25	RP–1	WH			6
7	90/3		AC	APC RACK MTD HVAC	15.00	A	1.20	AH–8,AH–9,AH–10	AH		15/2	8
9			---			B			---			10
11			---			C	2.75	HP–8	HP		20/2	12
13	90/3		AC	APC RACK MTD HVAC	15.00	A			---			14
15			---			B	2.75	HP–9	HP		20/2	16
17			---			C			---			18
19	100/3		---	SPARE		A	2.75	HP–10	HP		20/2	20
21			---			B			---			22
23			---			C	9.00	WH–1	WH		60/2	24
25	225/3		MISC	UPS1	40.00	A			---			26
27			---	(50KVA @ 80%)		B		SPARE	---		30/2	28
29			---			C			---			30
31	SPC		---	SPACE		A	2.70	LIFT STATION	MISC		15/3	32
33			---			B			---			34
35			---			C			---			36
37			---			A	5.00	CU–APC	AC		35/3	38
39			---			B			---			40
41			---			C			---			42
43			---			A	5.00	CU–APC	AC		35/3	44
45			---			B			---			46
47			---			C			---			48
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TOTAL KVA: **103.90** | LTG 0.00 | AC 40.00 | 2nd HT 0.00 | MISC 45.20
TOTAL AMPS: **288.40** | REC 0.00 | AH 1.20 | KIT 0.00 | MTR1 0.00
HP 8.25 | PR HT 0.00 | WH 9.25 | MTR2 0.00

GFI=Ground Fault Breaker
AFI=Arc Fault Breaker
S/T=Shunt Trip Breaker
VH=High Interrupting Breaker

NEW PANEL "1C" — ELECTRICAL ROOM 106

SQUARE D TYPE: **NQ** AMPS: **80** MAIN: **MAIN LUGS ONLY (TOP)** No. of Ckts **30**
VOLTS (L–L): **208** L–N: **120** GND: **GROUND BUS** MOUNTING: **SURFACE**
PHASE: **3** WIRE: **4** AIC: **10K** ENCLOSURE: **NEMA 1**
OPTIONS: ———— | ———— | ————

CKT No.	CKT BKR	BKR TYPE	LOAD TYPE	LOAD DESCRIPTION	LOAD KVA	PH	LOAD KVA	LOAD DESCRIPTION	LOAD TYPE	BKR TYPE	CKT BKR	CKT No.
1	20/1		REC	RECEPT – DEM. WALLS	0.20	A	0.80	RECEPT – CUBICLE	REC		20/1	2
3			REC	RECEPT – DEM. WALLS	0.80	B	0.80	RECEPT – CUBICLE	REC			4
5			REC	RECEPT – DEM. WALLS	1.20	C	0.80	RECEPT – CUBICLE	REC			6
7			REC	RECEPT – DEM. WALLS	0.20	A	0.80	RECEPT – CUBICLE	REC			8
9			REC	RECEPT – DEM. WALLS	0.60	B	0.80	RECEPT – CUBICLE	REC			10
11			REC	RECEPT – DEM. WALLS	1.00	C	0.80	RECEPTACLE	REC			12
13			REC	RECEPT – DEM. WALLS	0.80	A	1.00	RECEPTACLE	REC			14
15			---	SPARE		B	1.20	RECEPTACLE	REC			16
17			---			C	1.40	RECEPTACLE	REC			18
19			---			A	0.40	RECEPTACLE	REC			20
21			---			B	0.80	EXISTING LOAD @	REC			22
23			---			C	0.80	EXISTING LOAD @	REC			24
25			---			A	0.80	EXISTING LOAD @	REC			26
27			---			B		SPARE	---			28
29			---			C			---			30
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TOTAL KVA: **16.00** | LTG 0.00 | AC 0.00 | 2nd HT 0.00 | MISC 0.00
TOTAL AMPS: **44.41** | REC 16.00 | AH 0.00 | KIT 0.00 | MTR1 0.00
HP 0.00 | PR HT 0.00 | WH 0.00 | MTR2 0.00

GFI=Ground Fault Breaker
AFI=Arc Fault Breaker
S/T=Shunt Trip Breaker
VH=High Interrupting Breaker

@ Denotes Circuit reserved for existing load to remain. If circuit is unused, label as "SPARE"

PANELBOARDS – SHEET E605:

PANEL "BA"
PANEL "BB"
PANEL "BC"
PANEL "BD"
PANEL "BE"
PANEL "BF"
PANEL "1A"
PANEL "1B"
PANEL "1C"

BID SET C14003

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SOUTH CAROLINA PROFESSIONAL ENGINEER No. 18744 CHRIS PARTRICH 3/20/2014

1600 HAMPTON ST. ANNEX RENOVATION
[TENANT UPFIT PACKAGE]
DIVISION OF LAW ENFORCEMENT & SAFETY (DLES)
UNIVERSITY OF SOUTH CAROLINA

REVISIONS:

DRAWN BY:

CHECKED BY: CLP

COMM NO: 12113

DATE: 3/13/2014

SHEET TITLE: PANEL SCHEDULES

SHEET NO: E605

EXISTING PANEL "2A"

ELECTRICAL ROOM 200A

SQUARE D TYPE: | AMPS: 200 | MAIN: MAIN LUGS ONLY (BOTTOM) | No. of Ckts 42
VOLTS (L–L): 208 | L–N: 120 | GND: GROUND BUS | MOUNTING: SURFACE
PHASE: 3 | WIRE: 4 | AIC: | ENCLOSURE: NEMA 1

OPTIONS: ----------

CKT No.	CKT BKR	BKR TYPE	LOAD TYPE	LOAD DESCRIPTION	LOAD KVA	PH	LOAD KVA	LOAD DESCRIPTION	LOAD TYPE	BKR TYPE	CKT BKR	CKT No.
1	20/1	EXIST	LTG	LIGHTS	1.06	A	1.04	LIGHTS – CORR (2)	LTG	EXIST	20/1	2
3		EXIST	LTG	LIGHTS	0.91	B	0.39	LIGHTS	LTG	EXIST		4
5		EXIST	LTG	LIGHTS	1.03	C		SPARE	---	EXIST		6
7		EXIST	REC	RECEPT – DEM. WALLS	0.80	A	0.80	RECEPT – CUBICLE	REC	EXIST		8
9		EXIST	REC	RECEPT – DEM. WALLS	0.80	B	0.80	RECEPT – CUBICLE	REC	EXIST		10
11		EXIST	REC	RECEPT – DEM. WALLS	0.80	C	0.80	RECEPT – CUBICLE	REC	EXIST		12
13		EXIST	REC	RECEPT – DEM. WALLS	0.80	A	0.80	RECEPT – CUBICLE	REC	EXIST		14
15		EXIST	REC	RECEPT – DEM. WALLS	0.80	B	0.80	RECEPT – CUBICLE	REC	EXIST		16
17		EXIST	REC	RECEPT – DEM. WALLS	0.80	C	0.80	RECEPT – CUBICLE	REC	EXIST		18
19		EXIST	REC	RECEPT – DEM. WALLS	0.80	A	0.80	RECEPT – CUBICLE	REC	EXIST		20
21		EXIST	REC	RECEPT – DEM. WALLS	0.80	B	0.80	RECEPT – CUBICLE	REC	EXIST		22
23		EXIST	---	SPARE		C	0.80	RECEPT – CUBICLE	REC	EXIST		24
25		EXIST	---			A	0.60	RECEPTACLE	REC	EXIST		26
27	20/1	NEW	---			B		EXISTING LOAD ⓔ	MISC	EXIST	30/2	28
29		NEW	---			C			---			30
31		NEW	---			A		EXISTING LOAD ⓔ	MISC	EXIST	20/1	32
33		NEW	---			B		EXISTING LOAD ⓔ	MISC	EXIST		34
35		NEW	---			C		EXISTING LOAD ⓔ	MISC	EXIST		36
37		NEW	---			A	0.80	RECEPT – CUBICLE	REC	NEW	20/1	38
39		NEW	---			B	0.80	RECEPT – CUBICLE	REC	NEW		40
41		NEW	---			C	0.80	RECEPT – CUBICLE	REC	NEW		42

TOTAL KVA: **21.03** | LTG 4.43 | AC 0.00 | 2nd HT 0.00 | MISC 0.00
TOTAL AMPS: **58.37** | REC 16.60 | AH 0.00 | KIT 0.00 | MTR1 0.00
HP 0.00 | PR HT 0.00 | WH 0.00 | MTR2 0.00

GFI=Ground Fault Breaker
AFI=Arc Fault Breaker
S/T=Shunt Trip Breaker
VH=High Interrupting Breaker

ⓔ Denotes Circuit reserved for existing load to remain. If circuit is unused, label as "SPARE"

EXISTING PANEL "3A"

ELECTRICAL ROOM 300A

SQUARE D TYPE: | AMPS: 200 | MAIN: MAIN LUGS ONLY (BOTTOM) | No. of Ckts 42
VOLTS (L–L): 208 | L–N: 120 | GND: GROUND BUS | MOUNTING: SURFACE
PHASE: 3 | WIRE: 4 | AIC: | ENCLOSURE: NEMA 1

OPTIONS: ----------

CKT No.	CKT BKR	BKR TYPE	LOAD TYPE	LOAD DESCRIPTION	LOAD KVA	PH	LOAD KVA	LOAD DESCRIPTION	LOAD TYPE	BKR TYPE	CKT BKR	CKT No.
1	20/1	EXIST	REC	EXISTING LOADS ⓔ	0.50	A	0.80	RECEPT – DEM. WALLS	REC	EXIST	20/1	2
3		EXIST	REC	EXISTING LOADS ⓔ	0.50	B	1.40	RECEPT – DEM. WALLS	REC	EXIST		4
5		EXIST	REC	EXISTING LOADS ⓔ	0.50	C	0.40	RECEPT – DEM. WALLS	REC	EXIST		6
7		EXIST	REC	RECEPT – DEM. WALLS	0.80	A	0.60	RECEPT – DEM. WALLS	REC	EXIST		8
9		EXIST	REC	RECEPT – DEM. WALLS	0.80	B	0.80	RECEPT – DEM. WALLS	REC	EXIST		10
11		EXIST	REC	RECEPT – DEM. WALLS	0.80	C	0.80	RECEPT – DEM. WALLS	REC	EXIST		12
13		EXIST	REC	RECEPT – DEM. WALLS	0.80	A	0.60	RECEPT – DEM. WALLS	REC	EXIST		14
15		EXIST	REC	RECEPT – DEM. WALLS	0.80	B	0.80	RECEPT – DEM. WALLS	REC	EXIST		16
17		EXIST	REC	RECEPT – DEM. WALLS	0.80	C	0.60	RECEPT – DEM. WALLS	REC	EXIST		18
19		EXIST	---	SPARE		A		SPARE	---	EXIST		20
21		EXIST	---			B			---	EXIST		22
23		EXIST	---			C			---	NEW		24
25		EXIST	MISC	ILF–7	0.35	A	3.17	HP–7	HP	NEW	15/3	26
27	25/3	NEW	HP	HP–6	4.61	B			---			28
29			---			C			---			30
31			---			A	2.75	HP–14	HP	EXIST	20/2	32
33	100/3	NEW	---	PANEL 3B	29.81	B			---			34
35			---			C	2.75	HP–15	HP	NEW	20/2	36
37			---			A			---			38
39	20/1	EXIST	---	SPARE		B	0.17	AH–14,AH–15	AH	NEW	15/2	40
41		EXIST	---			C			---			42

TOTAL KVA: **56.71** | LTG 0.00 | AC 0.00 | 2nd HT 0.00 | MISC 0.35
TOTAL AMPS: **157.41** | REC 13.10 | AH 0.17 | KIT 0.00 | MTR1 0.00
HP 13.28 | PR HT 0.00 | WH 0.00 | MTR2 0.00

GFI=Ground Fault Breaker
AFI=Arc Fault Breaker
S/T=Shunt Trip Breaker
VH=High Interrupting Breaker

ⓔ Denotes Circuit reserved for existing load to remain. If circuit is unused, label as "SPARE"

NEW PANEL "3B"

ELECTRICAL ROOM 300A

SQUARE D TYPE: NQ | AMPS: 100 | MAIN: MAIN LUGS ONLY (BOTTOM) | No. of Ckts 42
VOLTS (L–L): 208 | L–N: 120 | GND: GROUND BUS | MOUNTING: SURFACE
PHASE: 3 | WIRE: 4 | AIC: 10K | ENCLOSURE: NEMA 1

OPTIONS: HINGED TRIM ----------

CKT No.	CKT BKR	BKR TYPE	LOAD TYPE	LOAD DESCRIPTION	LOAD KVA	PH	LOAD KVA	LOAD DESCRIPTION	LOAD TYPE	BKR TYPE	CKT BKR	CKT No.
1	30/2		MISC	EXISTING LOADS ⓔ	2.00	A	0.25	RECIRC. PUMP	MISC		20/1	2
3			---			B	0.80	RECEPT – CUBICLE	REC			4
5	20/1		MISC	EXISTING LOADS ⓔ	0.50	C	0.80	RECEPT – CUBICLE	REC			6
7			MISC	EXISTING LOADS ⓔ	0.50	A	0.80	RECEPT – CUBICLE	REC			8
9			MISC	EXISTING LOADS ⓔ	0.50	B	0.80	RECEPT – CUBICLE	REC			10
11			MISC	EXISTING LOADS ⓔ	0.30	C	0.80	RECEPT – CUBICLE	REC			12
13			MISC	EXISTING LOADS ⓔ	0.50	A	0.80	RECEPT – CUBICLE	REC			14
15	15/2		AH	AH–12	0.10	B	0.60	RECEPTACLE	REC			16
17			---			C	0.40	RECEPTACLE	REC			18
19	20/2		HP	HP–12	3.30	A	0.40	RECEPTACLE	REC			20
21			---			B	0.60	RECEPTACLE	REC			22
23	45/2		AH	AH–6	0.50	C	0.40	RECEPTACLE	REC			24
25			2nd HT		7.20	A	0.40	RECEPTACLE	REC			26
27	40/2		AH	AH–7	0.40	B	0.40	RECEPTACLE	REC			28
29			2nd HT		5.76	C		SPARE	---			30
31	SPC		---	SPACE		A			---			32
33			---			B			---			34
35			---			C			---			36
37			---			A			---			38
39			---			B			---			40
41			---			C			---			42

TOTAL KVA: **29.81** | LTG 0.00 | AC 0.00 | 2nd HT 12.96 | MISC 4.55
TOTAL AMPS: **82.74** | REC 8.00 | AH 1.00 | KIT 0.00 | MTR1 0.00
HP 3.30 | PR HT 0.00 | WH 0.00 | MTR2 0.00

GFI=Ground Fault Breaker
AFI=Arc Fault Breaker
S/T=Shunt Trip Breaker
VH=High Interrupting Breaker

ⓔ Denotes Circuit reserved for existing load to remain. If circuit is unused, label as "SPARE"

PANELBOARDS – SHEET E606:

PANEL "2A"
PANEL "3A"
PANEL "3B"

BID SET | C14003

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SOUTH CAROLINA
SIMS GROUP ENGINEERS, INC. No. C03104
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER
No. 18744
CHRIS PARTRICK
3/20/2014

1600 HAMPTON ST. ANNEX RENOVATION
[TENANT UPFIT PACKAGE]
DIVISION OF LAW ENFORCEMENT & SAFETY (DLES)
UNIVERSITY OF SOUTH CAROLINA

REVISIONS:

DRAWN BY:

CHECKED BY: CLP

COMM NO: 12113

DATE: 3/13/2014

SHEET TITLE:
PANEL SCHEDULES

SHEET NO: E606