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EXISTING TREES AND LANDSCAPE:

THIS ELECTRICAL DEMOLITION AND INSTALLATION WORK SHALL BE DONE IN COMPLETE COORDINATION WITH USC CAMPUS HORTICULTURE DIVISION. ALL TREES, SELECTED LANDSCAPE, AND THEIR ASSOCIATED ROOT SYSTEMS SHALL BE PROTECTED DURING THE CONSTRUCTION OF THIS PROJECT.










CONDUIT ROUTING SHOWN ON THESE DRAWINGS HAVE BEEN COORDINATED WITH THE BEST UNDERGROUND UTILITY INFORMATION AVAILABLE. THE ELECTRICAL CONTRACTOR SHALL OBTAIN THE SERVICES OF AN UTILITIES LOCATOR COMPANY AND MARK ALL UNDERGROUND LINES BEFORE DIGGING.

ANY DAMAGE TO TREES OR LANDSCAPING SHALL BE IMMEDIATELY REPORTED TO THE OWNER AND THE CONTRACTOR IS SUBJECT TO DAMAGE EXPENSES.

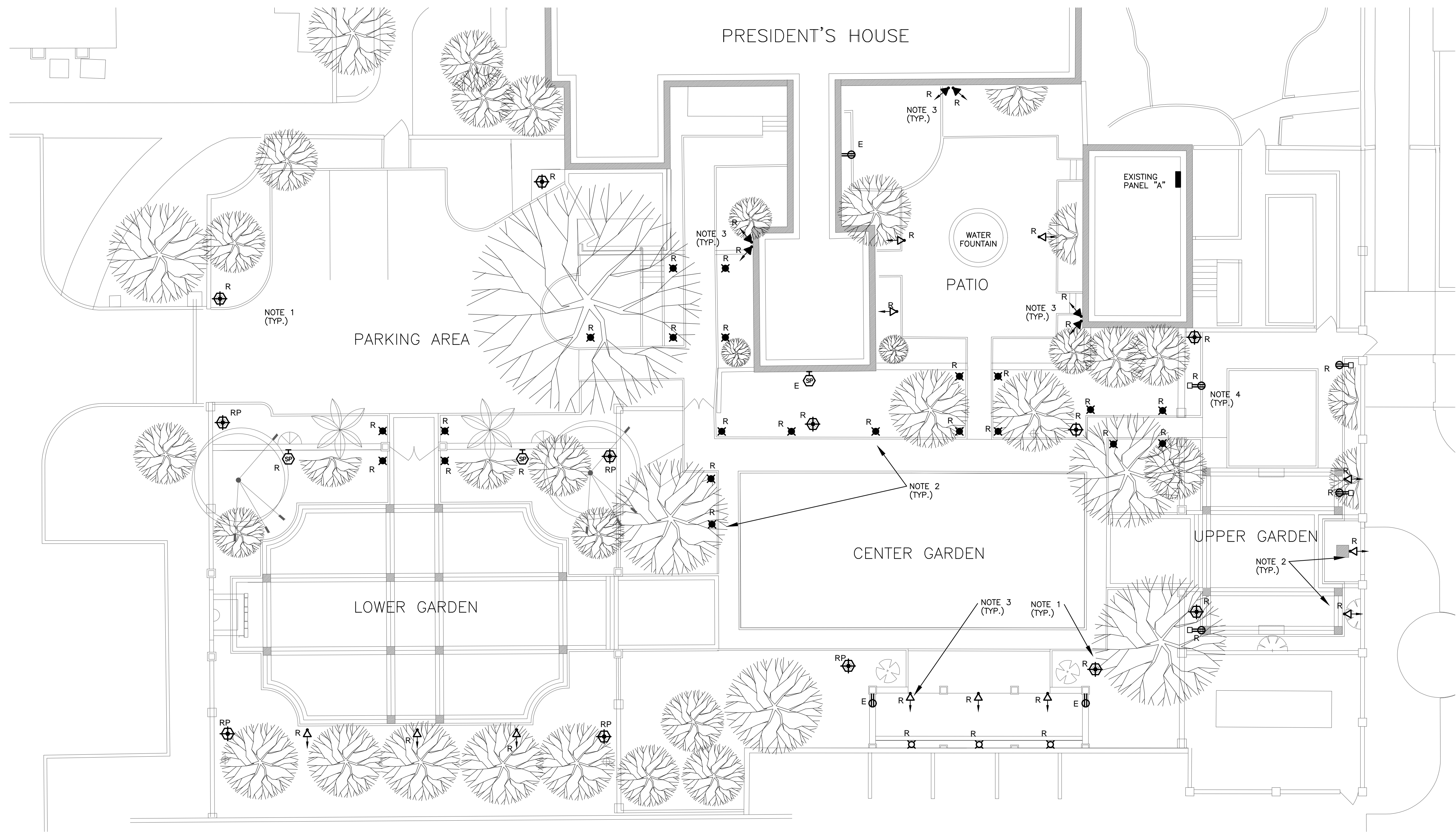
ELECTRICAL DEMOLITION NOTES

1. REMOVE ALL EXISTING POST TOP LANTERN FIXTURES AND TURN OVER TO OWNER. DELIVER TO DESIGNATED LOCATION ON CAMPUS. EXISTING POLES SHALL BE REUSED IN PRESENT LOCATION OR SLIGHTLY RELOCATED. ADDITIONAL POLES SHALL BE FURNISHED BY USC AND INSTALLED BY THIS CONTRACTOR. REMOVE EXISTING CONDUCTORS; EXISTING CONDUITS MAY BE USED IF NOT DAMAGED.
2. REMOVE ALL EXISTING LANDSCAPE LIGHTING FIXTURES AND ASSOCIATED CONDUCTORS/CONDUITS AS MUCH AS POSSIBLE WITHOUT DISTURBING EXISTING LANDSCAPING. ABANDON UNDERGROUND IF CONFLICT EXISTS IN REMOVAL.
3. REMOVE EXISTING WALL AND TRELIS MOUNTED FIXTURES AND ASSOCIATED CONDUCTORS/CONDUITS.
4. CLEAN EXISTING EXTERIOR POWER CONVENIENCE RECEPTACLES AND REPLACE ANY DAMAGED COMPONENTS INCLUDING WEATHERPROOF COVERS. AT COMPLETION OF PROJECT, ALL RECEPTACLES SHALL BE OPERATIONAL.

ELECTRICAL SYMBOL LEGEND

-  EXISTING POST TOP LANTERN AREA LIGHTING FIXTURE
-  EXISTING LOW LEVEL LANDSCAPE LIGHT
-  EXISTING GRADE MOUNTED LANDSCAPE SPOTLIGHT
-  EXISTING WALL MOUNTED FLOODLIGHT
-  EXISTING GRADE MOUNTED WALL WASH FIXTURE
-  EXISTING DUPLEX RECEPTACLE, WALL MOUNTED
-  EXISTING DUPLEX RECEPTACLE, GRADE MOUNTED BOX
-  EXISTING PANELBOARD
-  EXISTING OUTDOOR SPEAKER, WALL MOUNTED

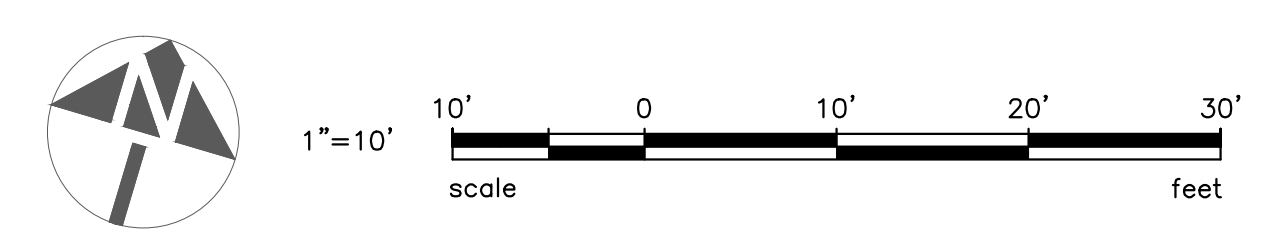
- E** DENOTES EXISTING FIXTURE/POLE TO REMAIN. PROTECT DURING CONSTRUCTION. REPLACE WITH NEW IF DAMAGED.
- R** DENOTES EXISTING FIXTURE TO BE REMOVED BY THE ELECTRICAL CONTRACTOR AND TURNED OVER TO OWNER. POLE SHALL REMAIN IN PLACE (BASE BID) AND REUSED. PROVIDE NEW BRANCH CIRCUIT IN NEW CONDUIT.
- RP** DENOTES EXISTING FIXTURE TO BE REMOVED BY THE ELECTRICAL CONTRACTOR AND TURNED OVER TO OWNER. POLE SHALL BE RELOCATED SLIGHTLY (SEE RENOVATION PLAN ON DRAWING E2).



ALTERNATES NO. 1 & 2
SEE DRAWINGS E2 & E3 FOR DESCRIPTIONS OF ALTERNATE NO. 1 & 2.

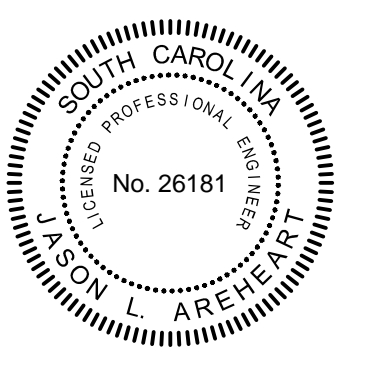
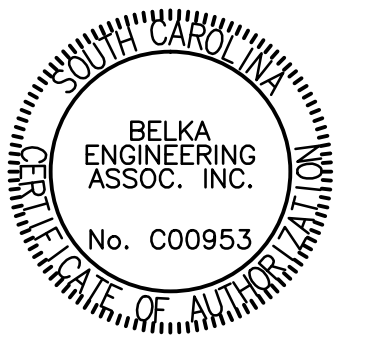
ELECTRICAL DRAWING INDEX	
E1	ELECTRICAL DEMOLITION PLAN
E2	LIGHTING RENOVATION PLAN
E3	SOUND SYSTEM INFRASTRUCTURE PLAN
E4	ELECTRICAL SPECIFICATIONS

1
E1 ELECTRICAL DEMOLITION PLAN
SCALE: 1" = 10'-0"



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NO. DATE REVISION

DRAWING TITLE:
ELECTRICAL DEMOLITION PLAN

PROJECT TITLE:
USC PRESIDENT'S GARDENS LIGHTING RENOVATION COLUMBIA, S.C.

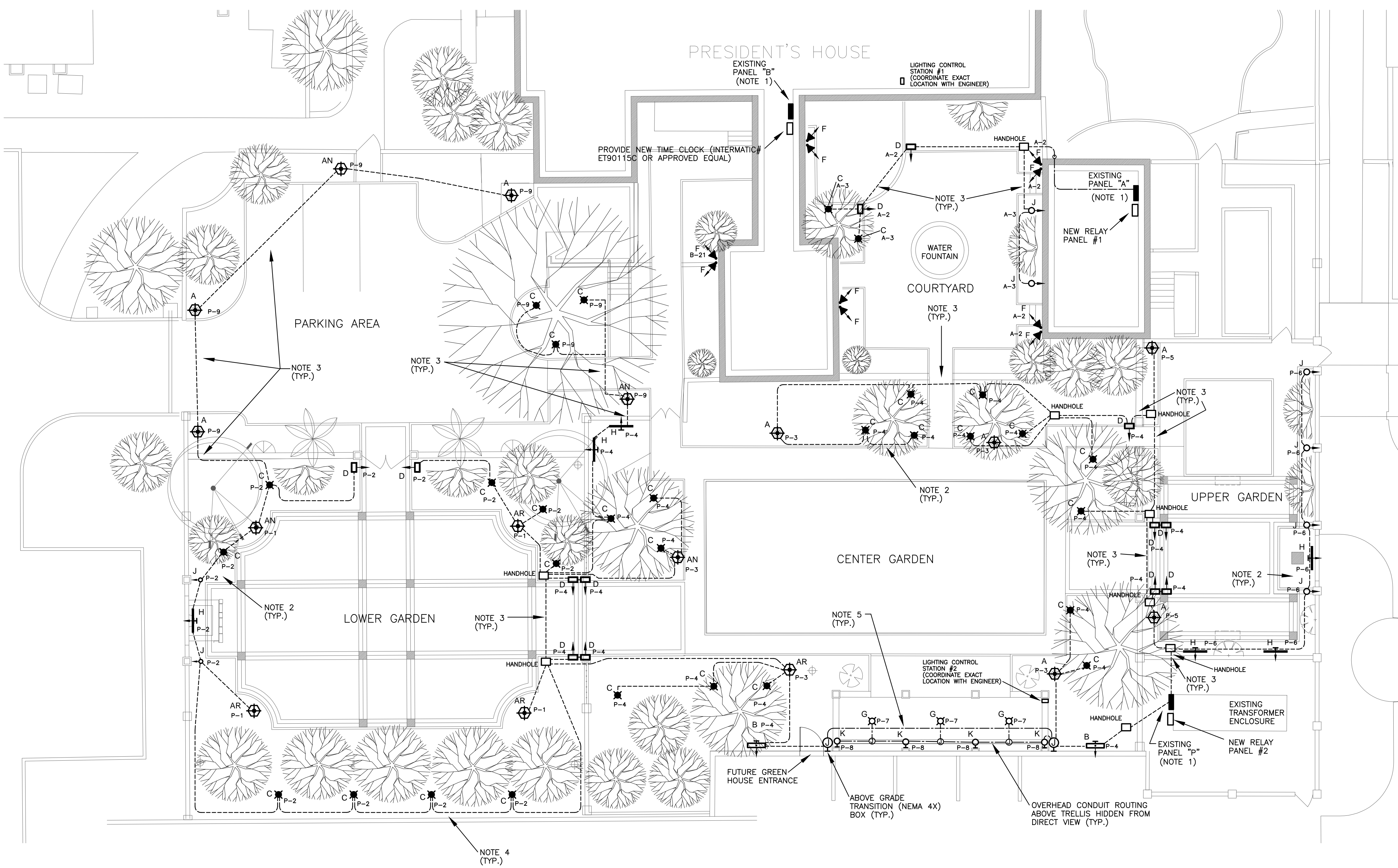
PROJECT NO.: US21313
DRAWING NO.: US21313E1
DRAWN BY: CES
CHECKED BY: JAS
DATE: 09/24/14
DRAWING NO.:

E1

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LIGHTING FIXTURE SCHEDULE										
SYMBOL	TYPE	DESCRIPTION	MANUFACTURER	MODEL NUMBER	OPTICAL ELEMENT	MOUNTING	VOLTS	LAMPING	INSTALLATION NOTES	
⊕	A	NEW LED POST TOP LANTERN ON EXISTING POLE IN SAME LOCATION	HOLOPHANE	ARE 70 35K AS G3 B S D	GLASS PRISMATIC REFRACTOR	EXISTING 10' POLE	120	LED - LUMENS/3500K WATTS	REMOVE EXISTING FIXTURE. PROVIDE NEW FIXTURE WITH NEW SLIP FITTER TENON COMPATIBLE WITH EXISTING POLE. ADJUST POLE AS REQUIRED TO BE PLUMB. CLEAN DIRT/DEBRIS FROM POLE AND PROVIDE HANDHOLE COVER IF MISSING.	
⊕	AN	NEW LED POST TOP LANTERN ON USC-SUPPLIED POLE	HOLOPHANE	ARE 70 35K AS G3 B S D	GLASS PRISMATIC REFRACTOR	EXISTING 10' POLE	120	LED - LUMENS/3500K WATTS	INSTALL OWNER-SUPPLIED POLE TO MATCH EXISTING. PROVIDE NEW FIXTURE WITH NEW SLIP FITTER TENON ON EXISTING POLE. CLEAN DIRT/DEBRIS FROM POLE AND PROVIDE HANDHOLE COVER IF MISSING.	
⊕	AR	NEW LED POST TOP LANTERN ON EXISTING POLE IN NEW LOCATION	HOLOPHANE	ARE 70 35K AS G3 B S D	GLASS PRISMATIC REFRACTOR	EXISTING 10' POLE	120	LED - LUMENS/3500K WATTS	REMOVE EXISTING FIXTURE AND RELOCATE EXISTING POLE TO NEW LOCATION. PROVIDE NEW FIXTURE WITH NEW SLIP FITTER TENON. SET POLE PLUMB. CLEAN DIRT/DEBRIS FROM POLE AND PROVIDE HANDHOLE COVER IF MISSING.	
★	B	LED LINEAR WALL WASH FIXTURE	CREE	FLD OL SN D2 07 E UL BK 700 35K	ACRYLIC LENS	ON GRADE	120	LED - LUMENS/3500K WATTS	PROVIDE 30"L x 12"W x 6"D CONCRETE PAD WITH TOP OF PAD 2" ABOVE GRADE. COORDINATE J-BOLT CONFIGURATION WITH MANUFACTURER. COORDINATE EXACT OFFSET DISTANCE FROM WALL WITH ENGINEER BEFORE INSTALLATION.	
★	C	LED TREE UPLIGHT FIXTURE	VISION 3	IG5C-BLT-STD-PC-GS-STD-LED-JA-117-0-0-0-GM	GLASS LENS	ON GRADE	120	LED - 300 LUMENS/3000K 10 WATTS	FIXTURE COMES WITH 6.25" POUR COLLAR. PROVIDE 3" CONCRETE ENCASEMENT AROUND FIXTURE AND INSTALL PARTIALLY IN GRADE WITH FIXTURE LENS AT 6" ABOVE GRADE. CHAMFER EDGES.	
□	D	LED SURFACE STEP LIGHT FIXTURE	VISION 3	PA7B-BLT-C1-S1-12-117-000	GLASS LENS	ON GRADE	120	LED - 300 LUMENS/3000K 10 WATTS	PROVIDE 8"L x 6"W x 6"D CONCRETE PAD WITH TOP OF PAD LEVEL WITH EXISTING SIDEWALK/PAVEMENT. STUB CONDUITS UP IN CENTER OF PAD TO FEED FIXTURE. COORDINATE J-BOLT CONFIGURATION WITH MANUFACTURER.	
	E	EXISTING LIGHTING FIXTURES TO REMAIN. CLEAN FIXTURE AND RE-LAMP.						120		
⬅	F	BUILDING MOUNT LED CYLINDER FLOODLIGHT	VISION 3	FL1A-X-C4F-K2-118-L3-0-0 M013A-X-DO-75-120	GLASS LENS	WALL	120	LED - 300 LUMENS/3000K 10 WATTS	USE EXISTING J-BOX WHERE AVAILABLE. PROVIDE NEW J-BOX WHERE REQUIRED AND CONCEAL CONDUIT. COORDINATE FINAL AIMING OF THESE FIXTURES WITH OWNER & ENGINEER.	
⊕	G	TRELLIS MOUNT LED CYLINDER FLOODLIGHT	VISION 3	DL3B-NAT-C2L-118-L3-0-0 AC4B-NAT-C4	GLASS LENS	STRUCTURE	120	LED - 300 LUMENS/3000K 10 WATTS	MOUNT FIXTURE IN CENTER OF TRELLIS BAY WITH B.O.F. SLIGHTLY BELOW TRELLIS. PROVIDE 100W LV TRANSFORMER (VISION 3 #XM2-100-120 OR APPROVED EQUAL) MOUNTED ON WALL HIDDEN FROM VIEW. ONE TRANSF. FOR TYPE "G" & "K" FIXTURES.	
★	H	LINEAR LED WALLWASH FIXTURE	LUMENPULSE	LOG ASHRAE 120 24 30K 30x60	POLYCARBONATE LENS	ON GRADE	120	LED - 500 LUMENS/3000K 10 WATTS	PROVIDE 30"L x 6"W x 6"D CONCRETE PAD WITH TOP OF PAD 2" ABOVE GRADE. COORDINATE J-BOLT CONFIGURATION WITH MANUFACTURER. COORDINATE EXACT OFFSET DISTANCE FROM WALL WITH ENGINEER BEFORE INSTALLATION.	
★	J	LED WALLWASH UPLIGHT FIXTURE	VISION 3	FL16A-BLT-C4-116-0-0-0	GLASS LENS	ON GRADE	120	LED - 300 LUMENS/3000K 10 WATTS	PROVIDE GRADE STAKE MOUNT ACCESSORY (#M01A-BLT-S1-12-0-0). STABILIZE MOUNTING WITH CONCRETE BELOW GRADE. CONFIRM EXACT LOCATION BELOW INSTALLATION. PROVIDE 100W LV TRANSFORMER (1 FOR UPPER, 1 FOR LOWER GARDEN).	
★	K	LED COLUMN LIGHT FIXTURE	VISION 3	WM1B-NAT-OR-M015-116-000	GLASS LENS	COLUMN	120	LED - 300 LUMENS/3000K 10 WATTS	MOUNT FIXTURE HIGH AS POSSIBLE ON BRICK COLUMN OF WALL. PROVIDE 100W LOW VOLTAGE TRANSFORMER (VISION 3 #XM2-100-120 OR APPROVED EQUAL) MOUNTED ON WALL HIDDEN FROM VIEW. ONE TRANSF. FOR TYPE "G" & "K" FIXTURES.	
R		EXISTING FIXTURE/POLE REMOVED BY THE ELECTRICAL CONTRACTOR AND TURNED OVER TO OWNER.								

★ DENOTES FIXTURES PROVIDED UNDER ALTERNATE NO. 1 (SEE ALTERNATE DESCRIPTION ON THIS DRAWING).



1 LIGHTING RENOVATION PLAN
SCALE: 1" = 10'-0"

EXISTING TREES AND LANDSCAPE:

EXTERIOR ELECTRICAL WORK ON THIS PROJECT SHALL BE DONE IN COMPLETE COORDINATION WITH USC CAMPUS HORTICULTURE DIVISION. ALL TREES, SELECTED LANDSCAPE, AND THEIR ASSOCIATED ROOT SYSTEMS SHALL BE PROTECTED. POLE & FIXTURE LOCATIONS AND NEW CONDUIT ROUTING IS SHOWN BASED ON EXISTING AS-BUILT DRAWINGS AND FIELD NOTES. ALL POLE LOCATIONS AND ALL CONDUIT ROUTING SHALL BE COMPLETELY COORDINATED IN A FORMAL MEETING ON SITE BEFORE WORK BEGINS. ONCE WORK BEGINS, CONTRACTOR SHALL COORDINATE PROGRESS OF WORK WITH OWNER, TREES AND THEIR ROOT SYSTEMS SHALL NOT BE DISTURBED OR DAMAGED.

ANY DAMAGE TO TREES OR LANDSCAPING SHALL BE IMMEDIATELY REPORTED TO THE OWNER AND THE CONTRACTOR IS SUBJECT TO DAMAGE EXPENSES.

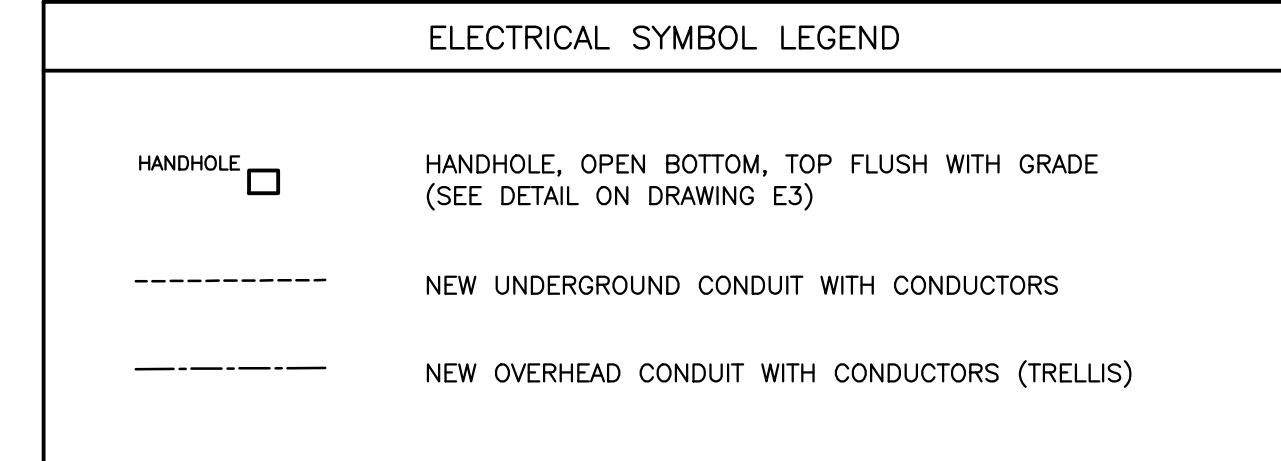
- LIGHTING NOTES**
- CIRCUIT NUMBERS ARE SHOWN FOR LOADING PURPOSES ONLY. REMOVE EXISTING LANDSCAPE LIGHTING CIRCUITS FED FROM BREAKERS IN EXISTING PANELS "A" AND "B". PROVIDE NEW LIGHTING FIXTURES AND FEED FROM EXISTING PANELS "A", "B" AND "P" AS INDICATED. CIRCUIT NUMBERS SHOWN ARE FOR LOADING PURPOSES ONLY; FIELD VERIFY ACTUAL CIRCUITS. PROVIDE UPDATED, TYPED PANEL DIRECTORIES FOR BOTH PANELS AFTER RENOVATION.
 - CLOSE-TO-GRADE LIGHTING FIXTURE LOCATIONS SHOWN ON THIS DRAWING ARE DIAGRAMMATIC. CONTRACTOR SHALL CONFIRM EXACT LOCATIONS WITH ENGINEER IN FIELD BEFORE ROUGH-IN. NEW CONDUIT ROUTINGS THROUGH EXISTING PLANTING BEDS SHALL BE COORDINATED WITH ENGINEER BEFORE INSTALLATION. THE USE OF TRENCHING MACHINERY IN PLANTING BEDS IS PROHIBITED WITHOUT SPECIFIC PERMISSION. MINIMUM COVER ON NEW CONDUITS SHALL BE 18 INCHES, BUT WHERE CONFLICTS WITH ROOT SYSTEMS ARE PRESENT, THAT MAY BE REDUCED TO 12 INCHES. SEE NOTE ON THIS DRAWING REGARDING DIGGING AROUND EXISTING TREES.
 - BORE UNDER EXISTING SIDEWALKS, WALLS, AND/OR PAVEMENT TO INSTALL CONDUITS IN THESE LOCATIONS.
 - IN THIS AREA THERE IS CRITICAL PLANT GROWTH. COORDINATE CONDUIT ROUTING WITH ENGINEER BEFORE DIGGING.
 - IN EXISTING TRELLIS, COORDINATE ROUTING WITH EXISTING STRUCTURE AND CONCEAL CONDUITS AS MUCH AS POSSIBLE.
 - THE CONTRACTOR SHALL CONTACT UNDERGROUND UTILITY LOCATING SERVICE (P.U.P.S) AND HAVE ALL EXISTING UNDERGROUND LINES MARKED BEFORE DIGGING.

LIGHTING CONTROL SCHEDULE

CIRCUIT	RELAY	DESCRIPTION
PANEL "P"	P-1	1 LOWER GARDEN POLES
	P-2	2 LOWER GARDEN ACCENT
	P-3	3 CENTER GARDEN POLES
	P-4	4 CENTER GARDEN ACCENT
	P-5	5 UPPER GARDEN POLES
	P-6	6 UPPER GARDEN ACCENT
	P-7	7 TRELLIS DOWNLIGHTS
	P-8	8 TRELLIS ACCENT
	P-9	9 PARKING AREA POLES/ACCENT
	P-10	10 SPARE
	P-11	11 SPARE
	P-12	12 SPARE
PANEL "A"	A-1	1A SPARE FLOODS
	A-2	2A COURTYARD FLOODS
	A-3	3A COURTYARD ACCENT
	A-4	4A SPARE
PANEL "B"	B-21	- ENTRY/SECURITY FLOODS - CONTROLLED WITH TIME CLOCK (APPROX. DUST TO DAWN)

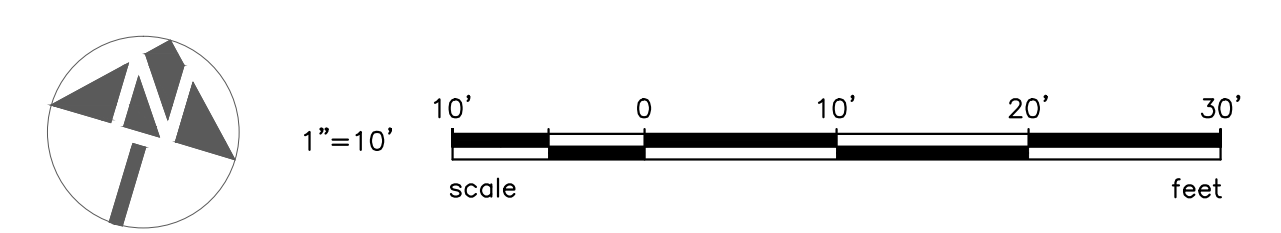
RELAY PANEL ZONE SCHEDULE

ZONE	RELAYS	CONTROLLED BY
A	1, 3, 5, 9	TIME CLOCK (APPROX. DUST TO DAWN)
B	2	CONTROL STATION #2
C	4	CONTROL STATION #2
D	6	CONTROL STATION #2
E	7, 8	CONTROL STATION #2
F	2A, 3A	CONTROL STATION #1



ALTERNATE NO. 1

AS PART OF THE BASE BID, THE CONTRACTOR SHALL PROVIDE ALL BREAKERS, CONDUCTORS, CONDUITS, BOXES, HANDHOLES, CONCRETE PADS, ALL HARDWARE, AND ASSOCIATED TRENCHING AND INSTALLATION. ALTERNATE NO. 1 SHALL BE PROVISION (FURNISH AND INSTALL) OF ALL LANDSCAPE LIGHTING FIXTURES (TYPES B, C, H, J, AND K) AND CONNECTION TO LIGHTING CONTROL SYSTEM. DUE TO SAFETY AND SECURITY CONCERNS, OTHER LANDSCAPE TYPE FIXTURES (TYPES D, F, AND G) SHALL BE PROVIDED AS PART OF BASE BID.



BEA
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PROFESSIONAL ENGINEER
No. 000953
SOUTH CAROLINA
No. 26181
SOUTH CAROLINA
No. 26181

REVISION NO. DATE

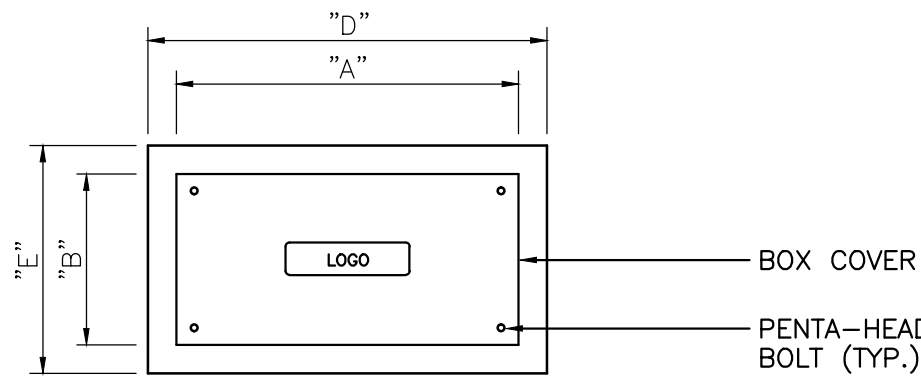
DRAWING TITLE: **LIGHTING RENOVATION PLAN**

PROJECT TITLE: **USC PRESIDENT'S GARDENS LIGHTING RENOVATION COLUMBIA, S.C.**

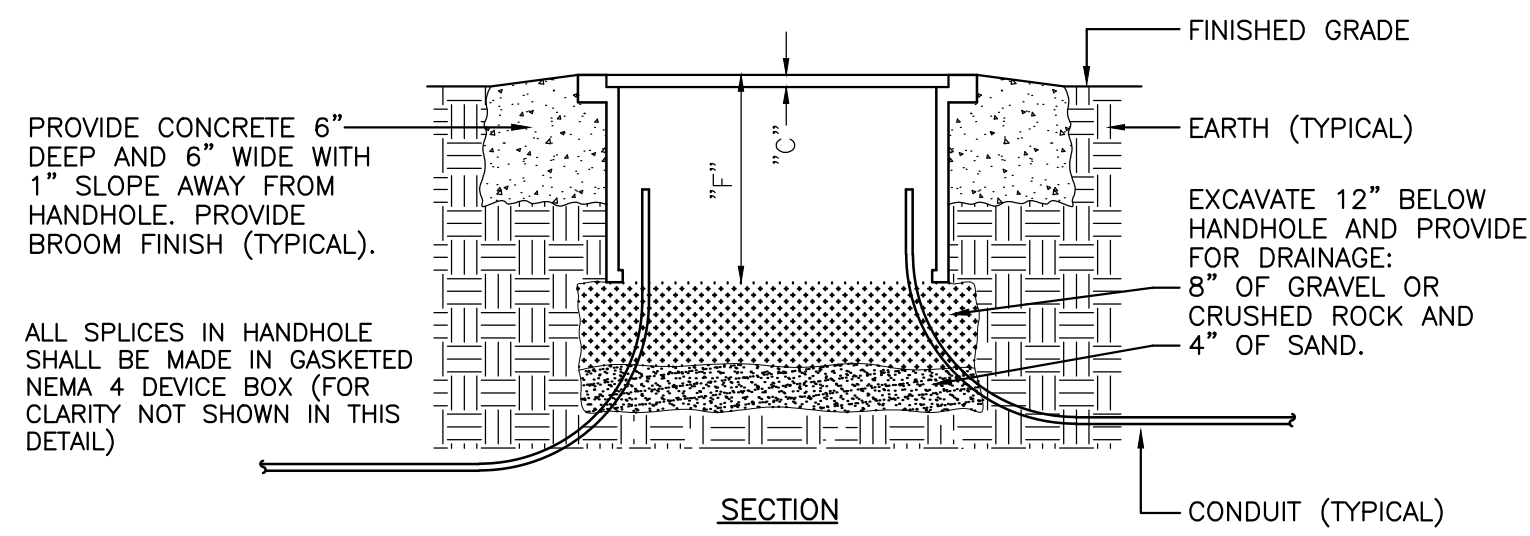
PROJECT NO.: US21313
DRAWING NO.: US21313E2
DRAWN BY: CES
CHECKED BY: JAS
DATE: 09/24/14
DRAWING NO.: **E2**

HANDHOLE NO.	BOX MODEL NO.	COVER MODEL NO.	PENTA BOLT NO.	DIMENSIONS					
				"A"	"B"	"C"	"D"	"E"	
HH-1	PC1118BG12	PC1118CG17 (LIGHTING)	UH0389AA (4 REQUIRED/BOX)	18.5"	11.5"	.75"	20.5"	13.5"	12.5"

NOTE: HANDHOLE MODEL NUMBERS IN SCHEDULE ARE QUOTE (PHONE: 800-348-3000) OR PRIOR APPROVED EQUAL. BOXES AND COVERS SHALL BE GREEN IN COLOR WITH LOGOS AS INDICATED BY PART NUMBER.



PLAN VIEW



SECTION

2 HANDHOLE DETAIL
SCALE: NONE

ALTERNATE NO. 2

THIS SCOPE OF WORK REFLECTED ON THIS DRAWING (EXCLUDING DETAILS) SHALL BE PRICED AS ALTERNATE NO. 2. THE SCOPE OF WORK INCLUDES THE INSTALLATION OF ALL SOUND SYSTEM RELATED INFRASTRUCTURE (CONDUITS AND OWNER-SUPPLIED CABLES).

EXISTING TREES AND LANDSCAPE:

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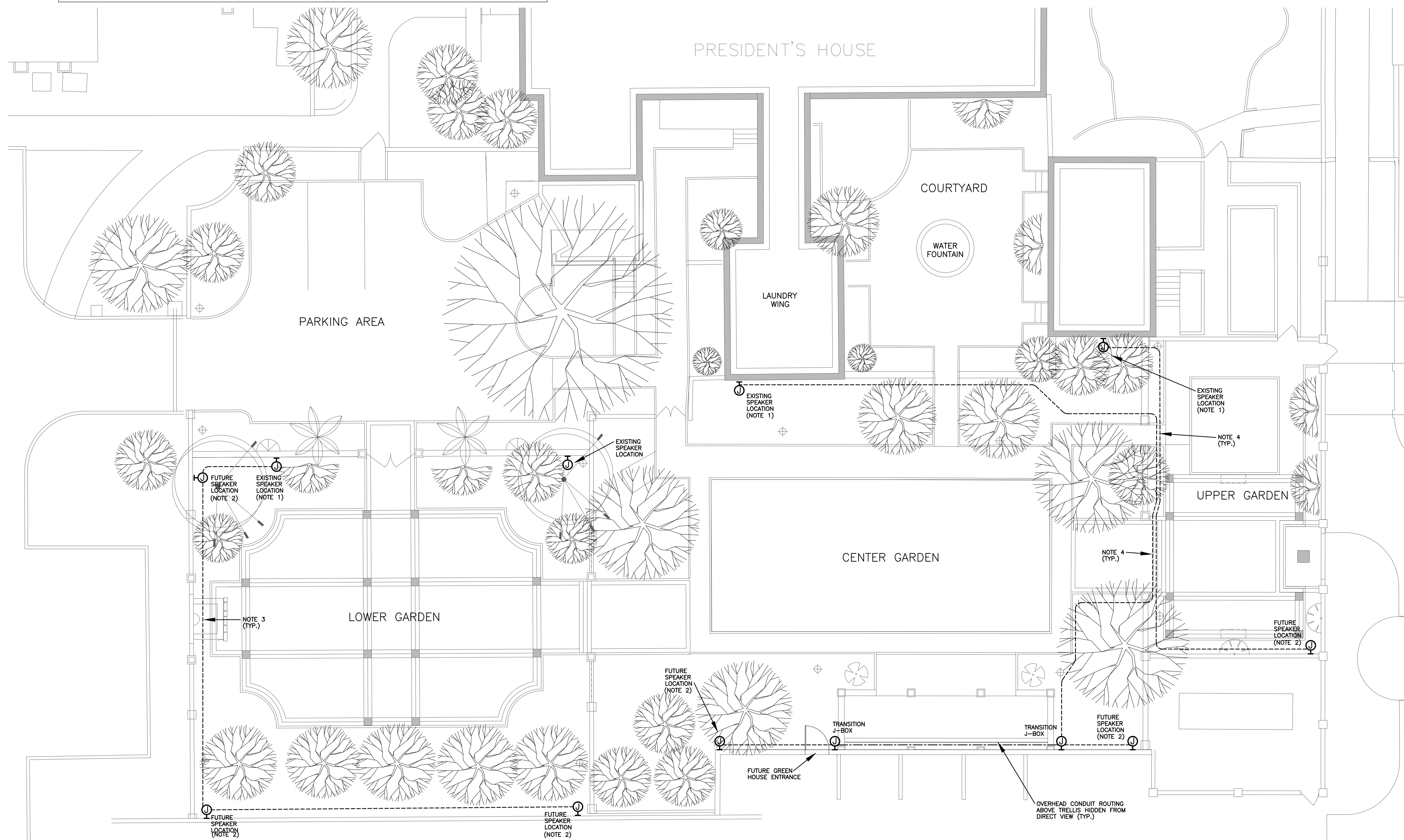
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INFRASTRUCTURE NOTES

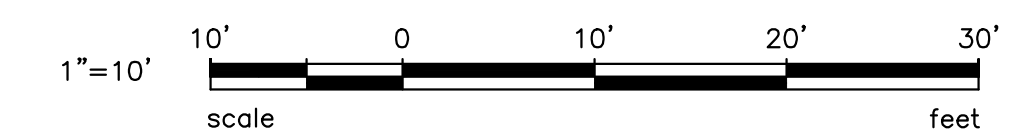
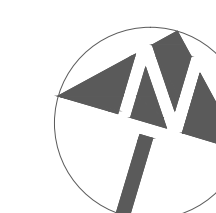
1. PROVIDE NEW 3/4" CONDUIT FROM EXISTING SOUND SYSTEM J-BOX TO FUTURE SPEAKER J-BOX LOCATIONS. PROVIDE RGS CONDUIT ABOVE GRADE WITH RGS LONG SWEEP ELBOWS. PROVIDE SCHEDULE 40 PVC UNDERGROUND. INSTALL OWNER (USC-UTS) SUPPLIED SPEAKER CABLE, PROVIDING SLACK WITH A LOOP AT EACH FUTURE SPEAKER J-BOX AND REPLACING HOME RUNS TO EXISTING EQUIPMENT LOCATED IN LAUNDRY WING OF HOUSE. PROVIDE 12" MINIMUM COVER ON UNDERGROUND CONDUITS.
2. PROVIDE FUTURE SPEAKER J-BOX AND INTERCONNECTING 3/4" CONDUIT (SEE NOTE 1 ABOVE).
3. PROVIDE A MINIMUM OF 12" SEPARATION BETWEEN POWER CONDUITS AND SPEAKER WIRING CONDUITS (CONGESTED AREA INDICATED).
4. BORE UNDER EXISTING SIDEWALKS AND WALLS TO INSTALL NEW CONDUIT.

SOUND SYSTEM INFRASTRUCTURE SYMBOL LEGEND

- 6"x6"x4" NEMA 4X J-BOX WITH BLANK COVER, MOUNTED 24" AFG (NEW OR EXISTING AS NOTED)
- NEW 3/4" UNDERGROUND CONDUIT AND OWNER-SUPPLIED SPEAKER CABLES INSTALLED BY ELECTRICAL CONTRACTOR
- NEW 3/4" OVERHEAD CONDUIT (ABOVE TRELIS) AND OWNER-SUPPLIED SPEAKER CABLES INSTALLED BY ELECTRICAL CONTRACTOR

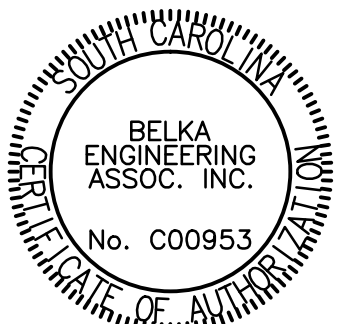


1 SOUND SYSTEM INFRASTRUCTURE PLAN
SCALE: 1" = 10'-0"



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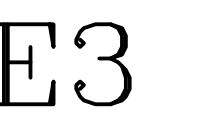
NO. DATE REVISION

DRAWING TITLE:
SOUND SYSTEM
INFRASTRUCTURE PLAN

PROJECT TITLE:
USC PRESIDENT'S GARDENS
LIGHTING RENOVATION
COLUMBIA, S.C.

PROJECT NO.: US21313
DRAWING NO.: US21313E3
DRAWN BY: CES
CHECKED BY: JAS
DATE: 09/24/14

DRAWING NO.:



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BASIC ELECTRICAL MATERIALS AND METHODS

- Coordinate arrangement, mounting, and support of electrical equipment:
 - To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
 - To provide for ease of disconnecting the equipment with minimum interference to other installations.
 - To allow right of way for piping and conduit installed at required slope.
 - So connecting raceways will be clear of obstructions and of the working and access space of other equipment.
- Comply with NECA 1.
- Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items. All devices shall be ADA-compliant.
- Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
- Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- Right of Way: Give to raceways and piping systems installed at a required slope.

CONDUCTORS AND CABLES

- Building wires and cables rated 600 V and less.
- Connectors, splices, and terminations rated 600 V and less.
- Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70-2011, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- Comply with NFPA 70-2011.
- Conductor Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - American Insulated Wire Corp.; a Leviton Company.
 - General Cable Corporation.
 - Senior Wire & Cable Company.
 - Southwire Company.
- Copper Conductors: Comply with NEMA WC 70.
- Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN.
- Connector Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - Hubbell Power Systems, Inc.
 - 0-Z/Gedney; EGS Electrical Group LLC.
 - 3M; Electrical Products Division.
 - Tyco Electronics Corp.
- Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.
- CONDUCTOR MATERIAL APPLICATIONS
 - Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS
 - Class 1 Control Circuits: Type THHN-THWN, in raceway.
- INSTALLATION OF CONDUCTORS AND CABLES
 - Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
 - Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
 - Support cables according to "Electrical Supports and Seismic Restraints."
 - Identify and color-code conductors and cables according to "Electrical Identification."
- CONNECTIONS
 - Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
 - Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
 - Wiring at Outlets: Install conductor at each outlet, with at least 6 inches (150 mm) of slack.
- LOW VOLTAGE CABLING
 - Provide low voltage cables as recommended by lighting fixture and control system manufacturers. All cables shall be in conduit.
 - Install owner-supplied sound system cable in conduit as indicated on drawing. Coordinate cable pulling guidelines with owner's representative so not to damage cables. Leave sufficient slack at each proposed speaker location.

GROUNDING AND BONDING

- Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70-2011, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- Comply with UL 467 for grounding and bonding materials and equipment.
- Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- CONNECTORS: Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.
- APPLICATIONS:
 - Conductors: Install solid conductor for No. 10 AWG and smaller, and stranded conductors for No. 8 AWG and larger, unless otherwise indicated.
- EQUIPMENT GROUNDING
 - Install insulated equipment grounding conductors with all branch circuits.
- INSTALLATION
 - Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
 - Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.

ELECTRICAL SUPPORTS AND SEISMIC RESTRAINTS

- Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.
- SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS
 - Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed under this Project, with a minimum structural safety factor of five times the applied force.
 - Steel Slotted Support Systems: Comply with MFMA-3, factory-fabricated components for field assembly.
 - Channel Dimensions: Selected for structural loading.
- Raceway Supports: As described in NECA 1.
- Conduit Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- Lighting fixtures shall be installed securely fastened to concrete poles, concrete pads, or concrete reinforced backfill.
- Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, upper truss chords of bar joists, or at concrete members.

RACEWAYS AND BOXES

- DEFINITIONS
 - EMT: Electrical metallic tubing.
 - LFMC: Liquidtight Flexible metal conduit.
- QUALITY ASSURANCE
 - Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70-2011, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 - Comply with NFPA 70-2011.
- METAL CONDUIT AND TUBING
 - EMT: ANSI C80.3.
 - LFMC: Plastic coated zinc-coated steel.
 - Fittings for Conduit (Including all Types) and EMT: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.
- Fittings for EMT: Steel, compression type.
- BOXES, ENCLOSURES, AND CABINETS
 - Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- RACEWAY APPLICATION
 - Comply with the following indoor applications, unless otherwise indicated:
 - Exposed, Not Subject to Physical Damage: EMT.
 - Concealed in Ceilings and Interior Walls and Partitions: EMT.
 - Exposed exterior connections: Liquidtight flexible conduit.
- Boxes and Enclosures: NEMA 250, Type 1 (indoor); Type 3R or 4 (outdoor).
- Minimum Raceway Size: 3/4-inch (21-mm).
- Raceway Fittings: Compatible with raceways and suitable for use and location. Retain first paragraph below for high-frequency installation.
- INSTALLATION
 - Comply with NECA 1 for installation requirements applicable to products specified in Part 2, except where requirements on this Article are stricter.
 - Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
 - Complete raceway installation before starting conductor installation.
 - Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
 - Flexible Conduit Connections: Use maximum of 72 inches (1830 mm) of flexible conduit for recessed and semi-recessed lighting fixtures, equipment subject to vibration, noise transmission, or movement.

ELECTRICAL IDENTIFICATION

- Comply with NFPA 70-2011.
- COORDINATION
 - Coordinate identification names, abbreviations, colors, and other features with requirements. Use consistent designations throughout Project.
 - Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
 - Coordinate installation of identifying devices with location of access panels and doors.
 - Install identifying devices before installing acoustical ceilings and similar concealment.
- CONDUCTOR AND CONTROL CABLE IDENTIFICATION MATERIALS
 - Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide.
 - Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
- Branch-Circuit Conductor Identification: Where there are conductors for more than three branch circuits in same junction or pull box, use color-coding conductor tape. Provide permanent stick-on label on each receptacle plate identifying panel and circuit number feeding receptacle.
- INSTALLATION
 - Verify identity of each item before installing identification products.
 - Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
 - Apply identification devices to surfaces that require finish after completing finish work.
 - Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- Provide updated, typed panel directories.
- Color shall be factory applied or, for sizes larger than No. 10 AWG if authorities having jurisdiction permit, field applied.
 - Colors for 120/208-V Circuits:
 - Phase A: Black.
 - Phase B: Red.
 - Phase C: Blue.
 - Neutral: White.
 - Ground: Green.
- Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches (150 mm) from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

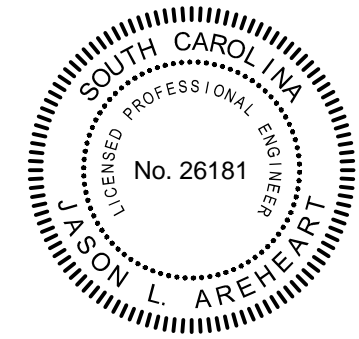
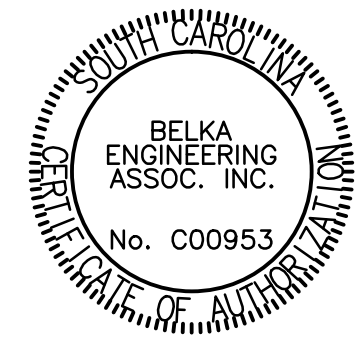
EXTERIOR LIGHTING

- SUBMITTALS - Provide submittals for all new lighting fixtures, as follows:
 - Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, finishes, and the following:
 - Physical description of lighting fixture including dimensions.
 - LED drivers and related components.
 - Energy-efficiency data.
 - Lighting Fixtures.
 - Structural members to which suspension systems for lighting fixtures will be attached.
- Operation and Maintenance Data: For lighting equipment and fixtures, operation, and maintenance manuals.
 - Special warranties specified in this Section.
- QUALITY ASSURANCE
 - Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70-2011, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 - Comply with NFPA 70-2011.
- COORDINATION
 - Coordinate layout and installation of lighting fixtures and foundations with other existing construction and underground utilities.
- MANUFACTURERS
 - Provide products listed in Lighting Fixture Schedule on the drawings or prior approved equals.
- LIGHTING FIXTURES AND COMPONENTS, GENERAL REQUIREMENTS
 - Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.
 - Comply with UL 1598.
 - Metal Parts: Free of burrs and sharp corners and edges.
 - Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.
 - Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.
- LIGHTING FIXTURE SUPPORT COMPONENTS
 - Comply with Division 26 Section "Electrical Supports and Seismic Restraints" for channel- and angle-iron supports and nonmetallic channel and angle supports.
 - Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage (2.68 mm).
- INSTALLATION
 - Lighting fixtures: Set level, plumb, and square with existing conditions.



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NO. DATE REVISION

DRAWING TITLE:
ELECTRICAL
SPECIFICATIONS

PROJECT TITLE:
USC PRESIDENT'S GARDENS
LIGHTING RENOVATION
COLUMBIA, S.C.

PROJECT NO.: US21313
DRAWING NO.: US21313E4
DRAWN BY: CES
CHECKED BY: JAS
DATE: 09/24/14

DRAWING NO.:

E4