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ELECTRICAL SPECIFICATIONS

General Provisions

1. All Electrical work shall be executed in accordance with the 2014 version of the National Electrical Code and all other local codes, laws, and ordinances. Where one code differs from another, the stricter of the two shall apply.
2. It is the duty of the Electrical contractor to be familiar with the construction details of the building. The contractor shall coordinate the installation of the electrical system with all other trades and shall complete the electrical installation as soon as conditions will allow.
3. Payment of all fees, permits, and licenses required to complete the electrical installation shall be the responsibility of the electrical contractor.
4. All work shall be done in a neat, quality manner with all wiring and raceways concealed.
5. All electrical work shall be warranted by the electrical contractor for one (1) year from the date of acceptance by the owner or his designated representative.
6. All electrical drawings are generally diagrammatic in nature. The electrical contractor shall closely coordinate all electrical work will all other trades working on the premises.
7. Electrical contractor shall submit five (5) sets of catalog cuts, brochures, or other technical data for all equipment furnished under this contract to the architect for his review.
8. All requests for prior approval shall be submitted to the engineer no later than ten (10) days prior to the bid date unless noted as "approved equal" in a written addendum. All manufactures shall be specified herein or as shown on the contract documents.
9. See general notes, schedules, and legends on the electrical drawing set for any additional requirements to the contract.
10. All electrical panelboards and lighting equipment shall be restrained per seismic requirements of the appropriate building code in effect.

Electrical Raceways

1. Conduit is to be installed between cabinets and boxes with no more than four (4) 90 degree bends. Conduit is to be securely fastened in place with straps, hangers and steel supports as required. Conduit is not to be fastened or supported from the ceiling grid or supporting wires. Conduit ends shall be reamed and conduit shall be thoroughly cleaned before installation. Openings in conduit shall be plugged or properly covered.
2. Conduit shall be furnished as shown on the electrical drawings. Approved types are heavy wall rigid steel hot dipped galvanized or EMT with compression type fittings and connections. All runs shall be continuous with all joints and connections pulled tight. Conduit shall be required in and under all slabs and in masonry walls. PVC conduit may be used underground or under slabs. Minimum conduit size shall be 3/4".
3. Contractor shall install a nylon pull wire in each empty conduit.
4. Contractor to include an equipment grounding conductor in each conduit. Conductor size to be determined by National Electrical Code requirements.

Conductors

1. Conductors shall be soft-annealed 98% copper. All conductors larger than #8 AWG shall be stranded. Minimum size conductor shall be #12 AWG unless otherwise specified. No aluminum conductors will be permitted. Type THHN shall not be used underground, outside, at service entrances or in wet locations. All insulation shall be rated at 600 volts.

The following insulation types are permitted:

#10 AWG and smaller THW,THWN,THW
#8 AWG to #4/0 AWG THW, THHN
Over 4/0 AWG THW
Service Entrance USE, RHW
Wire through fluorescent fixture or within 3' of heating equipment THHN

Conductors shall be color coded as follows:

	208/120 Volt Y	480/277 Volt Y
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	White
Ground	Green	Green

Distribution

1. Electrical power service voltage shall be as noted on the drawings. Size of the electrical service conductors shall be as shown on the riser diagram. All service connections and grounding detail shall be per the National Electrical Code article 250 and shall be inspected before covering.
2. Contractor shall comply with the 2014 National Electrical Code and all laws that apply to electrical installations.
3. All material used on the project shall be new and conform to Underwriters Laboratories (UL) standards.
4. Contractor to verify voltage drops and A.I.C. ratings for all equipment connected and verify the size of all electrical system breakers, conduit, wire size, etc.

Grounding

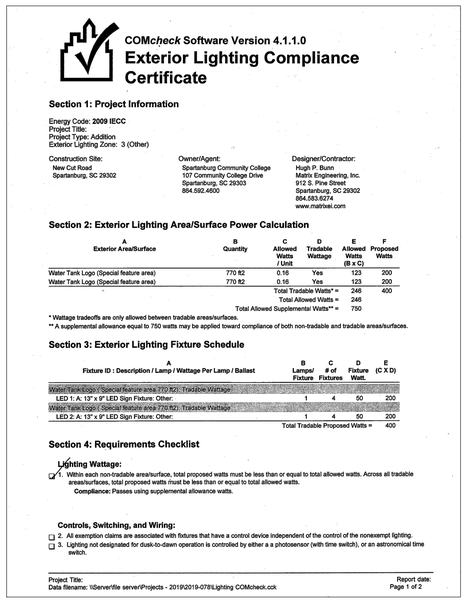
1. All metallic conduit, supports, cabinets, panelboards, and other electrical system components shall be permanently grounded per the National Electrical Code. All grounding devices and clamps shall be of the type approved specifically for grounding use. All circuits shall include a grounding conductor sized per National Electrical Code requirements.

Panelboards

1. Receptacle and lighting panels shall be safety dead-front type. Bussing and breakers shall be as shown on panelboard drawing. Panels shall be supplied with copper plated bus. Cabinets shall be NEMA type 3R. Contractor to supply nameplates and type-written panel schedules. Panel shall be manufactured by Square D General Electric, Cutler Hammer or approved equal.
2. All circuit breakers must show positive indication of tripped breaker.
3. All electrical equipment, panels, switches, etc., shall be tagged with white plastic nameplates with 1/4"H black letters. Nameplate shall show equipment designation and operating voltage.

Lighting Equipment

1. Lighting fixtures shall be of the type shown in the lighting fixture schedule.



COMcheck Software Version 4.1.1.0
Exterior Lighting Compliance Certificate

Section 1: Project Information

Energy Code: **2009 IECC**
Project Title:
Project Type: Addition
Exterior Lighting Zone: 3 (Other)

Construction Site:
New Cut Road
Spartanburg, SC 29302

Owner/Agent:
Spartanburg Community College
107 Community College Drive
Spartanburg, SC 29303
864.592.4600

Designer/Contractor:
Hugh P. Bunn
Matrix Engineering, Inc.
912 S. Pine Street
Spartanburg, SC 29302
864.583.6274
www.matrixei.com

Section 2: Exterior Lighting Area/Surface Power Calculation

A Exterior Area/Surface	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (B x C)	F Proposed Watts
Water Tank Logo (Special feature area)	770 ft2	0.16	Yes	123	200
Water Tank Logo (Special feature area)	770 ft2	0.16	Yes	123	200
			Total Tradable Watts* =	246	400
			Total Allowed Watts =	246	
			Total Allowed Supplemental Watts** =	750	

* Wattage tradeoffs are only allowed between tradable areas/surfaces.
** A supplemental allowance equal to 750 watts may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Section 3: Exterior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Water Tank Logo (Special feature area 770 ft2) : Tradable Wattage				
LED 1: A: 13" x 9" LED Sign Fixture: Other:	1	4	50	200
Water Tank Logo (Special feature area 770 ft2) : Tradable Wattage				
LED 2: A: 13" x 9" LED Sign Fixture: Other:	1	4	50	200
			Total Tradable Proposed Watts =	400

Section 4: Requirements Checklist

Lighting Wattage:

☑ 1. Within each non-tradable area/surface, total proposed watts must be less than or equal to total allowed watts. Across all tradable areas/surfaces, total proposed watts must be less than or equal to total allowed watts.
Compliance: Passes using supplemental allowance watts.

Controls, Switching, and Wiring:

☐ 2. All exemption claims are associated with fixtures that have a control device independent of the control of the nonexempt lighting.
☐ 3. Lighting not designated for dusk-to-dawn operation is controlled by either a photosensor (with time switch), or an astronomical time switch.

Project Title:
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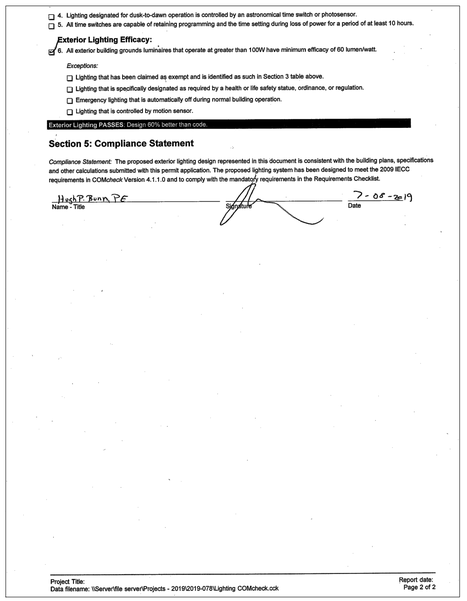
Report date:
Page 1 of 2



☐ 4. Lighting designated for dusk-to-dawn operation is controlled by an astronomical time switch or photosensor.
☐ 5. All time switches are capable of retaining programming and the time setting during loss of power for a period of at least 10 hours.

Exterior Lighting Efficacy:

☑ 6. All exterior building grounds luminaires that operate at greater than 100W have minimum efficacy of 60 lumen/watt.

Exceptions:

☐ Lighting that has been claimed as exempt and is identified as such in Section 3 table above.
☐ Lighting that is specifically designated as required by a health or life safety statue, ordinance, or regulation.
☐ Emergency lighting that is automatically off during normal building operation.
☐ Lighting that is controlled by motion sensor.

Exterior Lighting PASSES: Design 60% better than code.

Section 5: Compliance Statement

Compliance Statement: The proposed exterior lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 2009 IECC requirements in COMcheck Version 4.1.1.0 and to comply with the mandatory requirements in the Requirements Checklist.

Hugh P Bunn PE — Name - Title
Signature
7-08-2019 — Date

Project Title:
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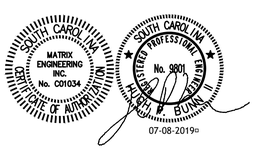
Report date:
Page 2 of 2



07-08-2019

REV	DATE	DESCRIPTION	DWN	CKD	APP
0	07-08-19	ISSUED FOR CONSTRUCTION & PERMITTING	JB	RM	HBP

CLIENT NAME LOCATION & DESCRIPTION

SPARTANBURG - NEW CUT ROAD
WATER TANK LOGO - LIGHTING
FOR
SPARTANBURG COMMUNITY COLLEGE

MATRIX ENGINEERING, INC.
912 SOUTH PINE STREET
SPARTANBURG, SOUTH CAROLINA 29302
(864)583-6274
www.matrixei.com

ELECTRICAL SPECIFICATIONS & COMCHECK

SCALE	NONE	DWG NO	E-3
DATE	JULY 8, 2019		
FILE NAME	E-3.dwg	PROJECT NO	2019-078
REV	0		