

# **TWR Lighting, Inc.** **MARK**<sup>®</sup>

*Enlightened Technology*<sup>®</sup>

10810 W. LITTLE YORK RD., STE. 130 - HOUSTON TX 77041-4051  
VOICE (713) 973-6905 - FAX (713) 973-9352  
web: [www.twrlighting.com](http://www.twrlighting.com)

## **IMPORTANT!!!**

**PLEASE TAKE THE TIME TO FILL OUT THIS FORM COMPLETELY. FILE IT IN A SAFE PLACE. IN THE EVENT YOU EXPERIENCE PROBLEMS WITH OR HAVE QUESTIONS CONCERNING YOUR CONTROLLER, THE FOLLOWING INFORMATION IS NECESSARY TO OBTAIN PROPER SERVICE AND PARTS.**

MODEL # AA2/3MLED230V

SERIAL # \_\_\_\_\_

PURCHASE DATE \_\_\_\_\_

PURCHASED FROM \_\_\_\_\_



# **TWR Lighting, Inc.** **HARK**

*Enlightened Technology*

## **AA2/3MLED230V CONTROLLER**

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**WARRANTY & RETURN POLICY**

**RETURN MERCHANDISE AUTHORIZATION (RMA) FORMS**



# **TWR Lighting, Inc.** HARK<sup>®</sup>

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## **AA2/3MLED230V CONTROLLER**

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# **TWR Lighting, Inc.** HARK<sup>®</sup>

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## **AA2/3MLED230V CONTROLLER**

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### **1.0 GENERAL INFORMATION**

The TWR Lighting<sup>®</sup>, Inc. (TWR<sup>®</sup>), Model AA2/3MLED230V, Controller is for A1 lighting of towers 351' to 700' above ground level (AGL) in accordance with the FAA Advisory Circular 70/7460-1K. One (1) LED beacon should be placed at the top and two (2) LED beacons at mid-level. Obstruction lights should be placed at the  $\frac{3}{4}$  and  $\frac{1}{4}$  intervals with respect to overall tower height.

The flash rate of the LED beacons is 30 per minute. The LED beacons flash synchronized to one another. The LED sidelights burn steady.

A by-pass switch (SW1) allows the controller to be turned on during daylight hours without covering the photocell. This is particularly helpful since the controller can be mounted indoors while the photocell is outdoors. SW1 can be operated by turning the switch up to "On" position.

The photocell is the three (3) blade, twist to lock, type.

Power supplied to the controller shall be 230V AC single phase.

The controller housing is rated at NEMA 4X. It is suitable for indoor or outdoor mounting.

Controller functions that are monitored by remote alarms in the form of dry contact closures (Form C) are as follows:

<b>POWER FAILURE</b>	Monitors 230V AC to the controller. Alarms in the event of power failure or tripped circuit breaker.
<b>LIGHTS "ON"</b>	Gives an indication whenever the controller is activated.
<b>LED BEACONS</b>	Will give an alarm in the event any of the LED beacons fail, along with visual indicator for that circuit.
<b>FLASHER FAILURE</b>	Will give an alarm in the event of failure of flasher.
<b>OBSTRUCTION LIGHTS</b>	Will give an alarm when one (1) of three (3) LED sidelights fails.

## **AA2/3MLED230V CONTROLLER**

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### **2.0 INSTALLATION INSTRUCTIONS**

#### **2.1 MOUNTING THE CONTROL CABINET**

(Refer to Drawing 1258-R)

The power supply control cabinet can be located at the base of the structure or in an equipment building. Mounting footprints are shown on drawing 1258-R. Power wiring to the control cabinet should be in accordance with local methods and National Electrical Codes (NEC).

2.1.1 If the control cabinet is mounted inside an equipment building, the photocell should be mounted vertically on ½” conduit outside the building above the eaves facing north. Wiring from the photocell socket to the control cabinet should consist of one (1) each, red, black, and white wires. The white wire is connected to the socket terminal marked “N,” the black wire is connected to the socket terminal marked “Li,” and the red wire is connected to the socket terminal marked “Lo.” Care must be taken to assure that the photocell does not “see” any ambient light that would prevent it from switching into the nightmode.

2.1.2 If the control cabinet is mounted outside an equipment building, the photocell should be mounted vertically on ½” conduit so the photocell is above the control cabinet. As above, the photocell should be positioned so that it does not “see” ambient light, which would prevent it from switching to the nightmode. The photocell wiring is the same as in 2.1.1.

2.1.3 The wiring from the photocell, the service breaker, the red LED beacons, and the LED sidelights should enter the control cabinet through the watertight connectors in the bottom of the cabinet. Inside the cabinet, the connections will be made on the terminal strips and circuit breakers located at the bottom of the chassis. These connections are made as follows:



## **AA2/3MLED230V CONTROLLER**

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### **2.2 EXTERNAL PHOTOCELL WIRING**

(Refer to Drawing 1258-R)

2.2.1 Connect the **BLACK** wire from the photocell to terminal block TB2 marked "L."

2.2.2 Connect the **RED** wire from the photocell to terminal block TB2 marked "SSR."

2.2.3 Connect the **WHITE** wire from the photocell to terminal block TB2 marked "N."

### **2.3 POWER WIRING**

(Refer to Drawing 1258-R)

2.3.1 Power wiring to the control cabinet should be in accordance with local methods and National Electrical Codes.

2.3.2 Circuit breaker needs to be a one (1) pole common trip rated at 10 amps.

2.3.3 Connect incoming 230V AC "Hot" to terminal block TB1 marked "L."

2.3.4 Connect the neutral wire(s) to one (1) of the terminal blocks on TB1 marked "N."

2.3.5 Connect the AC ground to the aluminum mounting plate.

### **2.4 LED BEACONS AND LED SIDELIGHTS WIRING**

(Refer to Drawings 1258-R, 801-01, or 801-02)

2.4.1 Connect the **BLACK** wire from LED Beacon #1 to the circuit breaker marked "B1."

2.4.2 Connect the **BLUE** wire from LED Beacon #2 and LED Beacon #3 to the circuit breaker marked "B2-B3."

2.4.3 Connect the **RED** wire from LED Beacon #3 to the circuit breaker marked "S1."

## **AA2/3MLED230V CONTROLLER**

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- 2.4.4 Connect the **YELLOW** wire from LED sidelight group #2 to the circuit breaker marked "S2."
- 2.4.5 Connect the **WHITE** neutral wire(s) to one (1) or more of the terminals marked "N."
- 2.4.5 Connect the ground wires to the ground lug located to the left of "TB2."

### **2.5 LED BEACONS AND LED SIDELIGHTS ALARM WIRING**

(Refer to Drawings 1258-R and 1258-S)

- 2.5.1 Alarm relays K1-K3, and alarm Modules M2, M3, M4, and M5, are provided for independent contact closures for: Power Failure, Lights "On," Flasher Failure, B1 Burnout, B2-B3 Burnout, S1 Lamp Burnout, and S2 Lamp Burnout.
- 2.5.2 Alarm Wiring: To utilize all of the red light alarms, the customer will need seven (7) pairs of wires to interface with his alarm device. One (1) wire from each of the seven (7) pairs will terminate at the points marking common (C). The remaining wire from each pair will terminate as follows:

**Power Failure Alarm:** Connect to relay K1, terminal #3, for normally open (OR) terminal #6, for normally closed monitoring.

**Lights "On" Alarm:** Connect to relay K2, terminal #3, for normally open (OR) terminal #6, for normally closed monitoring.

**Flasher Failure:** Connect to relay K3, terminal #6, for normally open (OR) terminal #3, for normally closed monitoring.

**B1 Burnout:** Connect to module M4, terminal #22, for normally open (OR) terminal #24, for normally closed monitoring.

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**B2 and B3 Burnout:** Connect to module M5, terminal #22, for normally open (OR) terminal #24, for normally closed monitoring.

**S1 Lamp Burnout:** Connect to module M4, terminal #22, for normally open (OR) terminal #24, for normally closed monitoring.

**S2 Lamp Burnout** Connect to module M3, terminal #22, for normally open (OR) terminal #24, for normally closed monitoring.

2.5.3 Alarm Testing: To test alarms, follow the procedures using an “ohm” meter between alarm common and alarm points.

**Power Failure:** Pull circuit breaker at electrical panel.

**Lights “On”:** Operate photocell by-pass switch SW1 or cover the photocell.

**LED Beacons and LED Sidelights:**  
Trip breakers on the controller panel.

**AA2/3MLED230V CONTROLLER**

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**3.0 THEORY OF OPERATION**

**3.1 POWER SUPPLY**

230V AC enters the controller from the circuit breaker panel. Line “L” sits at the PRD, waiting to be switched, and also keeps the power failure relay K1 energized. When the 6390-FAA photocell is activated, line “SSR” energizes the coil of the PRD and K2 “Lights On” relay. This also can be accomplished by using the photocell by-pass switch (SW1).

**3.2 LED SIDELIGHTS**

Line LDS is sent to Modules M2 and M3, which are current sensing modules for LED sidelights. Each RM22JA31MR monitors one (1) level of LED sidelights, and will provide a contact closure along a visual indication if one (1) or more lamps fail.

**3.3 LED BEACONS**

Line LDB is sent to Modules M1, M4, and M5. M1 is the primary flasher for all of the LED beacons. The output of this module is sent through the current sensing Modules M4, and M5, then to the circuit breaker outputs B1, and B2-B3. If Modules M4, or M5, detect an LED beacon burnout, then that particular module would provide a contact closure along with a visual indication for that circuit.

Relay K3 is a flasher failure relay for all the LED beacons. If Relay K3 detects a flasher failure, it would then provide a contact closure for the flasher circuit.

Module M6 is a 10 second time delay module for Flasher Fail Circuit.

## **AA2/3MLED230V CONTROLLER**

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### **4.0 MAINTENANCE**

#### **4.1 RED OBSTRUCTION LIGHTING**

No scheduled maintenance is required. Perform on an “as needed” basis only.

TOOLS REQUIRED:            NONE

#### **4.2 L-864 LED BEACON REPLACEMENT**

No scheduled maintenance is required. Perform on an “as needed” basis only.

#### **4.3 L-864 CONTROLLER**

No scheduled maintenance is required. Perform on an “as needed” basis only.

#### **4.4 PHOTOCELL**

The photocell is a sealed unit. No maintenance is needed or required other than replacement as necessary.

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## **AA2/3MLED230V CONTROLLER**

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### **5.0 MAJOR COMPONENTS PARTS LIST**

<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	6390-FAA	120 – 240V Photocell
1	PF-250	Solid State Flasher (M1)
1	B12J2K5	2,500 ohm 12 watt Resistor (R1)
1	PRD7AG0-240V	Mechanical Load Contactor (PRD)
3	PB27E122	Octal Sockets
3	9KE-240V	SPDT Relay (K1-K3)
1	STJ01002	Switch (SW1)
1	VJ1412HWPL2X004	Enclosure
6	8WA1204	Terminal Block (TB1 & TB2)
2	8WA1802	Rail Link
2	8WA1808	Terminal Block End Stop
4	S261D1	1 amp Circuit Breaker (B1-B3) (S1-S2)
4	RM22JA31MR	LED Sidelight Current Sensors (M2 and M3), and LED Beacon Current Sensors (M4 and M5)
1	TS16110	230V, 10 second time delay module (M6)

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## **AA2/3MLED230V CONTROLLER**

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### **6.0 SUGGESTED SPARE PARTS LIST**

<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	6390-FAA	120 – 240V Photocell
1	PF-250	Solid State Flasher (M1)
1	9KE-240V	SPDT Relay (K1-K3)
1	RM22JA31MR	LED Sidelight Current Sensors (M2 and M3), and LED Beacon Current Sensors (M4–M5)

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## **AA2/3MLED230V CONTROLLER**

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### **Warranty & Return Policy**

**TWR Lighting<sup>®</sup>, Inc. (“TWR<sup>®</sup>”)** warrants its products (other than “LED Product”) against defects in design, material (excluding incandescent bulbs) and workmanship for a period ending on the earlier of two (2) years from the date of shipment or one (1) year from the date of installation.

**TWR Lighting<sup>®</sup>, Inc. (“TWR<sup>®</sup>”)** warrants its “LED Product” against defects in design, material and workmanship for a period of five (5) years from the date of shipment. TWR<sup>®</sup>, at its sole option, will, itself, or through others, repair, replace or refund the purchase price paid for “LED Product” that TWR<sup>®</sup> verifies as being inoperable due to original design, material, or workmanship. All warranty replacement “LED Product” is warranted only for the remainder of the original warranty of the “LED Product” replaced. Replacement “LED Product” will be equivalent in function, but not necessarily identical, to the replaced “LED Product.”

**TWR Lighting<sup>®</sup>, Inc. (“TWR<sup>®</sup>”)** warrants its “LED Product” against light degradation for a period of five (5) years from the date of installation. TWR<sup>®</sup>, at its sole option, will, itself, or through others, repair, replace, or refund the purchase price paid for “LED Product” that TWR<sup>®</sup> verifies as failing to meet 75% of the minimum intensity requirements as defined in the FAA Advisory Circular 150/5345-43G dated 09/26/12. All warranty replacement “LED Product” is warranted only for the remainder of the original warranty of the “LED Product” replaced. Replacement “LED Product” will be equivalent in function, but not necessarily identical, to the replaced “LED Product.”

**Replacement parts (other than “LED Product”) are warranted for 90 days from the date of shipment.**

Conditions not covered by this Warranty, or which might **void** this Warranty are as follows:

- x Improper Installation or Operation
- x Misuse
- x Abuse
- x Unauthorized or Improper Repair or Alteration
- x Accident or Negligence in Use, Storage, Transportation, or Handling
- x Any Acts of God or Nature
- x **Non-OEM Parts**

**The use of Non-OEM parts or modifications to original equipment design will void the manufacturer warranty and could invalidate the assurance of complying with FAA requirements as published in Advisory Circular 150/5345-43.**



# **TWR Lighting, Inc.** HARK®

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## **AA2/3MLED230V CONTROLLER**

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### **Warranty & Return Policy** (continued)

**Field Service** – Labor, Travel, and Tower Climb are not covered under warranty. Customer shall be obligated to pay for all incurred charges. An extensive network of certified and insured Service Representatives is available if requested.

**Repair, Replacement or Product Return RMA Terms** – You must first contact our Customer Service Department at **713-973-6905** to acquire a Return Merchandise Authorization (RMA) number in order to return the product(s). Please have the following information available when requesting an RMA number:

- x The contact name and phone number of the tower owner or
- x The contact name and phone number of the contractor
- x The site name and number
- x The part number(s)
- x The serial number(s) (if any)
- x A description of the problem
- x The billing information
- x The Ship To address

**This RMA number must be clearly visible on the outside of the box.** If the RMA number is not clearly labeled on the outside of the box, your shipment will be refused. Please ensure the material you are returning is packaged carefully. **The warranty is null and void if the product(s) are damaged in the return shipment.**

**All RMAs must be received by TWR LIGHTING®, INC., 10810 W. LITTLE YORK RD., #130, HOUSTON, TX 77041-4051, within 30 days of issuance.**

Upon full compliance with the Return Terms, TWR® will replace, repair and return, or credit product(s) returned by the customer. It is TWR®'s sole discretion to determine the disposition of the returned item(s).

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## **AA2/3MLED230V CONTROLLER**

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### **Warranty & Return Policy** (continued)

**RMA Replacements** – Replacement part(s) will be shipped and billed to the customer for product(s) considered as Warranty, pending return of defective product(s). When available, a certified reconditioned part is shipped as warranty replacement with a Return Merchandise Authorization (RMA) number attached. Upon receipt of returned product(s), inspection, testing, and evaluation will be performed to determine the cause of defect. The customer is then notified of the determination of the testing.

- x Product(s) that is deemed defective and/or unrepairable and covered under warranty - a credit will be issued to the customer's account.
- x Product(s) found to have no defect will be subject to a **\$75.00 per hour testing charge (1 hour minimum), which will be invoiced to the customer.** At this time the customer may decide to have the tested part(s) returned and is responsible for the return charges.
- x Product(s) under warranty, which the customer does not wish returned, the customer will be issued a credit against the replacement invoice.

**RMA Repair & Return** – A Return Merchandise Authorization (RMA) will be issued for all part(s) returned to TWR<sup>®</sup> for repair. Upon receipt of returned product(s), inspection, testing, and evaluation will be performed to determine the cause of defect. The customer is then notified of the determination of the testing. If the returned part(s) is deemed unrepairable, or the returned part(s) is found to have no defect, the customer will be subject to a **\$75.00 per hour testing charge (1 hour minimum), which will be invoiced to the customer.** Should the returned parts be determined to be repairable, a written estimated cost of repair will be sent to the customer for their written approval prior to any work being performed. In order to have the tested part(s) repaired and/or returned, the customer must issue a purchase order and is responsible for the return shipping charges.

**RMA Return to Stock** – Any product order that is returned to TWR<sup>®</sup> for part(s) ordered incorrectly or found to be unneeded upon receipt by the customer, the customer may be required to pay a minimum **20% restocking fee.** Product returned for credit must be returned within 60-days of original purchase, be in new and resalable condition, and in original packaging. Once the product is received by TWR it's condition will be evaluated and a credit will be issued only once it is determined that the RMA Return Terms have been met.

**Credits** – Credits are issued once it is determined that all of the Warranty and Return Terms are met. All credits are processed on Fridays. In the event a Friday falls on a Holiday, the credit will be issued on the following Friday.

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## **AA2/3MLED230V CONTROLLER**

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### **Warranty & Return Policy** (continued)

**Freight** – All warranty replacement part(s) will be shipped via ground delivery and paid for by TWR<sup>®</sup>. Delivery other than ground is the responsibility of the customer.

REMEDIES UNDER THIS WARRANTY ARE LIMITED TO PROVISIONS OF REPLACEMENT PARTS AND REPAIRS AS SPECIFICALLY PROVIDED. IN NO EVENT SHALL TWR<sup>®</sup> BE LIABLE FOR ANY OTHER LOSSES, DAMAGES, COSTS, OR EXPENSES INCURRED BY THE CUSTOMER, INCLUDING, BUT NOT LIMITED TO, LOSS FROM FAILURE OF THE PRODUCT(S) TO OPERATE FOR ANY TIME, AND ALL OTHER DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING ALL PERSONAL INJURY OR PROPERTY DAMAGE DUE TO ALLEGED NEGLIGENCE, OR ANY OTHER LEGAL THEORY WHATSOEVER. THIS WARRANTY IS MADE BY TWR<sup>®</sup> EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESSED OR IMPLIED. WITHOUT LIMITING THE GENERALITY OF THE FORGOING, TWR<sup>®</sup> MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS OF THE PRODUCT(S) FOR ANY PARTICULAR PURPOSE. TWR<sup>®</sup> EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES.



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## **AA2/3MLED230V CONTROLLER**

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### **RETURN MERCHANDISE AUTHORIZATION (RMA) FORM**

**RMA#:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

**CUSTOMER:** \_\_\_\_\_

**CONTACT:** \_\_\_\_\_ **PHONE NO.:** \_\_\_\_\_

**ITEM DESCRIPTION (PART NO.):** \_\_\_\_\_

**MODEL NO.:** \_\_\_\_\_ **SERIAL NO.:** \_\_\_\_\_

**ORIGINAL TWR INVOICE NO.:** \_\_\_\_\_ **DATED:** \_\_\_\_\_

**DESCRIPTION OF PROBLEM:** \_\_\_\_\_

**SIGNED** \_\_\_\_\_ **DATE NEEDED** \_\_\_\_\_

**RETURN ADDRESS:** \_\_\_\_\_

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PLEASE RETURN PRODUCT TO: 10810 W. LITTLE YORK RD., #130 HOUSTON, TX 77041-4051



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## **AA2/3MLED230V CONTROLLER**

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### **RETURN MERCHANDISE AUTHORIZATION (RMA) FORM**

**RMA#:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

**CUSTOMER:** \_\_\_\_\_

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**CONTACT:** \_\_\_\_\_ **PHONE NO.:** \_\_\_\_\_

**ITEM DESCRIPTION (PART NO.):** \_\_\_\_\_

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**MODEL NO.:** \_\_\_\_\_ **SERIAL NO.:** \_\_\_\_\_

**ORIGINAL TWR INVOICE NO.:** \_\_\_\_\_ **DATED:** \_\_\_\_\_

**DESCRIPTION OF PROBLEM:** \_\_\_\_\_

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**SIGNED** \_\_\_\_\_ **DATE NEEDED** \_\_\_\_\_

**RETURN ADDRESS:** \_\_\_\_\_

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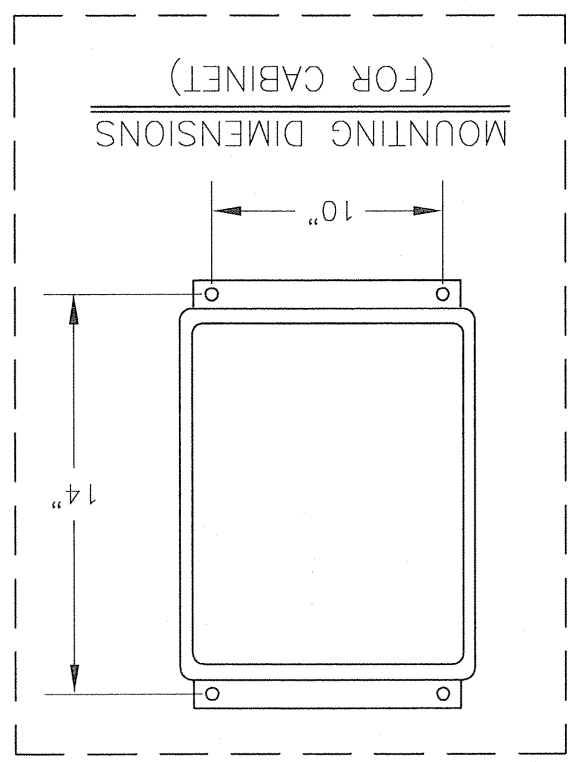
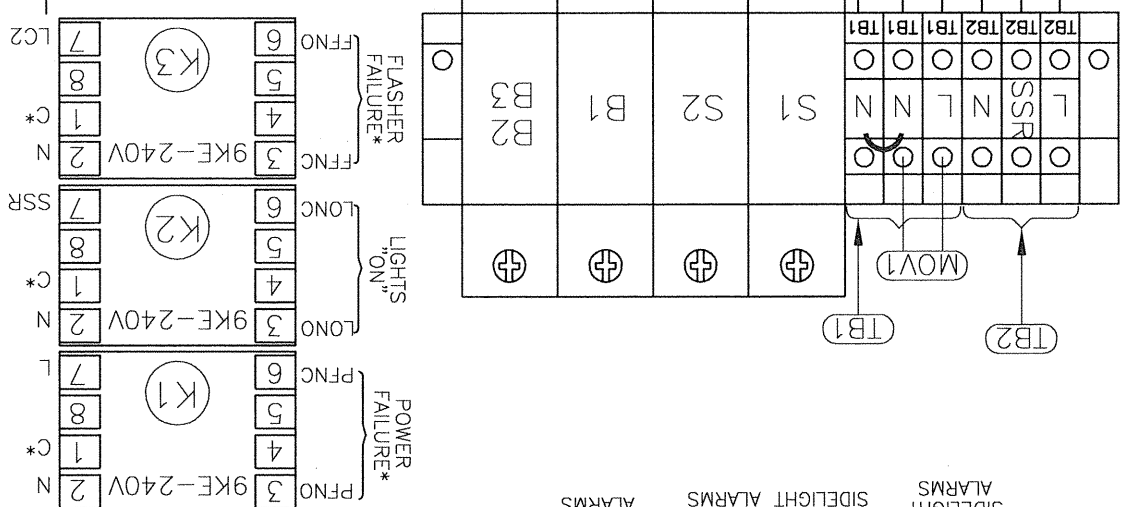
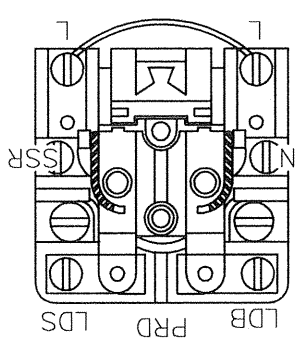
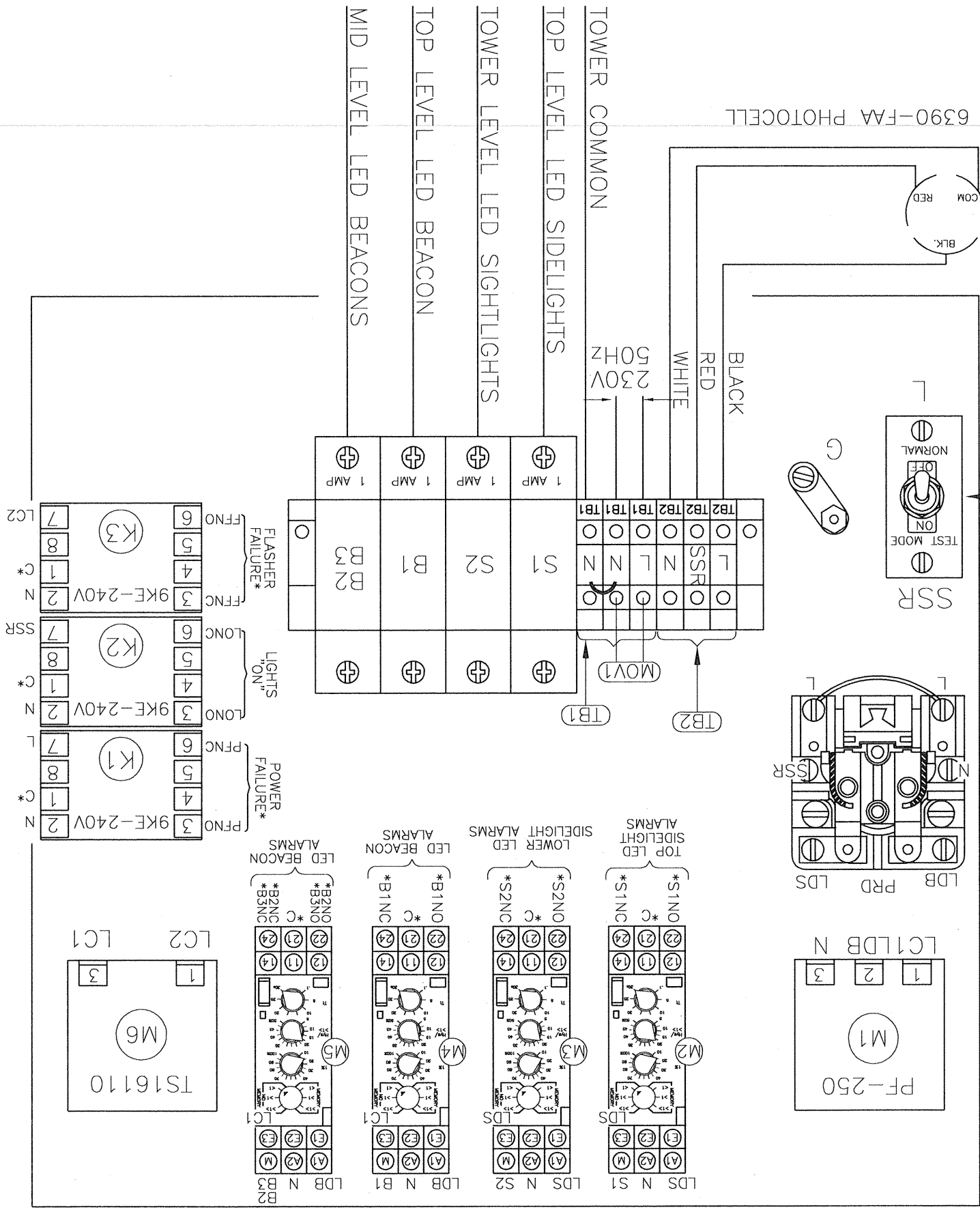
PLEASE RETURN PRODUCT TO: 10810 W. LITTLE YORK RD., #130 HOUSTON, TX 77041-4051





\*CUSTOMER ALARM POINTS

- C = ALARM COMMON
- PFNO/PFNC = POWER FAILURE
- LONO/LONC = LIGHTS "ON"
- FFNO/FFNC = FLASHER FAILURE
- S1NO/S1NC = TOP LEVEL LED SIDELIGHT BURNOUT
- S2NO/S2NC = LOWER LEVEL LED SIDELIGHT BURNOUT
- B1NO/B1NC = TOP LEVEL LED BEACON BURNOUT
- B2NO/B2NC = MID LEVEL LED BEACON BURNOUT
- B3NO/B3NC = MID LEVEL LED BEACON BURNOUT
- \* ALARM OUTPUTS ARE FORM C.



- NOTES:
1. WHEN REPLACING METAL BASE MODULES USE HEAT SINK COMPOUND BETWEEN MODULE AND ALUMINUM PLATE.
  2. PLUG 6390-FAA PHOTOCELL INTO 43109 TWIST LOCK RECEPTACLE AND TWIST TO LOCK.

**230V**

AA2/3MLED230V CONTROLLER  
CHASSIS LAYOUT

PROJ. DEPT. *[Signature]*  
SERV. DEPT.  
ENGINEER  
DRAWN BY E.A.SALAZAR  
DATE 07/30/09  
SCALE N.T.S.  
DWG. NO. 1258-R

11/30/2016  
DATE: 11/30/2016  
LTR. (B)  
REVISION CURRENT SENSOR

The use of non-FAA parts or modifications to original equipment design will void the manufacturer warranty and could invalidate the assurance of compliance with FAA requirements as published in Advisory Circular 150/5345-43.  
NOTICE: The drawings and photographic images contained herein are the sole property of TWR Lighting, Inc. All information contained herein that is not generally known shall be considered confidential except to the extent the information has been previously established. The drawings and photographic images contained herein may not be reproduced, copied or used as the basis for manufacture or sale or promotion of any other purpose without the expressed written permission of TWR Lighting, Inc.



# 230V

## AA2/3MLED230V CONTROLLER

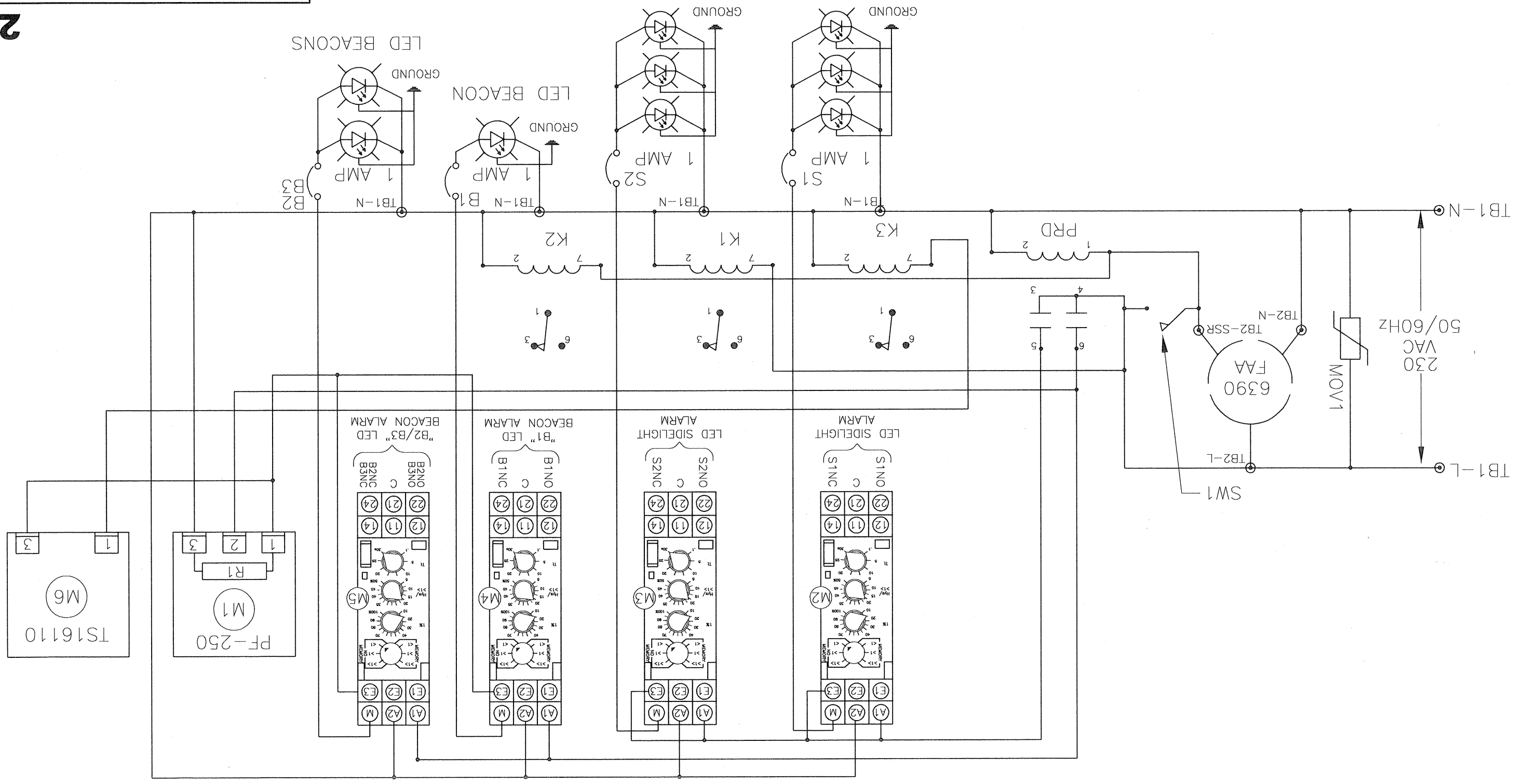
### SCHMATIC LAYOUT

PROJ. DEPT. *[Signature]*  
 SERV. DEPT. *[Signature]*  
**TWR Lighting, Inc. TWRK**  
*Enlightened Technology*  
 ENGINEER

DRAWN BY: V.HERNANDEZ  
 SHEET SIZE: B  
 SHEET QTY: 1 OF 1  
 DWG. NO.: 1258-S

DATE: 12/12/12  
 SCALE: N.T.S.  
 The use of non-DEM parts or modifications to original equipment design will void the manufacturer warranty and could invalidate the assurance of compliance with FAA requirements as published in Advisory Circular 1500345-43.  
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11/30/2016  
 CURRRENT SENSOR  
 LTR. REVISION



### LED SIDELIGHTS

### LED BEACONS

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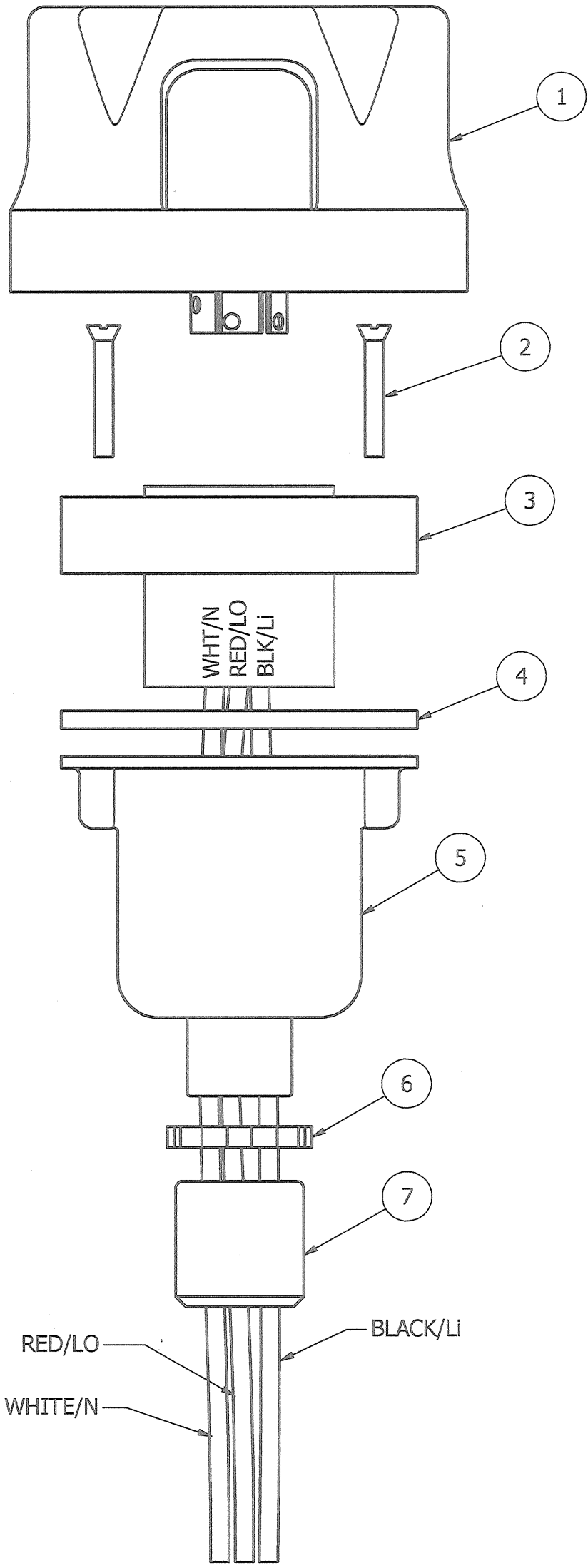
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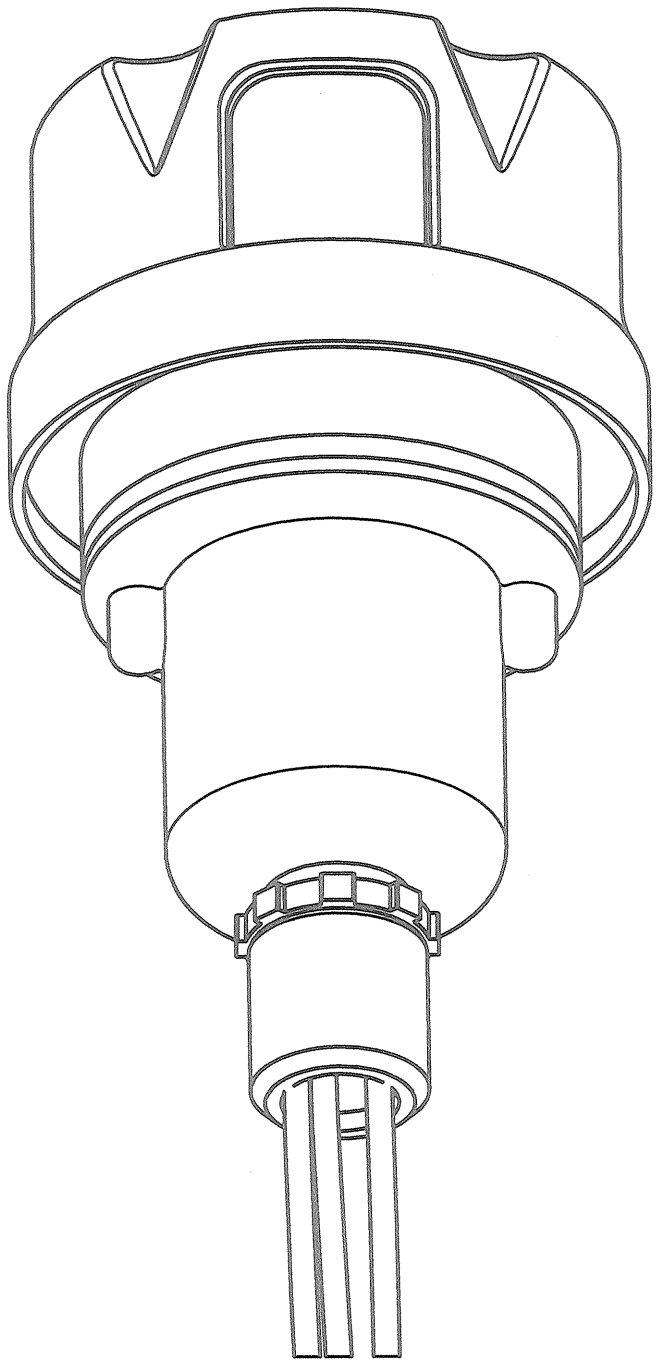
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PARTS LIST		
ITEM	QTY	PART NUMBER
1	1	PHOTOCELL
2	2	6-32 x 1" SCREW
3	1	RECEPTACLE SOCKET
4	1	RECEPTACLE GASKET
5	1	RECEPTACLE HOUSING
6	1	1/2" CONDUIT LOCKNUT
7	1	3/4" TO 1/2" REDUCER



EXPLODED VIEW



ASSEMBLY

- NOTES:
- ITEM #7 CAN BE USED TO REDUCE 3/4" CONDUIT TO 1/2" CONDUIT AT THE HOUSING OR AT THE CONTROLLER ITSELF.
  - IF ADDITIONAL WIRE IS REQUIRED OVER THE FACTORY 20', USE THE FOLLOWING CHART.  
 21' TO 300' - 16 AWG TFFN  
 301' TO 500' - 14 AWG TFFN

PHOTOCELL HOUSING DETAIL

PROD. DEPT  
 SERV. DEPT  
 ENGINEER  
**TWR Lighting, Inc. HARK**  
*Enlightened Technology®*

DRAWN BY	vhernandez	SHEET SIZE	B	SHEET QTY.	1 OF 1
DATE	10/18/1995	SCALE	1/1	DWG. NO.	100239i

DATE	REV	AUTHOR	DESCRIPTION
02/03/2015	H	JZAMORANO	UPDATED NOTES

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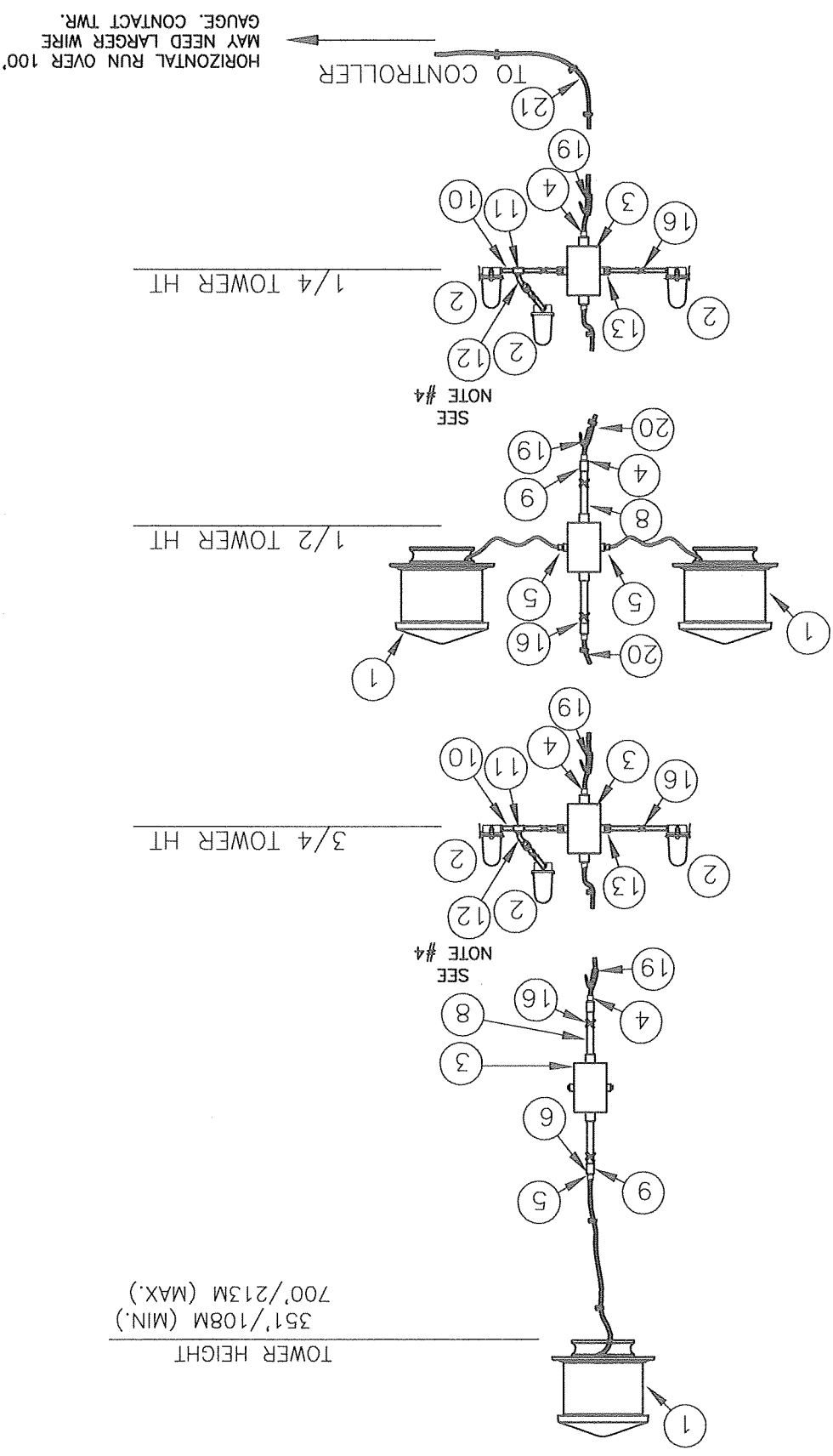
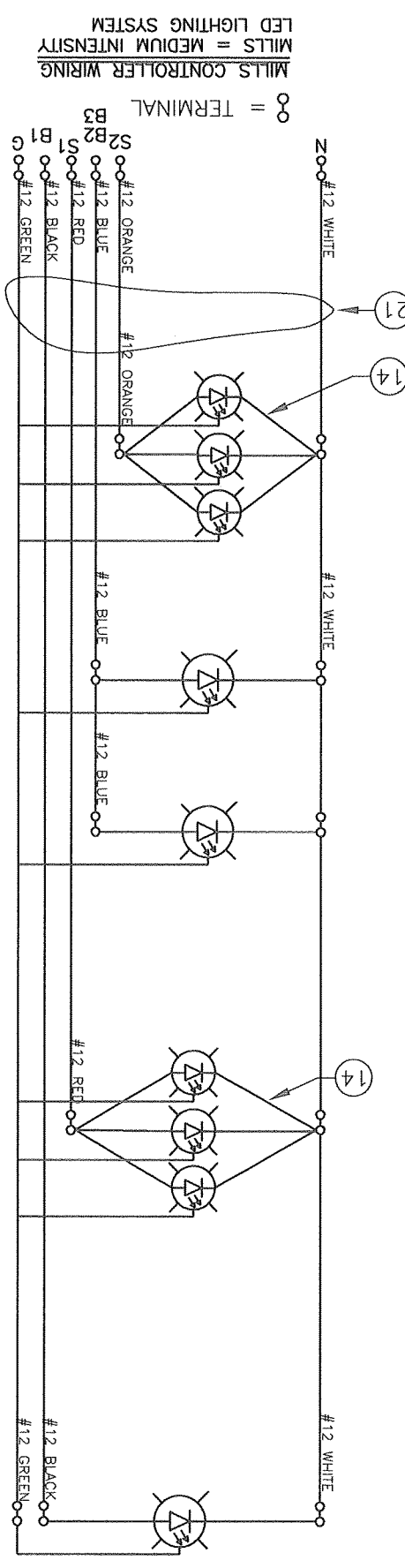
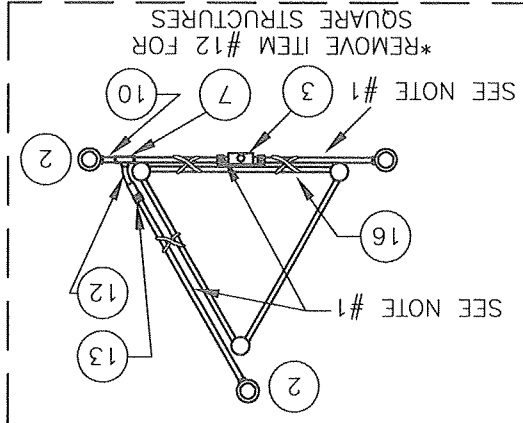
**BILL OF MATERIALS**

ITEM NO.	TWR PART NO.	DESCRIPTION
1	LEDBEACON	120 VAC L-864 LED BEACON
2	OL1-LED	LED SIDE LIGHT 3/4"
3	JB8C	1" JUNCTION BOX CAST
4	CGB396SA	1" CORD CONNECTOR 0.625 - .750
5	CGB295SA	3/4" CORD CONNECTOR 0.50 - 0.625
6	RE32	1" TO 3/4" REDUCER
7	A314	3/4" CONDUIT LOCKNUTS
8	N118	1" x 18" NIPPLE
9	CPLG1	1" GALVANIZED COUPLING
10	N3413	3/4" x 3" NIPPLE
11	T27CG	3/4" CONDULET W/COVER & GASKET
12	EL3430	3/4" 30" ELBOW
13	HC402	3/4" NO THREAD CONNECTOR
14	SLPIGAL25G	25' SIDE LIGHT PIGTAIL WITH GROUND
15	PIPDOP	4 oz. PIPE DOPE
16	SS10012	STAINLESS STEEL WRAPLOCK
17	CONDUIT34	3/4" CONDUIT (FOR OL1 MOUNTING)
18	AA2/3-LED	AA2/3-LED RED LED LIGHT CONTROLLER
19	CABLRIP6	SINGLE EYE LACE MESH .74-.99
20	STCABLEIE	STROBE CABLE TIES (TWR HEIGHT +5)
21	CS012/6	S.O. CORD, #12-6 WIRES (TWR HT.+BRIDGE+60'/18M)

\* = ITEMS NOT SHOWN  
 ~ = ITEMS QUANTITY CALCULATED ACCORDING TO STRUCTURE HEIGHT.

NOTES:  
 (1) ITEM #17 CUT TO LENGTH FOR PROPER EXTENSION OF OL1 (6"-12") FROM STRUCTURE. ATTACH ITEM #13 TO UNTHREADED CONDUIT TO COMPLETE ASSEMBLY.  
 (2) MOUNT BEACON HINGE SO LENS WILL OPEN UNOBSTRUCTED BY STRUCTURE.  
 (3) THIS DRAWING IS PROVIDED AS A GENERAL REFERENCE. TWR LIGHTING, INC. DOCUMENTATION SUPERSEDES THIS DRAWING & SHOULD BE REVIEWED PRIOR TO INSTALLATION OF THIS SYSTEM.  
 (4) USE COUPLING THAT IS PROVIDED WITH ITEM #17 TO ATTACH ITEM #12 TO ITEM #13.

FOR MORE DETAIL REFER TO DRAWING 100489  
 SEE NOTE #1  
 SEE NOTE #1  
 \*REMOVE ITEM #12 FOR SQUARE STRUCTURES  
 (TYPICAL)



DATE: 10/26/04  
 SCALE: N.T.S.  
 DRAWN BY: E.A. SALAZAR  
 SHEET SIZE: B  
 SHEET QTY: 1 OF 1  
 DWG. NO.: 801-01

ENGINEER: *[Signature]*  
 PROD. DEPT.: *[Signature]*  
 SERV. DEPT.: *[Signature]*  
**TWR Lighting, Inc. MARK**  
 Englightened Technology  
 (TOWERS 351'/108M TO 700'/213M)  
 LK1A2/3LED TOWER LIGHTING KIT

11/18/2014 (B) UPDATED LEADS  
 LTR. REVISION

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 FTA requirements as published in Advisory Circular 150/5345-43





**BILL OF MATERIALS**

ITEM NO.	QTY.	TWR PART NO.	DESCRIPTION
1	3	LED5ACON	LED BEACON
2	6	01LED	LED SIDE LIGHT 3/4"
3	3	CGB2955A	3/4" CORD CONNECTOR 0.50 - 0.625
4	4	J80	3/4" STRAIN RELIEF
5	5	J85/7	3/4" JUNCTION BOX
6	3	127CG	3/4" CONDULET W/COVER AND GASKET
7	2	EL3430	3/4" 30° ELBOW
8	2	EL3490	3/4" 90° ELBOW
9	24	A314	3/4" CONDUIT LOCKNUTS
10	2	PIP20P	4 oz. PIPE DOP
11	2	N3413	3/4" x 3" NIPPLE
12	4	UNY205	3/4" UNION
13	4	5012902	3/4" BREATHER
14	4	N3418	3/4" x 18" NIPPLE
15	4	EXPJNT34	3/4" EXPANSION JOINT
16	6	HC402	3/4" NO THREAD CONNECTOR
17	6	SLP1AL125G	25" SIDE LIGHT PIGTAIL WITH GROUND
18	2	SST10012	STAINLESS STEEL WRAPLOCK 100"
19	60	CONDUIT34	3/4" CONDUIT
20	1	AA2/3	LED CONTROLLER

\* = ITEMS NOT SHOWN

21	-	CONDUIT34	3/4" CONDUIT (TOWER HT. + 40'/12M)
22	-	12THHNWHT	#12 THHN WHI. WIRE (TOWER HT.+60'/19M)
23	-	12THHNBLK	#12 THHN BLK. WIRE (TOWER HT.+60'/19M)
24	-	12THHNRED	#12 THHN RED WIRE (3/4 TWR HT.+60'/19M)
25	-	12THHNBLUE	#12 THHN BLUE WIRE (1/2 TOWER HT.+60'/19M)
26	-	12THHNLW	#12 THHN YLW. WIRE (1/4 TWR HT.+60'/19M)

NOTES:  
 (1) ITEM #19 CUT TO LENGTH FOR PROPER EXTENSION OF OLI CONDUIT TO COMPLETE ASSEMBLY.  
 (6"-12") FROM STRUCTURE. ATTACH ITEM #16 TO UNTHREADED CONDUIT TO PREVENT AIR FROM ENTERING.  
 (2) MOUNT BEACON HINGE SO LENS WILL OPEN UNOBSTRUCTED BY STRUCTURE.  
 (3) ON AM TOWER APPLICATIONS, KEEP GROUND LUG FROM BEING CONNECTED TO EARTH GROUND. GROUND TO THE TOWER ONLY. LIGHTING, INC. DOCUMENTATION SUPERSEDES THIS DRAWING & SHOULD BE REVIEWED PRIOR TO INSTALLATION OF THIS SYSTEM.  
 (5) USE COUPLING THAT IS PROVIDED WITH ITEM #19.  
 (6) CONDUIT SIZE BASED ON USING TYPE THHN WIRE.  
 (7) USE RIGID GALVANIZED STEEL CONDUIT.  
 (8) BREATHERS ALLOW FOR CIRCULATION OF AIR TO PREVENT CONDENSATION.

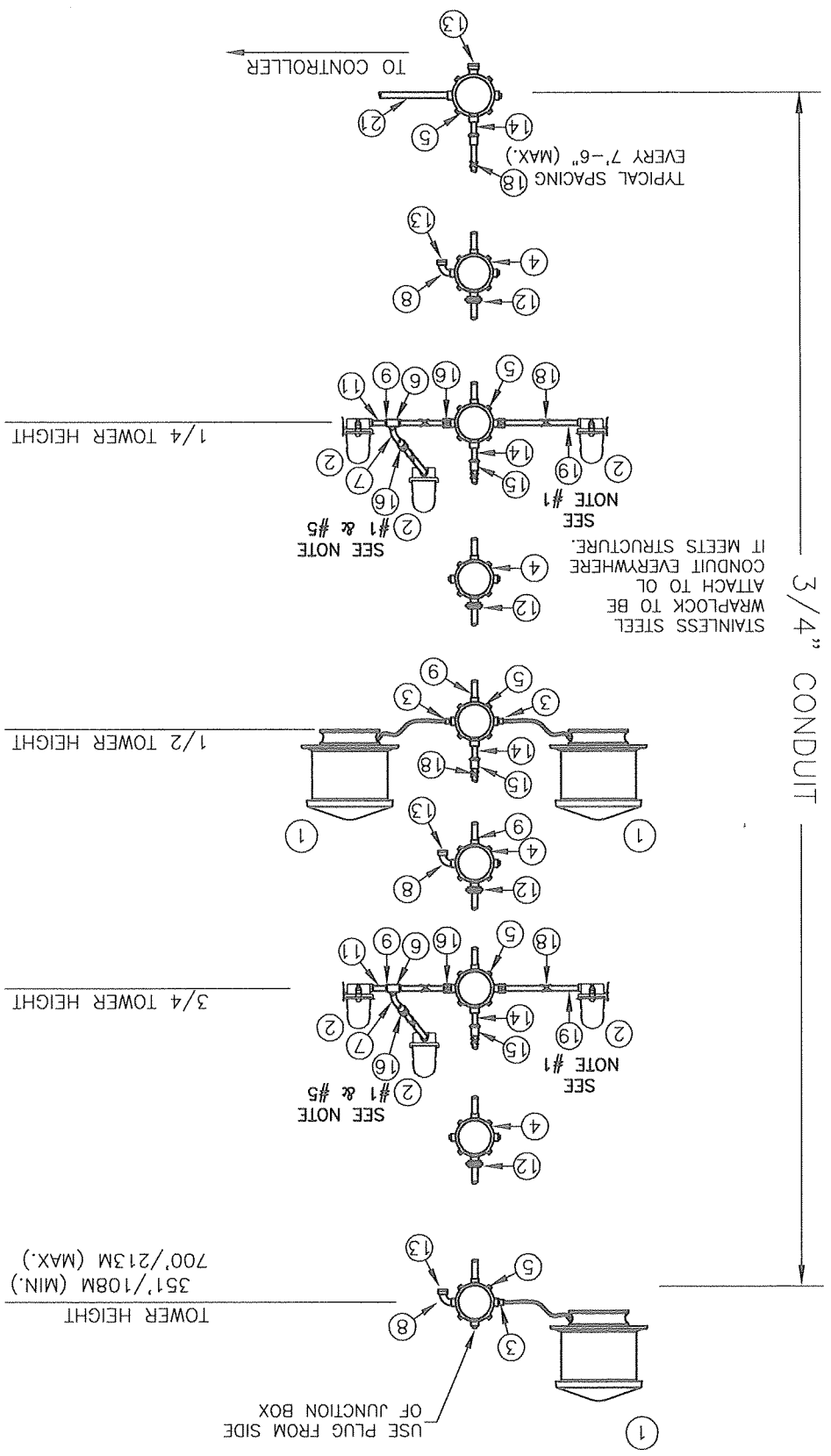
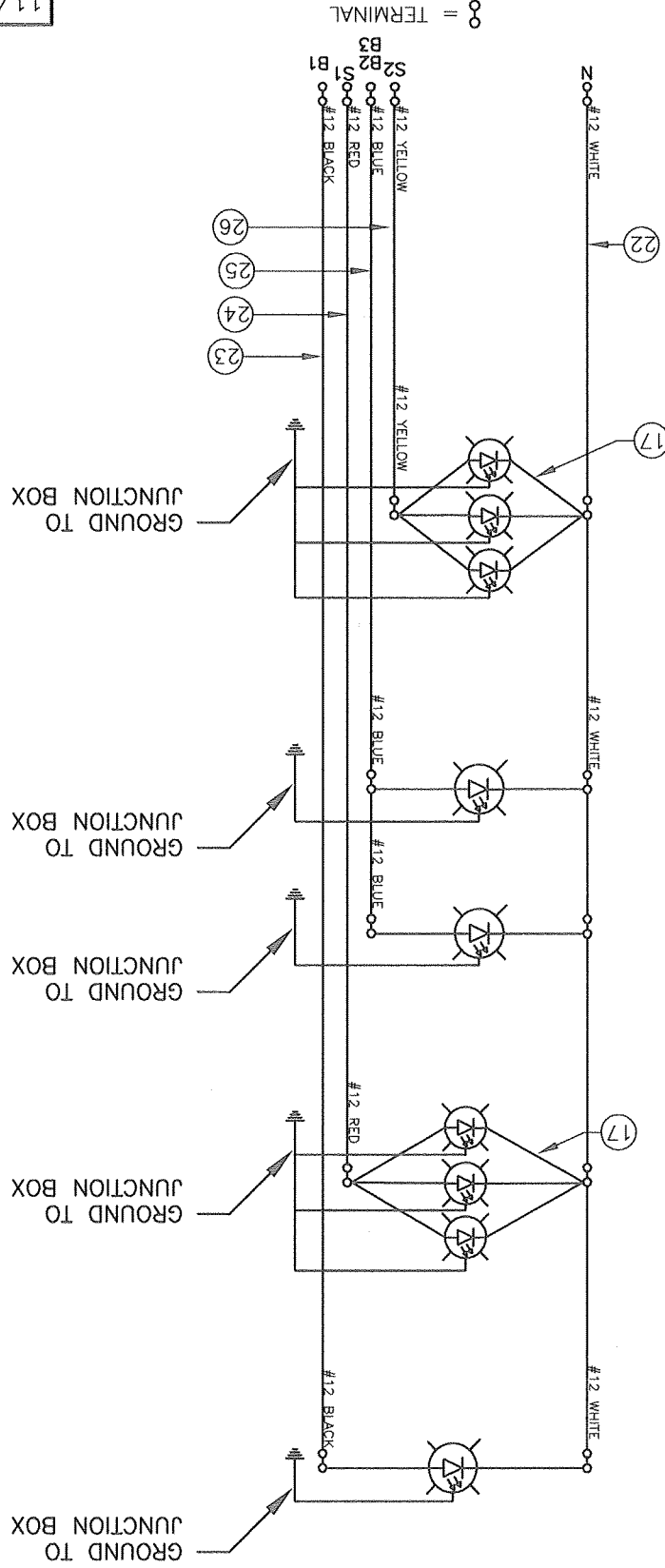
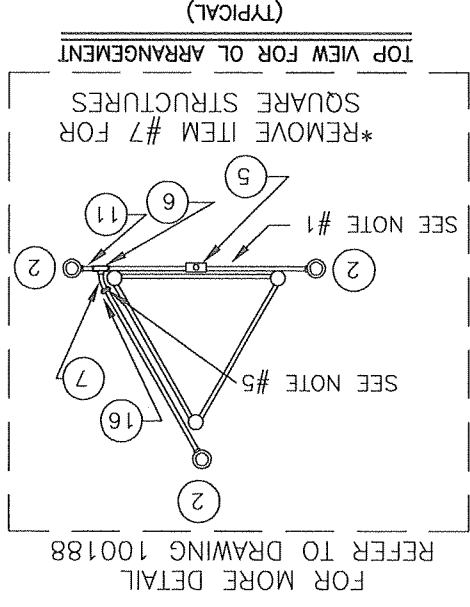
**TWR Lighting, Inc.**  
*Enlightened Technology*

PROJ. DEPT. \_\_\_\_\_  
 SERV. DEPT. \_\_\_\_\_  
 ENGINEER \_\_\_\_\_

DRWN BY: E.A. SALAZAR  
 DATE: 06/16/04  
 SCALE: N.T.S.  
 DWG. NO.: 801-02

PROJECT: LK2A2/3LED TOWER LIGHTING KIT  
 (TOWERS 351'/108M TO 700'/213M)

11/18/2014  
 DATE: \_\_\_\_\_  
 LTR. \_\_\_\_\_  
 REVISION \_\_\_\_\_



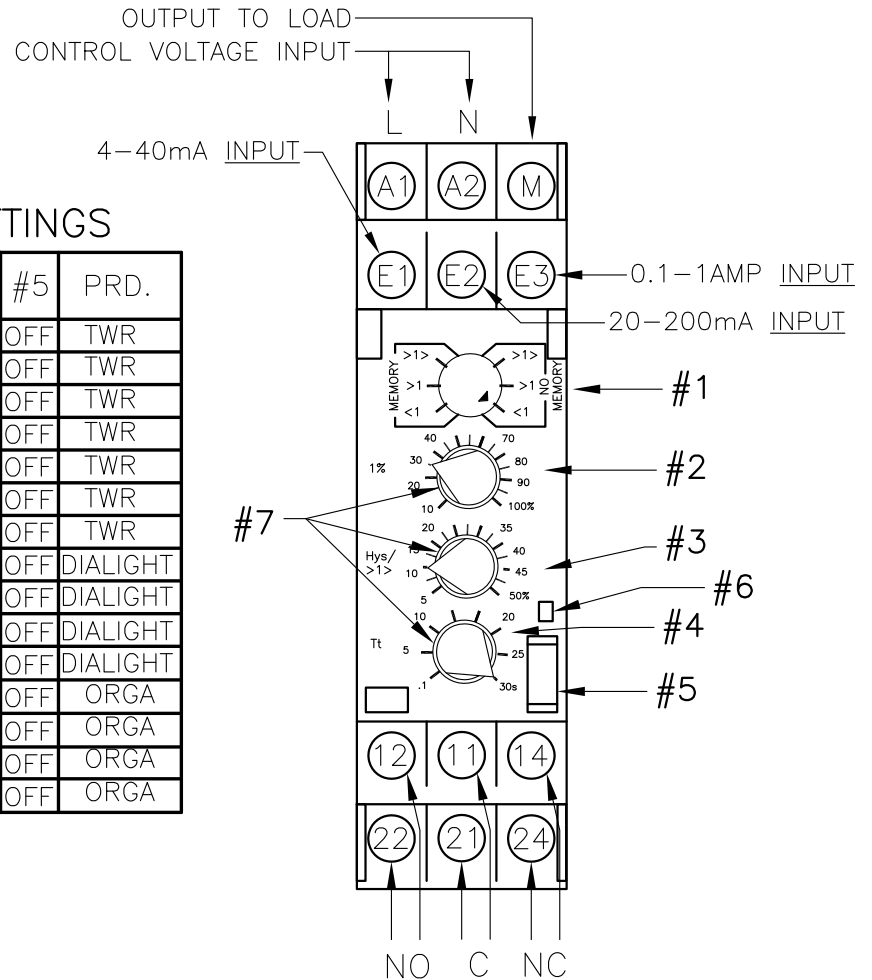


# AC UNITS CURRENT MEASUREMENT RM22JA31MR

## 120VAC PRODUCT SPECIFIC SETTINGS

QTY.	PART NO.	INPUT	#1	#2	#3	#4	#5	PRD.
1	OL1_LED2	E2	*<1	30	20	30	OFF	TWR
2	OL1_LED2	E3	*<1	10	20	30	OFF	TWR
3	OL1_LED2	E3	*<1	15	20	30	OFF	TWR
4	OL1_LED2	E3	*<1	23	20	30	OFF	TWR
6	OL1_LED2	E3	*<1	35	20	30	OFF	TWR
8	OL1_LED2	E3	*<1	43	15	30	OFF	TWR
10	OL1_LED2	E3	*<1	50	15	30	OFF	TWR
1	860-1R01-001	E2	*<1	20	20	30	OFF	DIALIGHT
3	860-1R01-001	E3	*<1	90	20	30	OFF	DIALIGHT
1	LEDBEACON	E3	*<1	50	20	30	OFF	DIALIGHT
1	STLDBEACON	E3	*<1	50	20	30	OFF	DIALIGHT
1	LEDBEACON2(T)	E3	*<1	10	20	30	OFF	ORGA
2	LEDBEACON2(T)	E3	*<1	35	20	30	OFF	ORGA
1	STLDBEACON2	E3	*<1	10	20	30	OFF	ORGA
2	STLDBEACON2	E3	*<1	35	20	30	OFF	ORGA

\*NO MEMORY



## FUNCTIONS

- 1) Configuration: Selection of operation mode (<1 / >1 / >1<) with or without memory.
- 2) Adjustment of current threshold as % of setting range.
- 3) Hysteresis adjustment from 5% to 50%.
- 4) Time Delay adjustment from 0.1 to 30sec.
- 5) Diagnostic button.
- 6) Relay outputs status (Yellow) LED.
  - Steady yellow LED indicates relay energized
  - Blinking yellow LED indicates current below threshold and the time delay has started
  - Yellow LED "OUT" indicates relay de-energized
- 7) Dial Pointer (Green) LED
  - Steady green LED indicates that supply to the RM22 is present

Due to current draw tolerances slight adjustments to setting #2 may be needed for proper alarming.

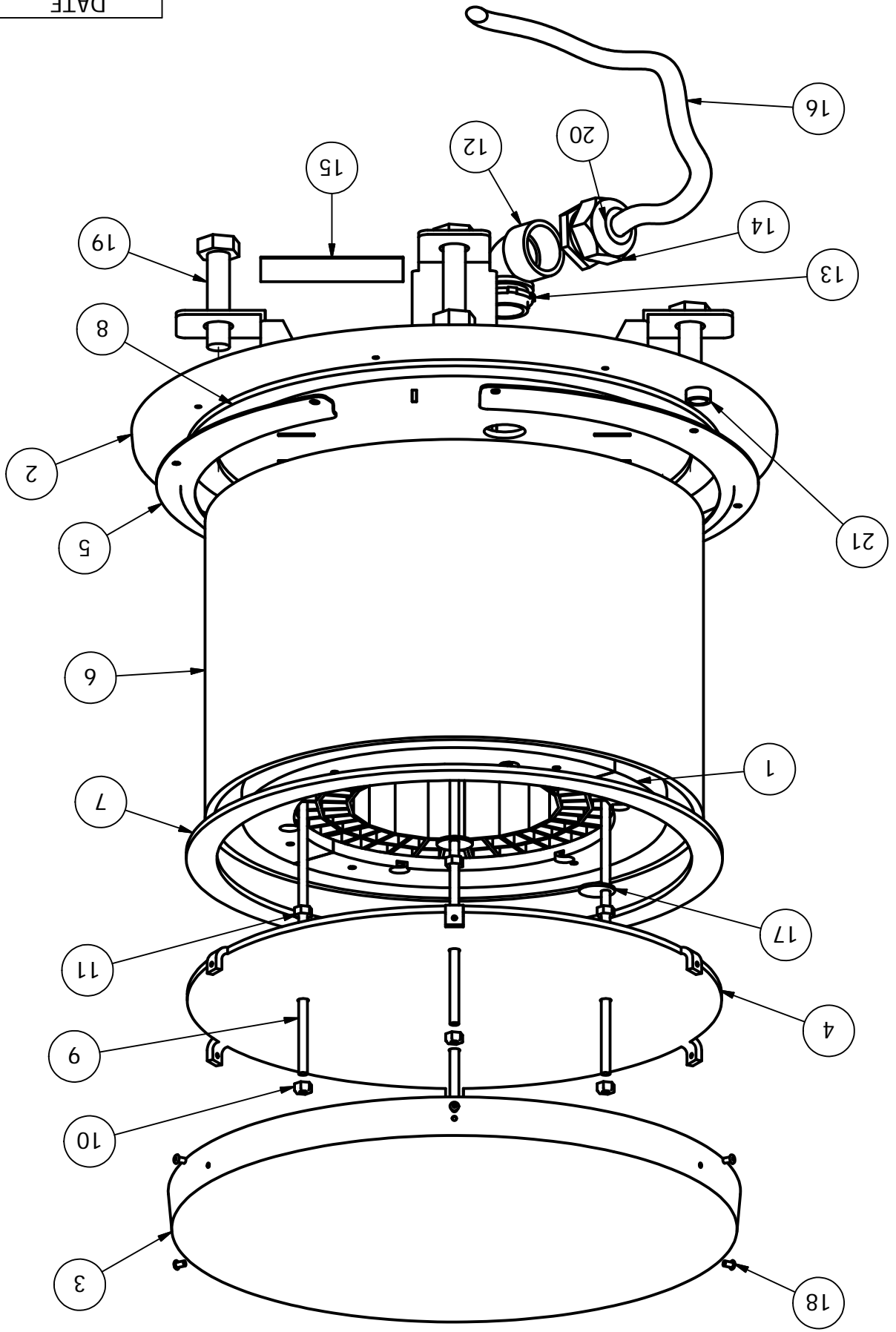
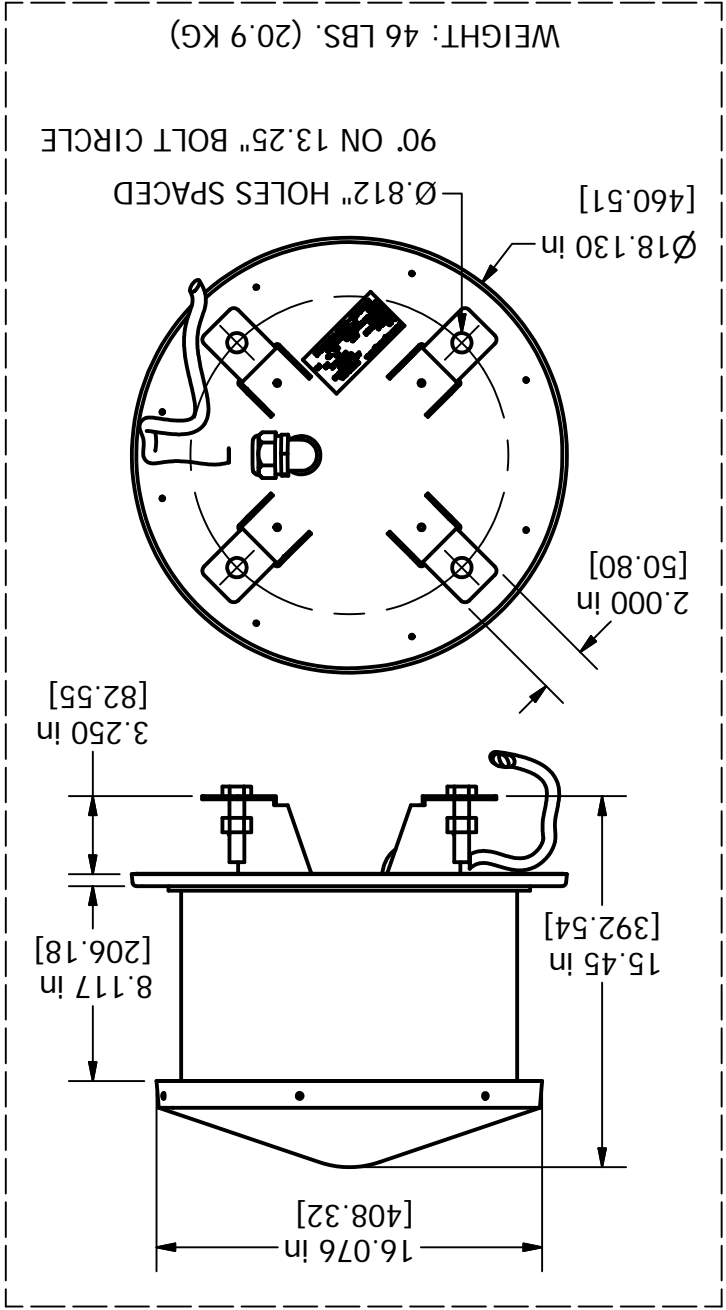


PARTS LIST		DESCRIPTION	
1	LEDLITEENG2	1	ORGA L-864 LED LIGHT ENGINE 120/240VAC
2	100672	1	LEDBEACON BASE PLATE
3	100344	1	CAP DUAL BEACON
4	100673	1	LEDBEACON LID PLATE
5	100337	2	LENS RETAINER RING
6	STLDBCTUBE2	1	CLEAR ACRYLIC TUBE
7	STBAGSK4	1	GASKET NEOPRENE 13 1/8 X 15 OD X
8	STBAGSKT	1	GASKET NEOPRENE 13 1/4 X 15
9	100727	4	14-20 X 9.875" DE 304 S.S. ORG
10	1420SSNUTN	4	1/4-20 NUT W/NYLON INSERT 304
11	1420NUT	4	1/4-20 NUT 304 S/S
12	EL190S	1	1" 90 DEGREE SHORT ELBOW GALV.
13	A315	1	1" CONDUIT LOCKNUT GALV.
14	CC-NPT34-G	1	3/4" NPT CORD CONNECTOR .500"
15	STCONLAB2	1	100223 PRODUCT LABEL
16	CSO14-3	21	S.O. CORD 14AWG/3 CONDUCTOR
17	100606M	2	LED LIGHT ENGINE TIE DOWN WASH
18	18PRSS-2	6	1/8 X .400 SS POP RIVET #44
19	58X112	4	5/8 X 1-1/2 HEX BOLT
20	RE32	1	1" TO 3/4" REDUCER, GALV.
21	2-10000	1	CIRCULAR SPIRIT LEVEL
22	1032X38PHW	8	10-32X3/8 PHILLS HD CAPTIVE SCREW
* = ITEMS NOT SHOWN			
<p>CONNECTION DIAGRAM:</p>			

**TWR Lighting, Inc. MARK**  
*Enlightened Technology*

DRAWN: V Hernandez  
 CHECKED: 9/4/2007

DATE	11/6/2014	AUTHOR	JZamorano	REV	C	DESCRIPTION	UPDATED BOM
SCALE	1/4	SIZE	B	DWG NO	100761	REV	C
TITLE	LEDBEACON2 ASSEMBLY						
APPROVED							



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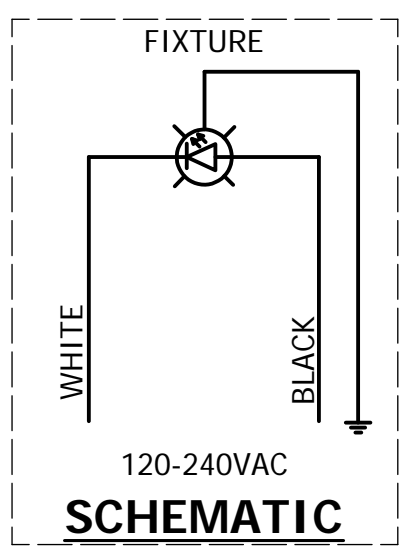
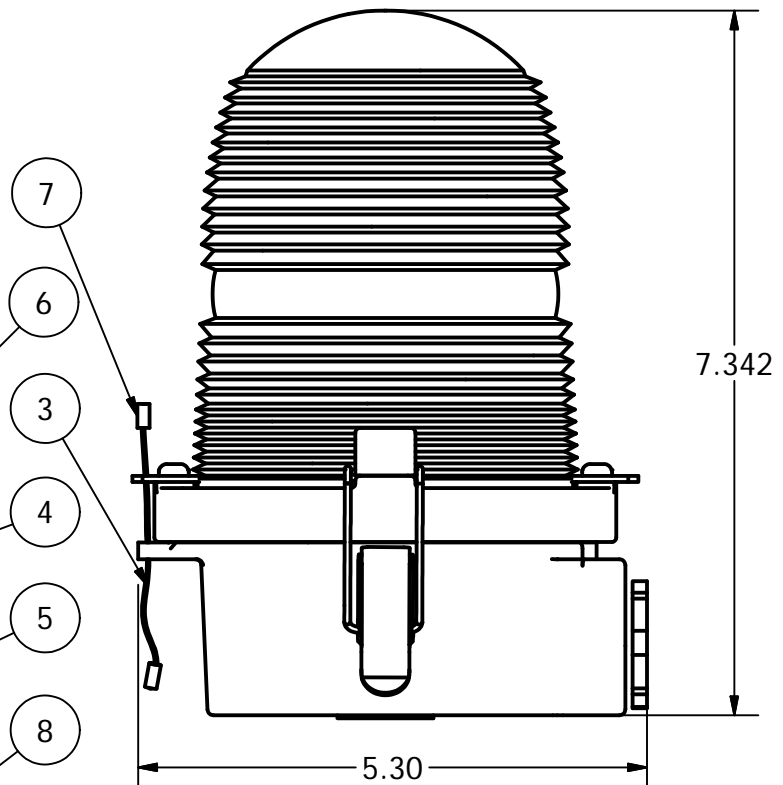
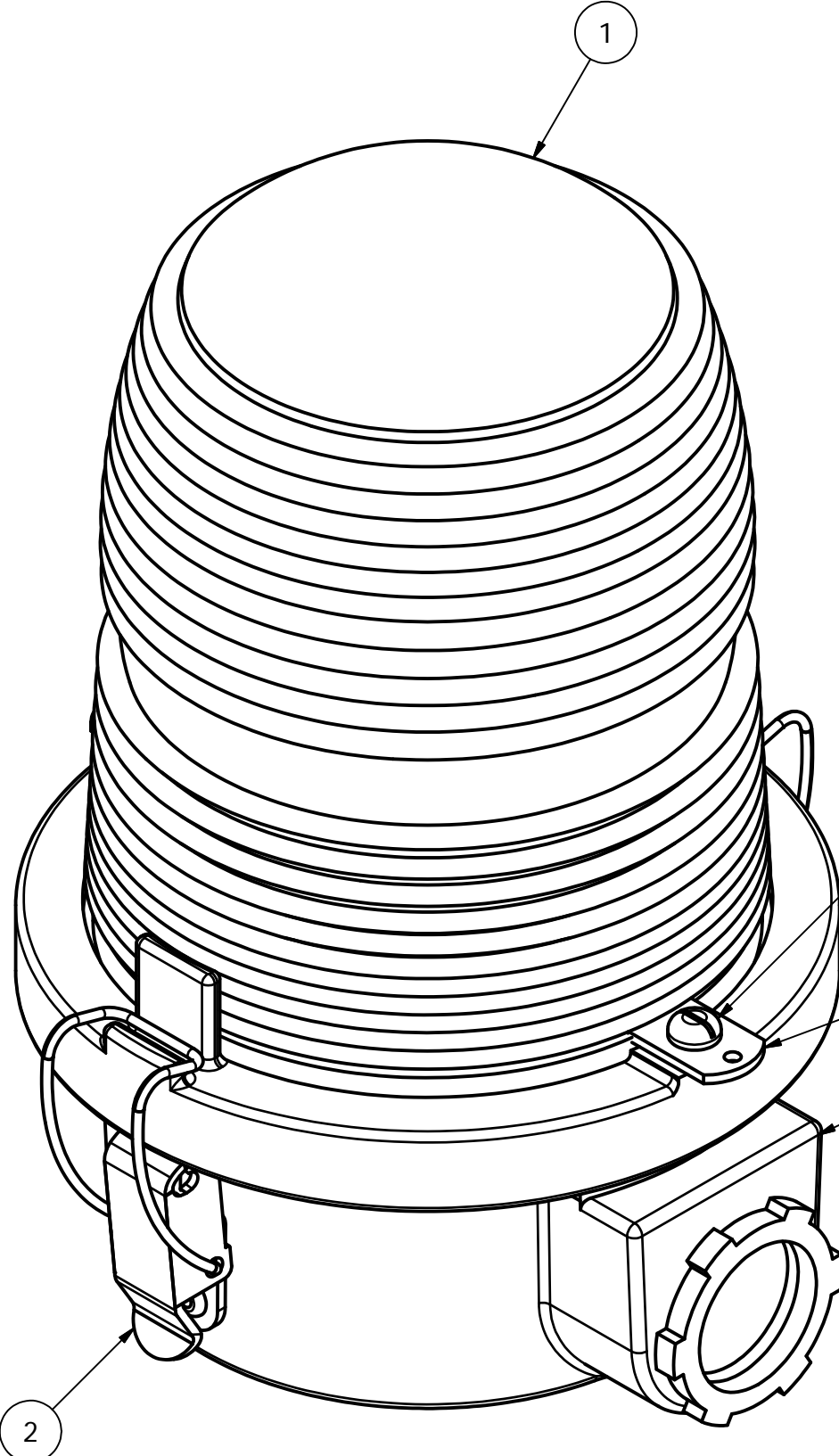
Parts List

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	OL1VLED2	L810 OBSTRUCTION LIGHT
* 1.1	1	100588_RE	OL 6LED BASE PLATE
* 1.2	1	100591	OL 6LED STAR DISK
* 1.3	1	100680	OL1/2 SERIAL # LABEL
* 1.4	1	A10290	5/32" ID RUBBER GROMMET
* 1.5	6	STD05008	LED EMITTER
* 1.6	1	OLG	OL GASKET
* 1.7	1	AP100846	SIDELIGHT LENS CLEAR ACYRLIC
* 1.8	1	106V	LENS HOLDER RING
* 1.9	6	STE01-047	LED VERTICAL PCB
* 1.10	16	18PRSS	1/8 X .45 SS POP RIVET
* 1.11	1	PS90-260/24	POWER SUPPLY
* 1.12	1	20RED	#20AWG RED BELDON WIRE
* 1.13	2	WIRENUTBLU	BLUE WIRE NUT
2	2	HC255SS	SIDELIGHT LATCH
3	1	7X7SS	1/16 HOL 7X7 S.S. WIRE
4	2	12V245	OL LENS CLIP
5	1	105V	SINGLE SIDELIGHT BODY
6	2	832X14PH	8-32 X 1/4 PH SS SLOT SCREW
7	2	A1A	STAKON CRIMP
8	1	A314	3/4" CONDUIT LOCKNUT GALV.

\* = ITEMS NOT SHOWN

B

B



\* GROUND WIRE MUST BE CONNECTED TO PROPERLY PROTECT POWER SUPPLY. FAILURE TO GROUND WILL VOID ALL WARRANTIES.

A

A

DRAWN	gsebek	8/18/2004
CHECKED		
QA		
MFG		
APPROVED		

**TWR Lighting, Inc.** **PARK**  
Enlightened Technology®

TITLE  
OL1VLED2 120-240VAC FAA-OL16LED  
(L810 OBSTRUCTION LIGHT)

SIZE	B	DWG NO	100656i	REV	E
SCALE		SHEET 1 OF 1			

DATE	REV	AUTHOR	DESCRIPTION
11/07/14	E	JZAMORANO	REM. WIRE CONNECT

4

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**JUNCTION AND STRAIN RELIEF BOXES**

PROD DEPT \_\_\_\_\_  
SERV DEPT \_\_\_\_\_  
ENGINEER \_\_\_\_\_

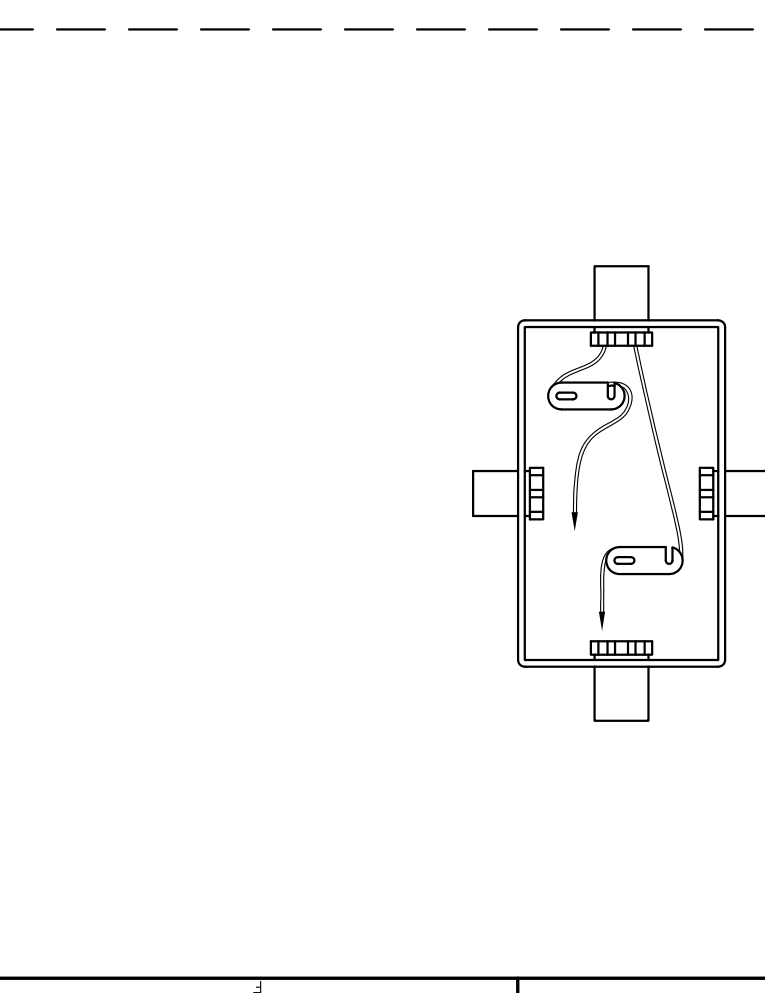
DRAWN BY G.D. SEBEK  
SHEET SIZE B  
SHEET QTY 1 OF 1  
DWG. NO. 100089

DATE 07/26/93  
SCALE N.T.S.

The use of non-union parts or materials to equal equipment design will void the manufacturer warranty and could invalidate the assurance of compliance with FAA requirements as published in Advisory Circular 150/5245-43.  
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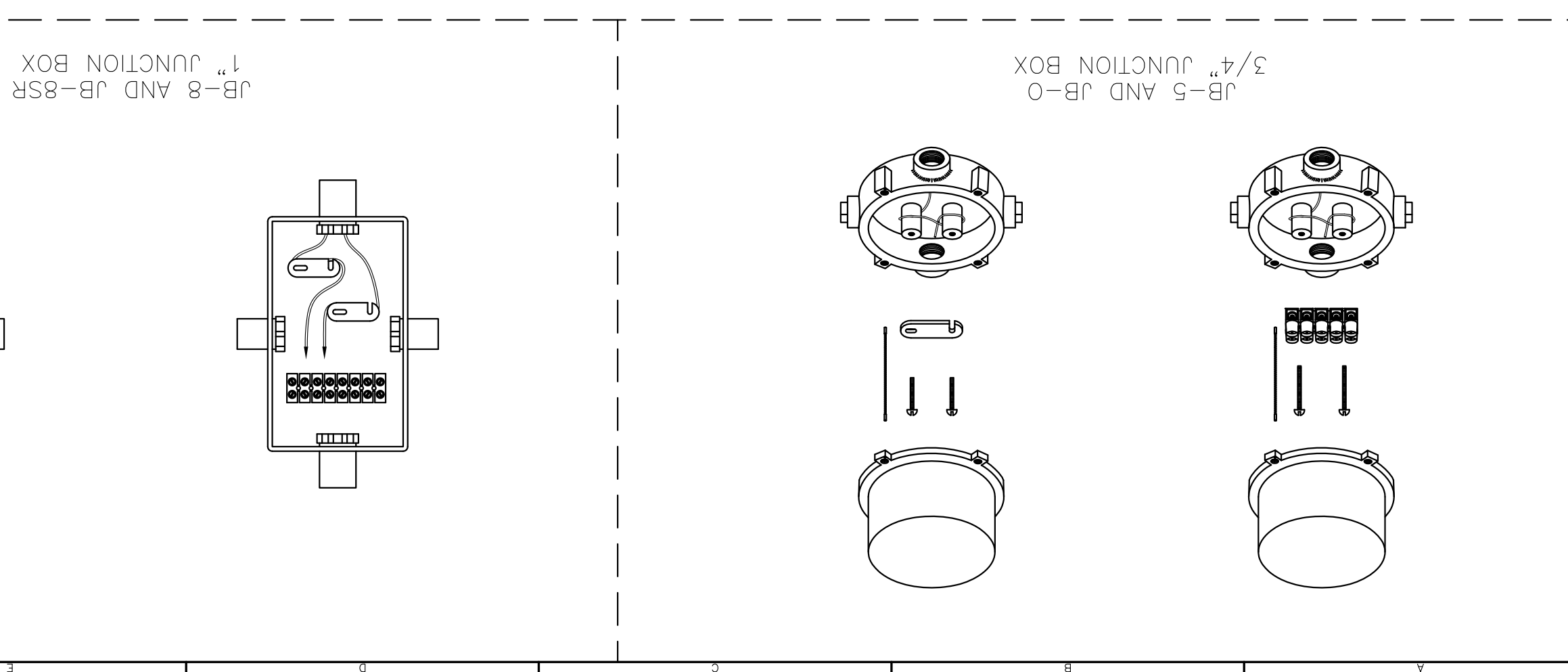
NOTES:

- 1) DRAWING ILLUSTRATES METHOD OF STRAIN RELIEVING WIRE. USE THIS METHOD ON ALL JUNCTION BOXES.
- 2) THE NATIONAL ELECTRICAL CODE-ARTICLE 300-19-B3 REQUIRES CONDUCTORS IN A VERTICAL CONDUIT BE SUPPORTED TO RELIEVE STRAIN ON TERMINAL BLOCK CONNECTIONS.
- 3) SKETCH ILLUSTRATES METHOD OF STRAIN RELIEVING A SINGLE CONDUCTOR. SEVERAL CONDUCTORS MAY BE GROUPED TOGETHER.
- 4) CONDUCTORS MAY BE MIXED BUT SHOULD NOT TAKE UP MORE THAN 40% OF CONDUIT'S INSIDE AREA.



AWG	MAX. NUMBER WIRES IN 3/4" CONDUIT	MAX. NUMBER WIRES IN 1" CONDUIT	WIRE AREA SQ. INCHES	WEIGHT PER 100 FEET
12 THHN	16	26	0.0117	2.50
10 THHN	10	17	0.0184	4.10
8 THHN	6	9	0.0373	6.70
6 THHN	4	7	0.0519	10.30
4 THHN	2	4	0.0845	16.20

USING THIS JUNCTION BOX METHOD SPACING IS 100 FEET MAXIMUM.



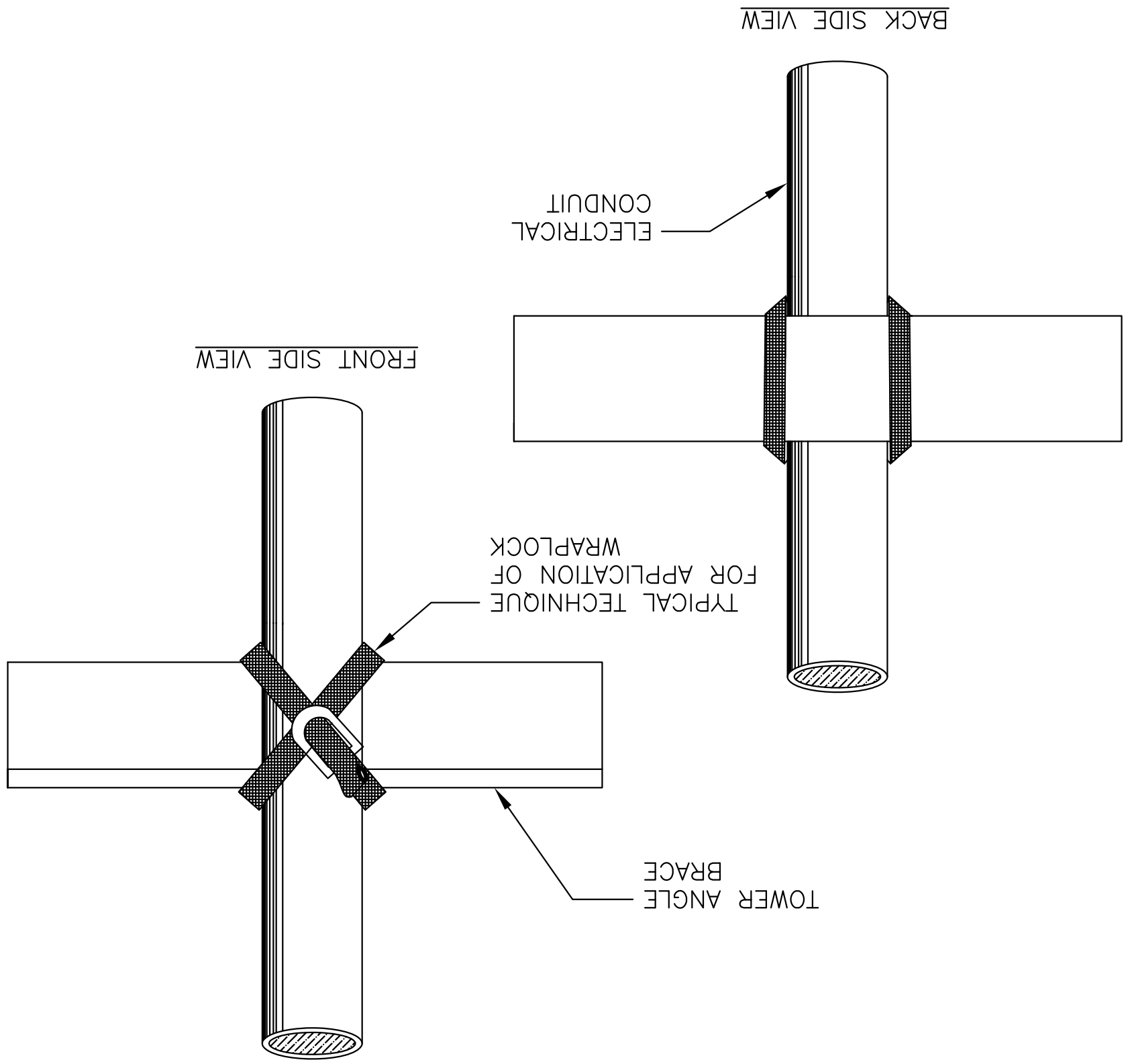


ENGINEER		APPROVED	
TWR Lighting, Inc. MARK		APPROVED	
TWR Lighting, Inc. MARK		APPROVED	
DATE	05/01/2014	SCALE	N.T.S.
DWG. NO.	100984	SHEET SIZE	B
DRAWN BY	M. PETERMAN	SHEET QTY.	1 OF 1

**WRAPLOCK FASTENING DETAIL**

**DIRECTIONS FOR USING Wraplock**  
 CUT OFF BAND TO PROPER LENGTH.  
 (SEE TABLE ON COVER OF BOX)

1. — PASS ONE END THROUGH YOKE AND BEND BACK ABOUT 1 1/2" AND FLATTEN DOWN.
2. — PASS BAND AROUND WORK AND THROUGH YOKE.
3. — REPEAT AND PASS END THROUGH A SECOND TIME, DRAW UP FREE END SNUGLY WITH PLIERS.
4. — INSERT FREE END IN SLOT OF RATCHET. TURN DOWN UNTIL CLAMP IS TIGHT.
5. — BACK OFF SLIGHTLY TO REMOVE RATCHET. CLAMP IS NOW SECURELY LOCKED.
6. — TO REMOVE Wraplock UNCOIL END WITH RATCHET. PRESS DOWN AT POINT WHERE BAND METAL HAS BEEN FORCED THROUGH CURVED PART OF YOKE.



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