TWR Lighting®, Inc. HARK
Enlightened Technology®

10810 W. LITTLE YORK #130 HOUSTON, TX 77041-4051
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web: 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 # AA1MDF-M

SERIAL # _____

PURCHASE DATE _____

PURCHASED FROM _____

TWR Lighting® Inc. HARK

Enlightened Technology®

AA1MDF-M CONTROLLER

TABLE OF CONTENTS

1.0 GENERAL INFORMATION 1

2.0 INSTALLATION INSTRUCTIONS 3
- 2.1 MOUNTING THE CONTROL CABINET 3
- 2.2 EXTERNAL PHOTOCELL WIRING 3
- 2.3 POWER WIRING 4
- 2.4 RED BEACON AND SIDELIGHT WIRING 4
- 2.5 RED BEACON AND SIDELIGHT ALARM WIRING 5

3.0 THEORY OF OPERATION 7
- 3.1 POWER SUPPLY 7
- 3.2 SIDELIGHTS 7
- 3.3 BEACON 7

4.0 MAINTENANCE GUIDE 8
- 4.1 RED OBSTRUCTION LIGHTING 8
- 4.2 L-864 LAMP REPLACEMENT 8
- 4.3 LAMP REPLACEMENT 8
- 4.4 L-864 CONTROLLER 9
- 4.5 PHOTOCELL 9

5.0 MAJOR COMPONENTS PARTS LIST 10

6.0 SUGGESTED SPARE PARTS LIST 11

WARRANTY & RETURN POLICY

RETURN MERCHANDISE AUTHORIZATION (RMA) FORM

TWR Lighting® Inc. HARK

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AA1MDF-M CONTROLLER

APPENDIX

CHASSIS COMPONENT LAYOUT ..... 1007-R (REV C)

SCHEMATIC LAYOUT ..... 1007-S (REV C)

TROUBLESHOOTING FLOW CHART ..... 1007-F (REV A)

PHOTOCELL HOUSING DETAIL ..... 100239 (REV H)

TOWER LIGHTING KIT 151' TO 200' ..... 260-13 (REV E)

TOWER LIGHTING KIT 201' TO 350' ..... 260-14 (REV E)

SIDELIGHT MOUNT ASSEMBLY ..... 100489 (REV A)

L-810 OL-1 SINGLE OBSTRUCTION LIGHT DETAIL ..... 279-OL (REV C)

L-810 OL-1 WIRING DETAIL ..... 274-S (REV A)

L-864 FM 300 MM BEACON DETAIL ..... 275-B (REV E)

L-864 FB 300 MM WIRING DETAIL 273-B

JUNCTION BOX DETAIL ..... 100089 (REV A)

WRAPLOCK FASTENING DETAIL 100984

TWR Lighting®, Inc. HARK

Enlightened Technology®

AA1MDF-M CONTROLLER

1. GENERAL INFORMATION

The TWR Lighting®, Inc. (TWR®) Model AA1MDF-M Controller is for A1 lighting of towers 151' to 350' AGL (above ground level) in accordance with the Federal Aviation Circular 70/7460-1K. One (1) beacon should be placed at the top of the structure. Three (3) obstruction lights should be placed at the mid-point with respect to the overall tower height.

The flash rate of the beacon is 30 per minute. The 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 "on" the toggle switch mounted on the panel of the controller.

Each beacon requires two (2) 620 watt or two (2) 700 watt, 120V bulbs. The use of any other bulb may give a false beacon lamp burnout alarm. TWR® recommends that you use only these bulbs. Do not try to use 130V bulbs. Each sidelight requires one (1) 116 watt, 120V bulb (620PS40P, 700PS40P, and 116A21TS).

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

Power supplied to the controller shall be 120V AC, 50/60 Hz.

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 form of dry contact closures (Form C) are as follows:

POWER FAILURE	Monitors 120V AC to the controller. Alarms in the event of power failure, or tripped circuit breaker.
LIGHTS ON	Gives an indication whenever the controller is activated.
BEACON	Will give an alarm in the event one (1) or both fails.
FLASHER FAILURE	Will give an alarm in the event of flasher failure.
OBSTRUCTION LIGHTS	Will give an alarm when one (1) or three (3) sidelights fail.

AA1MDF-M CONTROLLER

SPECIFICATIONS OF EQUIPMENT

Dimensions:

Controller (H x W x D) / Weight	(15.75” x 13.25” x 6.5”)/ 15.6 lbs.
Mounting Dim.(H x W)	4.75” x 10.0”

Electrical Voltage: 120V AC +/- 10% 60 Hz

Intensity

Beacon	2,000 Candelas +/- 25%
Sidelight	32.5 Candelas min.

Beam Spread

Beacon

Horizontal	360°
Vertical	10° min.

Sidelight

Horizontal	360°
Vertical	10° min.

Wattage: 1,600 watts

2.0 INSTALLATION INSTRUCTIONS

2.1 MOUNTING THE CONTROL CABINET

(Refer to Drawing 1007-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 1007-R. Power wiring to the control cabinet should be in accordance with local methods and the National Electric 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." The photocell should be positioned so that it does not "see" ambient light, which would prevent it from switching to 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. Care must be taken to assure that the photocell does not "see" any ambient light that would prevent it from switching into the nightmode. The photocell wiring is the same as in 1.1.1.

2.1.3 The wiring from the photocell, the service breaker, the red incandescent beacon, and the 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:

2.2 EXTERNAL PHOTOCELL WIRING

(Refer to Drawing 1007-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 1007-R)

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

2.3.2 Circuit breaker needs to be rated at 20 amps.

2.3.3 Connect incoming 120V AC line 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.

NOTE: On AM tower applications, keep the controller ground from being connected to earth ground. Ground to the tower only!

2.4 RED BEACON and SIDELIGHT WIRING

(Refer to Drawings 1007-R, 260-13, and 260-14)

Install wiring between the controller and the beacon utilizing the conduit method. Refer to drawings 1007-R, 260-13, and 260-14, for installation of light kits. Always work safely and adhere to all OSHA Safety Guidelines when lifting, wiring, or working on the structure or tower itself. It is the installer's responsibility to install the lighting kit in a safe manner. Installers can request from OSHA their requirements 29CFT 1926.21, and 29CFR 1926.105 to ensure compliance to regulations.

NOTE: ***On occasion, a set of custom lighting kit drawings may be specifically requested by a customer and installed in this manual. In cases such as this, the drawings will precede the manual if a conflict occurs.***

2.4.1 Connect the **BLACK** wire from the beacon to the circuit breaker marked "B."

2.4.2 Connect the **RED** wire from the sidelight group to the circuit breaker marked "S."

2.4.3 Connect the **NEUTRAL** wire(s) to one of the terminal blocks on TB1 marked "N."

2.5 RED BEACON and SIDELIGHT ALARM WIRING

(Refer to Drawing 1007-R)

2.5.1 Alarm relays K1 – K3, and alarm Modules M1, and M2, are provided for independent contact closures for: Power Failure, Lights "On," Beacon Flasher Failure, Beacon Lamp Burnout, and Sidelight Lamp Burnout.

2.5.2 Alarm Wiring: To utilize all of the red light alarms, the customer will need five (5) pairs of wires to interface with the alarm device. One (1) wire from each of the five (5) pairs will terminate at the points marking common (C). The remaining wire from each pair will terminate as follows:

2.5.2.1	Power Failure Alarm:	Connect to relay K1, terminal #3, for normally open (OR) terminal #6, for normally closed monitoring.
2.5.2.2	Lights "On" Alarm:	Connect to relay K2, terminal #3, for normally open (OR) terminal #6, for normally closed monitoring.
2.5.2.3	Beacon Flasher Failure:	Connect to relay K3, terminal #6, for normally open (OR) terminal #3, for normally closed monitoring.
2.5.2.4	Beacon Lamp Burnout:	Connect to Module M1, terminal T6, for normally open (OR) terminal T7, for normally closed monitoring.

2.5.2.5 Sidelight Lamp Burnout: Connect to Module M2, terminal T5, for normally open (OR) terminal T6, 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.

2.5.3.1 Power Failure: Pull circuit breaker at electrical panel.

2.5.3.2 Lights "On": Operate photocell by-pass switch (SW1) or cover the photocell. **NOTE: (Indication will be delayed 8 – 10 seconds for all the beacon and sidelight relays to position themselves.)**

2.5.3.3 Beacon and Sidelights: Trip circuit breakers on the controller panel.

3.0 THEORY OF OPERATION

3.1 POWER SUPPLY

120V AC enters the controller from the circuit breaker panel. Line 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 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 SIDELIGHTS

Line LD is sent through Module M2, which is a current sensing module for sidelights. The CM-250 monitors one (1) level of sidelights, and will provide a contact closure along a visual indication if one (1) or more lamps fails.

3.3 BEACON

Line LDB is sent to the Motor Driven Flasher, and Module M1. The Motor Driven Flasher is the flasher for the beacon. The output of the Motor Driven Flasher is sent through the current sensing Module M1 to the circuit breaker output “B.” If Module M1 detects a lamp burnout, then that module would provide a contact closure along with a visual indication for that lamp circuit.

Relay K3 is a flasher failure relay for the beacon. If Module M1 detects a flasher failure, then that module would provide voltage to relay K3, which would provide a contact closure along with a visual indication for that beacon circuit.

4.0 MAINTENANCE

WARNING – HIGH – VOLTAGE

THIS SYSTEM OPERATES AT HIGH VOLTAGE LEVELS THAT COULD BE LETHAL TO SERVICE PERSONNEL. ALL INSTALLATION AND MAINTENANCE WORK SHOULD BE DONE BY QUALIFIED SERVICE PERSONNEL. READ AND UNDERSTAND THE THEORY OF OPERATION AND ITS SAFETY MESSAGES BEFORE ATTEMPTING INSTALLATION OF THIS SYSTEM. DO NOT ATTEMPT TO DEFEAT THE INTERNAL SAFETY DEVICES.

TOOLS REQUIRED: NONE

4.1 RED OBSTRUCTION LIGHTING

The only required maintenance needed to be performed is replacement of the lamps in the L-864, and L-810 fixtures. Lamps should be replaced after being operated for not more than 75% of the rated life or immediately upon failure as per Federal Advisory Circular 70/7460-1K. By following these instructions, maximum safety and performance can be achieved.

4.2 L-864 LAMP REPLACEMENT

4.2.1 Loosen the one (1) wing nut on the latch pin so that it can recline.

4.2.2 Open the lens and tilt it back.

4.2.3 To remove each lamp, depress down while rotating the lamp counter-clockwise 90°.

4.2.4 Install the new lamps by depressing down while rotating the lamp clockwise 90°.

4.2.5 Close the lens and let the latch pin drop in the recessed slot.

4.2.6 Tighten the wing nut snug, then ¼ turn more.

4.3 L-810 LAMP REPLACEMENT

4.3.1 Unclasp the two (2) latches and let the bail recline back.

4.3.2 Lift the lens up and over the lamp, letting the lens hang from the safety cable.

4.3.3 Unscrew the lamp counter-clockwise and remove.

4.3.4 Install the new lamp by screwing the lamp clockwise.

4.3.5 Reinstall the lens, making sure it is seated properly on the base.

4.3.6 Reclasp the two (2) latches.

4.4 L-864 CONTROLLER

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

4.5 PHOTOCELL

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

5.0 MAJOR COMPONENTS PARTS LIST

QTY	PART NUMBER	DESCRIPTION
1	6390-FAA (This replaces the 102FAA Photocell)	120 – 240V AC Photocell
1	22-02	Motor Driven Flasher
1	PRD7AGO	Mechanical Load Contactor (PRD)
1	CM-250	Beacon Failure Detector (M1)
2	KRPA5AG120V	SPDT Relay (K1, and K3)
1	CM-250	Sidelight Burnout Detector (M2)
1	SPEC224	Time Delay Relay (K2)
1	VJ1412HWPL2	Enclosure
1	STJ01002	15 amp SPDT Switch (SW1)
1	MOV524V15	Metal Oxide Varistor (MOV)
2	S261D20	20 amp Circuit Breaker (B and S)
2	8WA1808	End Stop
6	8WA1204	Terminal Blocks (TB1, TB2)
3	PB27E122	Octal Sockets (K1 – K3)
1	SSPIGTAIL	20’ Pigtail

6.0 SUGGESTED SPARE PARTS LIST

QTY	PART NUMBER	DESCRIPTION
1	6390-FAA (This replaces the 102FAA Photocell)	120 – 240V AC Photocell
1	22-02	Motor Driven Flasher
1	PRD7AGO	Load Contactor (PRD)

TWR Lighting® Inc. HARK

Enlightened Technology®

AA1MDF-M CONTROLLER

Warranty & Return Policy

TWR Lighting®, Inc. ("TWR®") 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®, Inc. ("TWR®") warrants its "LED Product" against defects in design, material and workmanship for a period of five (5) years from the date of shipment. TWR®, at its sole option, will, itself, or through others, repair, replace or refund the purchase price paid for "LED Product" that TWR® 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®, Inc. ("TWR®") warrants its "LED Product" against light degradation for a period of five (5) years from the date of installation. TWR®, at its sole option, will, itself, or through others, repair, replace, or refund the purchase price paid for "LED Product" that TWR® 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:

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

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:

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

TWR Lighting® Inc. HARK

Enlightened Technology®

AA1MDF-M CONTROLLER

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.

- Product(s) that is deemed defective and/or unrepairable and covered under warranty - a credit will be issued to the customer's account.
- 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.
- 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® 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® 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.

Warranty & Return Policy
(continued)

Freight – All warranty replacement part(s) will be shipped via ground delivery and paid for by TWR®. 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®** 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®** EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESSED OR IMPLIED. WITHOUT LIMITING THE GENERALITY OF THE FORGOING, **TWR®** MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS OF THE PRODUCT(S) FOR ANY PARTICULAR PURPOSE. **TWR®** EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES.

TWR Lighting® Inc. HARK

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AA1MDF-M CONTROLLER

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:_____

_____

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

TWR Lighting® Inc. HARK

Enlightened Technology®

AA1MDF-M CONTROLLER

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:_____

_____

_____

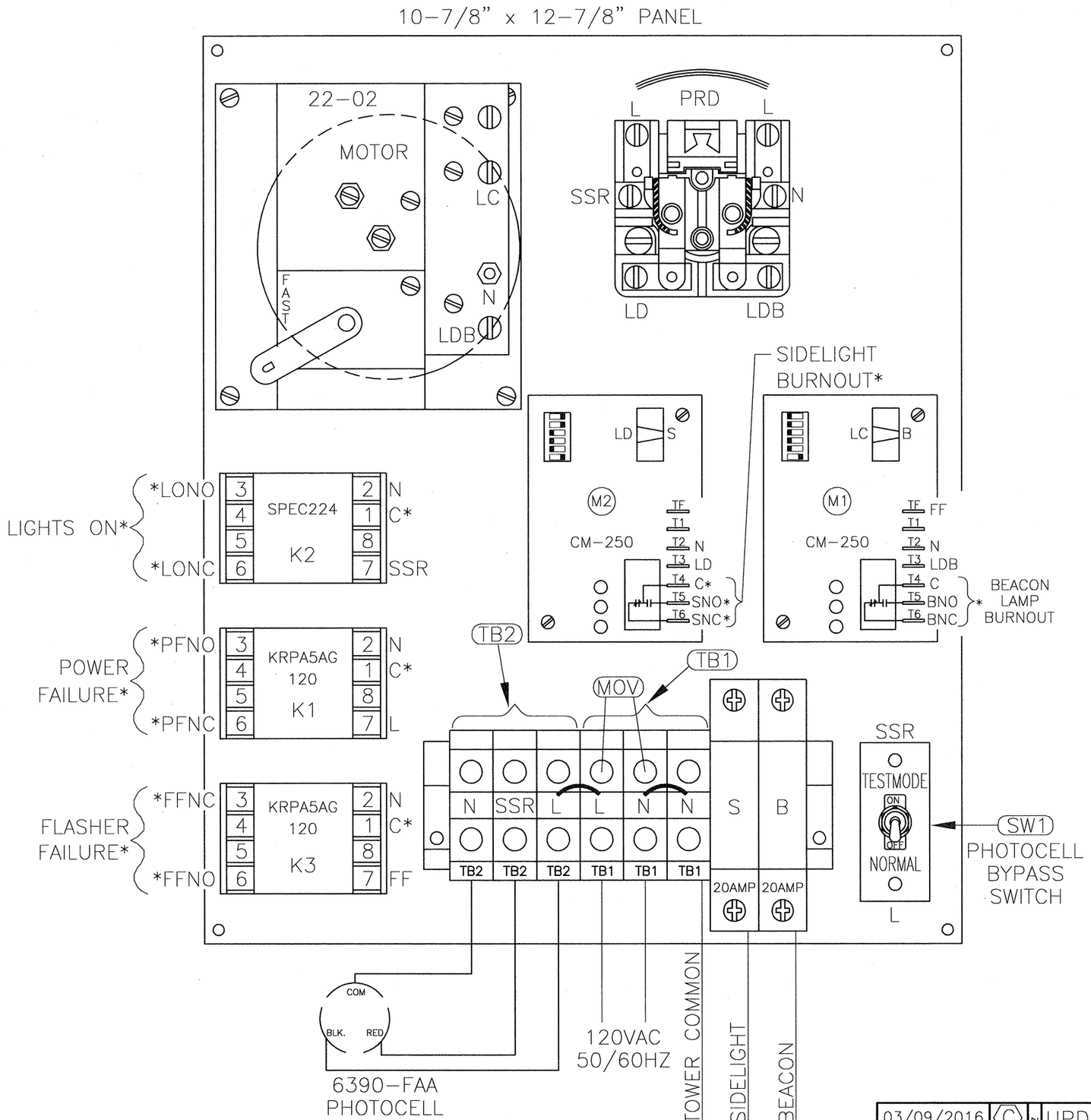
_____

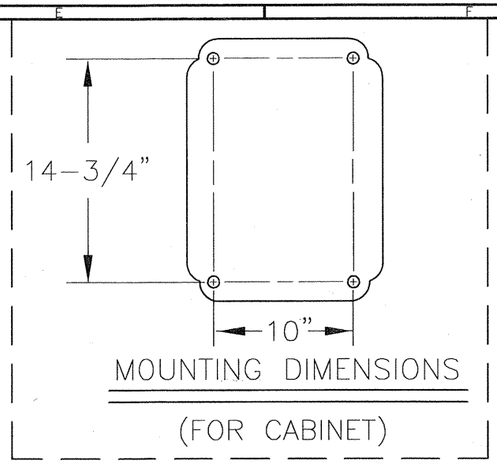
SIGNED:_____ **DATE NEEDED:**_____

RETURN ADDRESS:_____

_____

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





NOTES:

1. WIRES ARE CONNECTED LETTER TO LETTER. (EXAMPLE) L TO L TO L.

*CUSTOMER ALARM POINTS

C = COMMON
LONO/LONC = LIGHTS "ON"
PFNO/PFNC = POWER FAILURE
FFNO/FFNC = FLASHER FAILURE
SNO/SNC = SIDELIGHT BURNOUT
BNO/BNC = BEACON BURNOUT

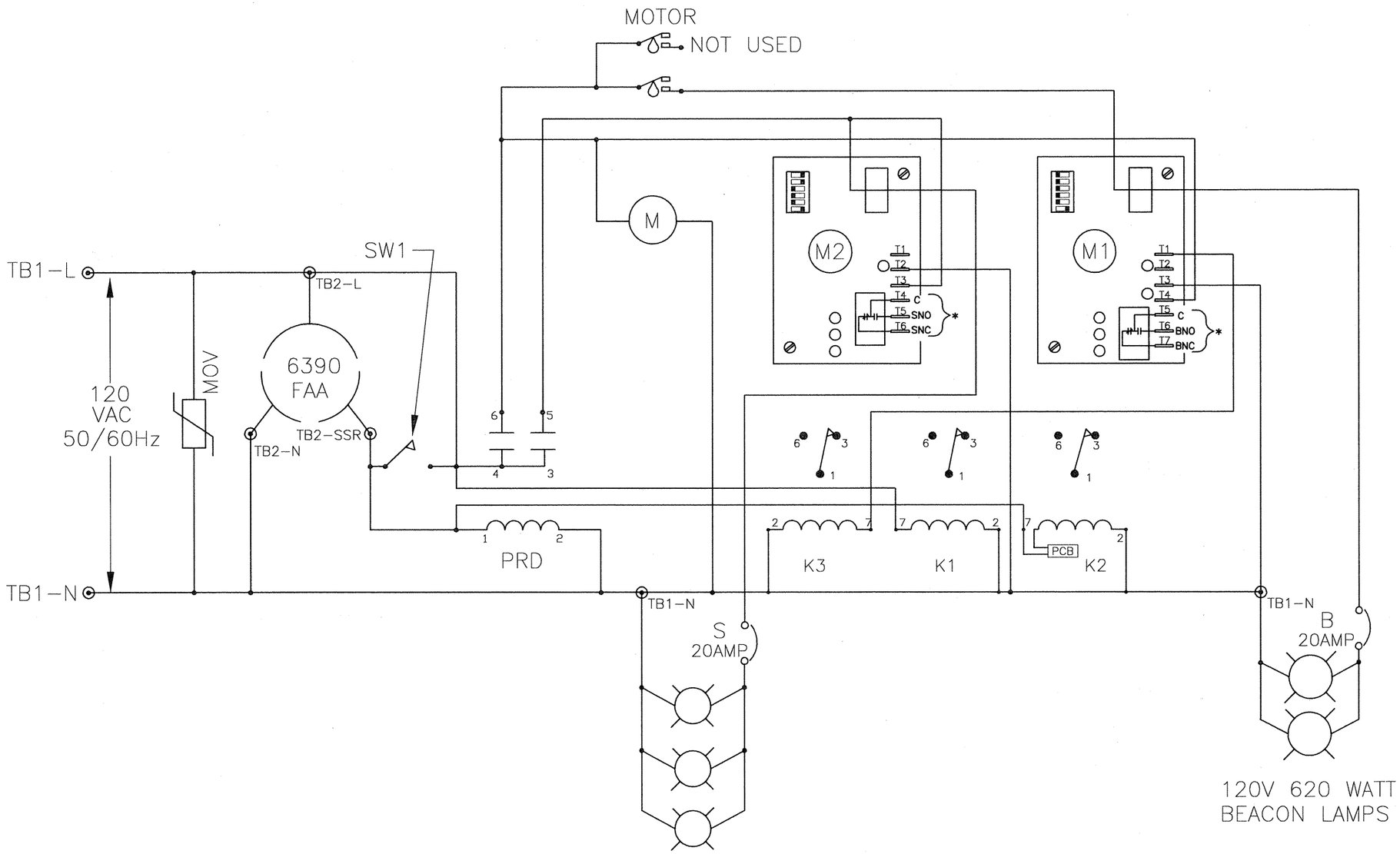
DATE:	LTR.	REVISION
03/09/2016	C	JJZ UPDATED MODULES

AA1MDF-M CHASSIS LAYOUT

PROD DEPT
SERV DEPT
ENGINEER

TWR Lighting, Inc. Enlightened Technology® HARK®

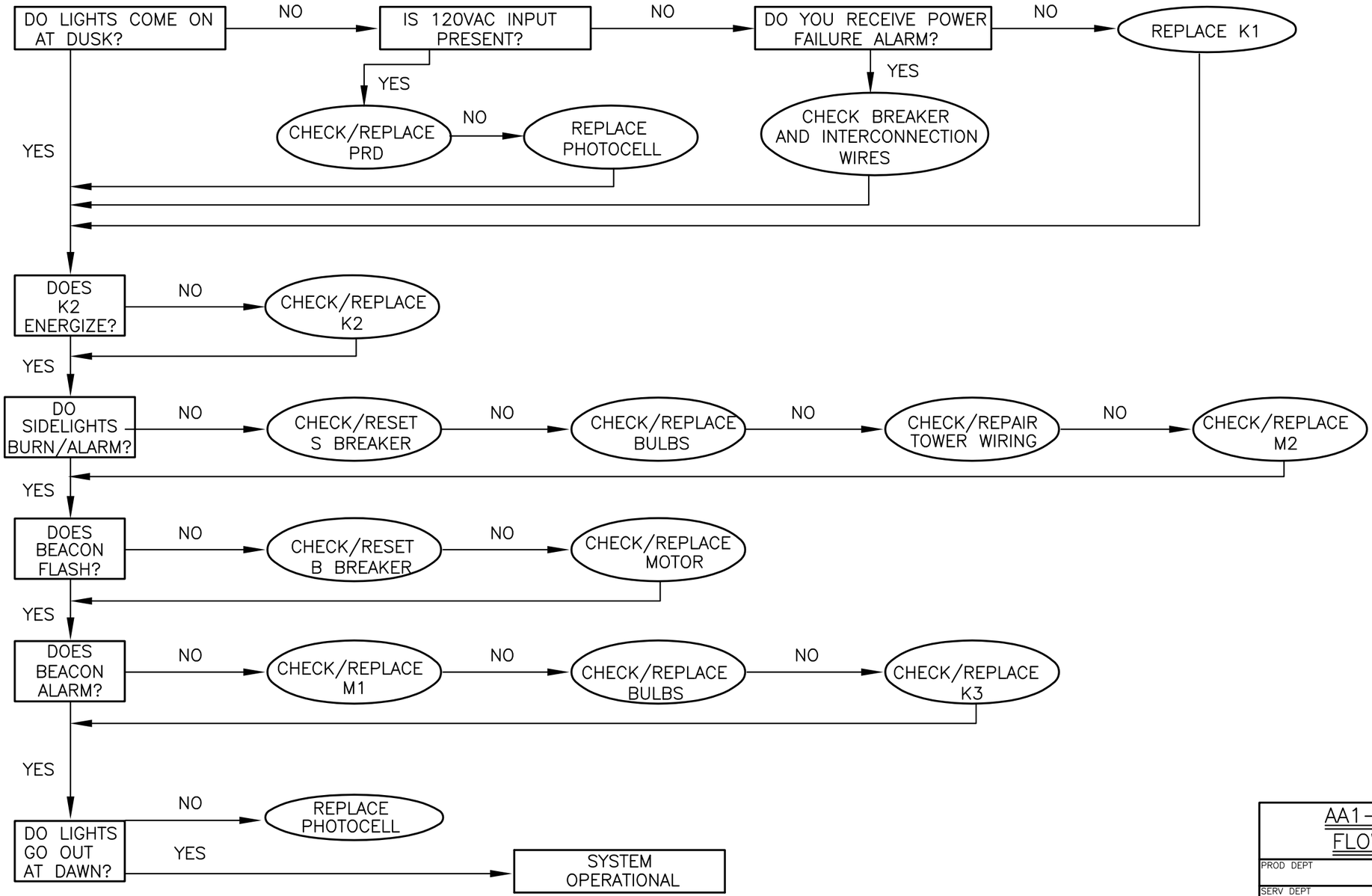
DRAWN BY	SHEET SIZE	SHEET QTY.
E.A.SALAZAR	B	1 OF 1
DATE 05/12/1999	SCALE N.T.S.	DWG. NO. 1007-R



AA1MDF–M SCHEMATIC LAYOUT

ENGINEER	TWR Lighting, Inc.		
APPROVED	Enlightened Technology®		
APPROVED			
APPROVED	DRAWN BY E.A.SALAZAR	SHEET SIZE B	SHEET QTY. 1 OF 1
APPROVED	DATE 05/06/1999	SCALE N.T.S.	DWG. NO. 1007–S

DATE:	LTR.	REVISION
03/09/2016	C JZ	UPDATED MODULES



05/06/1999	A	E.A.S.	UPDATED CONTROLLER
DATE:	LTR.		REVISION

AA1–MDFM TROUBLESHOOTING FLOW CHART DWG# 1007–R

PROD DEPT

SERV DEPT

ENGINEER

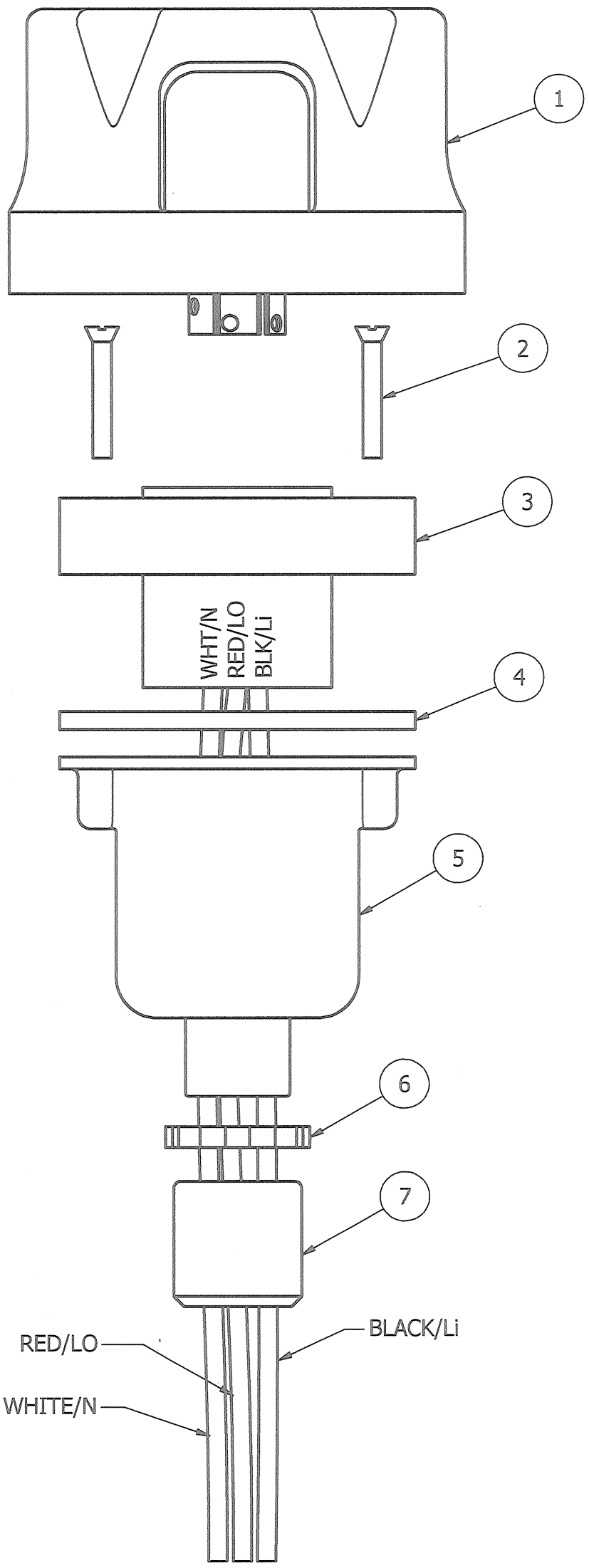
TWR Lighting,® Inc.
Enlightened Technology®

DRAWN BY E.A.SALAZAR | SHEET SIZE B | SHEET QTY. 1 OF 1

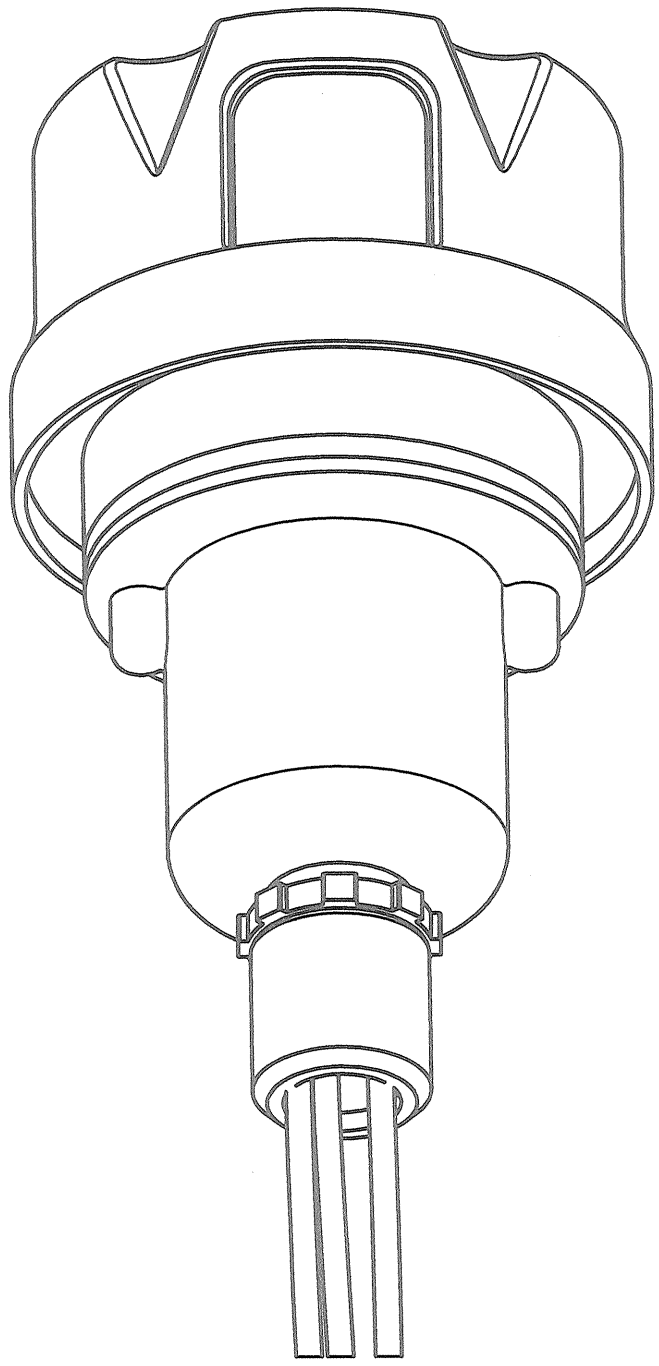
DATE 05/13/99 | SCALE N.T.S. | DWG. NO. 1007–F

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.

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:
1. ITEM #7 CAN BE USED TO REDUCE 3/4" CONDUIT TO 1/2" CONDUIT AT THE HOUSING OR AT THE CONTROLLER ITSELF.
2. 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

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

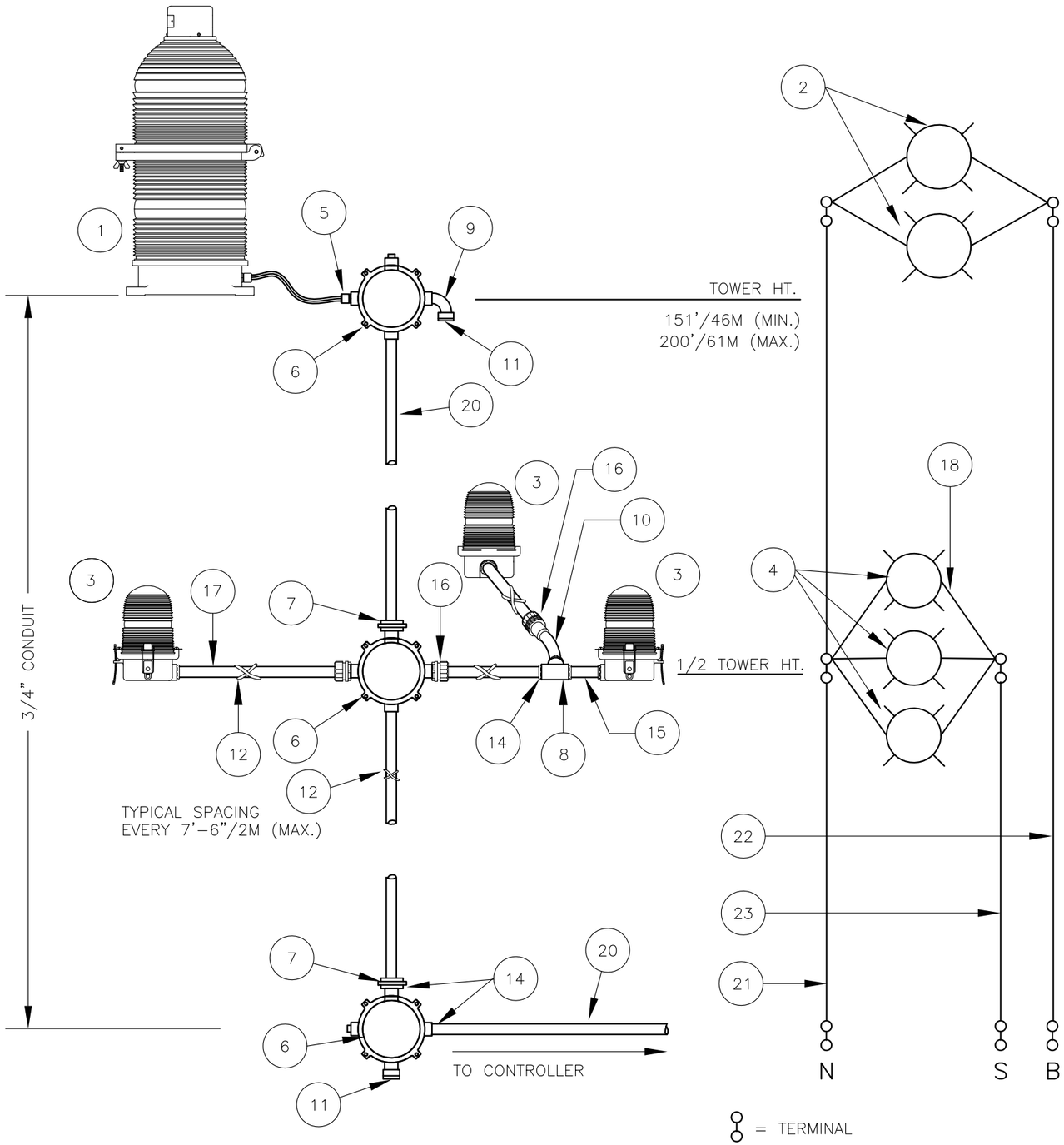
PHOTOCELL HOUSING DETAIL

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	

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.



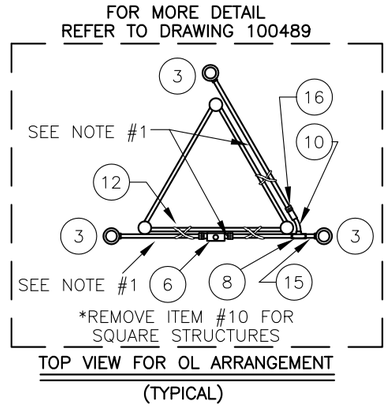
BILL OF MATERIALS

	ITEM NO.	QTY.	TWR PART NO.	DESCRIPTION
	1	1	BEACON	300 MM BEACON RED
	2	2	---	120 OR 240 VOLT LAMP
	3	3	OL1	3/4" OBSTRUCTION LIGHT
	4	3	---	120 OR 240 VOLT LAMP
	5	1	CGB295SA	3/4" CORD CONNECTOR
	6	3	JB5	3/4" JUNCTION BOX
	7	4	UNY205	3/4" UNION
	8	2	T27CG	3/4" CONDULET W/COVER AND GASKET
	9	2	EL3490	3/4" 90° SHORT ELBOW
	10	1	EL3430	3/4" 30° ELBOW
	11	2	5012902	3/4" BREATHER
	12	1	SS10012	WRAPLOCK
*	13	1	PIPDOP	4 oz. PIPE DOPE
	14	12	A314	3/4" CONDUIT LOCKNUTS
	15	1	N34T3	3/4" x 3" NIPPLE
	16	3	HC402	3/4" NO THREAD CONNECTOR
	17	30'	CONDUIT34	3/4" CONDUIT (FOR OL)
	18	3	SLPIGTAIL25	25' SIDELIGHT PIGTAIL
*	19	1	AA1_____	AA1_____CONTROLLER

ITEM NUMBERS #20-#23 ARE NOT INCLUDED IN THE KIT BUT ARE AVAILABLE UPON REQUEST, AND REQUIRED FOR INSTALLATION.

20	–	CONDUIT34	3/4" CONDUIT (TOWER HT. + 30'/9M)
21	–	8THHNWHT	#8 THHN WHT. WIRE (TOWER HT.+40'/12M)
22	–	8THHNBLK	#8 THHN BLK. WIRE (TOWER HT.+40'/12M)
23	–	12THHNRED	#12 THHN RED WIRE (1/2 TWR HT.+40'/12M)

* = ITEMS NOT SHOWN



TOP VIEW FOR OL ARRANGEMENT
(TYPICAL)

NOTES:

1) PART #CONDUIT34 CUT TO LENGTH FOR PROPER EXTENTION OF OL1 (6"–12") FROM STRUCTURE. ATTACH PART #HC402 TO UNTHREADED CONDUIT TO COMPLETE ASSEMBLY.
2) CONDUIT SIZE BASED ON USING TYPE THHN WIRE.
3) USE RIGID GALVANIZED STEEL CONDUIT.
4) BREATHERS ALLOW FOR CIRCULATION OF AIR TO PREVENT CONDENSATION.
5) USE COUPLING THAT IS PROVIDED WITH PART #CONDUIT34 TO ATTACH PART #EL3430 TO PART #HC402.

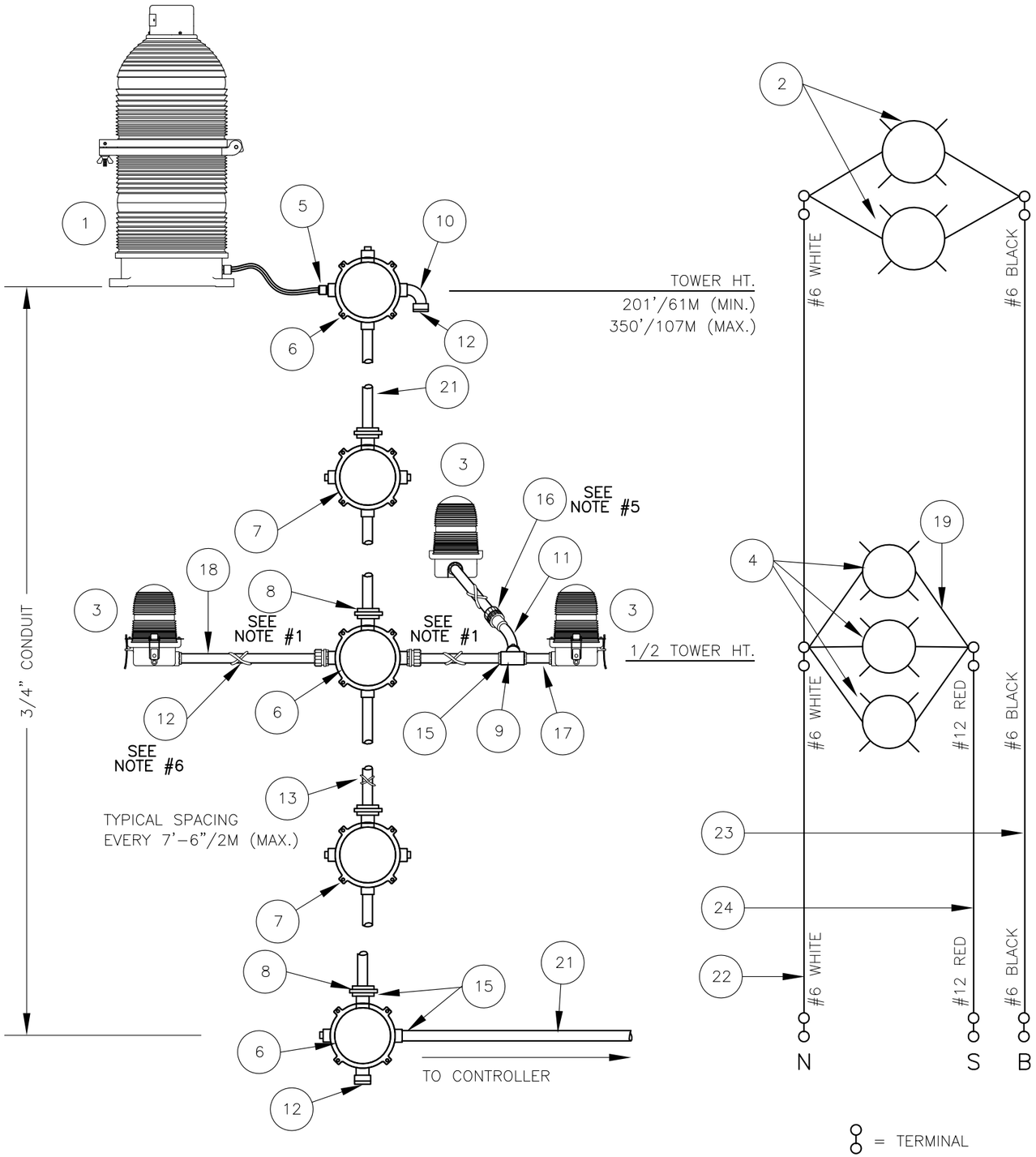
DATE:	LTR.	REVISION
12/03/07	E (J.L.B.)	CHG OL ARRANGEMENT

LK3A1 TOWER LIGHTING KIT W/NO BOOST
(TOWERS 151'/46M TO 200'/61M)

PROD DEPT
SERV DEPT
ENGINEER

TWR Lighting, Inc.
Enlightened Technology®

DRAWN BY G.D. SEBEK | SHEET SIZE B | SHEET QTY. 1 OF 1
DATE 3/5/94 | SCALE N.T.S. | DWG. NO. 260–13



= TERMINAL

BILL OF MATERIALS

ITEM NO.	QTY.	TWR PART NO.	DESCRIPTION
1	1	BEACON	300 MM BEACON RED
2	2	---	120 OR 240 VOLT LAMP
3	3	OL1	3/4" OBSTRUCTION LIGHT
4	3	---	120 OR 240 VOLT LAMP
5	1	CGB295SA	3/4" CORD CONNECTOR
6	3	JB5	3/4" JUNCTION BOX
7	2	JB0	3/4" STRAIN RELIEF BOX
8	6	UNY205	3/4" UNION
9	2	T27CG	3/4" CONDULET W/COVER AND GASKET
10	2	EL3490	3/4" 90° SHORT ELBOW
11	1	EL3430	3/4" 30° ELBOW
12	2	5012902	3/4" BREATHER
13	1	SS10012	WRAPLOCK
* 14	1	PIPDOP	4 oz. PIPE DOPE
15	16	A314	3/4" CONDUIT LOCKNUTS
16	3	HC402	3/4" NO THREAD CONNECTOR
17	3	N34T3	3/4" x 3" NIPPLE
18	30'	CONDUIT34	3/4" CONDUIT (FOR OLS)
19	3	SLPIGTAIL25	25' SIDELIGHT PIGTAIL
* 20	1	AA1_____	AA1_____CONTROLLER

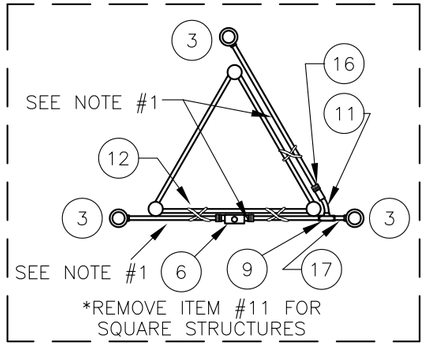
ITEM NUMBERS #21-#24 ARE NOT INCLUDED IN THE KIT BUT ARE AVAILABLE UPON REQUEST, AND REQUIRED FOR INSTALLATION.

21	–	CONDUIT34	3/4" CONDUIT (TOWER HT. + 30'/9M)
22	–	6THHNWHT	#6 THHN WHT. WIRE (TOWER HT.+40'/12M)
23	–	6THHNBLK	#6 THHN BLK. WIRE (TOWER HT.+40'/12M)
24	–	12THHNRED	#12 THHN RED WIRE (1/2 TWR HT.+40'/12M)

* = ITEMS NOT SHOWN

NOTES:
1) ITEM #18 CUT TO LENGTH FOR PROPER EXTENSION OF OL1 (6"-12") FROM STRUCTURE. ATTACH ITEM #16 TO UNTHREADED CONDUIT TO COMPLETE ASSEMBLY.
2) CONDUIT SIZE BASED ON USING TYPE THHN WIRE.
3) USE RIGID GALVANIZED STEEL CONDUIT.
4) BREATHERS ALLOW FOR CIRCULATION OF AIR TO PREVENT CONDENSATION.
5) USE COUPLING THAT IS PROVIDED WITH ITEM #18 TO ATTACH ITEM #11 TO ITEM #16.
6) STAINLESS STEEL WRAPLOCK TO BE ATTACH TO OL CONDUIT EVERYWHERE IT MEETS STRUCTURE.

FOR MORE DETAIL
REFER TO DRAWING 100489



*REMOVE ITEM #11 FOR SQUARE STRUCTURES

TOP VIEW FOR OL ARRANGEMENT
(TYPICAL)

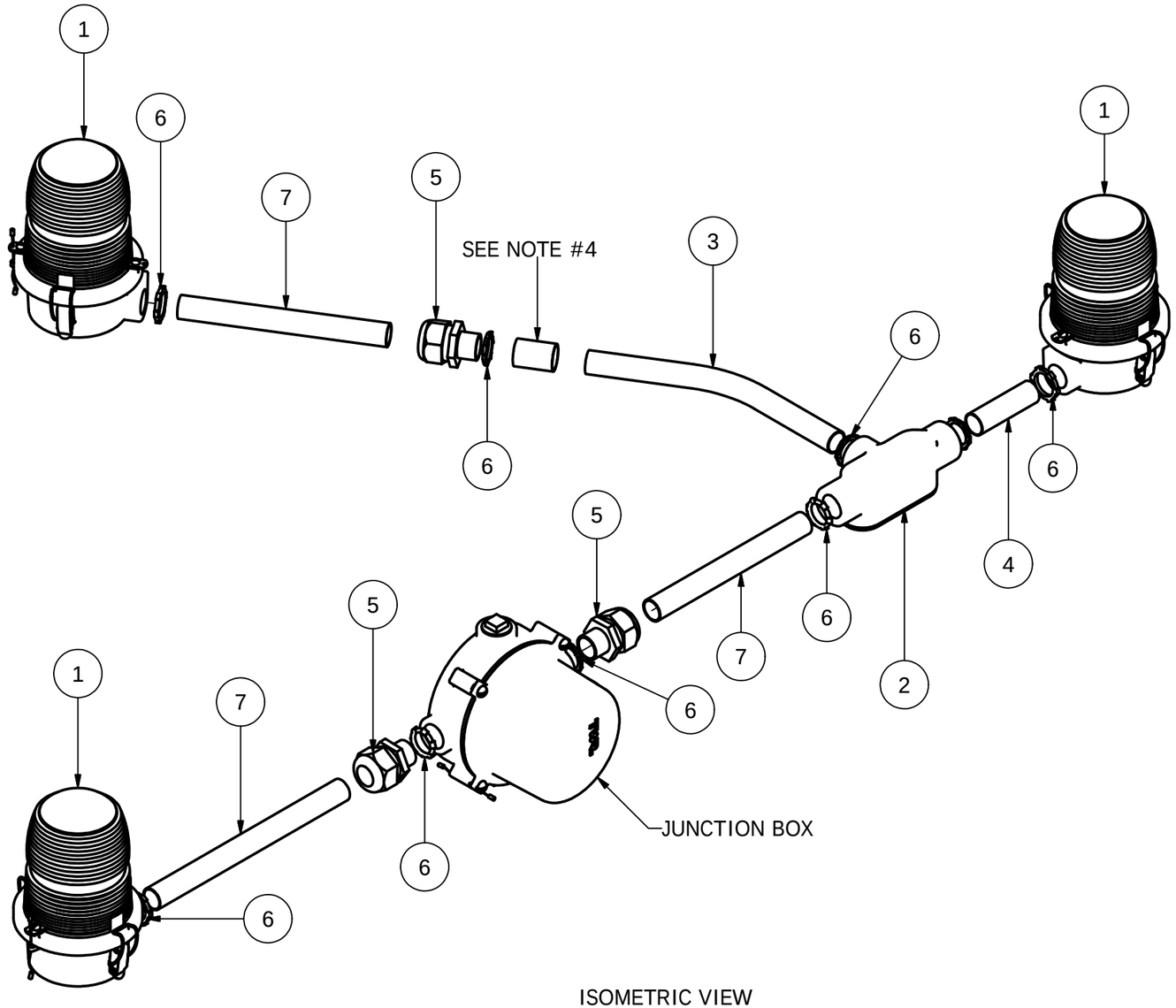
(NO BOOST)

LK4A1 TOWER LIGHTING KIT W/3 OL-1
(TOWERS 201'/61M TO 350'/107M)

PROD DEPT			
SERV DEPT			
ENGINEER			
DRAWN BY G.D. SEBEK		SHEET SIZE B	SHEET QTY. 1 OF 1
DATE 03/05/94	SCALE N.T.S.	DWG. NO.	260-14

TWR Lighting,® Inc.
Enlightened Technology®

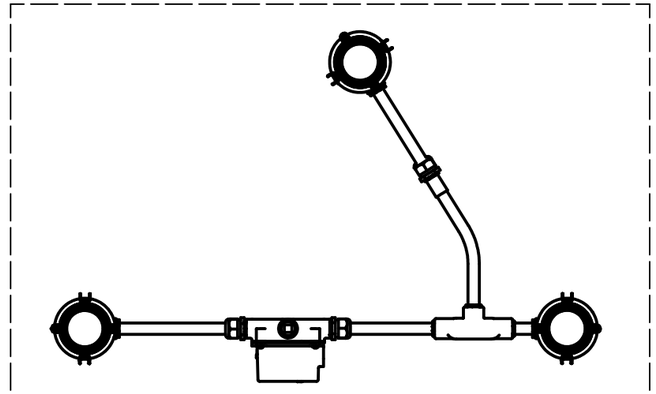
11/11/04	E EAS	UPDATED BOM
DATE:	LTR.	REVISION



ISOMETRIC VIEW

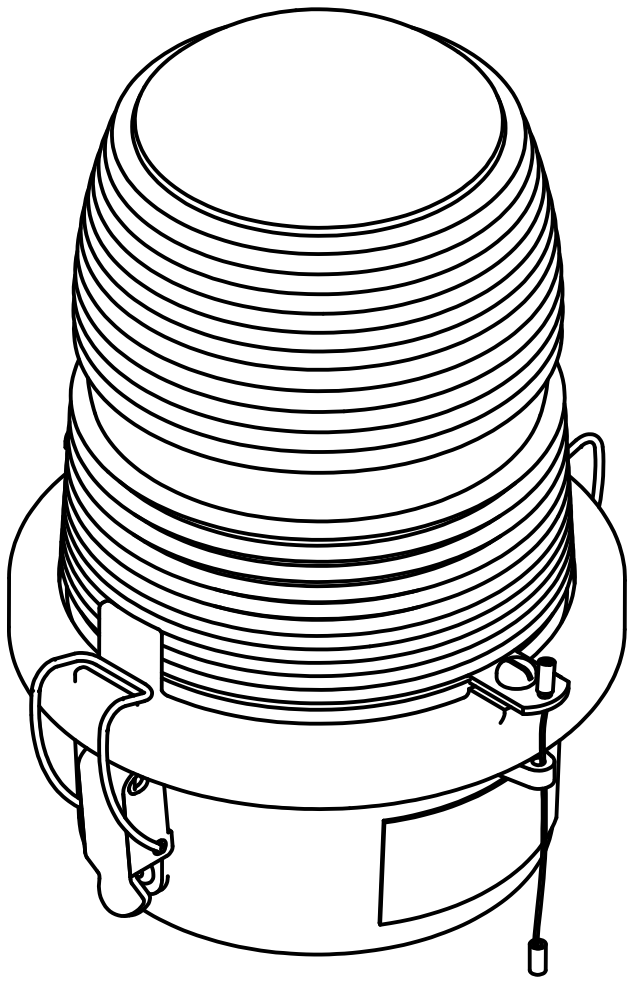
Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	3	OL1/LED	3/4" OBSTRUCTION LIGHT
2	1	T27CG	3/4" CONDULET W/COVER AND GASKET
3	1	EL3430	3/4" 30° ELBOW
4	1	N34T3	3/4" X 3" NIPPLE
5	3	HC402	3/4" NO THREAD CONNECTOR
6	5	A314	3/4" CONDUIT LOCKNUTS
7	1	CONDUIT34	3/4" CONDUIT

NOTES:
1. THIS DRAWING IS A TYPICAL INSTALLATION DETAIL FOR 3 OL-1 PER LEVEL SYSTEM.
2. PART # EL3430 MAY BE OMITTED WHEN ARRANGING FOUR LEG TOWERS.
3. PART # COUNDUIT34 CUT TO LENGTH FOR PROPER EXTENTION OF OL1 FROM STRUCTURE (6"-12"). ATTACH PART # HC402 TO UNTHREADED CONDUIT TO COMPLETE ASSEMBLY.
4. USE COUPLING THAT IS PROVIDED BY PART # CONDUIT34.
5. GREEN WIRE USED ONLY ON LED SIDELIGHTS



TOP VIEW

DRAWN jbustamante	1/4/2008	**TWR Lighting, Inc.** Enlightened Technology®
CHECKED		
QA		TITLE: SIDELIGHT MOUNT ASSEMBLY (10' FACE WIDTH MAX)
MFG		
APPROVED		
		SIZE B | DWG NO 100489 | REV A
		SCALE | SHEET 1 OF 1



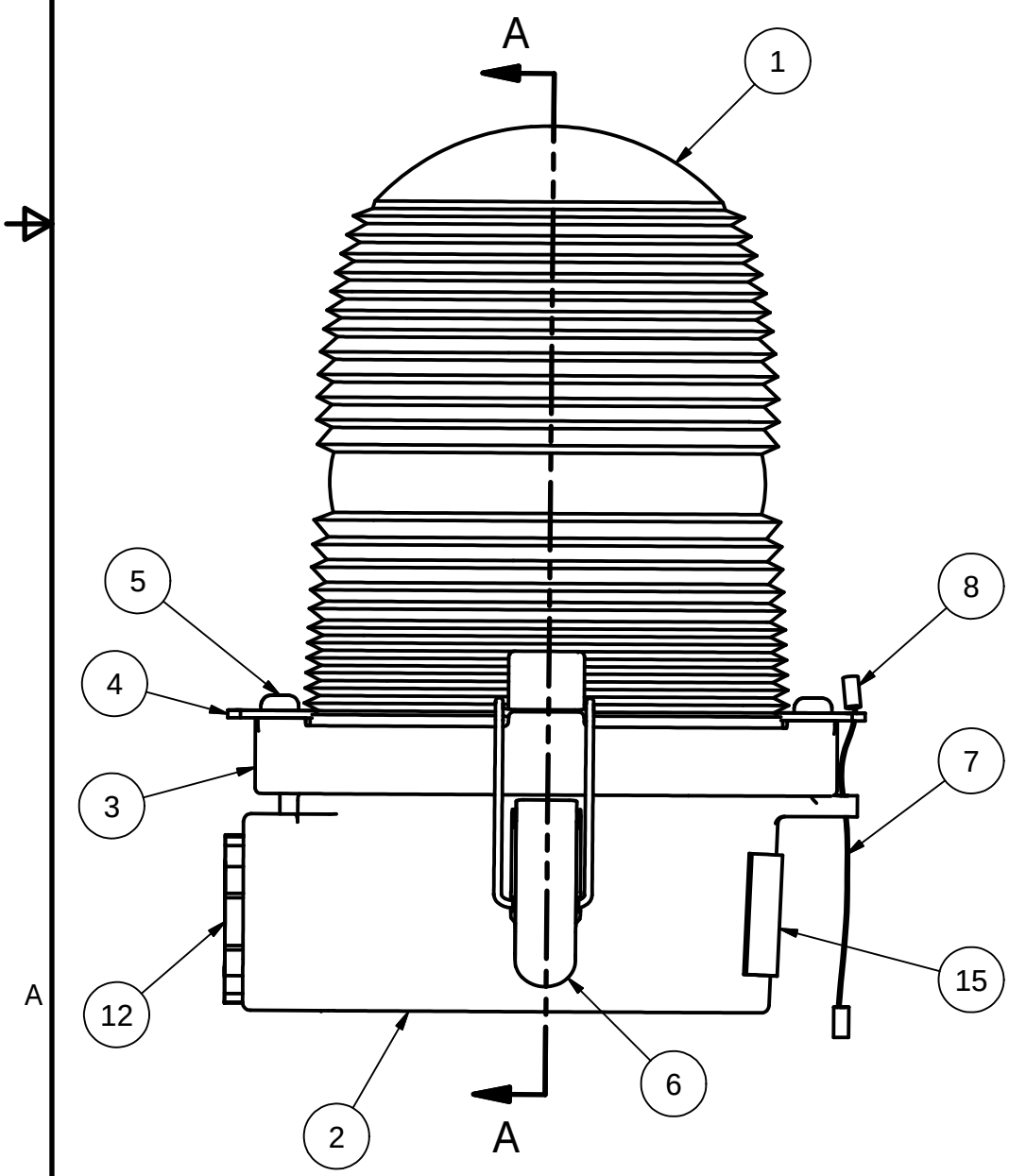
PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	AP35222	RED SIDELIGHT GLASS
2	1	105C	SINGLE SIDELIGHT BODY
3	1	106C	LENS HOLDER RING
4	2	12V245	OL LENS CLIP
5	2	832X14PH	8-32 X 1/4" PH SS SLOT SCREW
6	2	HC255SS	SIDELIGHT LATCH
7	1	7X7SS	1/16 HOL 7X7 S.S. WIRE
8	2	A1A	STAKON CRIMP
9	1	OLG	OL GASKET
10	1	TWR19062	SIDELIGHT RECEPTACLE
11	4	18PRSS	1/8 X .40 SS POP RIVET
12	1	A314	3/4" CONDUIT LOCKNUT GALV.
* 13	2	104G	WHITE TEFLON WASHER
14	2	832X34PH	8-32 X 3/4" S.S. RH SLOT
15	1	100327	OL1 SERIAL NUMBER LABEL
~ 16	1	116A21TS	116W-120V LAMP (TYP.)

* = PART NOT SHOWN

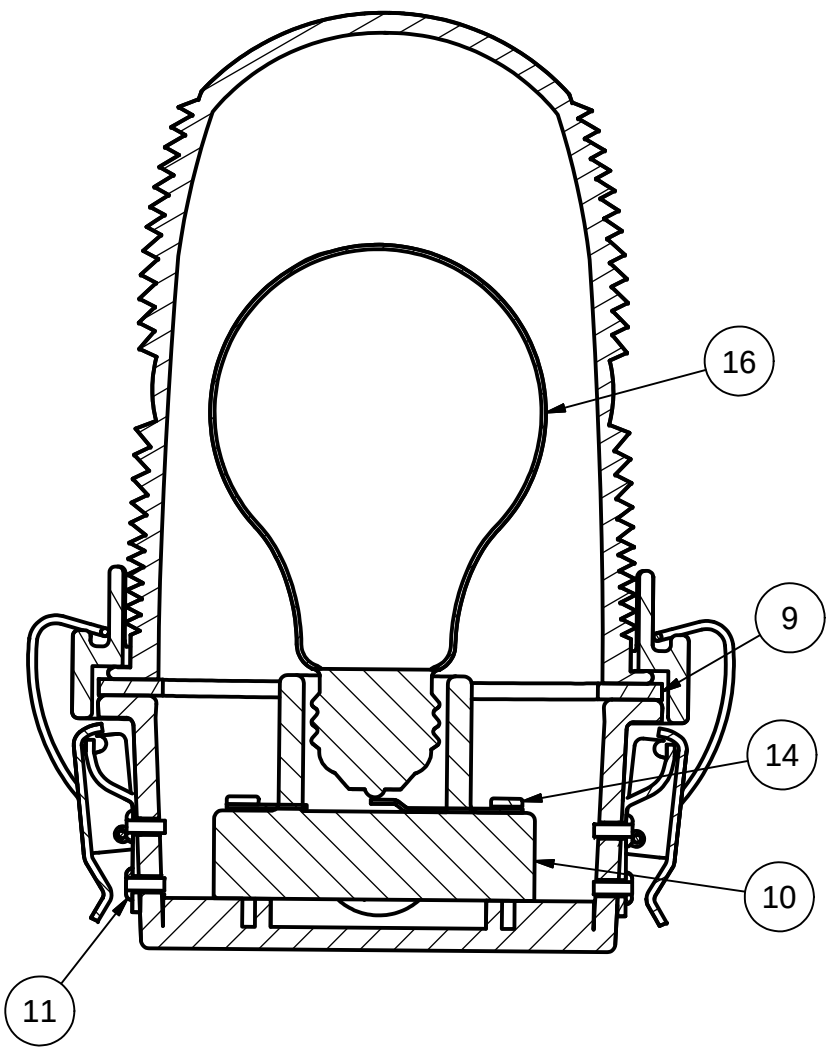
~ = PART SOLD SEPARATELY

NOTE:

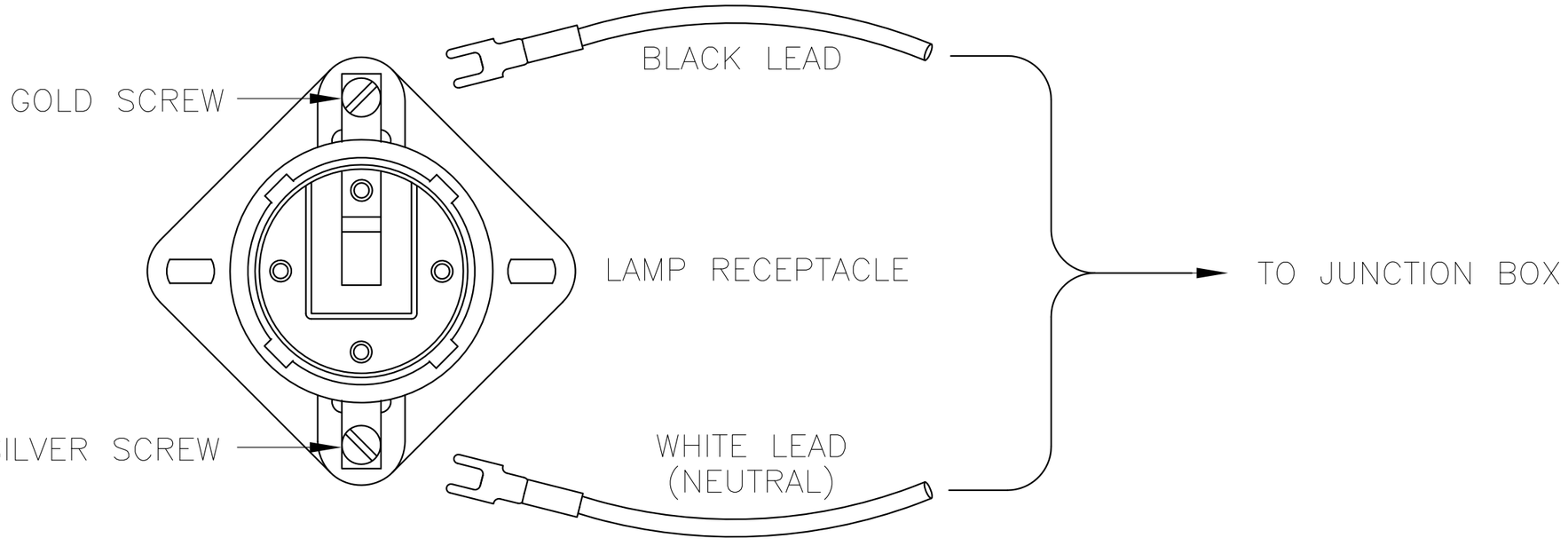
1. FAA APPROVED LIGHT USES THE 116A21TS LAMP. OTHER LAMPS ARE AVAILABLE TO MEET YOUR APPLICATION.



SECTION A-A



DRAWN vhernandez	2/13/2012	TWR Lighting,® Inc. *Enlightened Technology®*	
CHECKED		TITLE: 3/4" OL1 SIDE HUB ASSEMBLY DETAIL (PART#OL1)	
QA			
MFG			
APPROVED			
		SIZE B	DWG NO 279-OL / REV C
		SCALE 2/3	SHEET 1 OF 1

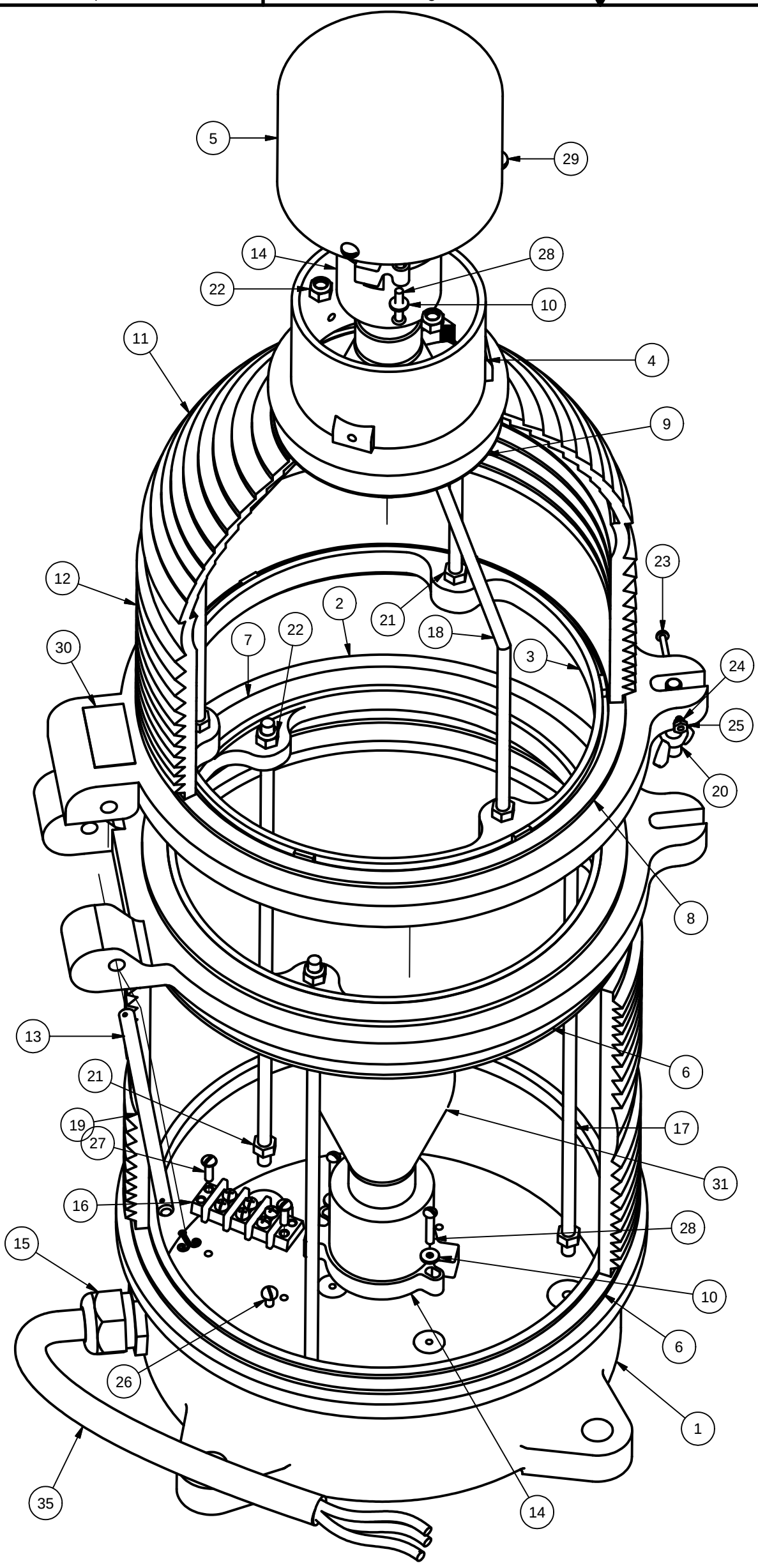


SIDELIGHT RECEPTACLE WIRING

PROD DEPT	TWR Lighting, Inc. Enlightened Technology® HARK®
SERV DEPT	
ENGINEER	
DRAWN BY: G.D. SEBEK	SHEET SIZE: B / SHEET QTY.: 1 OF 1
DATE: 06/08/91	SCALE: N.T.S. / DWG. NO.: 274–S

DATE:	LTR.	REVISION
7/2/98	A G.D.S.	CHANGED LABEL

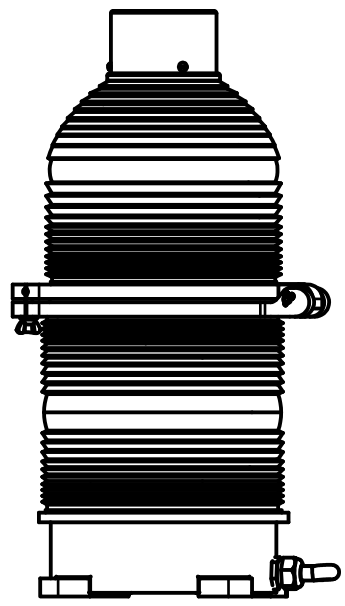
The use of non-OEM parts or modifications to original equipment design will void the manufacturer warranty and could invalidate the assurance of complying with FAA requirements as published in Advisory Circular 150/5345-43.



Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	100C	BEACON BASE
2	1	101C	LOWER HINGE
3	1	102C	UPPER HINGE
4	1	103C	CANOPY CAP
5	1	104C	CANOPY FLANGE
6	2	100G	GASKET BEACON BASE
7	1	101G	GASKET MIDDLE BEACON
8	1	102G	GASKET, TOP HINGE
9	1	103G	GASKET TEFLON, TOP
10	4	104G	WHITE TEFLON WASHER
11	1	AP3557	CAP LENS RED
12	1	AP3556	MIDDLE LENS RED
13	2	AP3555	BOTTOM LENS RED
14	2	TWR23-546	BEACON LAMP RECEPTACLE
15	1	CGB295SA	3/4" CORD CONNECTOR .62 TO .75
16	1	TERMBLK3	TERMINAL BLOCK 3-PART
17	3	BTRS-1	BEACON TIE ROD STRAIGHT
18	3	BTRB	BEACON TIE ROD BENT
19	1	BHP	BEACON HINGE PIN W/ COTTER PIN
20	1	BLP	BEACON LATCH PIN
21	6	516NUT	5/16-15 HEX NUT
22	6	516NUTN	5/16-18 NUT W/NYLON INSERT
23	1	632X2RH	6-32 X 2 SS RH SLOT SCREW
24	1	632LW	6-32 LOCK WASHER
25	1	632NUT	6-32 NUT HEX
26	1	1032x38BH	10-32 X 3/8 PILLIPS PAN HEAD
27	2	1032x58PH	10-32 X 5/8 PH SLOT SCREW
28	4	1032X1RH	10-32 X 1 SS RH SCREW
29	3	1420X58RH	14-20 X 5/8 RH SLOT SCREW
30	1	100328	BEACON SERIAL NUMBER LABEL
~	31	2	---	BEACON LAMP
*	32	7	TYZ23M	HI TEMP TY WRAPS T&B TEFZEL
*	33	4'	16HTWH	#16 HI-TEMP WIRE SRML WHITE
*	34	4'	16HTBL	#16 HI-TEMP WIRE SRML BLACK
	35	5'	CSO14/3	S.O. CORD 14AWG/3 CONDUCTOR
*	36	11	YAV14-H34F	(STAKON) BURNDY HEAVY DUTY

* = ITEMS NOT SHOWN

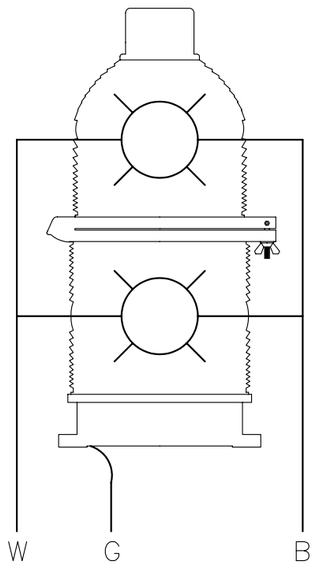
~ = PART SOLD SEPARATELY

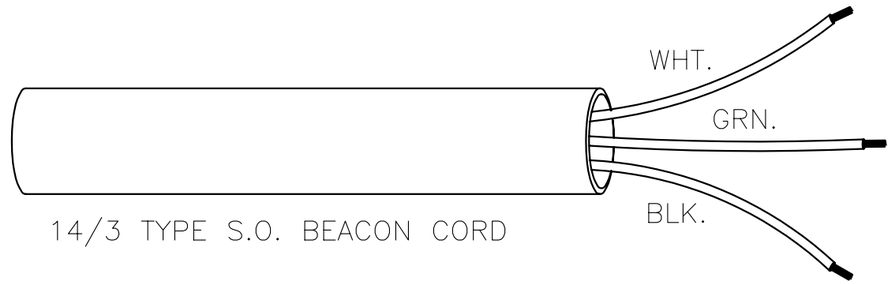


DRAWN J.L.BUSTAMANTE	11/27/07	TWR Lighting, Inc. Enlightened Technology® HARK	
CHECKED		TITLE	300 MM BEACON ASSEMBLY DETAIL
QA			
MFG			
APPROVED		SIZE B	DWG NO 275-B
			REV E
		SCALE	SHEET 1 OF 1

1) WHITE WIRE IS NEUTRAL TO BOTH LAMPS.
2) BLACK WIRE IS LINE TO BOTH LAMPS.
3) GREEN WIRE IS EARTH GROUND.

300 MM BEACON



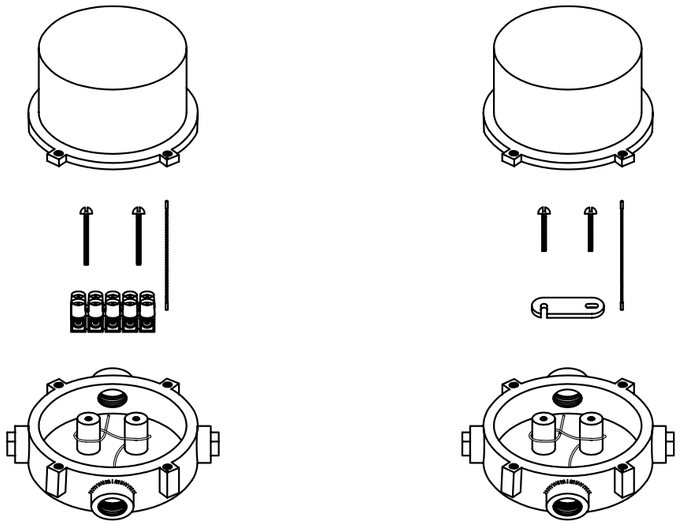


14/3 TYPE S.O. BEACON CORD

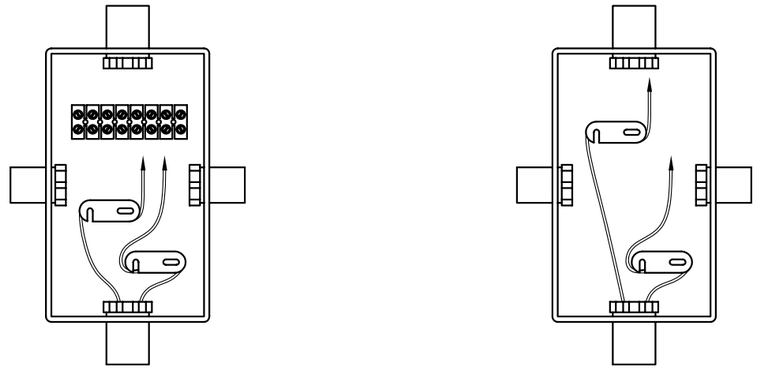
300 MM BEACON WIRE

PROD DEPT	**TWR Lighting, Inc.** *Enlightened Technology*
SERV DEPT	
ENGINEER	
DRAWN BY: G.D. SEBEK	SHEET SIZE: B / SHEET QTY.: 1 OF 1
DATE: 6/10/91	SCALE: N.T.S. / DWG. NO.: 273–B

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.



JB–5 AND JB–0
3/4" JUNCTION BOX



JB–8 AND JB–8SR
1" JUNCTION BOX

USING THIS JUNCTION BOX METHOD SPACING IS 100 FEET MAXIMUM.

AWG WIRE SIZE	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

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.

DATE:	LTR.	REVISION
9/29/00	⟨A⟩ FB	UPDATED NOTES

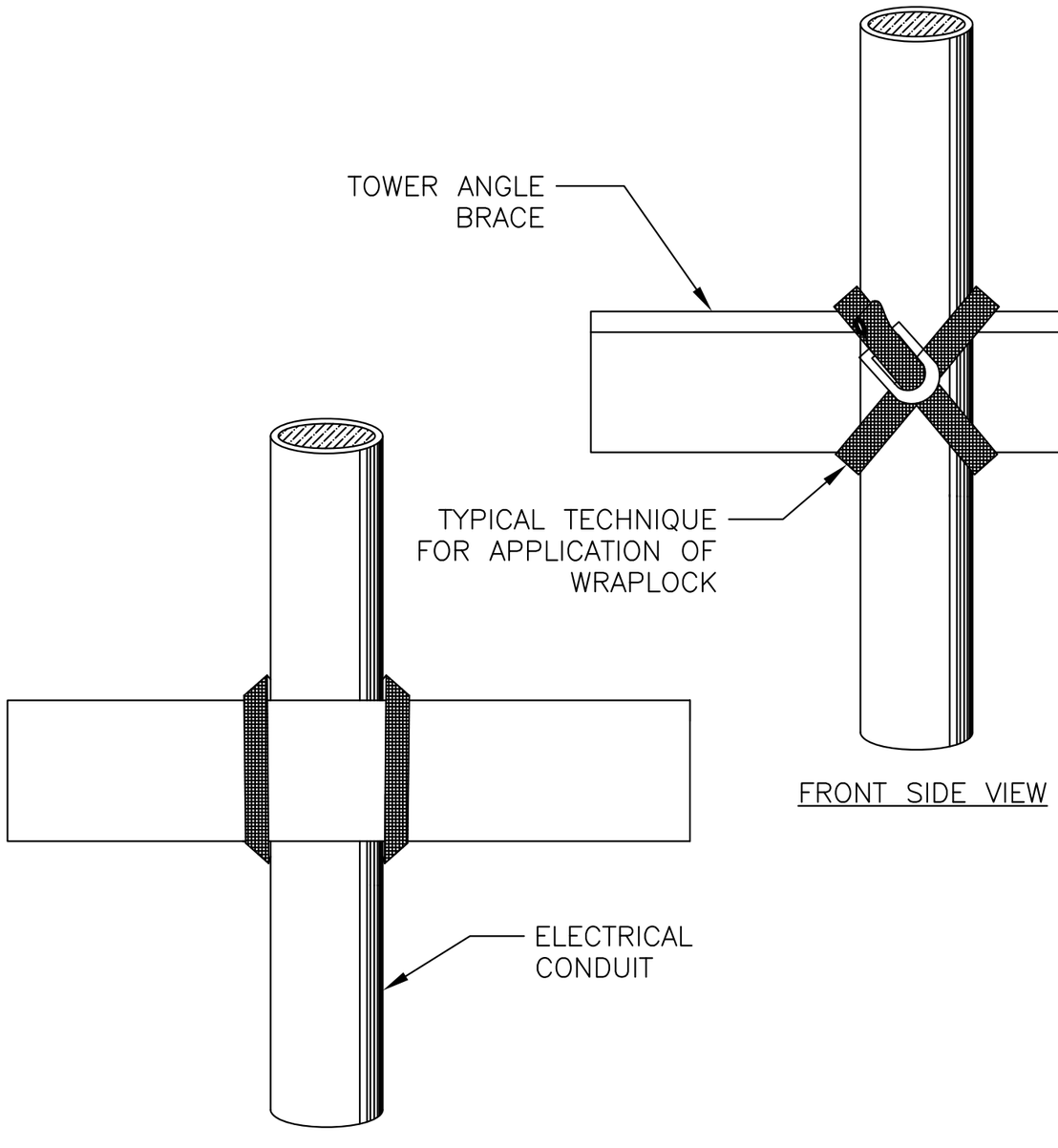
JUNCTION AND STRAIN RELIEF BOXES

PROD DEPT
SERV DEPT
ENGINEER

TWR Lighting, Inc.
Enlightened Technology

DRAWN BY G.D. SEBEK | SHEET SIZE B | SHEET QTY. 1 OF 1
DATE 07/26/93 | SCALE N.T.S. | DWG. NO. 100089

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.



FRONT SIDE VIEW

BACK SIDE VIEW

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.

5.—

TURN DOWN UNTIL CLAMP IS TIGHT.

6.— BACK OFF SLIGHTLY TO REMOVE RATCHET. CLAMP IS NOW SECURELY LOCKED.

TO REMOVE WrapLock

UNCOIL END WITH RATCHET. PRESS DOWN AT POINT WHERE BAND METAL HAS BEEN FORCED THROUGH CURVED PART OF YOKE.

WRAPLOCK FASTENING DETAIL

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

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.