

TWR Lighting, Inc. **HARK**[®]

Enlightened Technology[®]

10810 W. LITTLE YORK RD., #130 - HOUSTON, TX 77041-4051
VOICE (713) 973-6905 - FAX (713) 973-9352
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 # AA2/3MB

SERIAL # _____

PURCHASE DATE _____

PURCHASED FROM _____

TWR Lighting, Inc. **HARK**

Enlightened Technology

AA2/3MB CONTROLLER

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WARRANTY & RETURN POLICY

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APPENDIX

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1.0 GENERAL INFORMATION

The TWR Lighting[®], Inc. (TWR[®]) Model AA2/3MB Controller is for A2 lighting of towers 351' to 700' above ground level (AGL) in accordance with the FAA Advisory Circular 70/7460-1L. One (1) beacon should be placed at the top and two (2) 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 beacons is 30 per minute. The beacons flash synchronized to one another. 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 pulling out on the plunger.

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) blade, twist to lock, type.

Power supplied to the controller shall be 120/240V, three (3) wire, 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:

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.
BEACONS	Will give an alarm in the event of one (1) or both bulbs failing, or the flasher stalling.
FLASHER FAILURE	Will give an alarm in the event of failure of flasher.
OBSTRUCTION LIGHTS	Will give an alarm when one (1) of three (3) sidelights fails.

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2.0 INSTALLATION INSTRUCTIONS

2.1 MOUNTING THE CONTROL CABINET

(Refer to Drawing 1135-R)

2.1.1 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 1135-R. Power wiring to the control cabinet should be in accordance with local methods and National Electrical Codes (NEC).

2.1.2 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." As above, the photocell should be positioned so that it does not "see" ambient light, which can prevent it from switching to the nightmode.

2.1.3 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 can prevent it from switching into the nightmode. The photocell wiring is the same as in 2.1.1.

2.1.4 The wiring from the photocell, the service breaker, the red incandescent beacons, 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:

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2.2 EXTERNAL PHOTOCELL WIRING

(Refer to Drawing 1135-R)

2.2.1 Connect the **BLACK** wire from the photocell to terminal block TB2 marked "L2."

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 1135-R)

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

2.3.2 Circuit breaker needs to be a two (2) pole common trip rated at 40 amps.

2.3.3 Connect incoming 120V AC "Hot #1" to terminal block TB1 marked "L1."

2.3.4 Connect incoming 120V AC "Hot #2" to terminal block TB1 marked "L2."

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

2.3.6 Connect the AC ground to the aluminum mounting plate.

2.4 RED BEACON AND SIDELIGHT WIRING

(Refer to Drawings 1135-R, 261-31B, and 261-32B)

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

2.4.2 Connect the first **BLUE** wire from Beacon #2 to the circuit breaker marked "B2."

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- 2.4.3 Connect the second **BLUE** wire from Beacon #3 to the circuit breaker marked "B3."
- 2.4.4 Connect the **RED** wire from sidelight group #1 to the circuit breaker marked "S1."
- 2.4.5 Connect the **YELLOW** wire from sidelight group #2 to the circuit breaker marked "S2."
- 2.4.6 Connect the **WHITE** neutral wire(s) to one (1) or more of the terminals marked "N."

2.5 RED BEACON AND SIDELIGHT ALARM WIRING

(Refer to Drawings 1135-R and 1135-S)

- 2.5.1 Alarm relays K1-K5, and alarm Modules M2, M4, M6, M7, and M8, are provided for independent contact closures for: Power Failure, Lights "On," B1 Flasher Failure, B2 Flasher Failure, B3 Flasher Failure, B1 Lamp Burnout, B2 Lamp Burnout, B3 Lamp 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 ten (10) pairs of wires to interface with his alarm device. One (1) wire from each of the ten (10) 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.

B1 Flasher Failure: Connect to relay K3, terminal #6, for normally open (OR) terminal #3, for normally closed monitoring.

B2 Flasher Failure: Connect to relay K4, terminal #6, for normally open (OR) terminal #3, for normally closed monitoring.

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B3 Flasher Failure: Connect to relay K5, terminal #6, for normally open (OR) terminal #3, for normally closed monitoring.

B1 Lamp Burnout: Connect to relay M2, terminal T5, for normally open (OR) terminal T6, for normally closed monitoring.

B2 Lamp Burnout: Connect to relay M4, terminal T5, for normally open (OR) terminal T6, for normally closed monitoring.

B3 Lamp Burnout: Connect to relay M6, terminal T5, for normally open (OR) terminal T6, for normally closed monitoring.

S1 Lamp Burnout: Connect to relay M7, terminal T5, for normally open (OR) terminal T6, for normally closed monitoring.

S2 Lamp Burnout: Connect to relay M8, terminal T5, for normally open (OR) terminal T6, for normally closed monitoring.

2.5.3 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.

Beacon and Sidelights: Trip breakers on the controller panel.

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3.0 THEORY OF OPERATION

3.1 POWER SUPPLY

120/240V AC enters the controller from the circuit breaker panel. Lines L1 and L2 sit at the PRD, waiting to be switched, and also keep the power failure relay K1 energized. When the 6390-FAA photocell is activated, Line L2 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 LD4 is sent to Modules M7 and M8, which are current sensing modules for sidelights. Each CM-250 monitors one (1) level of sidelights, and will provide a contact closure along a visual indication if one (1) or more lamps fail.

3.3 BEACONS

Lines LD1, LD2, and LD3 are sent to Modules M1, M3, and M5. M1 is the primary flasher for Beacon #1, which provides control voltage to Modules M3 and M5, which are auxiliary flashers for Beacon #2 and Beacon #3. The output of these modules is sent to the primary of boost transformers T1, T2, and T3. The boosted output voltage (126V at 120V nominal input) is sent through the current sensing Modules M2, M4, and M6, then to the circuit breaker outputs B1, B2, and B3. If Modules M2, M4, or M6 detect a lamp burnout, then that particular module would provide a contact closure along with a visual indication for that lamp circuit.

Relays K3 – K5 are flasher failure relays for the Beacons B#1 – B#3. If Modules M2, M4, or M6 detect a flasher failure, then that particular module would provide a contact closure for that flasher circuit.

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4.0 MAINTENANCE GUIDE

4.1 RED OBSTRUCTION LIGHTING

The only required maintenance that needs 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 FAA Advisory Circular 70/7460-1K. By following these instructions, maximum safety and performance can be achieved.

TOOLS REQUIRED: NONE

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 backward.
- 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 allow the latch pin to drop in the recessed slot.
- 4.2.6 Tighten the wing nut snug, then ¼ turn more.

4.3 LAMP REPLACEMENT

- 4.3.1 Unclasp the two (2) latches and allow the bail to recline backward.
- 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.

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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.

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5.0 MAJOR COMPONENTS PARTS LIST

QTY	PART NUMBER	DESCRIPTION
1	6390-FAA (This replaces the 102FAA Photocell)	120 – 240V AC Photocell
1	PF-250 (This replaces the FS15530T Module)	Solid State Flasher (M1)
1	B12J2K5	2,500 ohm 12 watt Resistor (R1)
1	SF-250 (This replaces the FA155-2 Module)	Solid State Load Contactor (M3 & M5)
1	PM17AY120V	Mechanical Load Contactor (PRD)
3	XFMR-15amp	Boost Transformer (T1 - T3)
5	PB27E122	Octal Sockets
4	KRPA5AG120V	SPDT Relay (K1, K3, K4 & K5)
1	STJ02001	Switch (SW1)
1	VJ1816HWPL2X004	Enclosure
8	8WA1204	Terminal Block (TB1 & TB2)
3	8WA1802	Rail Link
2	8WA1808	Terminal Block End Stop
5	S261D20	20 amp Circuit (B1 - B3, S1 & S2)
5	CM-250 (This replaces the FB120A and SCR430T Modules)	Sidelight and Beacon Detector (M2, M4, M6, M7, and M8)

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6.0 SUGGESTED SPARE PARTS LIST

QTY	PART NUMBER	DESCRIPTION
1	6390-FAA (This replaces the 102FAA Photocell)	120 – 240V AC Photocell
1	PF-250 (This replaces the FS15530T Module)	Solid State Flasher (M1)
1	SF-250 This replaces the FA155-2 Module)	Solid State Load Contactor (M3 - M5)
1	KRPA5AG120V	SPDT Relay (K1, K3, K4 & K5)
1	CM-250 (This replaces the FB120A and SCR430T Modules)	Sidelight and Beacon Detector (M2, M4, M6, M7, and M8)

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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:

- 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.

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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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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[®] 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.

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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®. 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.

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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: _____

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

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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:** _____

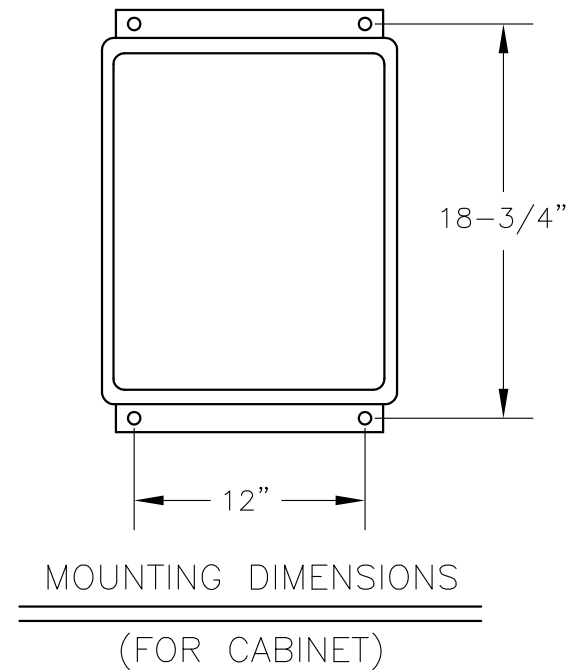
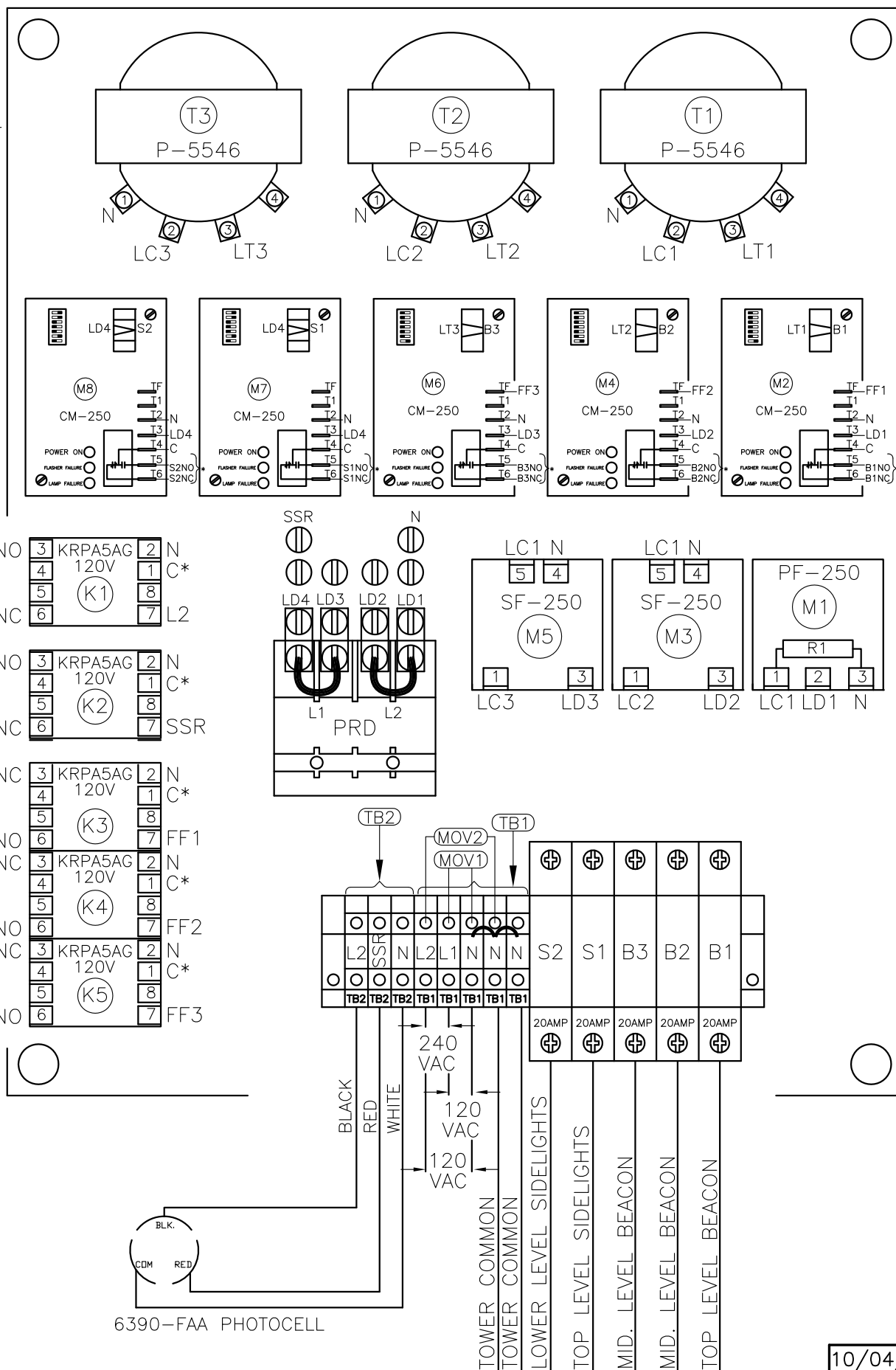
RETURN ADDRESS: _____

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

*CUSTOMER ALARM POINTS

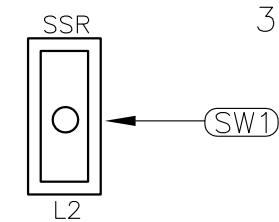
C = ALARM COMMON
 PFNO/PFNC = POWER FAILURE
 LONO/LONC = LIGHTS "ON"
 S1NO/S1NC = TOP LEVEL SIDELIGHT BURNOUT
 S2NO/S2NC = BOTTOM LEVEL SIDELIGHT BURNOUT
 FF1NO/FF1NC = FLASHER FAILURE 1
 FF2NO/FF2NC = FLASHER FAILURE 2
 FF3NO/FF3NC = FLASHER FAILURE 3
 B1NO/B1NC = TOP BEACON BURNOUT
 B2NO/B2NC = MIDDLE BEACON BURNOUT
 B3NO/B3NC = MIDDLE BEACON BURNOUT

* ALARM OUTPUTS ARE FORM C.



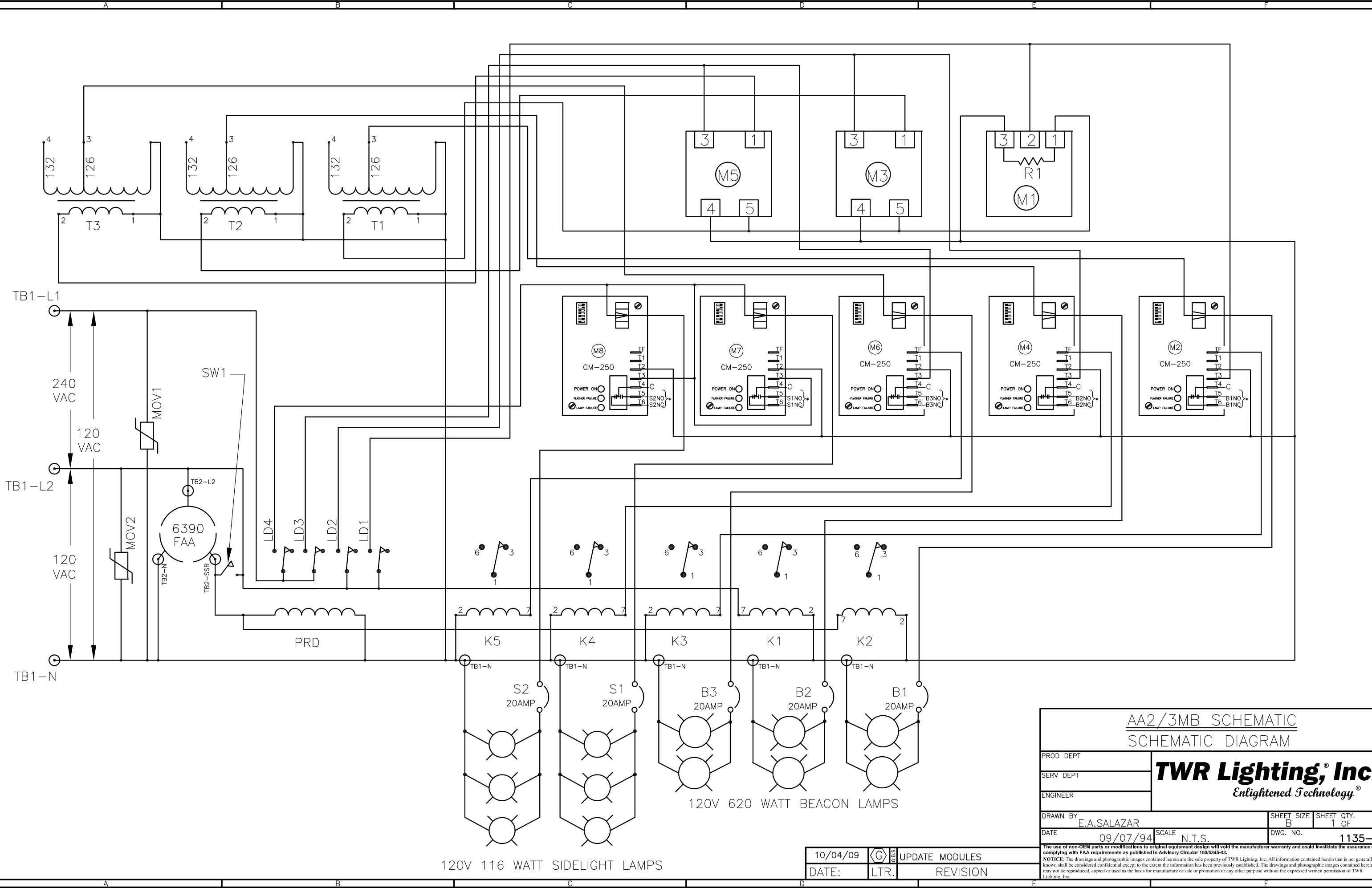
NOTES:

1. WHEN REPLACING METAL BASE MODULES USE HEAT SINK COMPOUND BETWEEN MODULE AND ALUMINUM PLATE.
2. PLUG 6390-FAA PHOTOCCELL INTO 43109 TWIST LOCK RECEPTACLE AND TWIST TO LOCK.
3. WIRES ARE CONNECTED LETTER TO LETTER. (EXAMPLE) B1 TO B1 TO B1.



AA2/3MB CONTROLLER CHASSIS LAYOUT			
PROD DEPT	TWR Lighting, Inc. <i>Enlightened Technology®</i>		
SERV DEPT			
ENGINEER			
DRAWN BY E.A.SALAZAR	SHEET SIZE B	SHEET QTY. 1 OF 1	
DATE 09/06/94	SCALE N.T.S.	DWG. NO. 1135-R	
<small>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 150/345-43. 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 or any other purpose without the expressed written permission of TWR Lighting, Inc.</small>			

10/04/09 (H) UPDATED MODULE
 DATE: LTR. REVISION



AA2/3MB SCHEMATIC
SCHEMATIC DIAGRAM

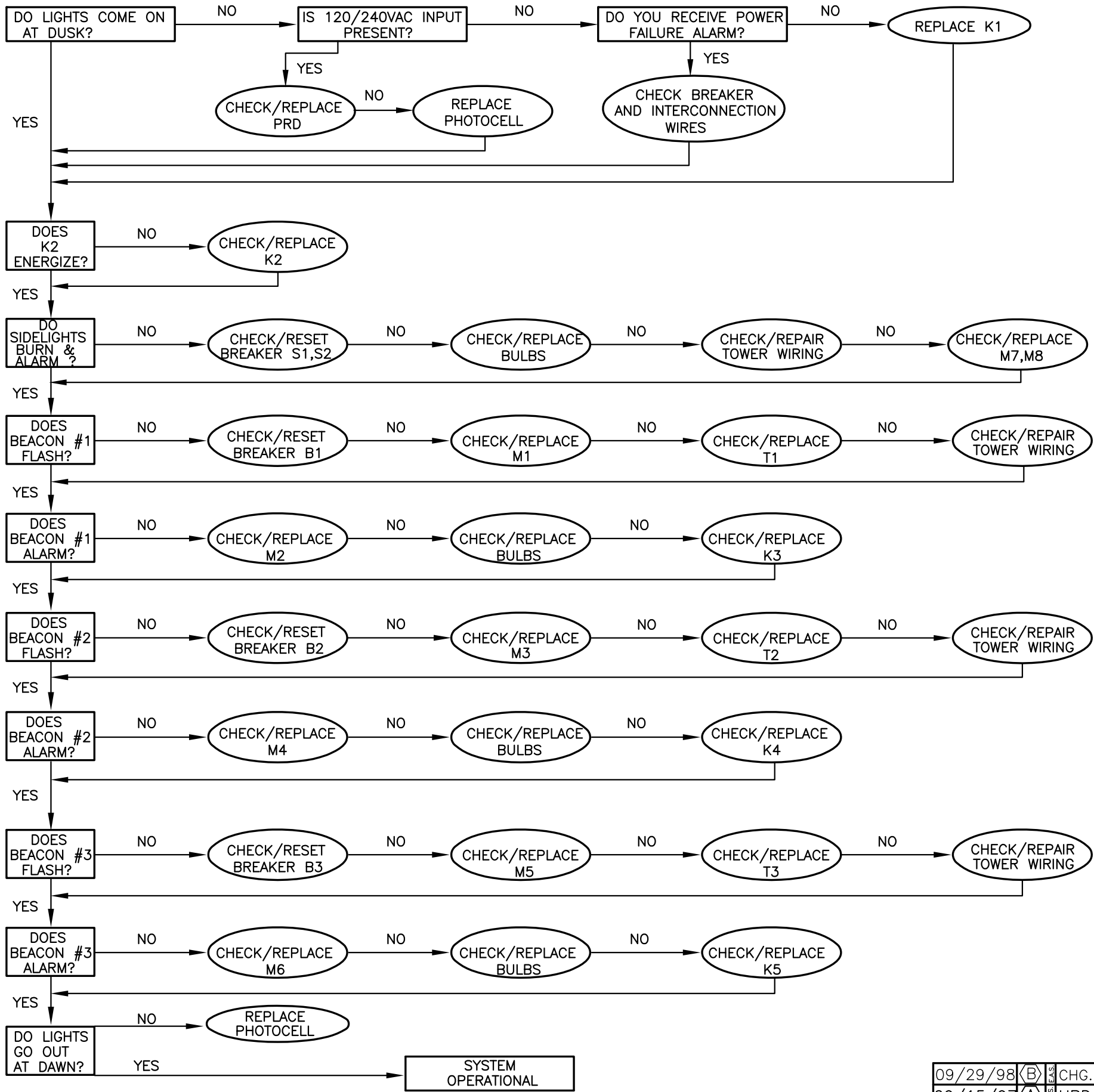
PROD DEPT	TWR Lighting, Inc. <i>Enlightened Technology®</i>	
SERV DEPT		
ENGINEER		
DRAWN BY E.A.SALAZAR	SHEET SIZE B	SHEET QTY. 1 OF 1
DATE 09/07/94	SCALE N.T.S.	DWG. NO. 1135-S

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.
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10/04/09	G	6	UPDATE MODULES
DATE:	LTR.		REVISION

120V 116 WATT SIDELIGHT LAMPS

120V 620 WATT BEACON LAMPS

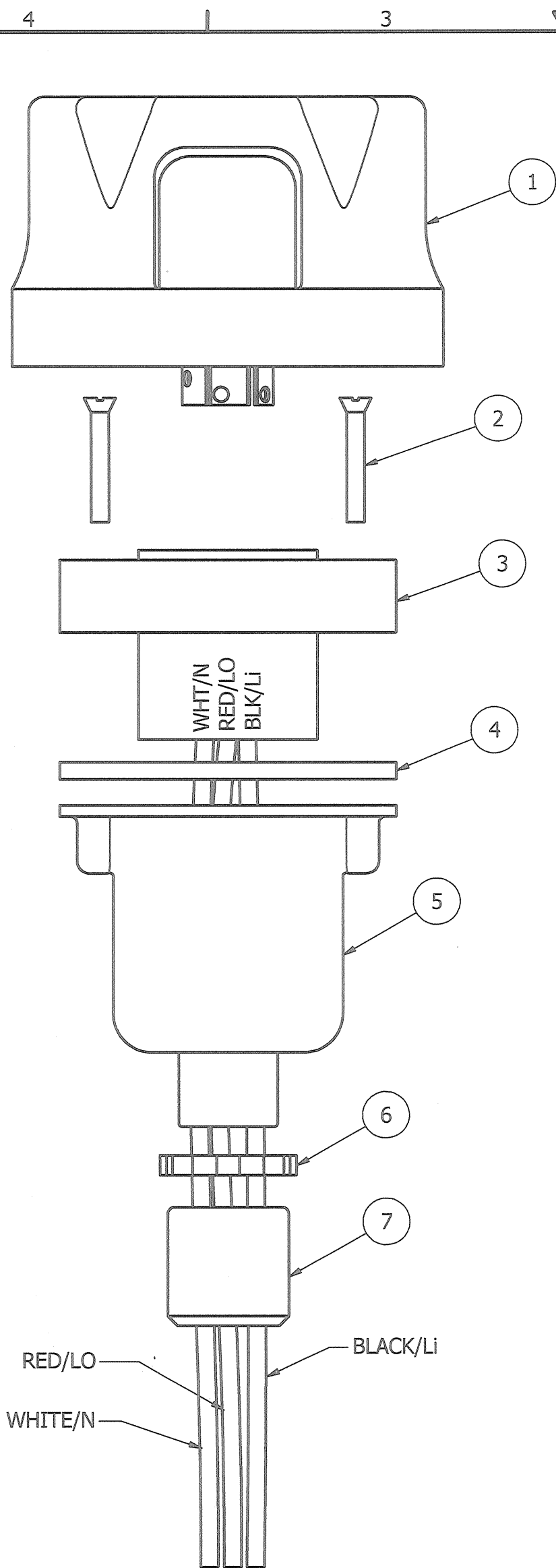


TROUBLESHOOTING FLOW CHART
AA2/3MB DWG.#1135-R

PROD DEPT	TWR Lighting, Inc. <i>Enlightened Technology®</i>		
SERV DEPT			
ENGINEER			
DRAWN BY E.A.SALAZAR	SHEET SIZE B	SHEET QTY. 1 OF 1	
DATE 09/07/94	SCALE N.T.S.	DWG. NO. 1135-F	

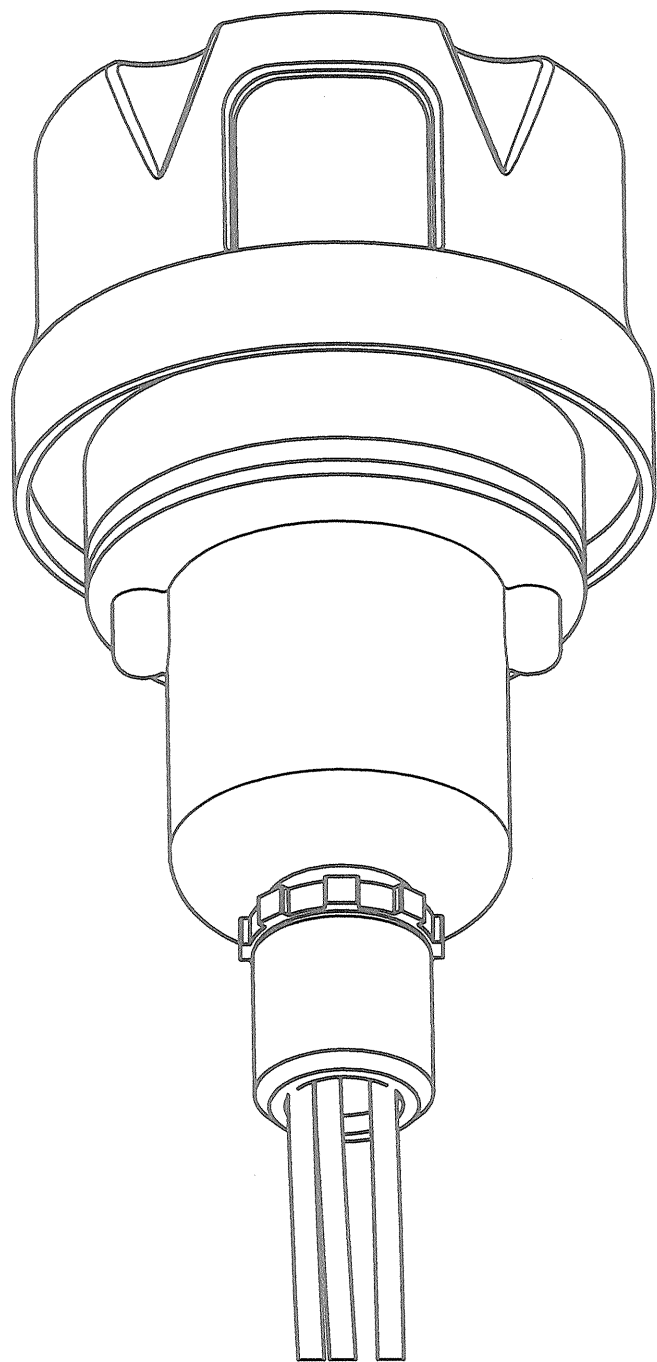
09/29/98	(B)	CHG. FUSE TO BREAKER
09/15/97	(A)	UPDATED CHART
DATE:	LTR.	REVISION

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EXPLODED VIEW

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



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

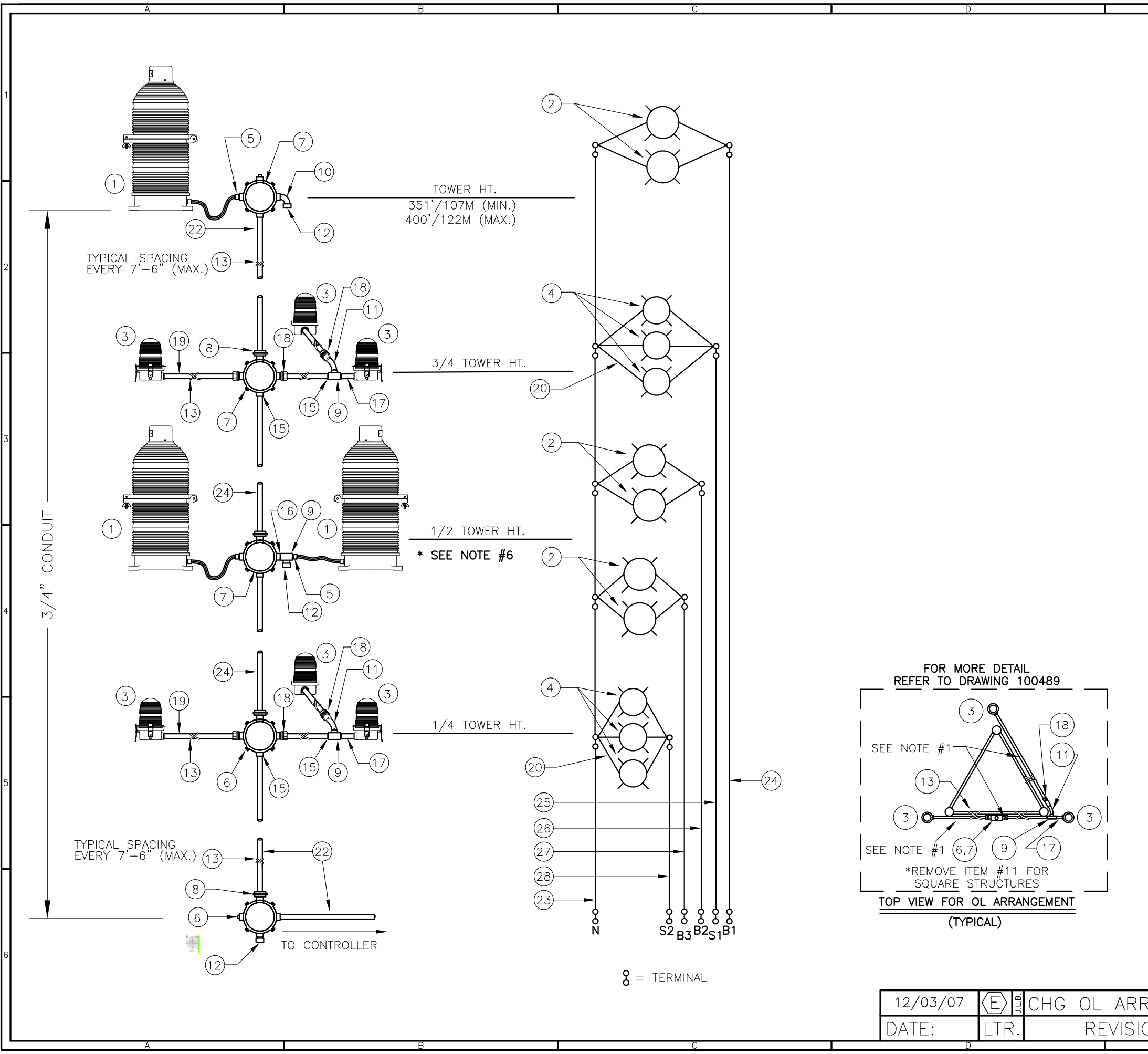
PHOTOCELL HOUSING DETAIL

PROD. DEPT. *[Signature]*
 SERV. DEPT. **TWR Lighting, Inc. HARK**
 ENGINEER *[Signature]*
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.	QTY.	TWR PART NO.	DESCRIPTION
1	3	BEACON	300 MM BEACON RED
2	6	620PS40P	620 WATT 120 VOLT LAMP
3	6	OL1	3/4" OBSTRUCTION LIGHT
4	6	116A21TS	116 WATT 120 VOLT LAMP
5	3	CGB295SA	3/4" CORD CONNECTOR
6	2	JB5/7	3/4" JUNCTION BOX W/ 7 TERMINALS
7	3	JB5	3/4" JUNCTION BOX
8	5	UNY205	3/4" UNION
9	4	T27CG	3/4" CONDULET W/COVER AND GASKET
10	2	EL3490	3/4" 90° SHORT ELBOW
11	2	EL3430	3/4" 30° ELBOW
12	3	5012902	3/4" BREATHER
13	2	SS10012	WRAPLOCK
* 14	2	PIPDOP	4 oz. PIPE DOPE
15	15	A314	3/4" CONDUIT LOCKNUTS
* 16	16	CPLG34	3/4" GALVANIZED COUPLING
17	2	N34T3	3/4" x 3" NIPPLE
18	6	HC402	3/4" NO THREAD CONNECTOR
19	60'	CONDUIT34	3/4" CONDUIT (FOR OL)
20	6	SLPIGTAIL25	25' SIDELIGHT PIGTAIL
* 21	1	AA2/3 B	AA2/3 B CONTROLLER W/BOOST

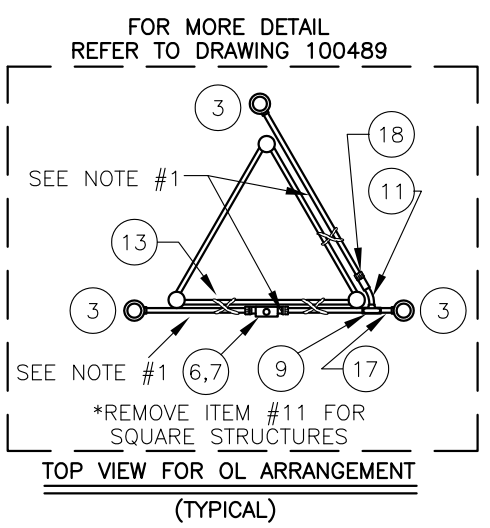
ITEM NUMBERS #22-#28 ARE NOT INCLUDED IN THE KIT BUT ARE AVAILABLE UPON REQUEST, AND REQUIRED FOR INSTALLATION.

22	-	CONDUIT34	3/4" CONDUIT (TOWER HT.+ 30'/9M)
23	-	6THHNWHT	#6 THHN WHT. WIRE (TOWER HT.+40'/12M)
24	-	10THHNBLK	#10 THHN BLK. WIRE (TOWER HT.+40'/12M)
25	-	12THHNRED	#12 THHN RED WIRE (3/4 TWR HT.+40'/12M)
26	-	12THHNBLUE	#12 THHN BLUE WIRE (1/2 TWR HT.+40'/12M)
27	-	12THHNBLUE	#12 THHN BLUE WIRE (1/2 TWR HT.+40'/12M)
28	-	12THHNYLW	#12 THHN YLW. WIRE (1/4 TWR HT.+40'/12M)

* = ITEMS NOT SHOWN

NOTES:

- PART #CONDUIT34 CUT TO LENGTH FOR PROPER EXTENTION OF OL1 (6"-12") FROM STRUCTURE. ATTACH PART #HC402 TO UNTHREADED CONDUIT TO COMPLETE ASSEMBLY.
- CONDUIT SIZE BASED ON USING TYPE THHN WIRE.
- USE RIGID GALVANIZED STEEL CONDUIT.
- BREATHERS ALLOW FOR CIRCULATION OF AIR TO PREVENT CONDENSATION.
- USE COUPLING THAT IS PROVIDED WITH PART #CONDUIT34 TO ATTACH ITEM EL3430 TO PART #HC402.
- MIDDLE LEVEL BEACON CAN NOT BE MOUNTED AT LESS THAN 200'/61M

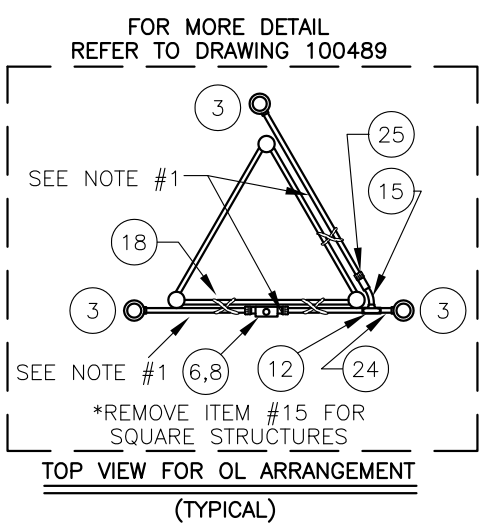
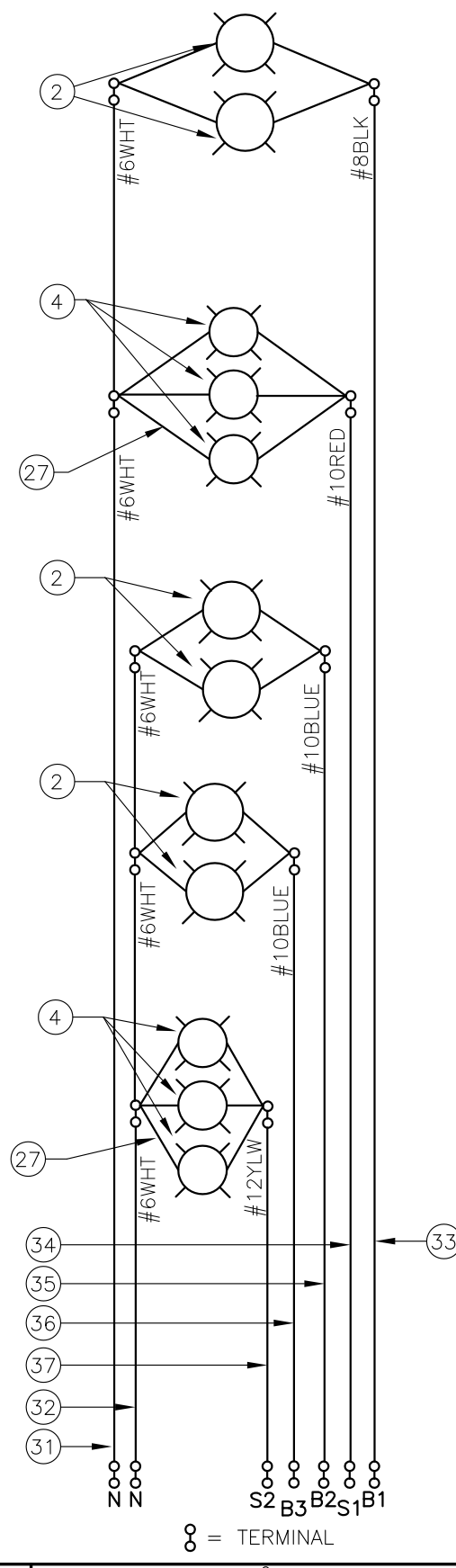
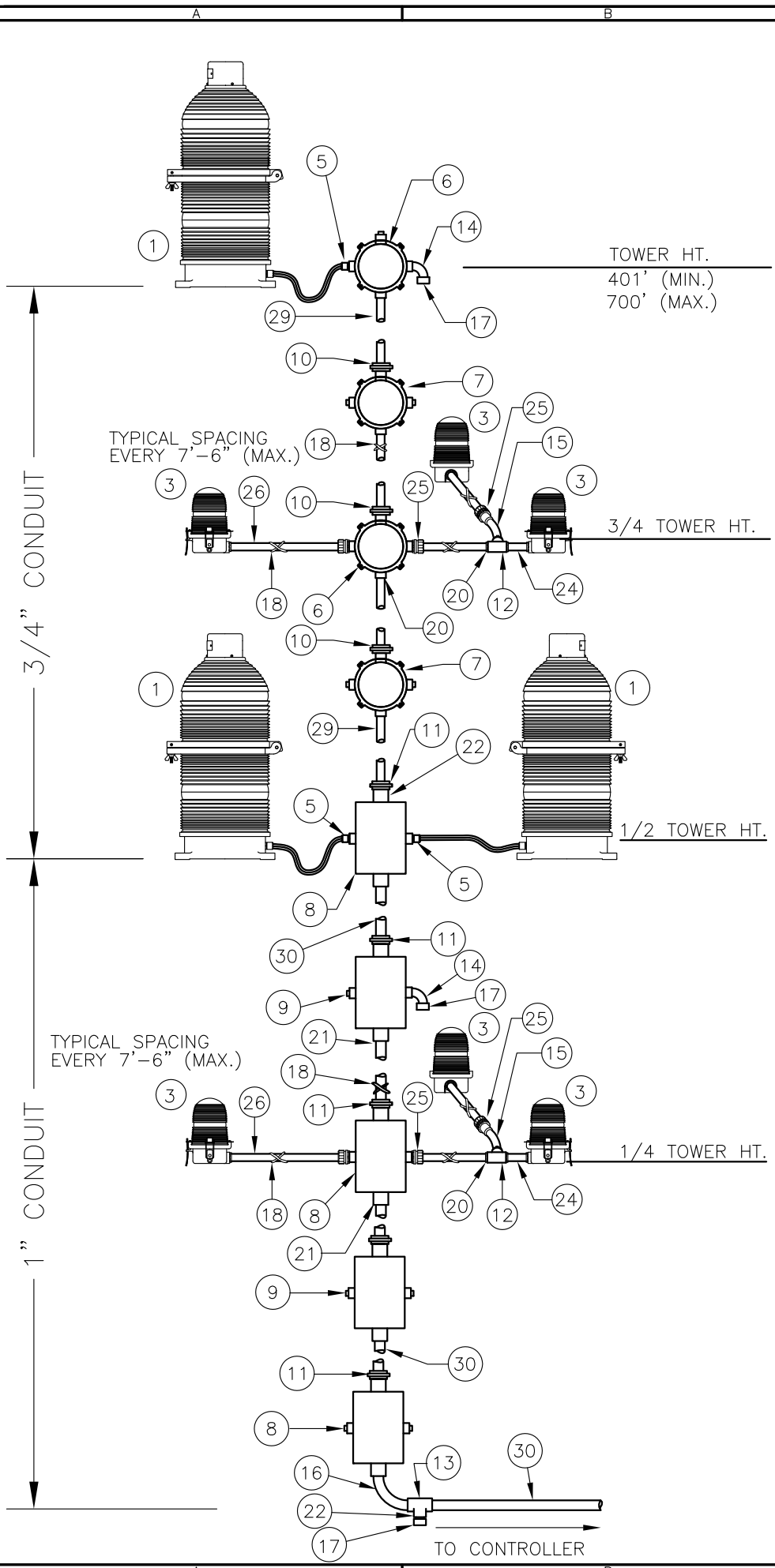


LK1A2/3B TOWER LIGHTING KIT W/BOOST
(TOWERS 351'/107M TO 400'/122M)

PROD DEPT	TWR Lighting, Inc. Enlightened Technology®	SHEET SIZE	SHEET QTY.
SERV DEPT		B	1 OF 1
ENGINEER			
DRAWN BY	E.A.SALAZAR	SCALE	N.T.S.
DATE	12/08/92	DWG. NO.	261-31B

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

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.
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BILL OF MATERIALS

ITEM NO.	QTY.	TWR PART NO.	DESCRIPTION
1	3	BEACON	300 MM BEACON RED
2	6	620PS40P	620 WATT 120 VOLT LAMP
3	6	OL1	3/4" OBSTRUCTION LIGHT
4	6	116A21TS	116 WATT 120 VOLT LAMP
5	4	CGB295SA	3/4" CORD CONNECTOR
6	2	JB5	3/4" JUNCTION BOX
7	2	JB0	3/4" STRAIN RELIEF BOX
8	3	JB8	1" JUNCTION BOX
9	2	JB8SR	1" STRAIN RELIEF BOX
10	6	UNY205	3/4" UNION
11	5	UNY305	1" UNION
12	3	T27CG	3/4" CONDULET W/COVER AND GASKET
13	2	T37CG	1" CONDULET W/COVER AND GASKET
14	2	EL3490	3/4" 90° SHORT ELBOW
15	2	EL3430	3/4" 30° ELBOW
16	2	EL190	1" 90° ELBOW
17	3	5012902	3/4" BREATHER
18	2	SS10012	WRAPLOCK
* 19	2	PIPDOP	4 oz. PIPE DOPE
20	19	A314	3/4" CONDUIT LOCKNUTS
21	12	A315	1" CONDUIT LOCKNUT
22	2	RE32	1" TO 3/4" REDUCER
* 23	16	CPLG34	3/4" GALVANIZED COUPLING
24	2	N34T3	3/4" x 3" NIPPLE
25	6	HC402	3/4" NO THREAD CONNECTOR
26	60'	CONDUIT34	3/4" CONDUIT (FOR OL)
27	6	SLPIGTAIL25	25' SIDELIGHT PIGTAIL
* 28	1	AA2/3 B	AA2/3 B CONTROLLER

ITEM NUMBERS #29-#37 ARE NOT INCLUDED IN THE KIT BUT ARE AVAILABLE UPON REQUEST, AND REQUIRED FOR INSTALLATION.

29	-	CONDUIT34	3/4" CONDUIT (1/2 TOWER HT.)
30	-	CONDUIT1	1" CONDUIT (1/2 TOWER HT.+ 30'/9M)
31	-	6THHNWHT	#6 THHN WHT. WIRE (TOWER HT.+40'/12M)
32	-	6THHNWHT	#6 THHN WHT. WIRE (1/2 TWR HT.+40'/12M)
33	-	8THHNBLK	#8 THHN BLK. WIRE (TOWER HT.+40'/12M)
34	-	10THHNRED	#10 THHN RED WIRE (3/4 TWR HT.+40'/12M)
35	-	10THHNBLUE	#10 THHN BLUE. WIRE (1/2 TWR HT.+40'/12M)
36	-	10THHNBLUE	#10 THHN BLUE. WIRE (1/2 TWR HT.+40'/12M)
37	-	12THHNYLW	#12 THHN YLW. WIRE (1/4 TWR HT.+40'/12M)

* = ITEMS NOT SHOWN

NOTES:

- 1) PART #CONDUIT34 CUT TO LENGTH FOR PROPER EXTENSION 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 ITEM EL3430 TO PART #HC402.

LK2A2/3B TOWER LIGHT KIT W/BOOST
(TOWERS 401'/122M TO 700'/213M)

PROD DEPT	TWR Lighting, Inc. Enlightened Technology®	SHEET SIZE	SHEET QTY.
SERV DEPT		B	1 OF 1
ENGINEER			
DRAWN BY	E.A.SALAZAR	SCALE	N.T.S.
DATE	12/15/92	DWG. NO.	261-32B

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

BILL OF MATERIALS

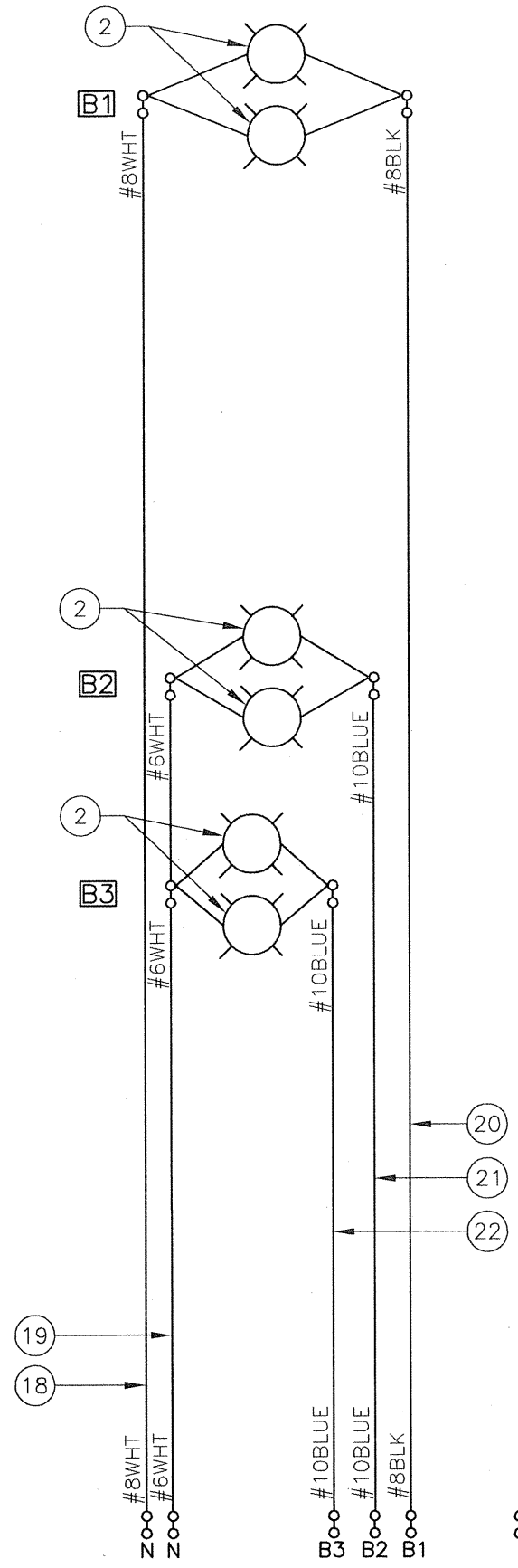
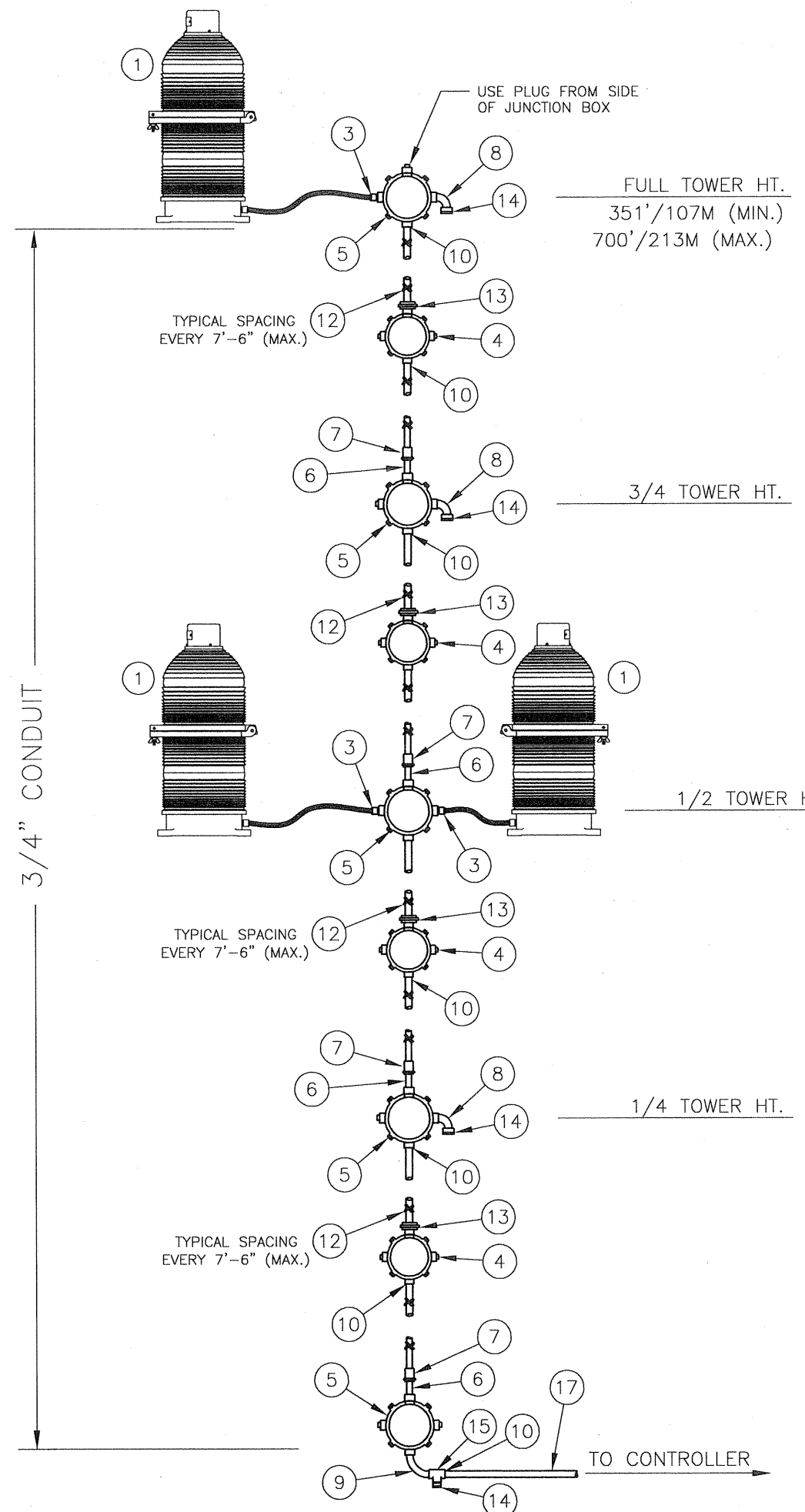
ITEM NO.	QTY.	TWR PART NO.	DESCRIPTION
1	3	BEACON	300 MM BEACON RED
2	6	620PS40P	620 WATT 120 VOLT LAMP
3	3	CGB295SA	3/4" CORD CONNECTOR 0.50 - 0.625
4	4	JB0	3/4" STRAIN RELIEF
5	5	JB5	3/4" JUNCTION BOX
6	4	N34T18	3/4" x 18" NIPPLE
7	4	EXPJNT34	3/4" EXPANSION JOINT
8	3	EL3490	3/4" 90° ELBOW
9	1	EL34SW90	3/4" 90° SWEEP ELBOW
10	20	A314	3/4" CONDUIT LOCKNUTS
* 11	2	PIPDOP	4 oz. PIPE DOPE
12	2	SS10012	STAINLESS STEEL WRAPLOCK 100'
13	4	UNY205	3/4" UNION
14	4	5012902	3/4" BREATHER
15	1	T27CG	3/4" CONDULET W/COVER AND GASKET
* 16	1	AA2/3MB	AA2/3MB CONTROLLER

ITEM NUMBERS #17-#22 ARE NOT INCLUDED IN THE KIT BUT ARE AVAILABLE UPON REQUEST, AND REQUIRED FOR INSTALLATION.

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

NOTES:

- 1) MOUNT BEACON HINGE SO LENS WILL OPEN UNOBSTRUCTED BY STRUCTURE.
- 2) ON AM TOWER APPLICATIONS, KEEP GROUND LUG FROM BEING CONNECTED TO EARTH GROUND. GROUND TO THE TOWER ONLY.
- 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 RIGID GALVANIZED STEEL CONDUIT.
- 5) BREATHERS ALLOW FOR CIRCULATION OF AIR TO PREVENT CONDENSATION.

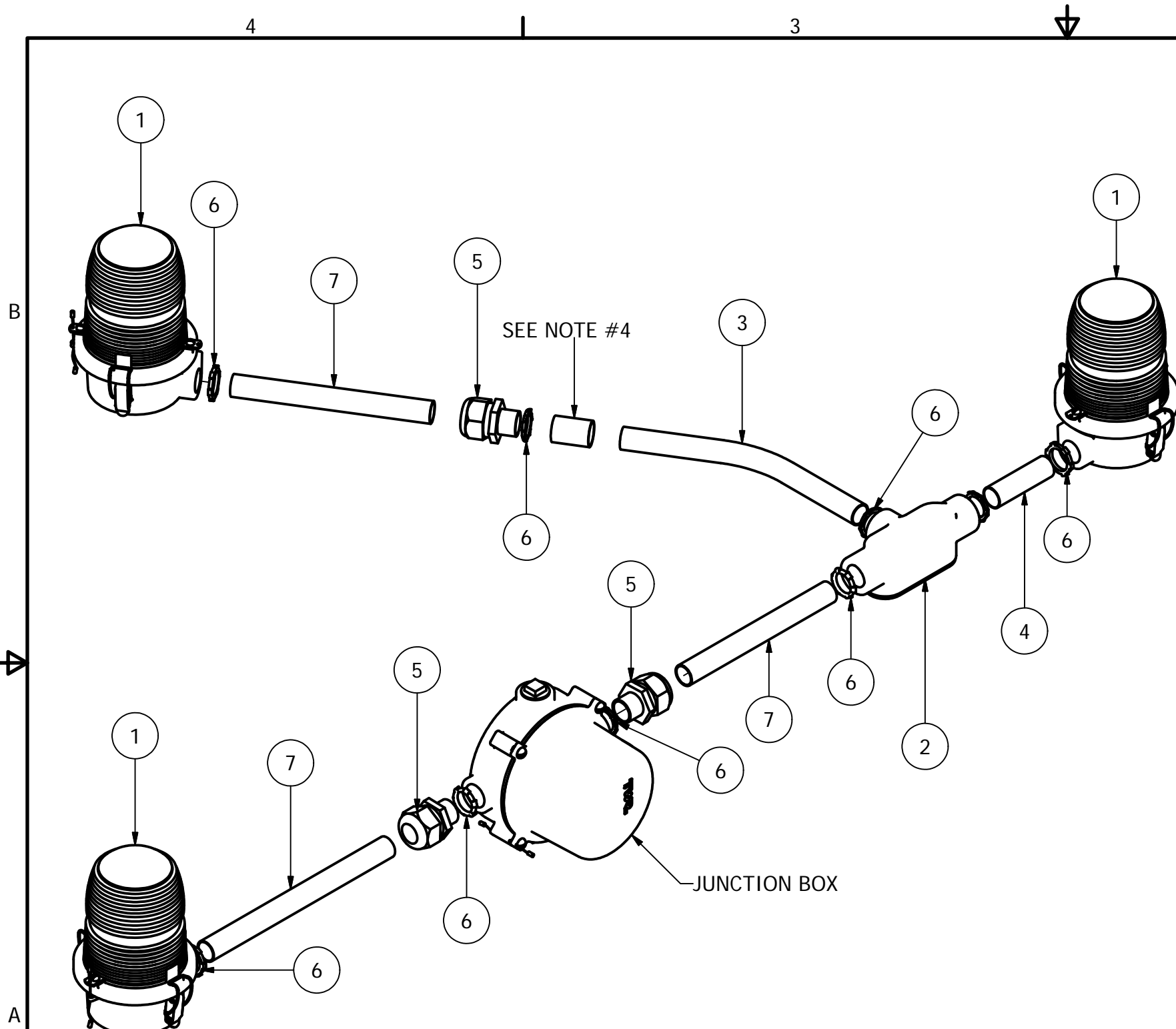


WIRING DIAGRAM

AA2/3MBAV TOWER LIGHT KIT W/BOOST
 (TOWERS 351'/107M TO 700'/213M)

PROD/DEPT	TWR Lighting, Inc. <i>Enlightened Technology</i>	WARK	
SERV/DEPT			
ENGINEER			
DRAWN BY	JZAMORANO	SHEET SIZE B	SHEET QTY. 1 OF 1
DATE	08/12/2016	SCALE N.T.S.	DWG. NO. T1698

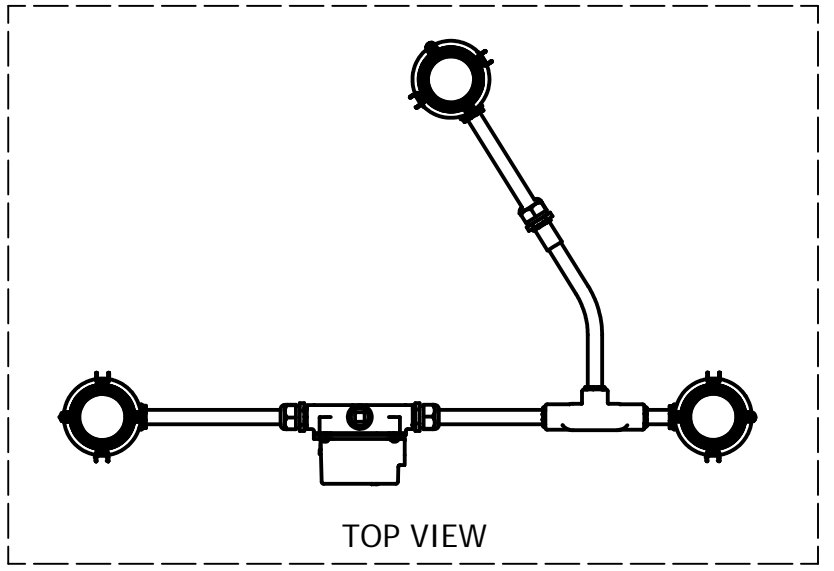
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ISOMETRIC VIEW

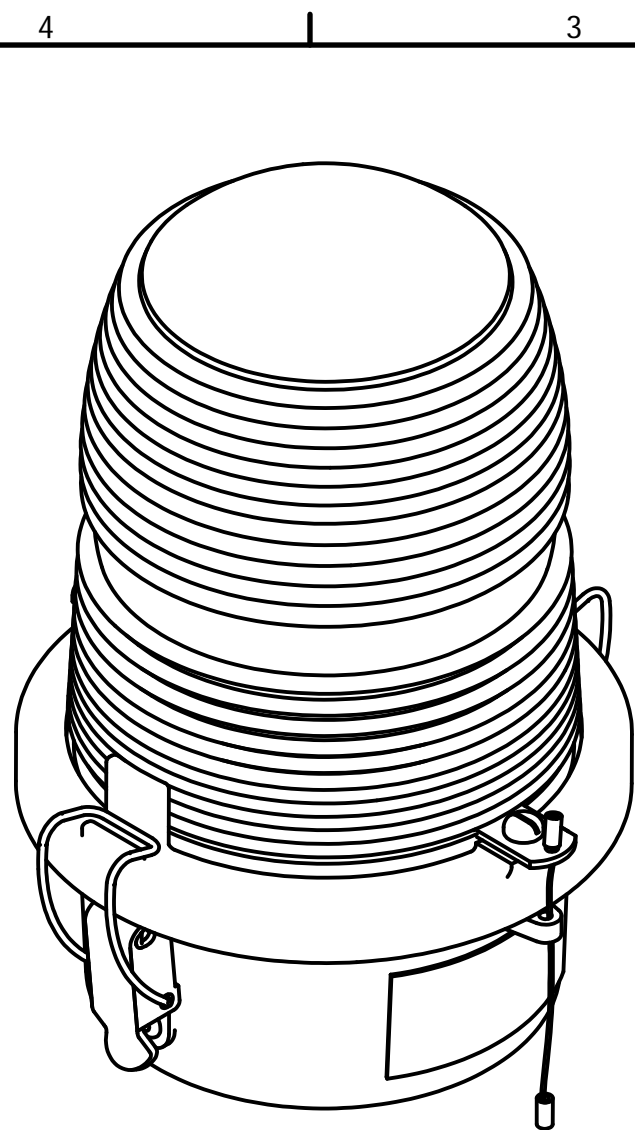
Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	3	OL1/LED	3/4" OBSTRUCTION LIGHT
2	1	T27CG	3/4" CONDULET W/COVER AND GASKET
3	1	EL3430	3/4" 30° ELBOW
4	1	N34T3	3/4" X 3" NIPPLE
5	3	HC402	3/4" NO THREAD CONNECTOR
6	5	A314	3/4" CONDUIT LOCKNUTS
7	1	CONDUIT34	3/4" CONDUIT

- 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



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

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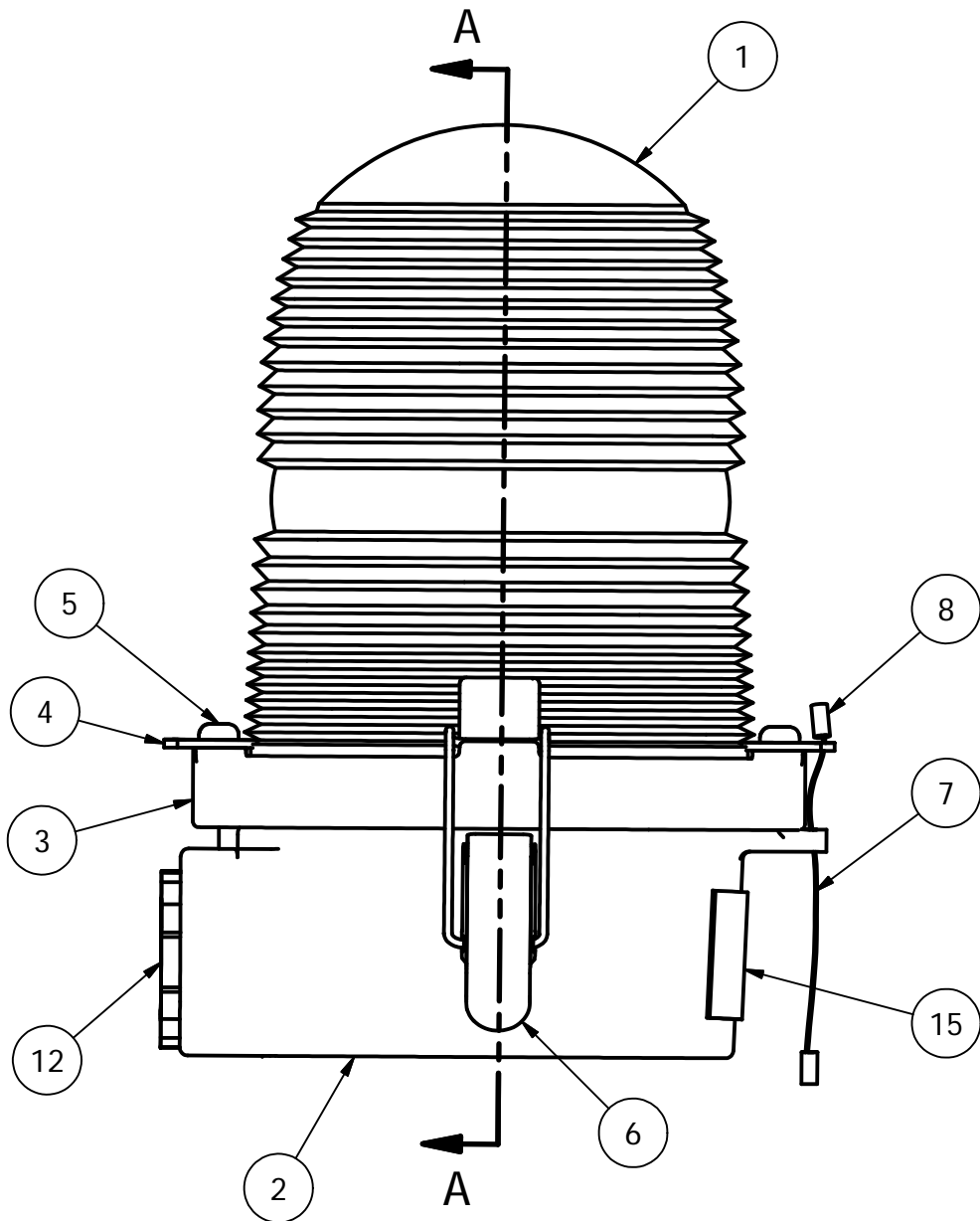


PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	AP35222	RED SIDELIGHT GLASS
2	1	105C	SINGLE SIDELIGHT BODY
3	1	106C	LENS HOLDER RING
4	2	12V245	OL LENS CLIP
5	2	832X14PH	8-32 X 1/4" PH SS SLOT SCREW
6	2	HC255SS	SIDELIGHT LATCH
7	1	7X7SS	1/16 HOL 7X7 S.S. WIRE
8	2	A1A	STAKON CRIMP
9	1	OLG	OL GASKET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

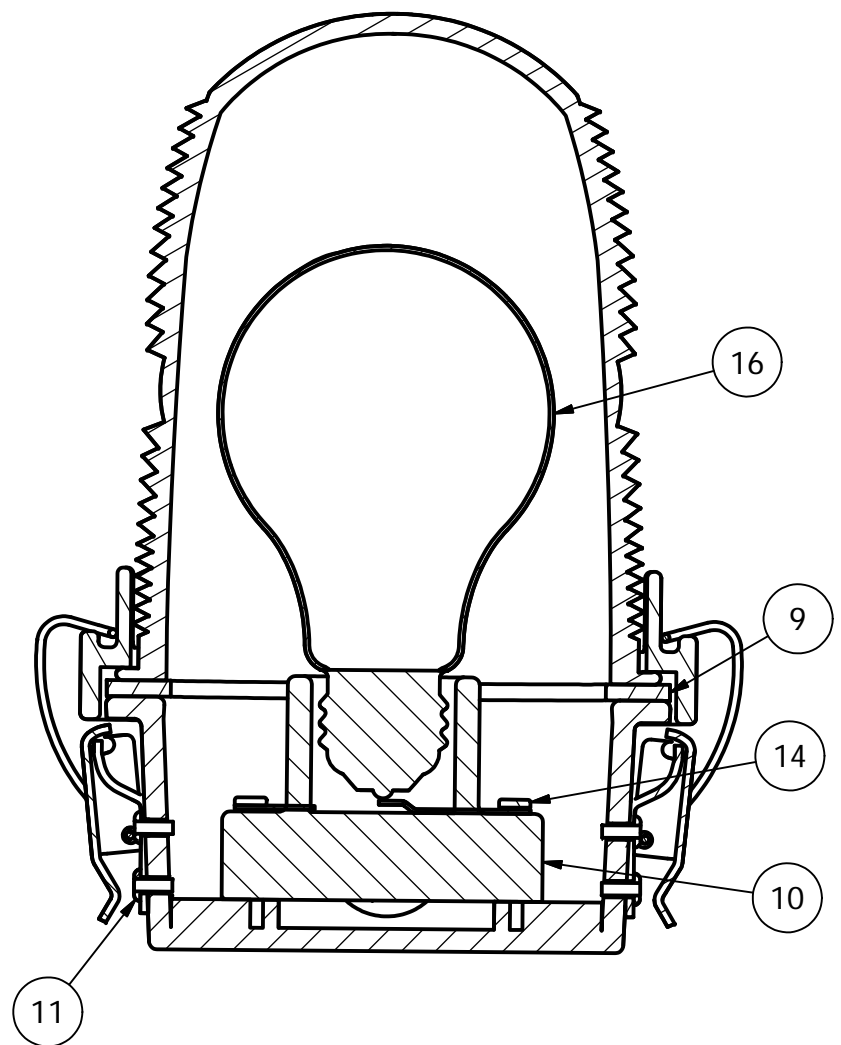
* = PART NOT SHOWN
 ~ = PART SOLD SEPARATELY

NOTE:

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

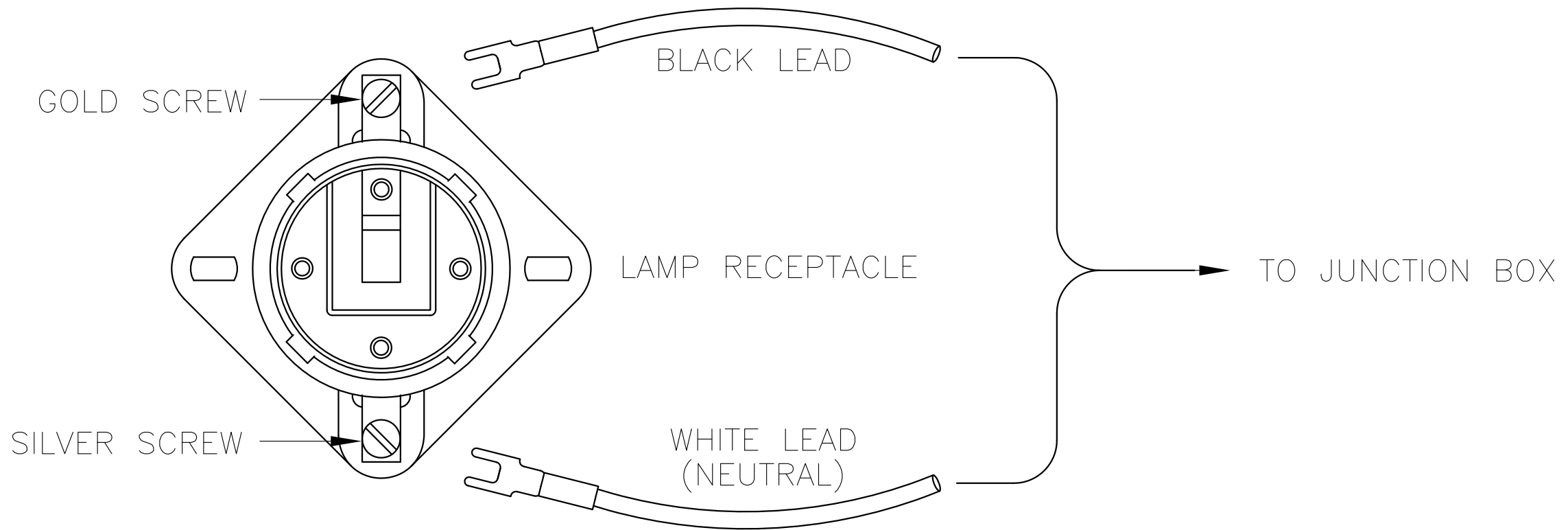


SECTION A-A



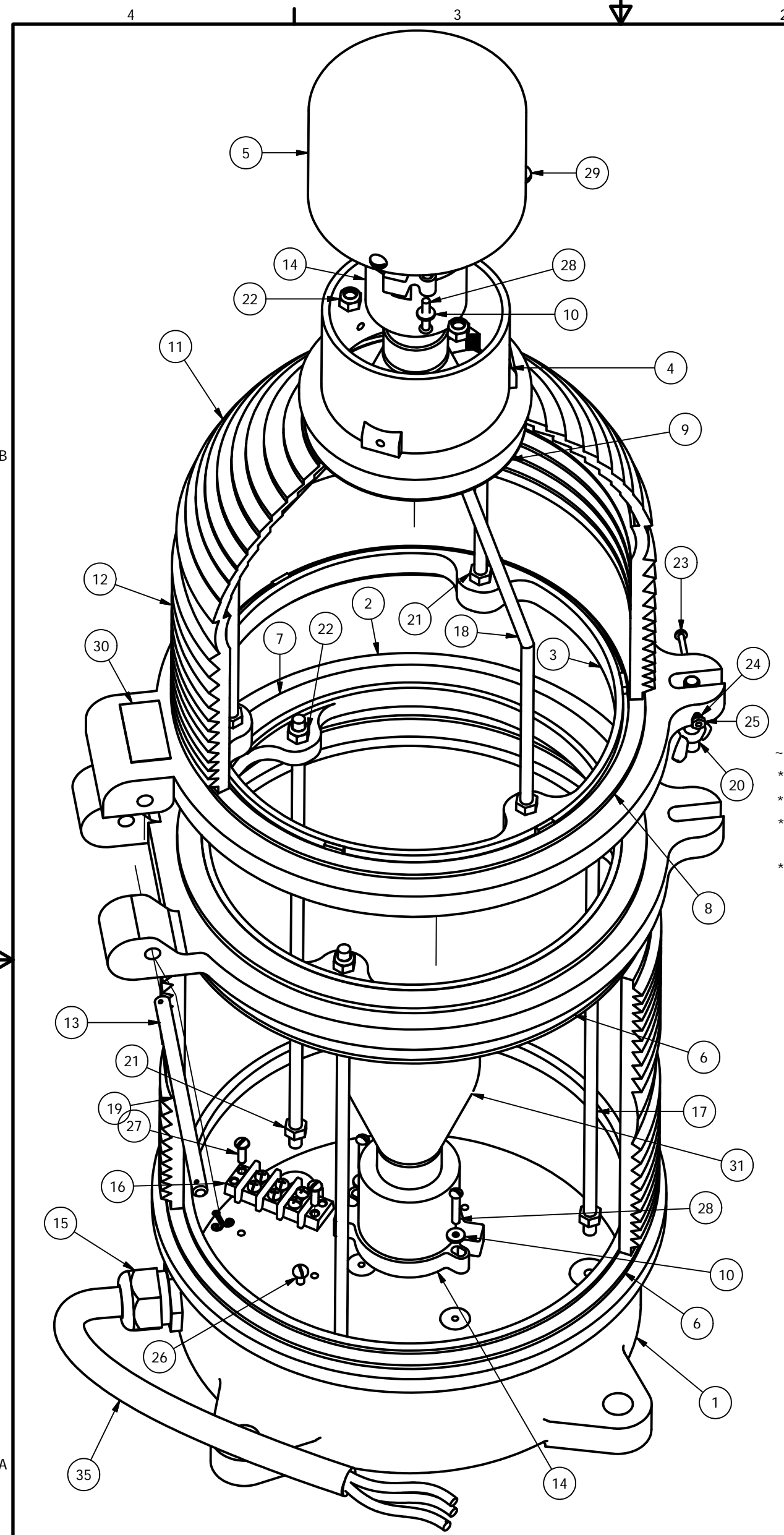
DRAWN	vhernandez	2/13/2012
CHECKED		
QA		
MFG		
APPROVED		
SIZE	B	DWG NO
SCALE	2/3	279-OL

TWR Lighting, Inc. <i>Enlightened Technology</i>	
TITLE 3/4" OL1 SIDE HUB ASSEMBLY DETAIL (PART#OL1)	
REV	C
SHEET 1 OF 1	



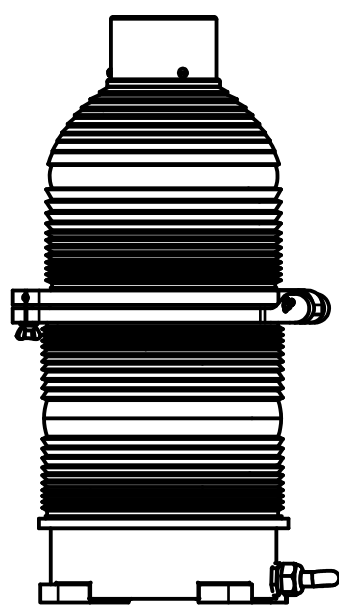
SIDELIGHT RECEPTACLE WIRING			
PROD DEPT	TWR Lighting, Inc. <i>Enlightened Technology</i> WORK		
SERV DEPT			
ENGINEER			
DRAWN BY G.D. SEBEK	SHEET SIZE B	SHEET QTY. 1 OF 1	DWG. NO. 274-S
DATE 7/2/98	SCALE N.T.S.		
<small>The use of non-OEM parts or modifications to original equipment design will void the manufacturer warranty and could invalidate the assurance of complying with FAA requirements as published in Advisory Circular 150/5345-43.</small>			
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7/2/98	(A)	CHANGED LABEL
DATE:	LTR.	REVISION



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

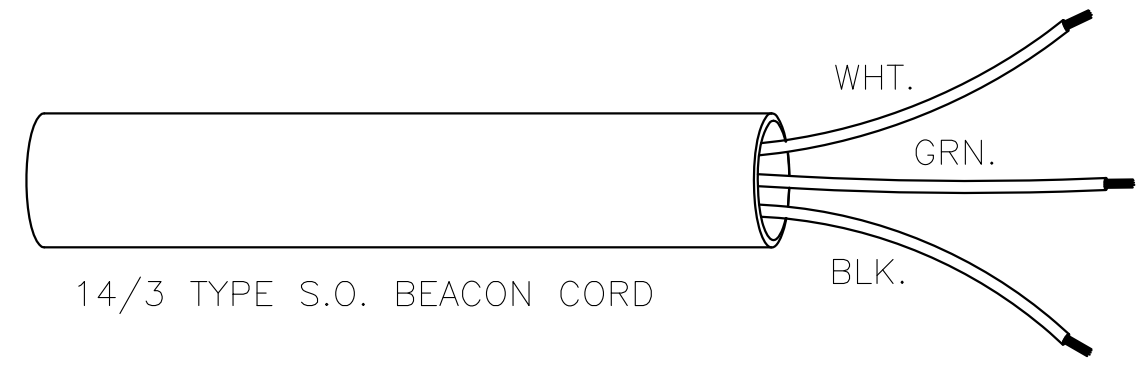
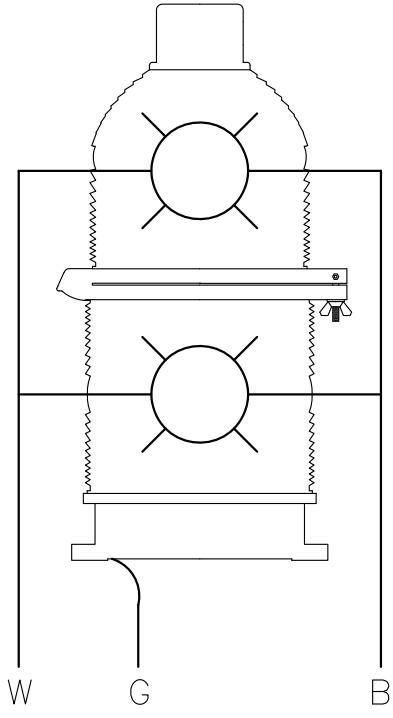


DRAWN J.L.BUSTAMANTE	11/27/07	TWR Lighting, Inc. MARK <i>Enlightened Technology®</i>	
CHECKED			
QA			
MFG			
APPROVED			
		TITLE 300 MM BEACON ASSEMBLY DETAIL	
		SIZE B	DWG NO 275-B
		SCALE	REV E
		SHEET 1 OF 1	

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- 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

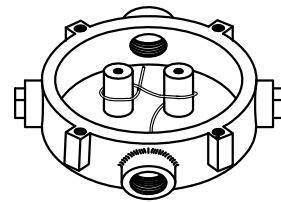
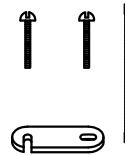
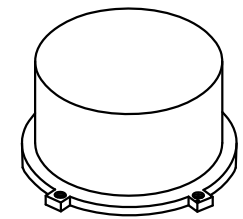
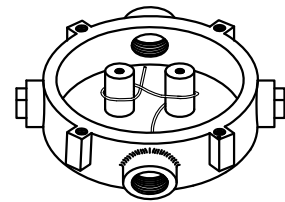
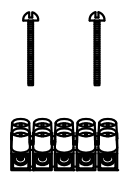
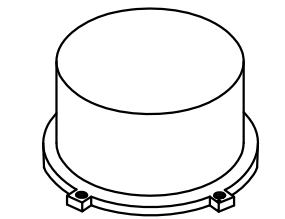


14/3 TYPE S.O. BEACON CORD

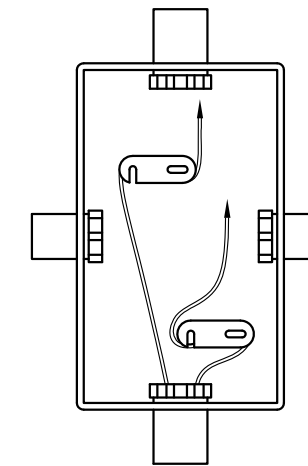
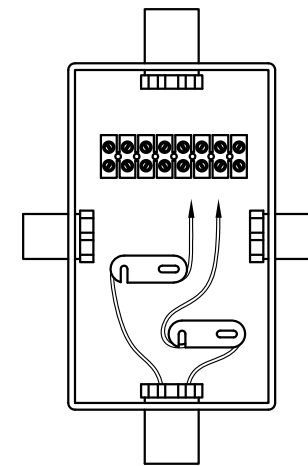
300 MM BEACON WIRE

PROD DEPT	TWR Lighting, Inc. <i>Enlightened Technology®</i>				
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

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JB-5 AND JB-0
3/4" JUNCTION BOX



JB-8 AND JB-8SR
1" JUNCTION BOX

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.

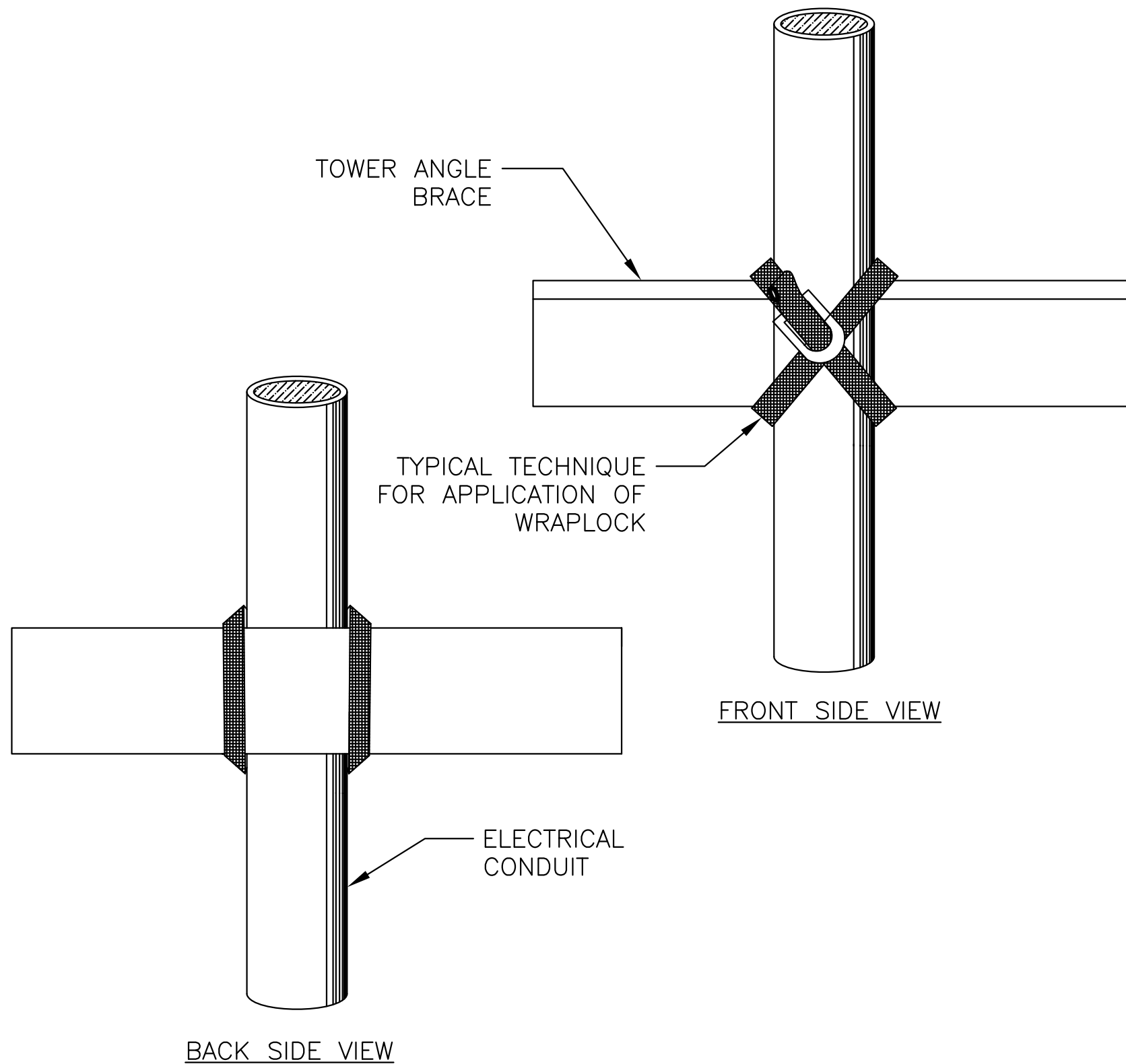
USING THIS JUNCTION BOX METHOD SPACING IS 100 FEET MAXIMUM.

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

<u>JUNCTION AND STRAIN RELIEF BOXES</u>					
PROD DEPT	TWR Lighting, Inc. <i>Enlightened Technology®</i>				
SERV DEPT					
ENGINEER					
DRAWN BY	G.D. SEBEK	SHEET SIZE	B	SHEET QTY.	1 OF 1
DATE	07/26/93	SCALE	N.T.S.	DWG. NO.	100089

9/29/00	(A)	UPDATED NOTES
DATE:	LTR.	REVISION

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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. <i>Enlightened Technology®</i>		
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

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