



Lee County Department of Transportation Plan Specifications for Signal & Street Lighting



Traffic Signal & Street Lighting

Date Revised: April 15, 2014

REVISION DATES

April 15, 2014
February 11, 2003
March 11, 2003
December 4, 2003
December 17, 2003
January 6, 2004
January 14, 2004
July 16, 2004
September 24, 2004
April 8, 2005
February 13, 2009
March 12, 2009
March 26, 2009
April 1, 2009
August 12, 2009
October 7, 2009
February 15, 2010
January 7, 2011
February 15, 2012
November 19, 2012

Current Revision:

Pg. 44 – Add Audible PED's 10.1.7
Pg. 151 – Gusset Tube Length 21.3
Pg. 165 – Changes to cable specs 21.10
Pg. 149 – Product name change and specs to Encore
Pg. 161 – Aldis Grid Smart 21.8
Pg. 193 - PATCH PANELS SHALL BE CORNING PART NUMBER SPH-01P 23.4.1

Note: Page Numbers shown correspond to the Document Page Numbers not the PDF Page Numbers.

LEE COUNTY PLAN SPECIFICATIONS

INDEX

	LEE COUNTY GENERAL NOTES.....	INDEX d
1.	LOOPS.....	PAGE 1-3
	ILLUSTRATION – Loop Color Code.....	PAGE 4-5
2.	CONDUIT.....	PAGE 6-7
3.	PULL BOXES	PAGE 8
	ILLUSTRATIONS - Pull Box	PAGE 9-15
4.	CABINET BASE	PAGE 16
	ILLUSTRATIONS - Cabinet Base	PAGE 17-19
5.	SIGNAL CABLE	PAGE 20
	ILLUSTRATIONS - Lee County DOT Signal Cable Color Code.....	PAGE 21-23
6.	GROUNDING.....	PAGE 24
7.	SIGNAL HEADS	PAGE 25-27
	ILLUSTRATION – Backplate	PAGE 27-29
8.	MAST ARM POLES	PAGE 30-31
	ILLUSTRATIONS - Astro Brac.....	PAGE 32-34
9.	DISCONNECTS	PAGE 35
	ILLUSTRATIONS -	PAGE 36-45
10.	PEDESTRIAN HEADS	PAGE 46
	ILLUSTRATIONS -	PAGE 47-57
11.	INTERCONNECT	PAGE 58-59
	ILLUSTRATIONS -	PAGE 60-61
12.	STREET LIGHTS	PAGE 62-63
	ILLUSTRATIONS -	PAGE 64-93
13.	SCHOOL FLASHERS.....	PAGE 94
	ILLUSTRATIONS -	PAGE 95-97
14.	ELECTRIC SERVICE	PAGE 98
	ILLUSTRATIONS -	PAGE 99-105

15.	CABINET ASSEMBLY.....	PAGE 106
	ILLUSTRATIONS -	PAGE 107-113
	ILLUSTRATION - TS2 “Plug-n-Go” Modular Cabinet Assembly.....	PAGE 114-129
16.	CONCRETE POLES	PAGE 130
	ILLUSTRATIONS	PAGE 131-134
17.	STEEL POLES.....	PAGE 135
	ILLUSTRATIONS -	PAGE 136-141
18.	DIRECTIONAL BORE.....	PAGE 142
19.	FLASHERS.....	PAGE 143
	ILLUSTRATIONS.....	PAGE 144-146
20.	OVERHEAD SIGNS	PAGE 147
	ILLUSTRATIONS -	PAGE 148-150
21.	VIDEO DETECTION.....	PAGE 151-169
22.	PERMANENT COUNT STATION LOOPS	PAGE 170-171
	ILLUSTRATIONS.....	PAGE 172-207
23.	FIBER OPTIC COMMUNICATIONS	PAGE 208-210
	ILLUSTRATIONS -	PAGE 211-226
24.	RADIO COMMUNICATIONS	PAGE 210

**GENERAL NOTES
TRAFFIC SIGNAL & STREET LIGHTING WORK WITHIN LEE COUNTY**

THE FOLLOWING PERTAINS TO ALL TRAFFIC SIGNAL/STREET LIGHTING WORK, EITHER IN CONJUNCTION WITH A ROAD PROJECT OR A "FREE STANDING" ELECTRICAL PROJECT. THESE NOTES APPLY TO ALL TRAFFIC SIGNAL PROJECTS WHERE EXISTING EQUIPMENT IS MAINTAINED AND/OR ANY NEW EQUIPMENT WILL BE MAINTAINED BY LEE COUNTY OR UNLESS OTHERWISE NOTED ON PROJECT PLAN SHEETS AND INDICATED AS APPROVED BY LEE COUNTY.

BEFORE ANY PROJECT WORK BEGINS THERE SHALL BE A MAINTENANCE TRANSFER (FORMS FOLLOW GENERAL NOTES). THE MAINTENANCE WILL TRANSFER FROM LEE COUNTY DOT/TRAFFIC TO AN FDOT QUALIFIED ELECTRICAL CONTRACTOR NO LATER THAN THE DAY BEFORE THE PROJECT BEGINS. THE CONTRACTOR IS REQUIRED TO HAVE AN AUTHORIZED REPRESENTATIVE ONSITE TO ACCEPT THE MAINTENANCE TRANSFER AND TO WITNESS THE EXISTING CONDITION OF THE TRAFFIC SIGNAL OR STREET LIGHTING SYSTEM.

ANY DEFICIENCIES THAT MAY BE FOUND ON THE DAY OF THE MAINTENANCE TRANSFER SHALL BE REPAIRED BY LEE COUNTY TRAFFIC AT THAT TIME. AFTER ANY DEFICIENCIES HAVE BEEN CORRECTED ON THE DAY OF THE TRANSFER, ANY AND ALL DEFICIENCIES FOUND FROM THAT DAY AND TIME SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

CONTRACTOR MAINTENANCE RESPONSIBILITIES: CONTRACTOR SHALL PROVIDE 24-HOUR CONTACT PERSON(S), TELEPHONE NUMBERS AND E-MAIL ADDRESSES AT THE TIME OF TRANSFER. FAILURE TO RESPOND TO MAINTENANCE RESPONSIBILITIES IN A TIMELY MANNER WILL TRIGGER A "VENDOR/CONTRACTOR COMPLAINT" NOTICE TO LEE COUNTY CONTRACTS AS WELL AS FDOT. TIMELY MANNER IN RESPONSE TO MAINTENANCE RESPONSIBILITIES IS DEFINED AS RESPONSE TO SITE NO LATER THAN TWO (2) HOURS AFTER NOTIFICATION. IN THE EVENT THAT LEE COUNTY FORCES ARE CALLED OUT TO RESPOND, THE CONTRACTOR WILL BE BILLED THE ENTIRE COST AS A "DEDUCT" ON THE NEXT PAYMENT REQUEST. BEING AN "OUT OF TOWN" CONTRACTOR DOES NOT RELIEVE THIS RESPONSIBILITY.

LOCATES: ONE (1) COURTESY LOCATE SHALL BE PERFORMED BY LEE COUNTY SIGNALS AT THE START OF THE PROJECT AT THE CONTRACTOR'S REQUEST. THE CONTRACTOR SHALL DOCUMENT THE LOCATION OF THE EXISTING UNDERGROUND AND ABOVE GROUND FACILITIES. AFTER THE COURTESY LOCATE, ALL LOCATES WITHIN THE PROJECT LIMITS ARE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE PERFORMED IN A TIMELY MANNER. TIMELY MANNER IN RESPONSE TO LOCATES IS DEFINED AS LOCATE SHALL BE PERFORMED NO LATER THAN TWENTY-FOUR (24) HOURS AFTER NOTIFICATION OR AS REQUIRED BY FLORIDA STATUTE. LEE COUNTY SIGNALS WILL ADVISE THE CONTRACTOR VIA E-MAIL OR FAX OF SUNSHINE LOCATE REQUESTS WITHIN THE WORK ZONE. ANY DAMAGE INCURRED DUE TO CONTRACTOR FAILURE TO LOCATE SHALL BE REPAIRED BY THE CONTRACTOR. SHOULD LEE COUNTY FORCES BE CALLED OUT TO MAKE REPAIRS DUE TO CONTRACTOR REFUSAL OR INABILITY TO MAKE REPAIRS, THE CONTRACTOR WILL BE BILLED THE ENTIRE COST AS A "DEDUCT" ON THE NEXT PAYMENT REQUEST AND WILL TRIGGER A "VENDOR/CONTRACTOR COMPLAINT" NOTICE TO BE FILED WITH LEE COUNTY CONTRACTS AS WELL AS FDOT. BEING AN "OUT OF TOWN" CONTRACTOR DOES NOT RELIEVE THIS RESPONSIBILITY.

DAMAGE TO EXISTING FACILITIES: ANY DAMAGE TO LEE COUNTY FACILITIES SHALL BE REPAIRED BY THE CONTRACTOR. REPAIRS SHALL BE MADE TO ENSURE FACILITIES ARE LIKE NEW OR BETTER. ANY DAMAGE TO EXISTING COMMUNICATION LINES SHALL NECESSITATE THE REMOVAL OF ALL DAMAGED LINES AND THE RE-PULLING OF NEW CABLE. SPLICING OF COMMUNICATION LINES WILL NOT BE ALLOWED. CAUTION SHALL BE EXERCISED DURING EXCAVATION NEAR EXISTING LEE COUNTY FIBER OPTIC LINES, SINCE MANY ENTITIES USE THESE FACILITIES. SHOULD DAMAGE OCCUR TO FIBER OPTIC LINES, LEE COUNTY WILL DECIDE WHICH QUALIFIED FIBER OPTIC SPLICING COMPANY WILL BE USED TO MAKE REPAIRS. CONTRACTOR WILL BE RESPONSIBLE FOR ALL REPAIR COSTS INCURRED, WHETHER REPAIRS ARE MADE BY LEE COUNTY OR A THIRD PARTY.

EXISTING EQUIPMENT: SHALL BE RETURNED TO LEE COUNTY DOT/TRAFFIC IN GOOD OPERATING CONDITION AND IN THE SAME CONDITION AS ON THE DAY OF THE MAINTENANCE TRANSFER AT 5650 ENTERPRISE PARKWAY, FORT MYERS, FL 33905 IN A TIMELY MANNER. TIMELY MANNER FOR EXISTING EQUIPMENT IS DEFINED AS NO LATER THAN 72 HOURS AFTER DISCONNECTION. THE CONTRACTOR SHALL NOTIFY LEE COUNTY OF THE DISCONNECTION 24 HOURS IN ADVANCE TO SCHEDULE THE DELIVERY OF THE EQUIPMENT SO THAT DELIVERY TAKES PLACE DURING A REGULAR BUSINESS DAY AND HOURS. FAILURE TO PERFORM AS OUTLINED IN THIS PARAGRAPH WILL RESULT IN NO INSPECTION AT COMPLETION UNTIL CONTRACTOR IS IN COMPLIANCE WITH THIS REQUIREMENT. LEE COUNTY SIGNALS WILL WITHHOLD PAYMENT REQUESTS UNTIL LEE COUNTY PROPERTY IS DELIVERED TO 5650 ENTERPRISE PARKWAY, FORT MYERS, FL 33905.

CABINET/CONTROLLER/VIDEO DETECTION PREP: LEE COUNTY SIGNALS WILL ASSIST THE CONTRACTOR IN THE SETUP OF NEW SIGNAL CABINET/CONTROLLERS/CAMERAS WHEN THE FOLLOWING CONDITIONS ARE MET: DELIVERY OF EQUIPMENT TO 5650 ENTERPRISE PARKWAY BY CONTRACTOR OR SHIPPER. THE CONTRACTOR SHALL SEND A QUALIFIED TECHNICIAN TO THE SIGNAL SHOP TO SET UP THE EQUIPMENT WITH THE AID OF A SENIOR SIGNAL TECH, GIVING MINIMUM OF 48 HOURS NOTICE. AFTER SET UP, CONTRACTOR SHALL ARRANGE TO PICK UP THE EQUIPMENT WITHIN ONE WEEK. AT TIME OF REMOVAL FROM THE LEE COUNTY SIGNAL SHOP, THE EQUIPMENT SHALL BE SIGNED OUT BY THE CONTRACTOR REPRESENTATIVE AS COMPLETE. LEE COUNTY WILL NOT STORE CONTRACTOR EQUIPMENT. UNDER THESE CONDITIONS, LEE COUNTY SIGNALS WILL ASSIST THE CONTRACTOR ON "TURN ON" DAY IN THE FIELD. SHOULD THE CONTRACTOR ELECT TO SET UP, BURN IN, AND TEST THE EQUIPMENT WITHOUT LEE COUNTY ASSISTANCE, A MANUFACTURER'S REPRESENTATIVE SHALL BE ONSITE, AT CONTRACTOR'S EXPENSE, ON THE DAY OF TURN ON TO ASSIST THE CONTRACTOR AND TO VERIFY PROPER OPERATION.

SPECIAL NOTE REGARDING NEW CONTROLLERS: LEE COUNTY RESERVES THE RIGHT TO SUBSTITUTE DIFFERENT CONTROL EQUIPMENT IN THE EVENT THAT DELIVERED EQUIPMENT IS NOT COMPATIBLE WITH THE EXISTING SYSTEM. SINCE SYSTEM UPGRADES MAY BE BEHIND CONTROLLER TECHNOLOGY, AS THE MAINTAINING AGENCY, LEE COUNTY SIGNALS WILL DECIDE EQUIPMENT PLACEMENT AND TIMING AND MAY PROVIDE AN ALTERNATE CONTROLLER TEMPORARILY UNTIL FUTURE UPGRADES ARE MADE. IF THERE IS A COST DIFFERENTIAL, PAYMENT WILL BE MADE TO THE CONTRACTOR PER PLAN QUANTITY AND SPECIFICATION.

DETECTION: TRAFFIC ACTUATED DETECTION SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. SEVERAL OPTIONS ARE AVAILABLE TO THE CONTRACTOR TO BE ABLE TO CONTINUE DETECTION:

- 1.) MAINTAIN AND/OR RECUT LOOPS AS NECESSARY.**
- 2.) INSTALL CONTRACTOR OWNED TEMPORARY VIDEO DETECTION.**
- 3.) INSTALL THE PERMANENT CAMERAS THAT MAY BE CALLED OUT ON THE PLANS FOR TEMPORARY USE DURING CONSTRUCTION. CONTRACTOR CAN RELOCATE THESE CAMERAS TO THEIR PERMANENT LOCATION AT THE APPROPRIATE TIME. SHOULD THE CONTRACTOR CHOOSE OPTION 3, LEE COUNTY WILL NOT BE RESPONSIBLE FOR ANY DAMAGE TO THE VIDEO CAMERAS DURING THE PROJECT. THE CAMERAS SHALL BE SUBJECT TO FINAL INSPECTION AND SHALL BE IN GOOD WORKING ORDER.**

REGARDING TEMPORARY DETECTION, REFER TO THE MOST CURRENT FDOT DESIGN STANDARDS, INDEX 600 AND REV 07/01/07 FOR SIGNALS AND INCLUDE THAT ALL SIGNALIZED INTERSECTIONS CONTAINED IN THE PROJECT PLANS SHALL BE IDENTIFIED AS LOCATIONS WHERE TEMPORARY DETECTION SHALL BE REQUIRED PER THIS STANDARD. ADDITIONALLY, ALL EXISTING SIGNAL PHASES, ANY PHASES ACTIVE DURING CONSTRUCTION, AND ALL NEW OR MODIFIED PHASES RESULTING FROM NEW CONSTRUCTION SHALL HAVE DETECTION FULLY MAINTAINED AND OPERATIONAL DURING THE DURATION OF THE PROJECT. ONLY DETECTION APPROVED BY THE ENGINEER AND OPERATES PROPERLY IN THE "PRESENCE" MODE MADE BE USED. MOTION DETECTION SUCH AS MICROWAVE PULSE DETECTION IS PROHIBITED.

NO ADDITIONAL COMPENSATION WILL BE ALLOWED, UNLESS SPECIFICALLY CALLED OUT IN THE PLANS FOR ANY OF THE ABOVE OPTIONS. MICROWAVE DETECTION OR PULSE DETECTION SHALL NOT BE USED IN LEE COUNTY FOR PRESENCE DETECTION DUE TO OPERATIONAL PROBLEMS AND FAILURE TO DETECT STOPPED VEHICLES.

INSPECTIONS: MAST ARM DRILL SHAFT INSPECTIONS ARE REQUIRED BEFORE CONCRETE PLACEMENT. PLEASE REFER TO THE MOST CURRENT FDOT STANDARD SPECIFICATIONS FOR DRILLED SHAFT INSTALLATIONS, WHICH REQUIRE AN FDOT CERTIFIED DRILLED SHAFT INSPECTOR TO BE ONSITE DURING THE ENTIRE PROCESS. USE CASING WHEN NECESSARY TO ENSURE SHAFT INTEGRITY. CONCRETE STRAIN POLE EXCAVATIONS WILL ALSO REQUIRE INSPECTION. WHEN USING "WET HOLE" METHOD, THE CONCRETE SHALL BE PLACED FROM THE BOTTOM UP, USING EITHER A CONCRETE PUMP OR TREME TUBE METHOD OR AS SPECIFIED IN THE PLANS BY THE EOR. NO FREE FALLING CONCRETE SHALL BE ALLOWED. ALL FDOT GUIDELINES FOR CONCRETE QA/QL SHALL BE ADHERED TO. TWENTY-FOUR (24) HOUR NOTICE IS REQUIRED TO THE INSPECTOR SHOWN IN THE PLAN SET GENERAL NOTES. SHOULD THE INFORMATION BE MISSING, THE CONTRACTOR IS HEREBY DIRECTED TO CALL LEE COUNTY SIGNALS AT 239-533-9500 AND ASK FOR THE SIGNAL INSPECTION DEPARTMENT.

MAST ARM MOUNTED SIGNAL HEADS SHALL BE WIRED WITH THE ENTIRE BLACK JACKET ENTERING THE SIGNAL HEAD. NO NON-JACKETED CABLE IS ALLOWED IN THE GUSSET TUBE. ASTRO BRACKETS TO BE INSTALLED AND TORQUED PROPERLY ACCORDING TO MANUFACTURES INSTRUCTIONS. NO IMPACT WRENCHES ALLOWED

CONTRACTOR IS REQUIRED TO HAVE AN AUTHORIZED REPRESENTATIVE OF THE CONTRACTOR AND NECESSARY EQUIPMENT TO COMPLETE THE INSPECTIONS ONSITE AT ALL SIGNAL AND LIGHTING INSPECTIONS. FAILURE TO HAVE A REPRESENTATIVE ONSITE WILL RESULT IN THE CANCELLATION OF THE INSPECTION AND THE WITHHOLDING OF FINAL PAYMENT. AUTHORIZED REPRESENTATIVE IS A PERSON WITH THE KNOWLEDGE AND ABILITY TO MAKE CORRECTIONS AS NEEDED. THIS IS A REQUIREMENT AND IS NECESSARY TO ELIMINATE COSTLY RE-INSPECTIONS AND TO SPEED UP THE CLOSE OUT OF THE PROJECT.



LEE COUNTY DEPARTMENT OF TRANSPORTATION
 SIGNALS SECTION
 5650 ENTERPRISE PARKWAY
 FORT MYERS, FL 33905

PHONE: (239) 533-9500
 FAX: (239) 694-1332

MAINTENANCE TRANSFER FROM LEE COUNTY TO CONTRACTOR

DATE: _____ LOCATION:----- PROJECT No: _____

CONTRACTOR: _____ SIGNAL CONTRACTOR:-----

REPRESENTED BY: -----

PRINTED NAME SIGNATURE
 DAYTIME PH. #: _____ AFTER HRS.# _____

AS OF TODAY'S DATE THE MAINTENANCE RESPONSIBILITIES FOR THIS SIGNALIZED INTERSECTION HAVE BEEN TURNED OVER TO THE ABOVE NAMED CONTRACTOR.
 NOTE: MAINTENANCE INCLUDES LOCATES.

ANY DEFICIENCIES FOUND AT THIS INTERSECTION HAVE BEEN NOTED BELOW:

ITEM(S): -----

NOTE: AFTER CONSTRUCTION IS COMPLETE, LEE COUNTY TRAFFIC SHALL INSPECT THE INTERSECTION WITH THE CONTRACTOR PRESENT. ANY "NEW" DEFICIENCIES FOUND DURING THIS INSPECTION WILL BE THE CONTRACTOR'S RESPONSIBILITY WHERE APPLICABLE. FINAL PAYMENT WILL NOT BE AUTHORIZED UNTIL REPAIRS HAVE BEEN MADE AND THE INTERSECTION HAS BEEN RE-INSPECTED. THE CONTRACTOR SHALL HAVE A REPRESENTATIVE PRESENT DURING ALL INSPECTIONS. FAILURE TO COMPLY WILL RESULT IN PAYMENT DELAYS, AS THE INTERSECTION WILL NOT BE INSPECTED WITHOUT A CONTRACTOR'S REPRESENTATIVE ONSITE.

The above paragraph does not relieve the contractor from any other DOT or contractual requirements. Such as but not limited to: 90 day burn in or any other item required by Lee County or FOOT.

 INSPECTOR (PRINT)

 INSPECTOR (SIGN)

 INSPECTOR (PRINT)

 INSPECTOR (SIGN)

LOOPS

1.1 - GENERAL

1.1.1A ALL LOOPS PLACED AT STOP BAR SHALL BE 6' x 40' TYPE F UNLESS AGREED TO BY THE LEE COUNTY TRAFFIC ENGINEER. THEY SHOULD BE PLACED TWO (2) FEET IN FRONT OF THE STOP BAR, UNLESS DIRECTED BY THE LEE COUNTY TRAFFIC ENGINEER.

1.1.1B

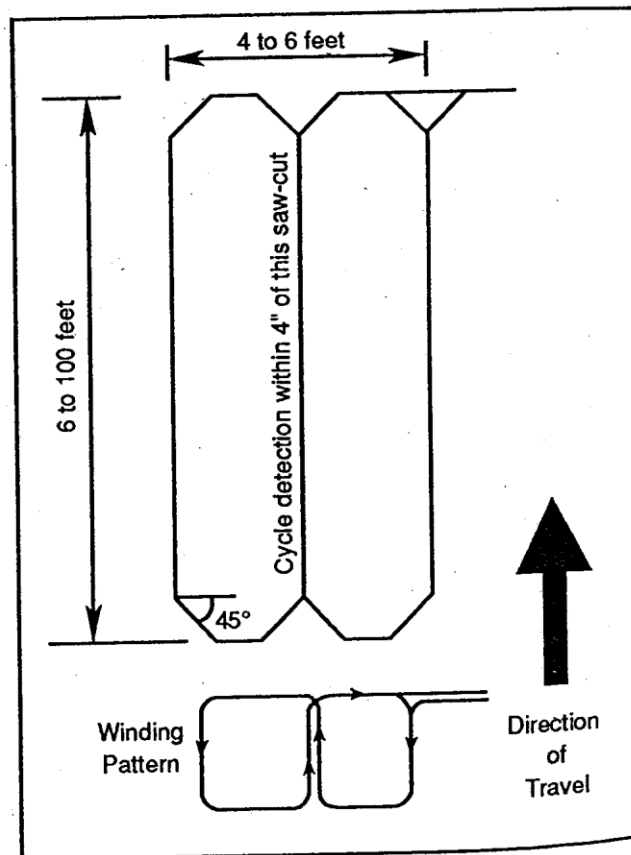


Figure 87. Quadrupole loop configuration.

1.1.2 ADVANCE AND/OR SYSTEM LOOPS SHALL BE 6' x 6' TYPE B AND HAVE THREE (3) TURNS.

1.1.3 ANY DISRUPTION TO VEHICULAR LOOP DETECTION SHALL BE CORRECTED WITHIN THIRTY-SIX (36) HOURS OF NOTICE BY THE CONTRACTOR.

1.1.4 NO PREFORMED LOOPS SHALL BE PERMITTED.

1.1.5 IF OTHER TYPES OF DETECTION ARE USED, THEY MUST BE PRESENCE

DETECTION.

1.2 - INSTALLATION

- 1.2.1 EACH LOOP SHALL HAVE A SEPARATE HOME RUN BACK TO THE CONTROLLER CABINET.**
- 1.2.2 NO MORE THAN ONE (1) LOOP LEAD-IN SHALL BE PERMITTED IN A SINGLE SAW CUT.**
- 1.2.3 DEPTH OF SAW CUT SHALL NOT BE LESS THAN THREE (3) INCHES OR GREATER THAN FOUR (4) INCHES BELOW ROADWAY SURFACE.**
- 1.2.4 BACKER ROD SHALL BE PLACED IN ALL SAW CUTS EVERY ONE (1) FOOT AND AT EACH TURN IN THE SAW CUT. THE BACKER ROD PIECES SHALL BE A MINIMUM OF ONE (1) INCH AND MAXIMUM OF TWO (2) INCHES IN LENGTH.**
- 1.2.5 LOOP SEALANT SHALL BE TYPE 3 ASPHALT TAR. NO TWO-PART EPOXY WILL BE PERMITTED. ALL OTHERS MUST BE APPROVED BY THE LEE COUNTY TRAFFIC ENGINEER.**
- 1.2.6 CURBS SHALL BE DRILLED TO ACCOMMODATE ONE TWO (2) INCH CONDUIT TO RUN LOOP LEAD-IN WIRES TO PULL BOX. NO HOLES IN ASPHALT WILL BE ACCEPTED.**
- 1.2.7 WHERE NO CURB IS EXISTING, SAW CUT TO THE EDGE OF PAVEMENT AND PLACE ONE TWO (2) INCH CONDUIT THREE (3) TO FIVE (5) INCHES UNDER THE PAVEMENT SURFACE.**

1.3 - TERMINATION

- 1.3.1 EACH LOOP SHALL BE MARKED PER PHASE AND PER DIRECTION AT EACH SPLICE POINT, AND AT THE CABINET TERMINATION POINT.**
- 1.3.2 LOOP LEAD-IN WIRES SHOULD BE TWISTED A MINIMUM OF FIVE (5) TURNS PER FOOT UP TO A MAXIMUM OF TWELVE (12) TURNS PER FOOT.**
- 1.3.3 LEAD-IN WIRE IN A SPLICE BOX SHALL BE LEFT A MINIMUM OF THREE (3) FEET AND A MAXIMUM OF FOUR (4) FEET TO SPLICE TO HOME RUN CABLE.**
- 1.3.4 WHEN HOME RUN CABLE IS SPLICED TO LOOP LEAD-IN WIRE, THE END OF THE HOME RUN CABLE SHALL BE SEALED TO PREVENT WATER INFILTRATION.**
- 1.3.5 SILICONE FILLED (WATER PROOF) WIRE NUTS SHALL BE USED TO SPLICE LOOP LEAD IN WIRE TO HOME RUN CABLE. MANUFACTURE KING**

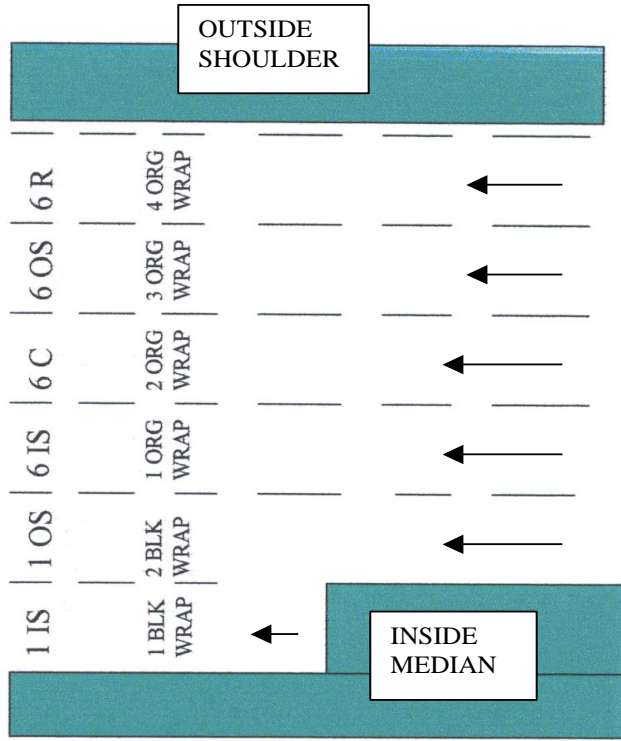
1.4 - TESTING

1.4.1 MINIMUM INSULATION MEGGER READING SHALL BE 250 MEG. OHMS FOR EACH LOOP.

1.4.2 MAXIMUM RESISTANCE READING SHALL BE LESS THAN 10 OHMS FOR EACH LOOP.

- PHASE 1 – BLACK WRAP
- PHASE 2 – RED WRAP
- PHASE 3 – GREEN WRAP
- PHASE 4 – BLUE WRAP
- PHASE 5 – BROWN
- PHASE 6 – ORANGE
- PHASE 7 – WHITE
- PHASE 8 – YELLOW

EACH HOME RUN CABLE SHALL BE MARKED WITH THE APPROPRIATE COLOR WITH AT LEAST 2 WRAPS OF TAPE.





DEFLECTOMETER™

LMD622

DEFLECTOMETER™ SERIES

TWO CHANNEL NEMA TS-2 TYPE A LOOP MONITOR™

Built-in DEFLECTOMETER™ Technology Provides Users With:

- Call Strength Indicator for Optimum Sensitivity Programming
- One step / One vehicle dynamic Sensitivity programming
- Frequency Meter for immediate analysis of loop frequency, avoiding loop cross-talk problems
- Push Button Programming

Why guess when you can know your detector is optimally programmed and performing for all vehicle classes!

ENHANCED FEATURES

DEFLECTOMETER Call Strength Indicator: The *Call Strength Indicator* provides the technician with a simple one-step method for accurately setting the optimum level of sensitivity that ensures accurate vehicle detection of all vehicles, including motorcycles and high-bed trucks. **NO MORE GUESSING!**

When a medium size vehicle is over the roadway loop, a DEFLECTOMETER™ Call Strength value of "5" assures that the optimum sensitivity has been achieved. You can adjust the DEFLECTOMETER™ reading *DYNAMICALLY* without moving the vehicle by using the front panel UP or DOWN sensitivity buttons. **IT DOES NOT GET ANY EASIER THAN THIS!**

Frequency Meter: The built-in *Frequency Meter* reports the operating frequency of the loop network. Ensuring that adjacent loops are separated by at least 5 KHz will avoid crosstalk problems and future service calls.

Output CALL Test Mode: The Output Call Test Mode provides a straight forward way to test that the Controller Unit is receiving an active output from the detector. This eliminates the need for cabinet test switches and associated wiring. A huge time saving feature during system set-up and trouble-shooting.

Rugged Handle Assembly: The rugged handle assembly is made of GE LEXAN™, which is a super durable polycarbonate resin. The design of this assembly strengthens and protects the whole PCB assembly much better than conventional face plates. The temperature stability of critical components is improved with the more encompassing enclosure. Quick reference instructions are conveniently attached directly on the side of the unit, eliminating the need for cards.

Advanced Loop Diagnostics: The Fault (FLT) indicator displays the type of fault: Short, Open or 25% change of inductance. The Fault Monitor will report and store three types of loop faults; Open Loops, Shorted Loops, and 25% sudden changes in inductance. Each type of fault is indicated by a unique sequence of flashes allowing the user to diagnose loop failures at a glance.

Options: Relay Outputs, Model LMD622R

STANDARD FEATURES

- Automatic Tuning
- Lightning & Surge Protection
- Four (4) Frequency Levels
- Fail Safe Output Configuration
- Separate Color-Coded LED indicators
- Wide Loop Inductance Range: 20 to 2500 microHenries.

EBERLE DESIGN INC.

3819 East La Salle Street Tel (480) 868-6407
Phoenix, AZ 85040 USA Fax (602) 437-1996
www.EDltraffic.com



LMD622 Catalog Sheet – 061507

Designed, Manufactured and Tested in the United States of America
DEFLECTOMETER and Loop Monitor are trademarks of Eberle Design Inc. LEXAN Resin is a trademark of General Electric

ISO 9001:2000 Registered

CONDUIT

2.1 - GENERAL

- 2.1.1 ANY CHANGES TO SPECIFICATIONS MUST BE APPROVED BY THE LEE COUNTY TRAFFIC ENGINEER.**
- 2.1.2 SUPPLY A ONE (1) INCH SCHEDULE 40 PVC CONDUIT FROM CABINET BASE TO OUTSIDE OF NEAREST CONCRETE SIGNAL POLE. (FOR TELEPHONE LINE) STUB UP TWO (2) FEET.**
- 2.1.3 CONDUITS CROSSING ALL STREETS SHALL BE MINIMUM OF FIVE (5) EACH TWO (2) INCH PVC CONDUITS.**
- 2.1.4A WHERE INTERCONNECT CONDUIT IS CALLED FOR, FOUR (4) EACH 1-1/4 INCH SDR 13.5 POLY CONDUIT BLUE, GREEN, ORANGE, YELLOW COLOR. COPPER WIRE MUST BE INSTALLED FOR LOCATING PURPOSES, #10 CU AWG MINIMUM IN ORANGE CONDUIT. SPLICES OF LOCATE WIRE SHALL BE IN PULL BOXES AND SPLICED WITH SPLIT BOLT AND INSULATED PER NEC. EACH PULL BOX SHALL HAVE A MINIMUM OF 2 FEET OF SLACK INTERCONNECT INSTALLED IN BLUE CONDUIT. LOCATE WIRE TO BE INSTALLED IN THE ORANGE CONDUIT. (REFER TO ILLUSTRATION.)**
- 2.1.4B PIPES SHALL INCLUDE THREE (3) SIGNAL, ONE (1) POWER STREET LIGHT, LIGHTED SIGN, AND ONE (1) DETECTION.**
- 2.1.5 PVC CONDUIT SHALL BE SCHEDULE 40 OR 80 APPROVED FOR ELECTRICAL USE (GRAY). NO THIN WALL CONDUIT IS ALLOWED. TWENTY (20) FOOT LENGTHS ON RUNS OVER TWENTY (20) FOOT SHALL BE USED.**
- 2.1.6 WHERE EXISTING THREE (3) INCH CONDUIT IS IN PLACE AND FIBER OPTIC CABLE OR NEW TWISTED PAIR IS TO BE INSTALLED, TWO (2) ONE (1) INCH INTERDUCTS SHALL BE INSTALLED AND THEN NEW CABLE PULLED IN.**
- 2.1.7 EXISTING TWO (2) INCH CONDUIT SHALL NOT HAVE INTERDUCT.**
- 2.1.8 ANY CONDUIT ABOVE GROUND SHALL BE RIGID GALVANIZED STEEL CONDUIT.**

2.2 - INSTALLATION

- 2.2.1 CONDUIT SHALL BE INSTALLED AT A DEPTH OF THIRTY-SIX (36) INCHES.**
- 2.2.2 ALL ROCKS AND TRASH SHALL BE REMOVED FROM THE TRENCH.**
- 2.2.3 BACKFILL SHALL BE CLEAN AND CONTAIN NO ROCKS.**
- 2.2.4 OBSERVE MAXIMUM NUMBER OF CONDUITS ALLOWED IN A PULL BOX PER NEC. INSTALL PER STANDARD INDEX**

2.3 - TERMINATION

- 2.3.1 CONDUIT TWO (2) INCH AND LARGER SHALL HAVE A THREADED BUSHING INSTALLED AT EACH END, OR A SLIP OVER BUSHING TO PROTECT CABLE
- 2.3.2 BOTH ENDS OF ALL CONDUITS SHALL BE SEALED WITH DUCT SEAL.
- 2.3.3 GALVANIZED RIDGED SWEEPS SHALL BE USED ON CONDUITS LARGER THAN TWO (2) INCH DIAMETER.

LCDOT Interconnect

10-2010

Four 1-1/4 inch SDR 13.5 poly conduits green, blue, orange, and yellow in color. A #10 copper wire shall be installed in the orange conduit for locating purposes.



3.1 - GENERAL

PULL BOX

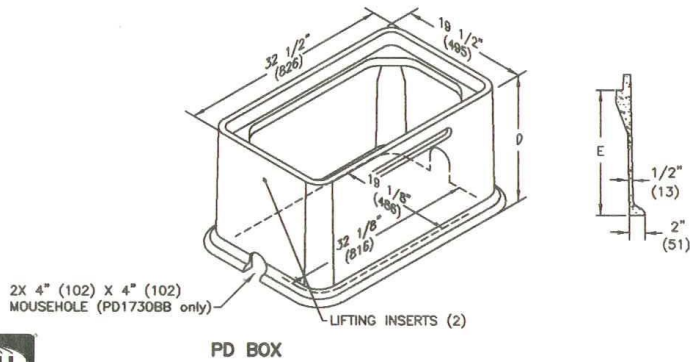
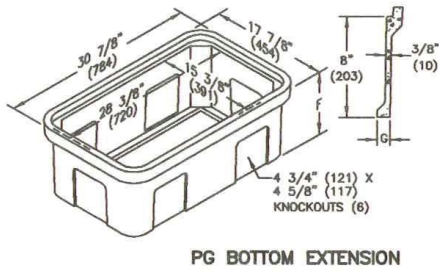
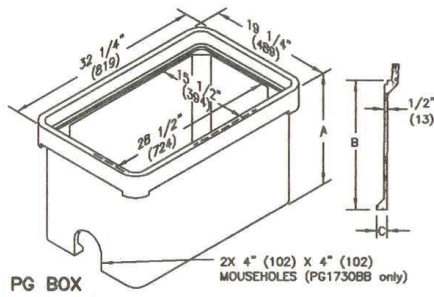
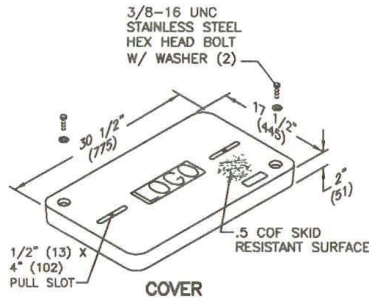
- 3.1.1 PULL BOXES SHALL BE COMPOSITE CONSTRUCTION (QUAZITE) AND LOAD RATED 20,000 LBS. NO EXCEPTIONS WILL BE APPROVED.
- 3.1.2 PULL BOX LIDS SHALL BE COMPOSITE CONSTRUCTION (QUAZITE) AND MARKED APPROPRIATELY, "TRAFFIC SIGNAL" OR "STREET LIGHTS".
- 3.1.3 NO CONCRETE PULL BOXES SHALL BE ALLOWED.
- 3.1.4 NO STEEL LIDS SHALL BE ALLOWED.
- 3.1.5 PULL BOXES SHALL BE SIZED TO ACCOMMODATE MAXIMUM NUMBER OF PIPES ALLOWED PER NEC AND TO COMPLY WITH CABLE MANUFACTURER'S BEND RADIUS.
- 3.1.6 MAXIMUM DISTANCE BETWEEN PULL BOXES ON LONG RUNS SHALL BE FIVE HUNDRED (500) FEET.
- 3.1.7 A PULL BOX WITH A MINIMUM COVER MEASUREMENT OF 24" X 36" X 24" SHALL BE USED ON INTERCONNECT BETWEEN CABINETS. COVER SHALL BE MARKED "TRAFFIC SIGNAL".
- 3.1.8 A PULL BOX WITH A MINIMUM COVER MEASUREMENT OF 30" X 48" X 24" SHALL BE SUED ON INTERCONNECT AT CABINET LOCATIONS.
- 3.1.9 A PULL BOX WITH A MINIMUM COVER MEASUREMENT OF 17" X 30" X 12" SHALL BE USED ON TRAFFIC SIGNALS AND STREET LIGHTS. COVER SHALL BE MARKED "TRAFFIC SIGNAL, OR STREET LIGHT".

3.2 - INSTALLATION

- 3.2.1 PULL BOXES SHALL BE INSTALLED ON A BED OF GRAVEL WITH A MINIMUM DEPTH OF TWELVE (12) INCHES. GRAVEL SHALL BE 57 STONE OR EQUIVALENT.
- 3.2.2 GRAVEL SHALL BE INSTALLED INSIDE THE PULL BOX TO A LEVEL OF TWO (2) INCHES BELOW TOP OF CONDUITS.
- 3.2.3 CONDUIT IN A PULL BOX SHALL BE NO HIGHER THAN HALF THE DEPTH OF THE PULL BOX.
- 3.2.4 ALL PULL BOXES SHALL HAVE A CONCRETE APRON. APRON SHALL BE 1FT WIDE X 6IN DEEP.

SPECIFICATIONS/DATA

17" x 30" PG Style (Stackable) Assembly and 17" x 30" PD Style Assembly



ENCLOSURE DRAWINGS

APRIL 2008



**17" x 30" PG Style (Stackable) Assembly
and 17" x 30 PD Style Assembly**

SPECIFICATIONS/DATA

Covers (Blank unless logo is specified)

DESCRIPTION	PART NO.	WEIGHT #	DESIGN/TEST LOAD #	ANSI TIER*
W/2 Bolts	PG1730CA00	52 (23.6 kg)	8,000 / 12,000	8
Gasketed w/2 Bolts	PG1730CG00	52 (23.6 kg)	8,000 / 12,000	8
No Bolts	PG1730WA00	52 (23.6 kg)	8,000 / 12,000	8
Heavy Duty w/2 Bolts	PG1730HA00	83 (37.6 kg)	15,000 / 22,500	15
Gasketed Heavy Duty w/2 Bolts	PG1730HG00	83 (37.6 kg)	15,000 / 22,500	15
Extra Heavy Duty w/2 Bolts	PG1730HH00	83 (37.6 kg)	22,500 / 33,750	22

* Covers with meter lids available upon request. See page 12 or page 56 for meter lid cover load rating explanation.
* Gasketed covers and bolt grommets must be used with a gasketed box. Gaskets reduce the inflow of fluids but do not make the enclosure water tight.

PG Boxes (Stackable with self-aligning, replaceable EZ Nut) **22" - 30" Deep boxes must be used as bottom of any stack.)

ENCLOSURE DRAWINGS

DESCRIPTION	PART NO.	WEIGHT #	DIMENSION A	DIMENSION B	DIMENSION C	DESIGN/TEST LOAD #	ANSI TIER*
Open Bottom	PG1730BA12	67 (30.4 kg)	12" (305 mm)	10" (254 mm)	1 1/4" (32 mm)	22,500 / 33,750	22
	PG1730BA18	94 (42.6 kg)	18" (457 mm)	16" (406 mm)	1 1/4" (32 mm)	22,500 / 33,750	22
	PG1730BA22	106 (48.1 kg)	22" (559 mm)	20" (508 mm)	1 1/4" (32 mm)	22,500 / 33,750	22
	PG1730BA24	122 (55.3 kg)	24" (610 mm)	22" (559 mm)	1 1/4" (32 mm)	22,500 / 33,750	22
	PG1730BA28	126 (57.2 kg)	28" (711 mm)	26" (660 mm)	1/2" (13 mm)	22,500 / 33,750	22
	PG1730BA30	144 (65.3 kg)	30" (762 mm)	28" (711 mm)	1/2" (13 mm)	22,500 / 33,750	22
Open Bottom w/2 Mouseholes	PG1730BB12	65 (29.5 kg)	12" (305 mm)	10" (254 mm)	1 1/4" (32 mm)	22,500 / 33,750	22
	PG1730BB18	92 (41.7 kg)	18" (457 mm)	16" (406 mm)	1 1/4" (32 mm)	22,500 / 33,750	22
	PG1730BB22	104 (47.2 kg)	22" (559 mm)	20" (508 mm)	1 1/4" (32 mm)	22,500 / 33,750	22
	PG1730BB24	120 (54.4 kg)	24" (610 mm)	22" (559 mm)	1 1/4" (32 mm)	22,500 / 33,750	22
	PG1730BB28	124 (56.2 kg)	28" (711 mm)	26" (660 mm)	1/2" (13 mm)	22,500 / 33,750	22
	PG1730BB30	142 (64.4 kg)	30" (762 mm)	28" (711 mm)	1/2" (13 mm)	22,500 / 33,750	22
Solid Bottom	PG1730DA12	85 (38.5 kg)	12 1/2" (318 mm)	10" (254 mm)	N/A	22,500 / 33,750	22
	PG1730DA18	112 (50.8 kg)	18 1/2" (470 mm)	16" (406 mm)	N/A	22,500 / 33,750	22
	PG1730DA22	124 (56.2 kg)	22 1/2" (572 mm)	20" (508 mm)	N/A	22,500 / 33,750	22
	PG1730DA24	137 (62.0 kg)	24 1/2" (622 mm)	22" (559 mm)	N/A	22,500 / 33,750	22
	PG1730DA28	143 (64.9 kg)	28 1/2" (724 mm)	26" (660 mm)	N/A	22,500 / 33,750	22
	PG1730DA30	150 (68.0 kg)	30 1/2" (775 mm)	28" (711 mm)	N/A	22,500 / 33,750	22

PD Boxes

DESCRIPTION	PART NO.	WEIGHT #	DIMENSION D	DIMENSION E	DESIGN/TEST LOAD #	ANSI TIER*
Open Bottom	PD1730BA18	129 (59 kg)	18" (457 mm)	16" (406 mm)	22,500 / 33,750	22
	PD1730BA26	166 (75 kg)	26" (660 mm)	24" (610 mm)	22,500 / 33,750	22
Open Bottom w/2 Mouseholes	PD1730BB18	127 (58 kg)	18" (457 mm)	16" (406 mm)	22,500 / 33,750	22
Open Bottom	PD1730BG18	129 (59 kg)	18" (457 mm)	16" (406 mm)	22,500 / 33,750	22
w/Gasket	PD1730BG26	166 (75 kg)	26" (660 mm)	24" (610 mm)	22,500 / 33,750	22

Extensions (For use under 12" and 18" boxes only, one per box.)

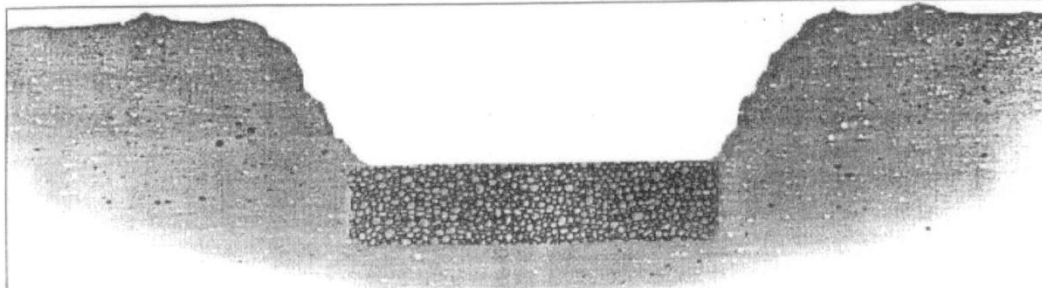
DESCRIPTION	PART NO.	WEIGHT #	DIMENSION F	DIMENSION G	DESIGN/TEST LOAD #	ANSI TIER*
Open Bottom	PG1730EA08	36 (16.3 kg)	8 3/4" (222 mm)	1" (25 mm)	22,500 / 33,750	22
Solid Bottom	PG1730RA08	55 (24.9 kg)	9 1/4" (235 mm)	N/A	22,500 / 33,750	22

Dimensions & weights in parentheses are metric equivalent.
* Loadings comply with ANSI/SCTE 77 (see page 9).

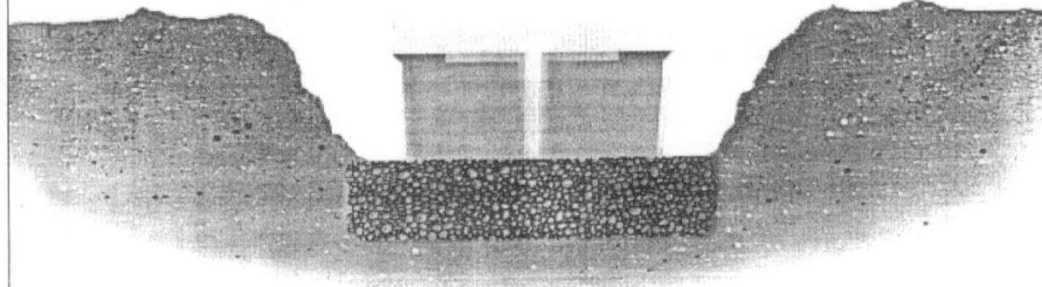




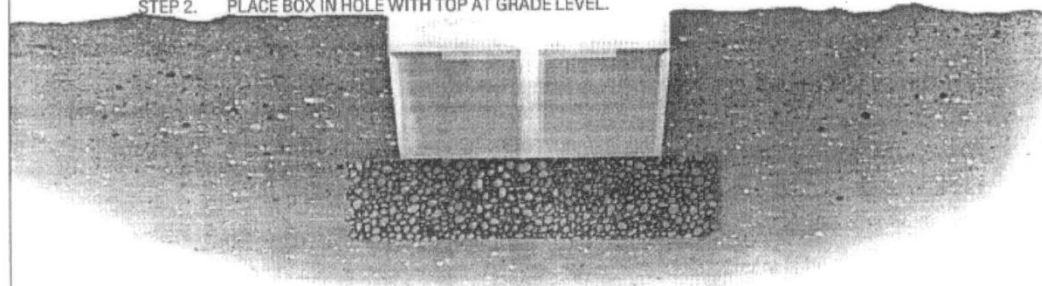
Instruction Sheet Standard Box Installation



STEP 1. PREPARE THE EXCAVATION APPROXIMATELY 12 INCHES DEEPER THAN THE DEPTH OF THE BOX, THEN ADD 12 INCHES OF GRAVEL OR CRUSHED ROCK FOR DRAINAGE.



STEP 2. PLACE BOX IN HOLE WITH TOP AT GRADE LEVEL.

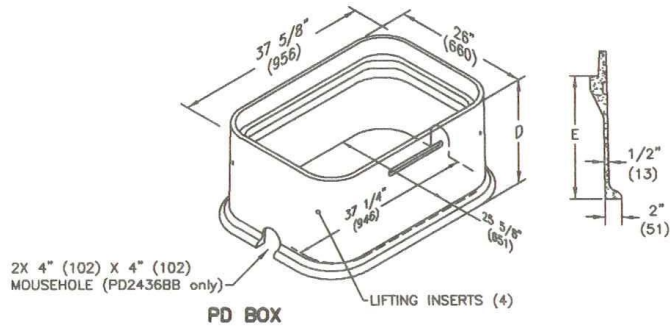
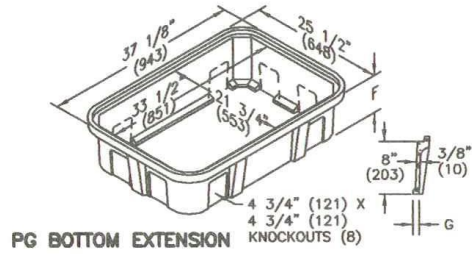
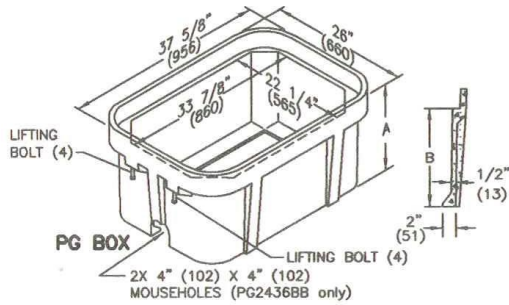
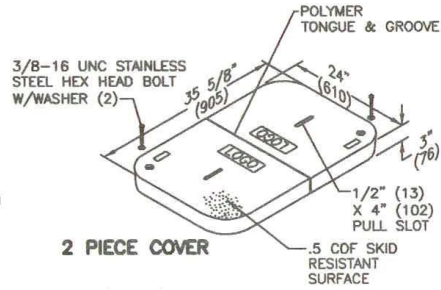
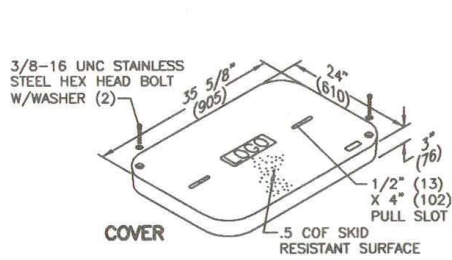


STEP 3. FILL AND COMPACT SOIL TO GRADE LEVEL WITH COVER IN BOX.

STEP 4. IF GRADE LEVEL IS RAISED LATER (THRU LANDSCAPING, ETC.), A STRAIGHT SIDED BOX CAN BE PULLED UP AND BRICKED AT THE BOTTOM ON ONE OR FOUR SIDES TO CONFORM TO THE LANDSCAPE.

SPECIFICATIONS/DATA

**24" x 36" PG Style (Stackable) Assembly
and 24" x 36" PD Style Assembly**



ENCLOSURE DRAWINGS



**24" x 36" PG Style (Stackable) Assembly
and 24" x 36" PD Style Assembly**

SPECIFICATIONS/DATA

Covers (Blank unless logo is specified)

DESCRIPTION	PART NO.	WEIGHT #	DESIGN/TEST LOAD #	ANSI TIER*
W/2 Bolts	PG2436CA00	100 (45 kg)	8,000 / 12,000	8
Gasketed w/2 Bolts	PG2436CG00	100 (45 kg)	8,000 / 12,000	8
2-Piece w/2 Bolts	PG2436CS00	122 (55 kg)	8,000 / 12,000	8
No Bolts	PG2436WA00	100 (45 kg)	8,000 / 12,000	8
Heavy Duty w/2 Bolts	PG2436HA00	115 (52 kg)	15,000 / 22,500	15
Gasketed Heavy Duty w/2 Bolts	PG2436HG00	115 (52 kg)	15,000 / 22,500	15
Heavy Duty 2-Piece w/2 Bolts	PG2436HS00	122 (55 kg)	15,000 / 22,500	15
Heavy Duty w/2 Bolts	PG2436HH00	122 (55 kg)	22,500 / 33,750	22

• Covers with meter lids available upon request. See page 12 or page 56 for meter lid cover load rating explanation.
• Gasketed covers and bolt grommets must be used with a gasketed box. Gaskets reduce the inflow of fluids but do not make the enclosure water tight.

PG Boxes (Stackable with self-aligning, replaceable EZ Nut) **24" - 42" Deep boxes must be used as bottom of any stack.)

DESCRIPTION	PART NO.	WEIGHT #	DIMENSION A	DIMENSION B	DESIGN/TEST LOAD #	ANSI TIER*
Open Bottom	PG2436BA18	141 (64 kg)	18" (457 mm)	15" (381 mm)	22,500 / 33,750	22
	PG2436BA24	180 (81.6 kg)	24" (610 mm)	21" (533 mm)	22,500 / 33,750	22
	PG2436BA30	196 (88.9 kg)	30" (762 mm)	27" (686 mm)	22,500 / 33,750	22
	PG2436BA36	254 (115 kg)	36" (914 mm)	33" (838 mm)	22,500 / 33,750	22
	PG2436BA42	293 (133 kg)	42" (1067 mm)	39" (991 mm)	22,500 / 33,750	22
Open Bottom w/2 Mouseholes	PG2436BB18	139 (63.1 kg)	18" (457 mm)	15" (381 mm)	22,500 / 33,750	22
	PG2436BB24	178 (80.7 kg)	24" (610 mm)	21" (533 mm)	22,500 / 33,750	22
	PG2436BB30	194 (88.0 kg)	30" (762 mm)	27" (686 mm)	22,500 / 33,750	22
	PG2436BB36	252 (114 kg)	36" (914 mm)	33" (838 mm)	22,500 / 33,750	22
	PG2436BB42	293 (133 kg)	42" (1067 mm)	39" (991 mm)	22,500 / 33,750	22
Solid Bottom	PG2436DA18	171 (78 kg)	18 1/2" (470 mm)	15" (381 mm)	22,500 / 33,750	22
	PG2436DA24	228 (103.4 kg)	24 1/2" (622 mm)	21" (533 mm)	22,500 / 33,750	22
	PG2436DA30	238 (107.0 kg)	30 1/2" (775 mm)	27" (686 mm)	22,500 / 33,750	22
	PG2436DA36	282 (128 kg)	36 1/2" (927 mm)	33" (838 mm)	22,500 / 33,750	22
	PG2436DA42	321 (146 kg)	42 1/2" (1080 mm)	39" (991 mm)	22,500 / 33,750	22

ENCLOSURE DRAWINGS

PD Boxes

DESCRIPTION	PART NO.	WEIGHT #	DIMENSION D	DIMENSION E	DESIGN/TEST LOAD #	ANSI TIER*
Open Bottom	PD2436BA18	159 (72 kg)	18" (457 mm)	15" (381 mm)	22,500 / 33,750	22
	PD2436BA26	199 (90 kg)	26" (660 mm)	23" (584 mm)	22,500 / 33,750	22
	PD2436BA48	313 (142 kg)	48" (1219 mm)	45" (1143 mm)	22,500 / 33,750	22
Open Bottom w/2 Mouseholes	PD2436BB18	157 (71 kg)	18" (457 mm)	15" (381 mm)	22,500 / 33,750	22
	PD2436BB26	197 (89 kg)	26" (660 mm)	23" (584 mm)	22,500 / 33,750	22
	PD2436BB48	311 (141 kg)	48" (1219 mm)	45" (1143 mm)	22,500 / 33,750	22
Open Bottom w/Gasket	PD2436BG18	159 (72 kg)	18" (457 mm)	15" (381 mm)	22,500 / 33,750	22
	PD2436BG26	199 (90 kg)	26" (660 mm)	23" (584 mm)	22,500 / 33,750	22
	PD2436BG48	313 (142 kg)	48" (1219 mm)	45" (1143 mm)	22,500 / 33,750	22

Extensions (For use under 18" deep box only, one per box.)

DESCRIPTION	PART NO.	WEIGHT #	DIMENSION F	DIMENSION G	DESIGN/TEST LOAD #	ANSI TIER*
Open Bottom	PG2436EA08	81 (37 kg)	8 3/4" (222 mm)	1" (25 mm)	22,500 / 33,750	22
Solid Bottom	PG2436RA08	95 (43.1 kg)	9 1/4" (235 mm)	N/A	22,500 / 33,750	22

Dimensions & weights in parentheses are metric equivalent.

* Loadings comply with ANSI/SCTE 77 (see page 9).

APRIL 2008





SPECIFICATIONS/DATA

30" x 48" PG Style (Stackable) Assembly 30" x 48" PD Style (Nestable) Assembly

Covers (Blank unless logo is specified)

DESCRIPTION	PART NO.	WEIGHT #	DESIGN/TEST LOAD	ANSI TIER*
W/2 Bolts	PG3048CA00	159 (72.1 kg)	8,000 / 12,000	8
Gasketed w/2 Bolts	PG3048CG00	159 (72.1 kg)	8,000 / 12,000	8
No Bolts	PG3048VA00	159 (72.1 kg)	8,000 / 12,000	8
Heavy Duty w/2 Bolts	PG3048HA00	206 (93.4 kg)	15,000 / 22,500	15
Gasketed Heavy Duty w/2 Bolts	PG3048HG00	206 (93.4 kg)	15,000 / 22,500	15
Extra Heavy Duty w/2 Bolts	PG3048HH00	220 (99.7 kg)	22,500 / 33,750	22
2-piece w/2 Bolts	PG3048CS00	181 (82.1 kg)	8,000 / 12,000	8
Heavy Duty 2-piece w/2 Bolts	PG3048HS00	206 (93.4 kg)	15,000 / 22,500	15
2-piece Overlapping	PG3048CC00	248 (112.0 kg)	8,000 / 12,000	8
Heavy Duty 2-piece Overlapping	PG3048HC00	248 (112.0 kg)	15,000 / 22,500	15

* Covers with meter lids available upon request. See page 12 or page 56 for meter lid cover load rating explanation.
* Gasketed covers and bolt grommets must be used with a gasketed box. Gaskets reduce the inflow of fluids but do not make the enclosure water tight.

PG Boxes (Stackable with self-aligning, replaceable EZ-Nut) *24" & 36" deep boxes must be used as bottom of any stack

DESCRIPTION	PART NO.	WEIGHT #	DIMENSION A	DIMENSION B	DESIGN/TEST LOAD #	ANSI TIER*
Open Bottom	PG3048BA18	185 (83.9 kg)	18" (457 mm)	15" (381 mm)	22,500 / 33,750	22
	PG3048BA24	238 (107.0 kg)	24" (609 mm)	21" (533 mm)	22,500 / 33,750	22
	PG3048BA36	343 (155.6 kg)	36" (914 mm)	33" (838 mm)	22,500 / 33,750	22
Open Bottom w/ Gasket	PG3048BG18	185 (83.9 kg)	18" (457 mm)	15" (381 mm)	22,500 / 33,750	22
	PG3048BG24	238 (107.0 kg)	24" (609 mm)	21" (533 mm)	22,500 / 33,750	22
	PG3048BG36	343 (155.6 kg)	36" (914 mm)	33" (838 mm)	22,500 / 33,750	22
Open Bottom w/ 2 Mouseholes	PG3048BB18	185 (83.9 kg)	18" (457 mm)	15" (381 mm)	22,500 / 33,750	22
	PG3048BB24	238 (107.0 kg)	24" (610 mm)	21" (533 mm)	22,500 / 33,750	22
	PG3048BB36	343 (155.6 kg)	36" (914 mm)	33" (838 mm)	22,500 / 33,750	22
Solid Bottom	PG3048DA18	220 (99.8 kg)	18 1/2" (470 mm)	15" (381 mm)	22,500 / 33,750	22
	PG3048DA24	287 (130.2 kg)	24 1/2" (622 mm)	21" (533 mm)	22,500 / 33,750	22
	PG3048DA36	394 (178.7 kg)	36 1/2" (927 mm)	33" (838 mm)	22,500 / 33,750	22
Solid Bottom w/ Gasket	PG3048DG18	220 (99.8 kg)	18 1/2" (470 mm)	15" (381 mm)	22,500 / 33,750	22
	PG3048DG24	287 (130.2 kg)	24 1/2" (622 mm)	21" (533 mm)	22,500 / 33,750	22
	PG3048DG36	394 (178.7 kg)	36 1/2" (927 mm)	33" (838 mm)	22,500 / 33,750	22

ENCLOSURE DRAWINGS

PD Boxes (Nestable)

DESCRIPTION	PART NO.	WEIGHT #	DIMENSION C	DIMENSION D	DESIGN/TEST LOAD #	ANSI TIER*
Open Bottom	PD3048BA24	286 (130 kg)	24" (610 mm)	21" (533 mm)	22,500 / 33,750	22
	PD3048BA48	614 (278.5 kg)	48" (1219 mm)	45" (1143 mm)	22,500 / 33,750	22
Open Bottom w/ Gasket	PD3048BG24	286 (130 kg)	24" (610 mm)	21" (533 mm)	22,500 / 33,750	22
	PD3048BG48	614 (278.5 kg)	48" (1219 mm)	45" (1143 mm)	22,500 / 33,750	22
Open Bottom w/ 2 Mouseholes	PD3048BB24	286 (130 kg)	24" (610 mm)	21" (533 mm)	22,500 / 33,750	22
	PD3048BB48	614 (278.5 kg)	48" (1219 mm)	45" (1143 mm)	22,500 / 33,750	22

Top Extension (For use on top of PG and PD boxes of any depth)

DESCRIPTION	PART NO.	WEIGHT #	DESIGN/TEST LOAD #	ANSI TIER*
Open Bottom*	PG3048EA11	100 (45.4 kg)	22,500 / 33,750	22

* In addition, this extension can be used as a bottom extension for 18" deep PG boxes.

Bottom Extensions (For use under 18" deep PG style box only, one per box)

DESCRIPTION	PART NO.	WEIGHT #	DIMENSION E	DIMENSION F	DESIGN/TEST LOAD #	ANSI TIER*
Open Bottom	PG3048EA08	102 (46.3 kg)	8 3/4" (222 mm)	1" (25 mm)	22,500 / 33,750	22
Solid Bottom	PG3048RA08	151 (68.0 kg)	9 1/4" (235 mm)	N/A	22,500 / 33,750	22

Dimensions & weights in parentheses are metric equivalent.

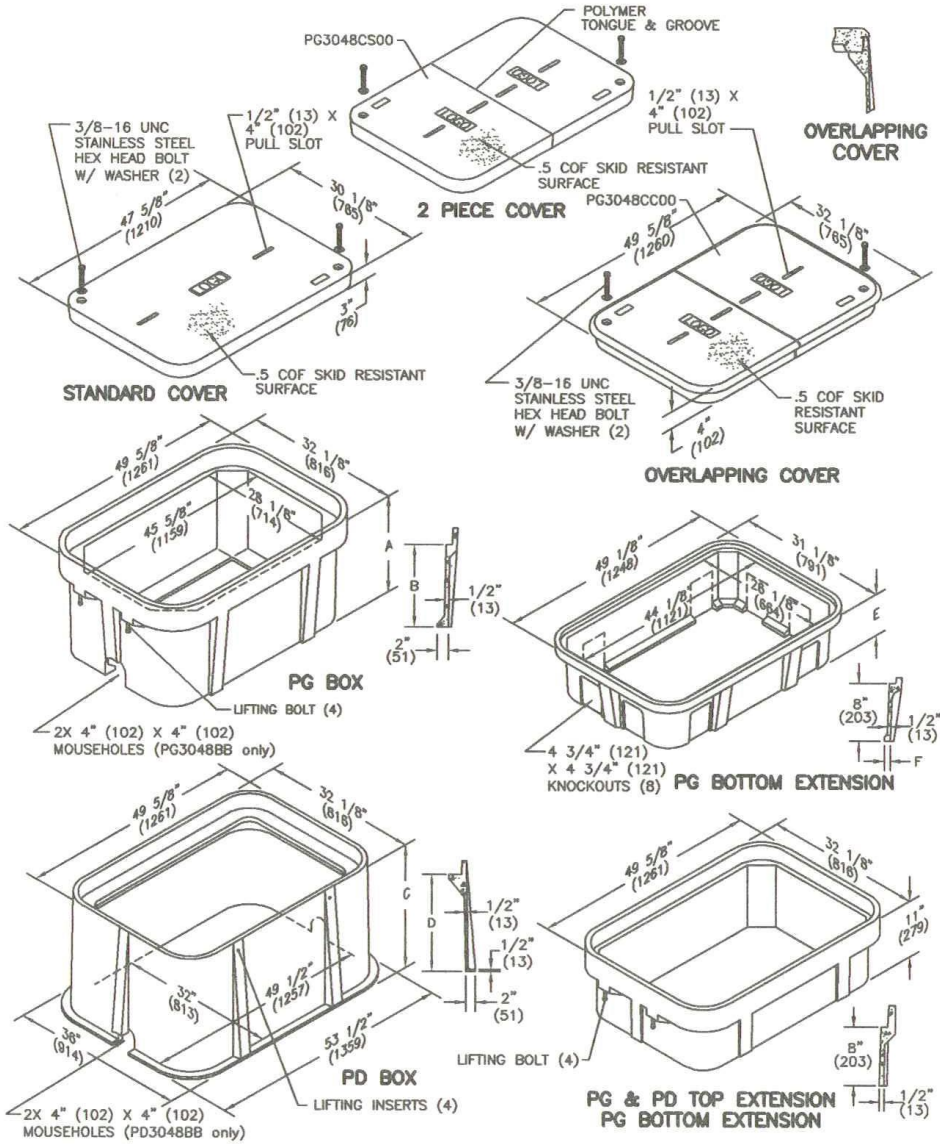
* Loadings comply with ANSI/SCTE 77 (see page 9).



APRIL 2008

SPECIFICATIONS/DATA

**30" x 48" PG Style (Stackable) Assembly
30" x 48" PD Style (Nestable) Assembly**



ENCLOSURE DRAWINGS



APRIL 2008

CABINET BASE

4.1 - GENERAL

- 4.1.1 CABINET BASE SHALL BE COMPOSITE CONSTRUCTION (QUAZITE). EQUAL TO QUAZITE P/N: PB40581224B24, APPROVED FOR LEE COUNTY (SEE ATTACHED DRAWING).**
- 4.1.2 CABINET BASE SHALL BE BURIED TO MANUFACTURER'S RECOMMENDED DEPTH.**
- 4.1.3 A PRECAST CONCRETE PAD SHALL BE PLACED IN FRONT OF THE CABINET BASE. IT SHALL BE THE LENGTH OF THE BASE AND A MINIMUM THIRTY (30) INCHES WIDE AND 4" THICK. CONTRACTOR'S OPTION TO POUR IN PLACE.**

4.2 - INSTALLATION

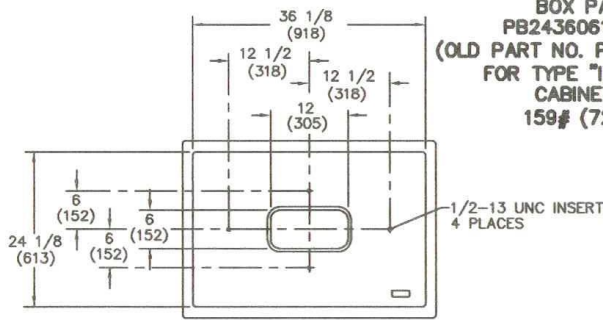
- 4.2.1 ELEVATION OF CABINET BASE SHALL BE AT THE SAME ELEVATION AS THE CENTER OF ROADWAY, BUT NO HIGHER THAN TWELVE (12) INCHES ABOVE THE CENTER OF ROADWAY.**
- 4.2.2 SPARE CONDUITS FROM CABINET BASE SHALL TERMINATE AT A PULL BOX IN FRONT OF THE BASE AND SHALL BE SEALED WITH DUCT SEAL OR CAPPED.**
- 4.2.3 ALL FILL DIRT MUST BE COMPACTED AROUND THE CABINET BASE.**
- 4.2.4 STUB UP CONDUITS SHALL BE NO LOWER THAN TWELVE (12) INCHES AND NO HIGHER THAN SIX (6) INCHES BELOW THE ACCESS HOLE IN CABINET PAD.**
- 4.2.5 INSTALL TWELVE (12) INCH MINIMUM OF BED OF ROCK UNDER CABINET BASE. GRAVEL SHALL BE 57 STONE OR EQUIVALENT.**



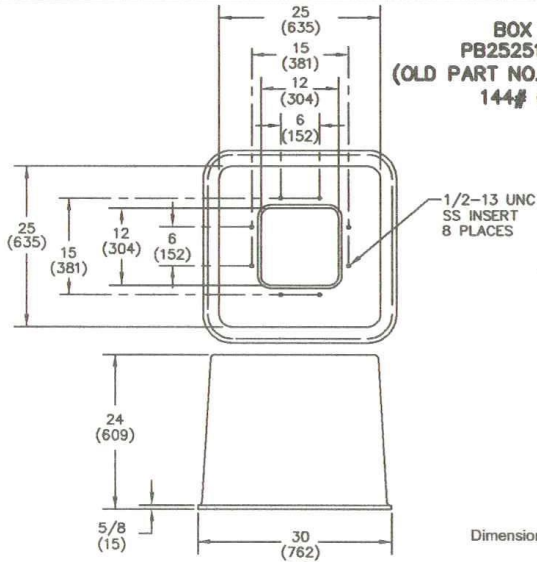
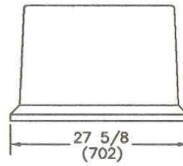
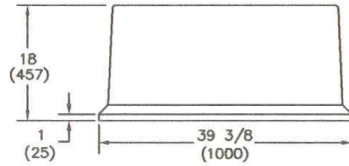
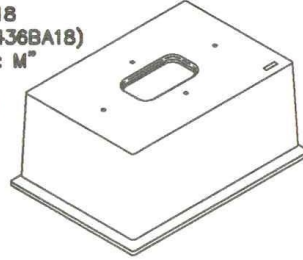
SPECIFICATIONS/DATA

Traffic Signal Cabinet Bases

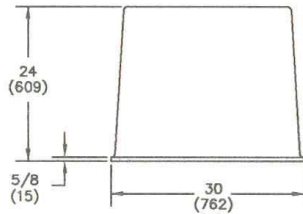
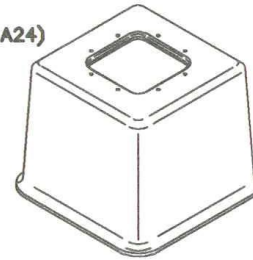
TRANSPORTATION INDUSTRY PRODUCTS



BOX PAD
PB24360612B18
 (OLD PART NO. PB2436BA18)
 FOR TYPE "IV & M"
 CABINETS
 159# (72.1)



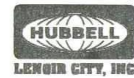
BOX PAD
PB25251212B24
 (OLD PART NO. PB2525BA24)
 144# (66.3)



Dimensions and weights in parentheses are metric equivalent.

Information shown in catalog is a partial listing. If pad or throat size desired is not listed, contact Quazite field sales office.

APRIL 2008

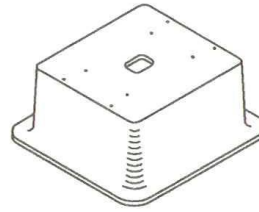
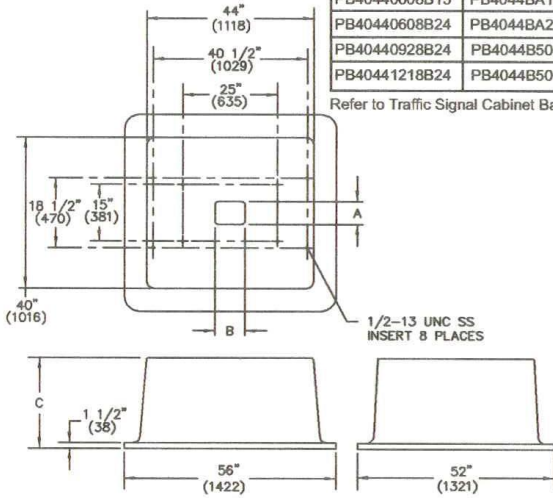


SPECIFICATIONS/DATA

Traffic Signal Cabinet Bases

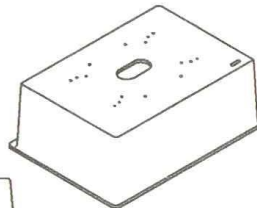
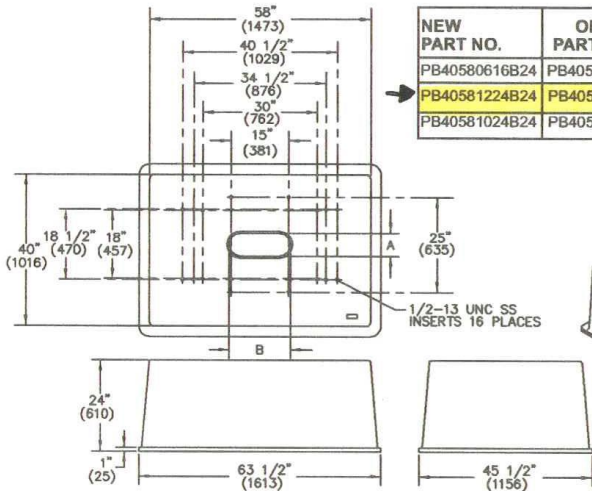
NEW PART NO.	OLD PART NO.	WEIGHT #	DIM. A	DIM. B	DIM. C
PB40440608B15	PB4044BA15	281 (127.0 kg)	6" (152 mm)	8" (203 mm)	15" (381 mm)
PB40440608B24	PB4044BA24	378 (171.0 kg)	6" (152 mm)	8" (203 mm)	24" (610 mm)
PB40440928B24	PB4044B503	385 (174.6 kg)	9" (229 mm)	28" (711 mm)	24" (610 mm)
PB40441218B24	PB4044B501	366 (166 kg)	12" (305 mm)	18" (457 mm)	24" (610 mm)

Refer to Traffic Signal Cabinet Base Cross Reference Guide on pages 80 - 81.



TRANSPORTATION INDUSTRY PRODUCTS

NEW PART NO.	OLD PART NO.	WEIGHT #	DIM. A	DIM. B
PB40580616B24	PB4058BA24	450 (204.1 kg)	6" (152 mm)	16" (406 mm)
PB40581224B24	PB4058B502	435 (197.3 kg)	12" (305 mm)	24" (610 mm)
PB40581024B24	PB4058B504	440 (199.6 kg)	10" (254 mm)	24" (610 mm)



Dimensions and weights in parentheses are metric equivalent.



Information shown in catalog is a partial listing. If pad or throat size desired is not listed, contact Quazite field sales office.

APRIL 2008

Traffic Signal Cabinet Base Installation

Installation Instructions

1. General

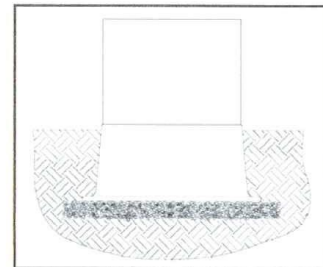
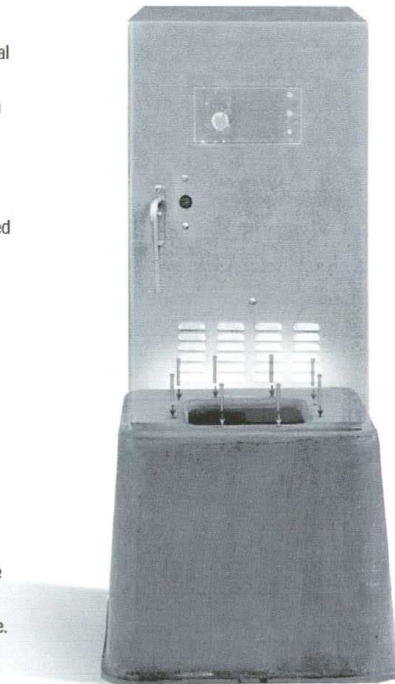
- 1.01 This section covers the description, installation and use of traffic signal cabinet bases for traffic signal cabinets.
- 1.02 The foundation base is designed for most cabinets now being used in the field.

2. Description and Use

- 2.01 The foundation base is constructed of polymer concrete and reinforced by a heavy-weave fiberglass mat.
- 2.02 The types and sizes of the bases vary depending on the size of the cabinet to be installed.
- 2.03 Inserts (1/2" anchors) are molded into the base and must align with the cabinet footprint.
- 2.04 Base is resistant to most chemicals.

3. Installation

- 3.01 The following installation procedure is the same for all sizes of foundation pads.
- 3.02 Determine cable/conduit entry position.
- 3.03 Excavate to the proper depth for traffic cabinet signal base. (The base should extend no more than 50% above grade level.)
- 3.04 Excavate the site to the proper depth as determined by the final grade. The work pad may be installed directly on undisturbed soil. (If the soil compaction is substandard, or if you wish to provide drainage, you need to lower the excavation 4" to 6" to accommodate pea gravel.)
- 3.05 Install conduit, 90° bends, to extend at least 2" above final grade of the base.
- 3.06 Compact the soil or pea gravel base.
- 3.07 Install the traffic signal cabinet base. When lowering the base in place, be sure the conduit is straight in line with the opening on the top surface of the base. After setting the base, check for alignment and plumb.
- 3.08 Backfill evenly around the base to maintain alignment and plumb. Tamp backfill after each 4" fill. Fill 1" to 2" above grade and tamp to grade.
- 3.09 Set the cabinet.



INSTALLATION

SIGNAL CABLE

5.1 - GENERAL

- 5.1.1A EACH SIGNAL CABLE SHALL HAVE FOUR (4) SPARE WIRES OVER THE ENTIRE LENGTH ON SPAN WIRE INSTALLATION.
- 5.1.1B ON MAST ARM, ALL THREE (3) SECTION HEADS SHALL HAVE A FIVE (5) CONDUCTOR AND FIVE (5) SECTION HEADS SHALL HAVE A SEVEN (7) CONDUCTOR.
- 5.1.2 EACH SIGNAL PHASE SHALL HAVE ITS OWN NEUTRAL. SHARING OF A NEUTRAL IS NOT ALLOWED.
- 5.1.3 EACH PEDESTRIAN PHASE SHALL HAVE ITS OWN NEUTRAL. SHARING OF A NEUTRAL IS NOT ALLOWED.
- 5.1.4 ON MAST ARM INSTALLATION, ALL SIGNAL HEADS SHALL BE WIRED WITH JACKETED CABLE INTO SIGNAL HEAD.
- 5.1.5 AT MAST ARM HAND HOLE, SIGNAL CABLE SHALL HAVE A MINIMUM OF THREE (3) FOOT OF SLACK.
- 5.1.6 SIGNAL CABLE #14 AWG STRANDED COPPER SHALL BE USED UNLESS OTHERWISE SPECIFIED, AND SHALL MEET IMSA SPECIFICATIONS #19-1.
- 5.1.7 ALL PED BUTTONS SHALL BE WIRED WITH A (2) CONDUCTOR SHIELDED CABLE (BELDEN/HOMERUN TYPE CABLE). EACH BUTTON TO HAVE ITS OWN CABLE FROM THE SIGNAL CABINET. NO SPLICING ALLOWED

5.2 - INSTALLATION

- 5.2.1 THE COLOR CODE OF SIGNAL CABLE SHALL BE VERIFIED WITH LEE COUNTY TRAFFIC SECTION PRIOR TO WIRING INTERSECTION. THE COLOR CODE CAN BE OBTAINED FROM LEE COUNTY TRAFFIC SECTION.
- 5.2.2 SIGNAL CABLE SHALL BE ATTACHED TO THE MESSENGER BY MEANS OF TIE WRAPS AND LASHING ROD. LASHING ROD SHALL THREAD THROUGH THE DRIP LOOP.
- 5.2.3 ALL IMSA 19-1 SIGNAL CABLE OUTER BLACK JACKET SHALL EXTEND INTO DISCONNECT AND SIGNAL HEAD ASSEMBLIES ON MAST ARM INSTALLATION A MINIMUM OF 3".

5 CONDUCTOR

<u>CABLE COLOR CODE</u>	<u>PHASE & COLOR</u>
<u>1) GREEN</u>	<u>P2, P4, P6, P8 - WALK</u>
<u>2) ORANGE</u>	<u>PED CALL</u>
<u>3) BLACK</u>	<u>PED COMMON</u>
<u>4) RED</u>	<u>DON'T WALK</u>
<u>5) WHITE</u>	<u>NEUTRAL</u>

9 CONDUCTOR

<u>CABLE COLOR CODE</u>	<u>PHASE & COLOR</u>
<u>1) GREEN</u>	<u>P2, P6 - WALK</u>
<u>2) ORANGE</u>	<u>P2, P6 - CALL</u>
<u>3) RED</u>	<u>P2, P6 - DON'T WALK</u>
<u>4) BLACK</u>	<u>P2, P4, P6, P8 - COMMON</u>
<u>5) WHITE</u>	<u>P2, P6 - NEUTRAL</u>
<u>6) BLUE</u>	<u>P4, P8 - CALL</u>
<u>7) GREEN/BLACK</u>	<u>P4, P8 - WALK</u>
<u>8) RED/BLACK</u>	<u>P4, P8 - DON'T WALK</u>
<u>9) WHITE/BLACK</u>	<u>P4, P8 - NEUTRAL</u>

16 CONDUCTOR

<u>CABLE COLOR CODE</u>	<u>PHASE & COLOR</u>
<u>1) GREEN / BLACK</u>	<u>*1 - GREEN</u>
<u>2) ORANGE / BLACK</u>	<u>*1 - AMBER</u>
<u>3) RED / BLACK</u>	<u>*1 - RED</u>
<u>4) WHITE / BLACK</u>	<u>*1 - NEUTRAL</u>
<u>5) GREEN</u>	<u>*2 - GREEN</u>
<u>6) ORANGE</u>	<u>*2 - AMBER</u>
<u>7) RED</u>	<u>*2 - RED</u>
<u>8) WHITE</u>	<u>*2 - NEUTRAL</u>
<u>9) BLUE</u>	<u>*3 - GREEN</u>
<u>10) BLUE / BLACK</u>	<u>*3 - AMBER</u>
<u>11) BLACK / RED</u>	<u>*3 - RED</u>
<u>12) BLACK</u>	<u>*3 - NEUTRAL</u>
<u>13) GREEN / WHITE</u>	<u>*4 - GREEN</u>
<u>14) BLUE / WHITE</u>	<u>*4 - AMBER</u>
<u>15) RED / WHITE</u>	<u>*4 - RED</u>
<u>16) BLACK / WHITE</u>	<u>*4 - NEUTRAL</u>

16 CONDUCTOR

<u>CABLE COLOR CODE</u>	<u>PHASE & COLOR</u>
<u>1) GREEN / BLACK</u>	<u>*5 - GREEN</u>
<u>2) ORANGE / BLACK</u>	<u>*5 - AMBER</u>
<u>3) RED / BLACK</u>	<u>*5 - RED</u>
<u>4) WHITE / BLACK</u>	<u>*5 - NEUTRAL</u>
<u>5) GREEN</u>	<u>*6 - GREEN</u>
<u>6) ORANGE</u>	<u>*6 - AMBER</u>
<u>7) RED</u>	<u>*6 - RED</u>
<u>8) WHITE</u>	<u>*6 - NEUTRAL</u>
<u>9) BLUE</u>	<u>*7 - GREEN</u>
<u>10) BLUE / BLACK</u>	<u>*7 - AMBER</u>
<u>11) BLACK / RED</u>	<u>*7 - RED</u>
<u>12) BLACK</u>	<u>*7 - NEUTRAL</u>
<u>13) GREEN / WHITE</u>	<u>*8 - GREEN</u>
<u>14) BLUE / WHITE</u>	<u>*8 - AMBER</u>
<u>15) RED / WHITE</u>	<u>*8 - RED</u>
<u>16) BLACK / WHITE</u>	<u>*8 - NEUTRAL</u>

GROUNDING

6.1 - GENERAL

- 6.1.1 EACH SIGNAL POLE SHALL HAVE A MINIMUM OF TWENTY (20) FOOT OF GROUND ROD DRIVEN. GROUND RODS MUST READ LESS THAN 15 OHMS WHEN TESTED AFTER INSTALLATION.**
- 6.1.2 EACH PEDESTRIAN POLE SHALL HAVE MINIMUM OF TWENTY (20) FOOT OF GROUND ROD DRIVEN. GROUND RODS MUST READ LESS THAN 15 OHMS WHEN TESTED AFTER INSTALLATION.**
- 6.1.3 EACH CABINET SHALL HAVE MINIMUM OF FIFTY (50) FOOT OF GROUND ROD DRIVEN. GROUND RODS MUST READ LESS THAN 5 OHMS WHEN TESTED AFTER INSTALLATION. NO RODS INSTALLED IN CABINET BASE. NO GROUND RODS IN CABINET BASE.**
- 6.1.4 EACH ELECTRICAL SERVICE SHALL HAVE MINIMUM OF TWENTY (20) FOOT OF GROUND ROD DRIVEN. GROUND RODS MUST READ LESS THAN 15 OHMS WHEN TESTED AFTER INSTALLATION.**
- 6.1.5 ALL GROUND WIRE SHALL BE #6 STRANDED COPPER.**
- 6.1.6 ENSURE THAT ALL GROUNDED ELEMENTS AT AN INTERSECTION ARE BONDED TOGETHER TO FORM AN INTERSECTION GROUNDING NETWORK (620-3.1). SPAN WIRE GROUND BOND AT CONCRETE POLES: USE BI-METAL SPLIT BOLT (CU-AL RATED) TO BOND ALL CABLES TOGETHER. KEEP COPPER WIRE SEPARATED FROM STEEL CABLES ON ONE SIDE OF THE SPLIT BOLT.**

6.2 - INSTALLATION

- 6.2.1 ALL SIGNAL POLES, PEDESTRIAN POLES SHALL BE TIED INTO A NETWORK GROUND SYSTEM AND BROUGHT BACK TO THE CABINET.**
- 6.2.2 ALL GROUND RODS SHALL BE INSTALLED IN A PULL BOX. TOP OF GROUND ROD SHALL BE TWO (2) INCHES ABOVE TOP OF ROCK IN PULL BOX, FOR A CONCRETE STRAIN POLE, INSTALL GROUND ROD IN PULL BOX NEXT TO POLE. FOR MAST ARM FOUNDATIONS OR STEEL POLES, INSTALL GROUND ROD IN PULL BOX WITH SIGNAL CABLE NEXT TO POLE**
- 6.2.3 GROUND SPARE CONDUCTORS INSIDE CABINET ON CABINET GROUND BAR**

6.3 - TESTING

- 6.3.1 ALL GROUND ROD READINGS SHALL BE VERIFIED BY LEE COUNTY DOT SIGNAL INSPECTOR BEFORE FINAL CONNECTION.**
- 6.3.2 ALL GROUND ROD READINGS SHALL BE NOTED ON A GROUND ROD SHEET.**
- 6.3.3 GROUND ROD READINGS SHALL BE RECORDED AT 10 FOOT INTERVALS (620-3.2).**

SIGNAL HEADS

7.1 - GENERAL

- 7.1.1 ALL THREE (3) SECTION SIGNAL HEADS SHALL HAVE A ONE-PIECE METAL LOUVERED REFLECTORIZED BACKPLATE. BACKPLATES SHALL BE REFLECTORIZED FOR ALL DIRECTIONS. PLASTIC BACKGROUNDS REQUIRE SUBMITTAL AND DEPARTMENT APPROVAL. ALL FIVE (5) SECTION HEADS SHALL HAVE A METAL LOUVERED REFLECTORIZED BACKPLATE (SEE ATTACHED DRAWING). BACKPLATES SHALL BE REFLECTORIZED FOR ALL DIRECTIONS.
- 7.1.2 ALL RED DISPLAYS SHALL BE EXTENDED VIEW LED DISPLAYS.
- 7.1.3 ALL GREEN DISPLAYS SHALL BE EXTENDED VIEW LED DISPLAYS.
- 7.1.4 ALL YELLOW DISPLAYS SHALL BE EXTENDED VIEW LED DISPLAYS.
- 7.1.5 NO HARNESS SHALL BE USED IN SPAN WIRE MOUNTED SIGNAL HEADS. USE #14 STRANDED (THHN) COPPER RED, YELLOW, GREEN, AND WHITE WIRE.
- 7.1.6 NO ARROW INSERTS ALLOWED.
- 7.1.7 HUBS SHALL BE SILICONE SEALED TO SIGNAL HEADS.
- 7.1.8 METAL HEADS SHALL BE USED UNLESS OTHERWISE APPROVED BY LEE COUNTY.
- 7.1.9 ALL SIGNAL HEADS SHALL BE NEW AND UNIFORM FOR EACH INTERSECTION

7.2 - INSTALLATION

- 7.2.1 TWO (2) EACH 1/4 INCH DRAIN HOLE SHALL BE PLACED IN BOTTOM OF EACH SIGNAL HEAD.
- 7.2.2 THE SIGNAL PHASE SHALL BE MARKED IN SIGNAL HEAD.
- 7.2.3 IMSA 19-1 SIGNAL CABLE OUTER JACKET SHALL REMAIN INTACT THROUGH ASSEMBLY, EXTENDING A MINIMUM 3" INTO TRAFFIC SIGNAL HEAD ON MAST ARM INSTALLATION. NO STRIPPED SIGNAL CABLE INSIDE GUSSETT TUBES.
- 7.2.4 IMSA 19-1 SIGNAL CABLE OUTER JACKET SHALL REMAIN INTACT THROUGH ASSEMBLY, EXTENDED A MINIMUM OF THREE (3) INCHES INTO TRAFFIC SIGNAL DISCO ON SPAN WIRE INSTALLATION.

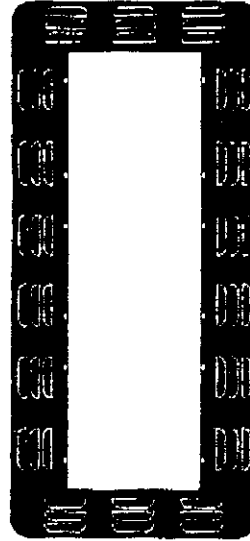
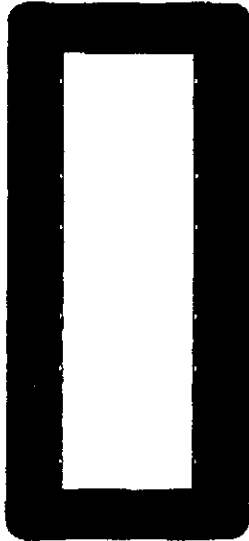
2659-101

U.S. Traffic Corporation

Manufacturers of Traffic Signal System Engineers

One Piece Aluminum Backplates

for IDC 12" Aluminum and Polycarbonate Signals



# of Sections	Standard Mount	Elevator Plumbizer Mount
1	SS0301	N/A
2	SS0302	SS0312
3	SS0303	SS0313
4	SS0304	SS0314
5	SS0305	SS0315

# of Sections	Standard Mount	Elevator Plumbizer Mount
1	SS0321	N/A
2	SS0322	SS0332
3	SS0323 ←	SS0333
4	SS0324	SS0334
5	SS0325 ←	SS0335

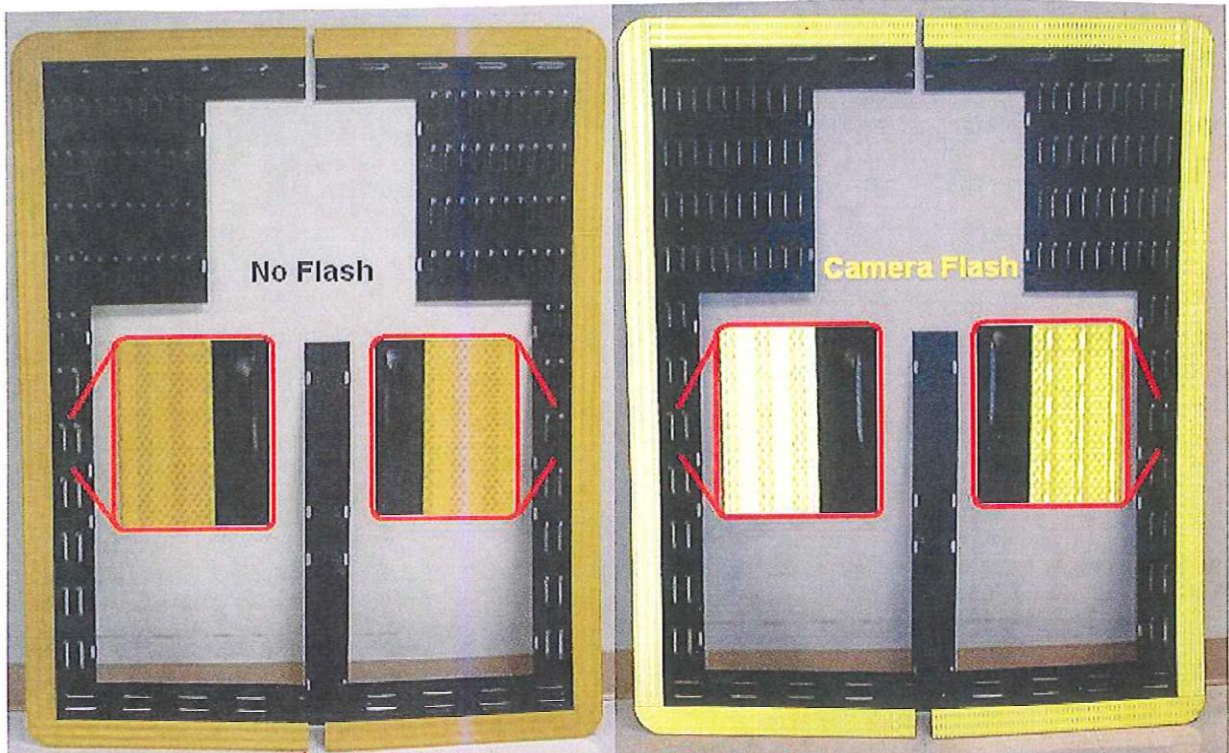
Specify color on back of backplate by inserting appropriate color suffix to end of part number.

- FBK = Flat Black (Standard)
- FYL = Federal Yellow
- OGR = Olive Green
- CST = Custom Color (paint chip required)

The front face of all backplates are finished in flat black unless otherwise specified by customer.

Backplates fabricated from .050 sheet aluminum and electrostatically powder coated with color of choice. Heavier gauge aluminum available upon request. Stainless steel attaching screws and washers included.





TCS BP-5007-C-M04/2010

Part numbers for the Aluminum Black Louvered Backplates with 2" Reflective 3M Tape:

- BP-5001B-X (1 Section)
- BP-5002B-X (2 Section)
- BP-5003B-X (3 Section)
- BP-5004B-X (4 Section)
- BP-5005B-X (5 Section)
- BP-5007B-X (Cluster Mast Arm Mount)
- BP-5021B-X (Cluster Spanwire Mount)

Legend for X = C, N or F:



MAST ARM POLES

8.1 - GENERAL

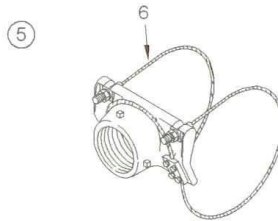
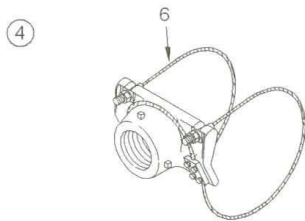
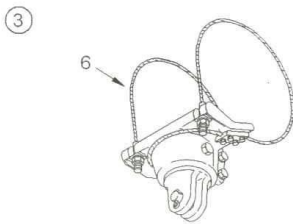
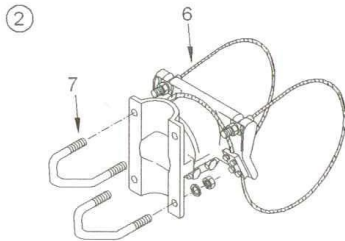
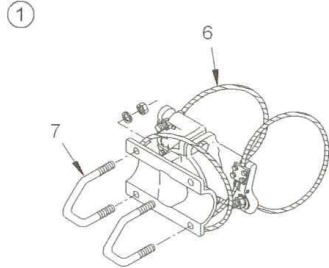
- 8.1.1 WHEN MAST ARM POLES ARE INSTALLED, THE POLE HEIGHT SHALL INCLUDE ADDITIONAL HEIGHT TO INCLUDE STREET LIGHTS.**
- 8.1.2 NO ELECTRICAL SERVICES ARE TO BE ATTACHED TO MAST ARM POLES.**
- 8.1.3 NO CONTROLLER CABINETS ARE TO BE ATTACHED TO MAST ARM POLES UNLESS APPROVED BY ENGINEER.**
- 8.1.4 NO TERMINAL BLOCKS ARE TO BE USED IN MAST ARM POLES OR ASTRO BRACKETS.**
- 8.1.4 ASTRO CLAMPS SHALL BE STAINLESS STEEL CABLES. NO BANDS SHALL BE PERMITTED.**
- 8.1.5 ASTRO BRACKET HARDWARE SHALL BE TIGHTENED TO MANUFACTURE SPECIFICATIONS WITH A TORQ WRENCH. NO IMPACT WRENCHES ALLOWED**
- 8.1.6 ALL MAST ARM HARDWARE SHALL BE STAINLESS STEEL 304 OR 316.**
- 8.1.7 STRAIN RELIEVES SHALL BE USED TO SUPPORT SIGNAL CABLE IN A MAST ARM POLE.**
- 8.1.8 ASTRO BRACKETS SHALL BE CAPABLE OF BEING ROTATED 90 DEGREES WITHOUT DISASSEMBLY.**
- 8.1.9 BASE OF MAST ARM POLE SHALL BE GROUTED. EVEN WITH COLLARS.**
- 8.1.10 NO PREFORMED CONCRETE BASES FOR MAST ARM POLES WILL BE PERMITTED.**
- 8.1.11 MAST ARMS SHALL BE GALVINIZED STEEL ONLY, UNLESS MAINTENANCE AGREEMENT IS IN PLACE (SEE ATTACHED MAINTENANCE AGREEMENT)**

8.2 - INSTALLATION

- 8.2.1 EACH SIGNAL HEAD SHALL HAVE A SEPARATE CABLE FROM HEAD TO BOTTOM OF MAST ARM POLE.**
- 8.2.2 A MINIMUM OF FOUR (4) SPARE CONDUCTORS AT BASE OF MAST ARM POLE IS REQUIRED PER CABLE FROM CABINET.**
- 8.2.3 BOLT CAPS SHALL BE INSTALLED ON ALL MAST ARM BASE BOLTS.**
- 8.2.4 BUCANON B2 B-CAP NON-SILICONE FILLED WIRE NUTS SHALL BE USED TO SPLICE SIGNAL CABLE IN THE BASE OF POLE.**
- 8.2.5 INSTALL 4 (FOUR) EACH 2-INCH CONDUITS, PLUS 1(ONE) EACH 1-INCH CONDUIT IN EACH FOUNDATION. STUB OUT LOCATION TO BE**

DETERMINED IN FIELD. STUB OUTS SHALL BE A MINIMUM OF THIRTY (30) INCHES DEEP.

These high tensile aluminum alloy clamp kits provide strength with maximum adjustability and complete clamping versatility. They feature high strength galvanized aircraft cable and stainless steel swaged fittings. Supplied complete with all necessary attaching hardware.



ITEM	DESCRIPTION	PART NO.
------	-------------	----------

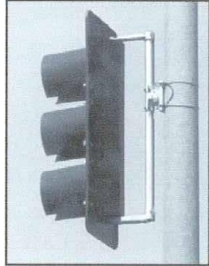
ASTRO-BRAC CLAMP KIT:

➔ ①	Stellar Series Cable Mount	AS-3009
②	Cable Mount	AB-3009
③	Free-Swinging Cable Mount, 3/4" Clevis	AB-3014
④	1 1/2" Threaded Cable Mount	AB-3034
⑤	2" Threaded Cable Mount	AB-3035
6	CABLE ASSEMBLY, Galv. Screw & Stainless Hdwr.	AB-0280
7	U-BOLT KIT, 5/16"-18, Stainless	AB-0256

Notes:

1. All assemblies are supplied standard with stainless fasteners and natural aluminum alodine coating.
2. Please specify options when ordering.

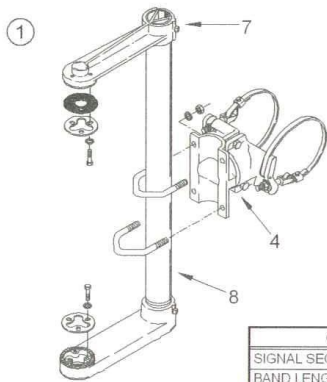
OPTIONS	
CABLE LENGTH:	62" fits 4"-8.6" dia. pole
	84" fits 4"-11.6" dia. pole
	96" fits 4"-14.6" dia. pole
PAINT	



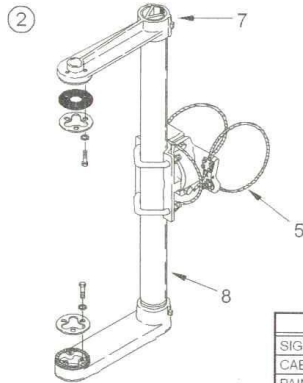
The Astro-Brac in its various configurations is a truly universal system for mounting signals.

The Astro-Brac is designed to facilitate the mounting of any size or combination of signals to any size of mast arm or pole. This complete adjustability is not possible with other types of rigid mountings.

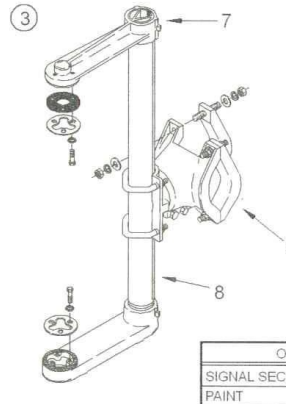
ITEM	DESCRIPTION	PART NO.
ASTRO-BRAC ASSY, Stellar Series:		
①	1-Way Band Mount	AS-0116
②	1-Way Cable Mount	AS-0125
③	1-Way Tenon Mount	AB-0137
ASTRO-BRAC CLAMP KIT:		
4	Band Mount, Stellar Series	AS-3004
5	Cable Mount, Stellar Series	AS-3009
6	Tenon Mount	AB-3010
7	ARM KIT, 8½" CTC	AB-4000
8	GUSSETED TUBE, w/ Vinyl Insert, 1½" Alum TOE	AB-2003



OPTIONS
SIGNAL SECTION: 1, 2, 3, 4, or 5
BAND LENGTH: 29", 36", 42", 48", or 56"
STAINLESS UPGRADE
PAINT



OPTIONS
SIGNAL SECTION: 1, 2, 3, 4, or 5
CABLE LENGTH: 62", 84", or 96"
PAINT



OPTIONS
SIGNAL SECTION: 1, 2, 3, 4, or 5
PAINT

Notes:

- All assemblies are supplied standard with stainless fasteners and natural aluminum alodine coating. Stainless upgrade to include stainless steel clamp screw where applicable.
- See pages T1-8 thru T1-14 for clamp kit pole diameter options.
- Please specify options when ordering.

Lee County DOT Maintenance Requirements
Painted Steel Strain & Mast Arm Poles

Upon final acceptance, Lee County will be responsible for the maintenance of the basic traffic signal facility, with exception of the painted finish on the steel strain or mast arm poles. Upon expiration of the pole manufacturers' painted finish warranty, _____ will be responsible for the maintenance of the finish on the steel strain or mast arm poles. If the painted finish on the steel strain or mast arm poles fades, cracks and/or peels off, or becomes chalky, as determined by Lee County DOT inspection, _____ will be fully responsible for the cost of repainting the finishes in accordance with the manufacturer and Lee County DOT standard specifications and procedures. If it is determined during the inspection of the interior surface of the structure, that iron oxide (steel corrosion) is present and has caused sufficient damage to cause structural failure as determined by a licensed professional structural engineer; the structure must be replaced at _____ expense also to include all fees and costs associated with the structural engineers' analysis.

In order to discharge the responsibility for maintaining the painted finish, _____ can either engage a licensed and certified contractor to accomplish the necessary surface preparation and painting; or, if the County enters into a contract for steel strain and or mast arm pole painting in the future, _____ may utilize the County's contract. All finish repair, rust removal and painting work must be accomplished in accordance with the manufacturer's recommendations and Lee County DOT's standard requirements. All activities associated with rust removal, repairs, and repainting the steel strain and or mast arm poles must be coordinated with Lee County DOT. If _____ fails to provide the required maintenance of the painted finish within sixty (60) calendar days after official notification from Lee County, the County, at its option, may perform maintenance activity that Lee County determines is necessary and shall invoice _____ for all costs incurred in accordance with the latest edition of the External Fees Manual.

January 18, 2012

DISCONNECTS

9.1 - GENERAL

- 9.1.1 TERMINAL BLOCKS AND JONES PLUGS SHALL BE REMOVED FROM EACH DISCONNECT PRIOR TO INSTALLATION.**
- 9.1.2 MESSENGER CLAMPS SHALL BE CORRECT SIZE FOR CABLE USED. MESSENGER CLAMPS SHALL BE 2-INCHES BY 6-INCHES WITH 2 (TWO) EACH 3/8 INCH HOLES.**
- 9.1.3 ALL ATTACHING HARDWARE FOR MESSENGER WIRE SHALL BE STAINLESS STEEL 304 OR 316.**
- 9.1.4 THE CATENARY WIRE SHALL BE A MINIMUM OF 3/8" HIGH STRENGTH GRADE SPAN WIRE RATED AT A MINIMUM OF 10,000 POUNDS. THE CATENARY SHALL BE INSTALLED AT THE SPECIFIED DESIGN SAG WITH A MINIMUM OF 12" AND A MAXIMUM OF 24" SEPARATION FROM THE BOTTOM MESSENGER WIRE.**
- 9.1.5 THE BOTTOM MESSENGER WIRE SHALL BE A MINIMUM OF 1/4" EXTRA HIGH STRENGTH GRADE SPAN WIRE RATED AT A MINIMUM OF 6,500 POUNDS. THE BOTTOM MESSENGER SHALL BE INSTALLED WITHOUT SAG AT THE SPECIFIED LOCATION ON THE CONCRETE/STEEL POLE.**
- 9.1.6 IF A HIGHER GRADE AND/OR RATED LOAD IS SPECIFIED FOR THE BOTTOM MESSENGER WIRE BY THE FDOT OR A DESIGNER, THE BOTTOM MESSENGER SHALL HAVE A RATED LOAD THAT IS LESS THAN THE TOP MESSENGER.**
- 9.1.7 2-POINT ATTACHMENT SPANS SHALL BE INSTALLED PER FDOT STANDARDS USING BREAKAWAY HINGE (SEE PAGE 36)**

9.2 - INSTALLATION

- 9.2.1 SPLICES IN DISCONNECTS SHALL BE DONE BY USING BUCHANAN B2 RED WIRE NUTS.**
- 9.2.2 TRI STUD HANGER SHALL BE SILICONE SEALED WHERE IT ATTACHES TO DISCONNECT.**
- 9.2.3 CABLE ENTRANCES IN DISCONNECTS, WHEN NOT USED, SHALL BE SEALED.**
- 9.2.4 NEOPRENE GROMMETS SHALL BE INSTALLED IN BOTH SIDES OF DISCONNECTS.**
- 9.2.5 SIGNAL CABLE OUT JACKET TO BE INSERTED A MINIMUM OF THREE (3) INCHES INTO DISCONNECT.**



www.pelcoinc.com
 320 W. 18TH ST. EDMOND OK 73013
 PH: 405-340-3434 FAX: 405-340-3435

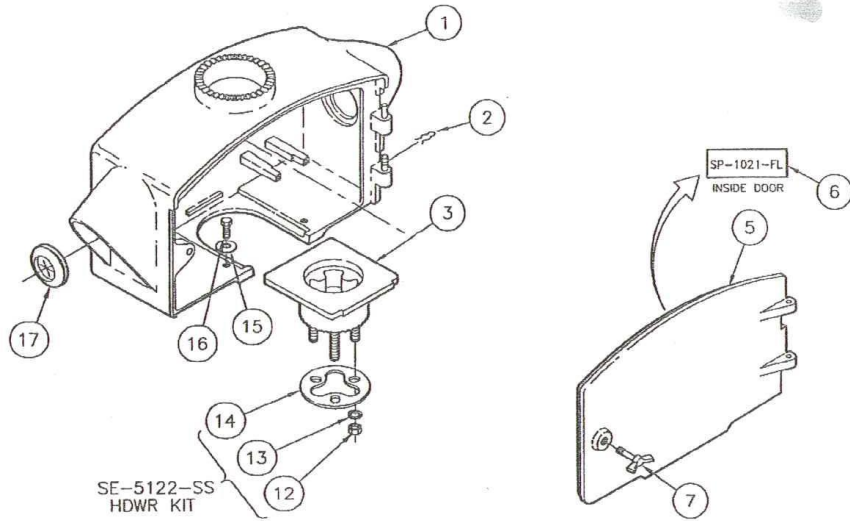
This drawing is for reference only. It is the property of Pelco and is not to be used in whole or in part without Pelco's permission.

ASSEMBLY SHEET

REF: STATE OF FLORIDA

TITLE: DISCONNECT HANGER ASSY, 12 CIRCUIT
 W/2" NON THREADED TOP
 CERT# 65910252011011

PELCO NO.: SP-1087-FL



OPTIONS
PAINT

ITEM	PART NO.	DESCRIPTION	QTY
1	SE-5120-M1	DISCONNECT BODY, TRI-STUD 2" NON-THD'D OPENING, W/DOOR, ALUM	1
2	FS-6902-SS	CLIP, HAIRPIN 1/8", STAINLESS	1
3	SE-0504-M1	HUB, TRI-STUD DISCONNECT - DISCONNECT HANGER ASSY	1
4	FS-3287-SS	SCREW, PHIL PAN HD, TYPE "F" SELF-TAP, #10-32 X 1 1/2", SS	2
5	SE-4000	SPONGE CORE, CLOSED CELL, 3/16" ROUND	1
6	O-3090	LABEL, 1" x 2", SP-1021-FL, CERT# 6591025201101	1
7	SE-6065-SS	WING SCREW, 1/4"-20, STAINLESS, DISCONNECT DOOR	1
8	SE-0624	MALE SIGNAL HARNESS @ 48" LNG, 12 CIRCUIT	1
9	FS-3102-SS	SCREW, PHIL PAN HD, TYPE 23, 6-32 X 3/8", STAINLESS	2
10	FS-4117-SS	WASHER, FLAT #6 STAINLESS	1
11	SE-0620	WIRING HARNESS, FEMALE, TERMINAL BLOCK, 7" LEADS, 12 CIRCUIT	1
12	FS-1001-SS	NUT, HEX, 5/16"-18, STAINLESS	3
13	FS-4201-SS	WASHER, SPLIT LOCK, 5/16", STAINLESS	3
14	SE-0375-SS	WASHER, SLOTTED, STAINLESS	1
15	FS-4000-SS	WASHER, FENDER 1/4" X 1", 18-8 STAINLESS	2
16	FS-2001-SS	BOLT, HX HD, 1/4"-20 X 5/8" STAINLESS	2
17	SE-0449	GROMMET, 1-1/2" WITH DIAPHRAM	2

DRAWN: L ACORD DATE: 4/4/95 CHK'D: KBM DATE: 5/25/05 REV: L 06/22/06 RLB REV: KBM 6/27/06 SH1, 1 OF 1

PELCO-1021-FL.dwg, 10/27/2006 1:24:05 PM, Controlled Document Valid for 72 Hours
 C:\pelco\dwg\SP1



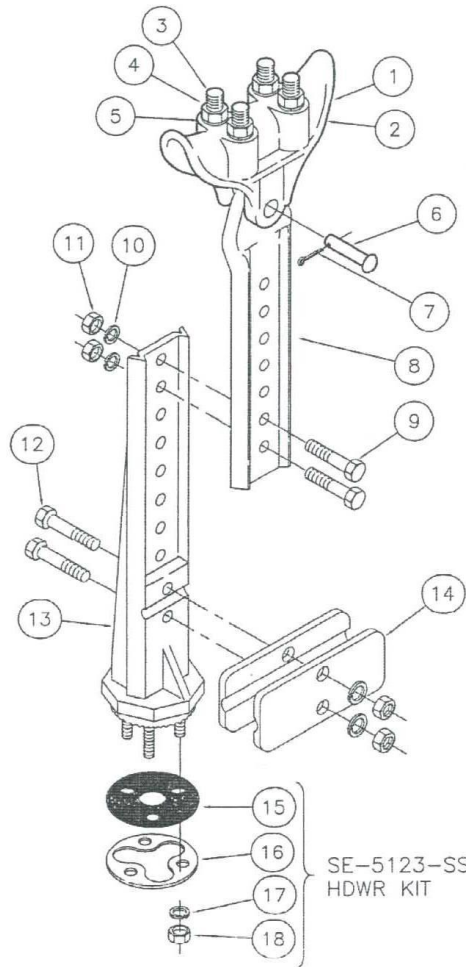
www.pelcoinc.com
320 W. 18TH ST., EDMOND, OK 73013
405-340-3434 FAX: 405-340-3435

ASSEMBLY SHEET

REF.:
LEE COUNTY
FLORIDA

TITLE:
SPAN WIRE ASSEMBLY
ADJUSTABLE SIGNAL HANGER W/ TETHER
& 3/8" STAINLESS HARDWARE

PELCO NO.:
SP-2027-FL



OPTIONS
PAINT

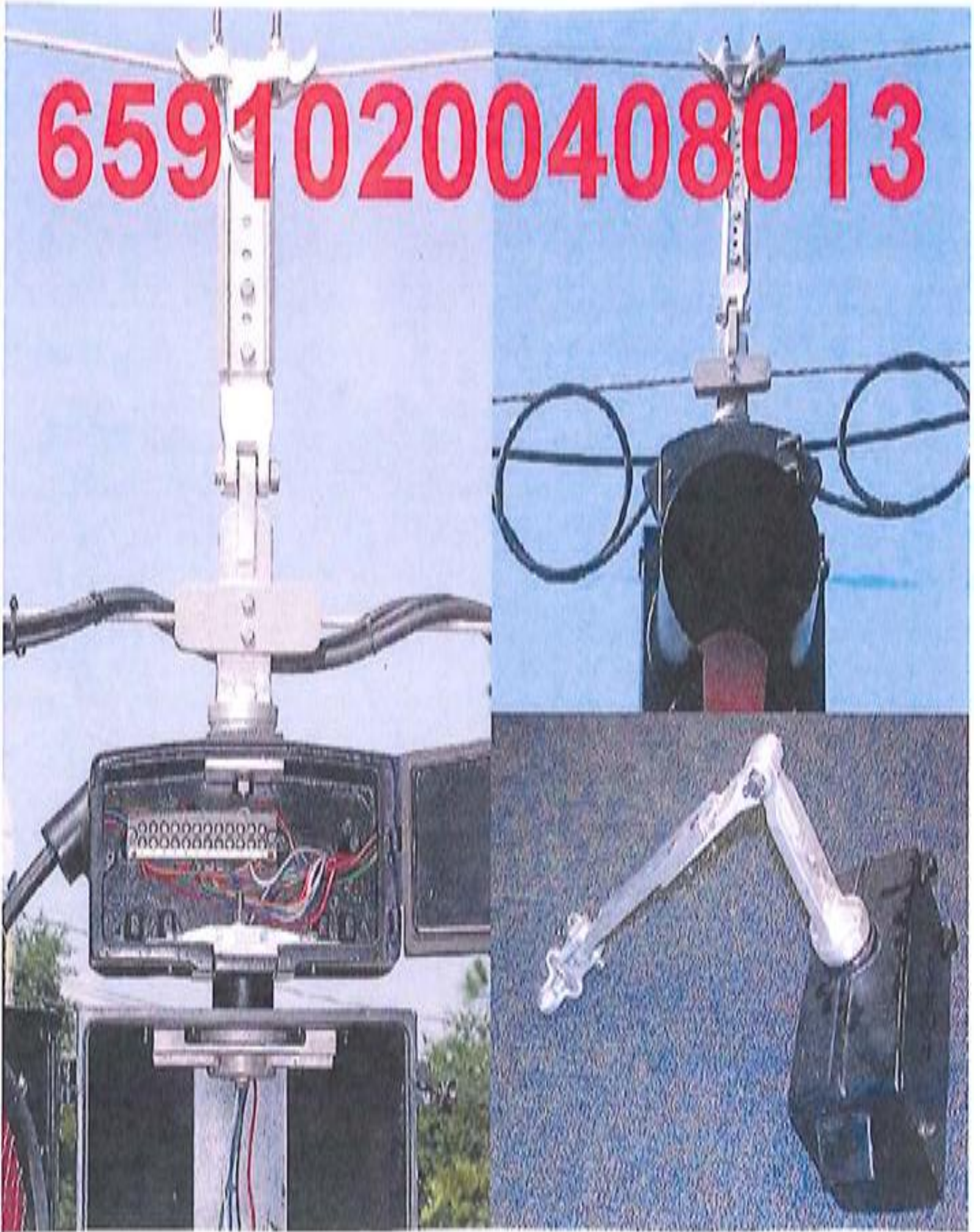


www.pelcoinc.com
 320 W. 18TH ST., EDMOND, OK 73013
 405-340-3434 FAX: 405-340-3435

ASSEMBLY SHEET

REF.: LEE COUNTY FLORIDA	TITLE: SPAN WIRE ASSEMBLY ADJUSTABLE SIGNAL HANGER W/ TETHER & 3/8" STAINLESS HARDWARE	PELCO NO.: SP-2027-FL
--------------------------------	---	--------------------------

ITEM	PART NO.	DESCRIPTION	QTY
1	SE-4064-M2	SPAN WIRE CLAMP BODY, 1/2" WIDE SLOT, ALUM	1
2	SE-0462-M1	BAR, CABLE FOR ALUM, SPAN WIRE CLAMP	1
3	FS-2507-SS	BOLT, U, 1/2"-13NC x 2-1/8" x 49/64" x 1-3/8", STAINLESS	2
4	FS-1005-SS	NUT, HEX 1/2"-13, HEAVY GRADE 2, STAINLESS	4
5	FS-4202-SS	WASHER, SPLIT LOCK 1/2", STAINLESS	4
6	FS-6000-SS	PIN, CLEVIS 5/8" x 2 1/4", STAINLESS	1
7	FS-6100-SS	PIN, COTTER 5/32" x 1 1/2", STAINLESS	1
8	SE-0539-M3	EXTENDER, CONNECTOR HANGER, 10 HOLE, 3/8 HDWR, SS BUSH, ALUM	1
9	FS-2055-SS	BOLT, HEX HD, 3/8"-16 X 1-1/4", STAINLESS	2
10	FS-4205-SS	WASHER, LOCK SPLIT 3/8", STAINLESS	4
11	FS-1003-SS	NUT, HEX 3/8"-16, STAINLESS	4
12	FS-2017-SS	BOLT, HEX HEAD, 3/8"-16 X 2", STAINLESS STEEL	2
13	SE-0538-M2	HANGER BODY, TRI-STUD, ADJ, 10 HOLE, 3/8 HDWR, ALUM	1
14	SE-0536-M2	STABILIZER BAR, 2" X 6", 2-HOLE, 3/8 HDWR, ALUM	2
15	AB-0278	GASKET, TRI-BOLT, 1/16" X 70 DURO NEOPRENE	1
16	SE-0375-SS	WASHER, SLOTTED STAINLESS	1
17	FS-4201-SS	WASHER, LOCK SPLIT, 5/16" STAINLESS	3
18	FS-1001-SS	NUT, HEX 5/16"-18, STAINLESS	3





www.pelcoinc.com
 320 W. 18TH ST. EDMOND OK 73013
 PH: 405-340-3434 FAX: 405-340-3435

This drawing is for reference only, it is the property of Pelco and is not to be used in whole or in part without Pelco's permission.

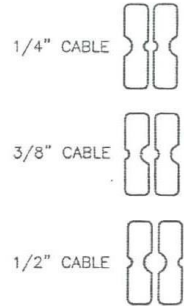
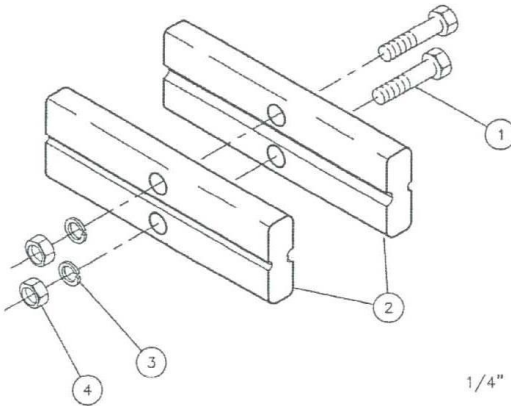
ASSEMBLY SHEET

REF: LEE COUNTY,
FLORIDA

TITLE: STABILIZER BAR ASSY
W/ 3/8" HARDWARE
FOR 1/4"-1/2" CABLE

PELCO NO.: SP-2042-FL

54812MB



Y:\Cant\Pelco Dwg\SPS\FL\SP-2042-FL.dwg, 10/27/2006 1:51:30 PM, Controlled Document Valid for 72 Hours

ITEM	PART NO.	DESCRIPTION	QTY
1	FS-2017-SS	BOLT, HEX HD 3/8"-16 X 2" STAINLESS STEEL	2
2	SE-4234-M2	STABILIZER BAR, UNIVERSAL, EXTRUDED, FOR 3/8" HDWR, ALUM	2
3	FS-4205-SS	WASHER, LOCK SPLIT 3/8", STAINLESS	2
4	FS-1003-SS	NUT, HEX 3/8"-16, STAINLESS	2

DRAWN: J ROGERS DATE: 4/7/06 CHK'D: R WOODS DATE: 4/7/06 REV: _____ REV CHK'D: _____ SH. 1 OF 1



www.pelcoinc.com
 320 W. 18TH ST, EDMOND OK 73013
 PH: 405-340-3434 FAX: 405-340-3435

This drawing is for reference only. It is the property of Pelco and is not to be used in whole or in part without Pelco's permission.

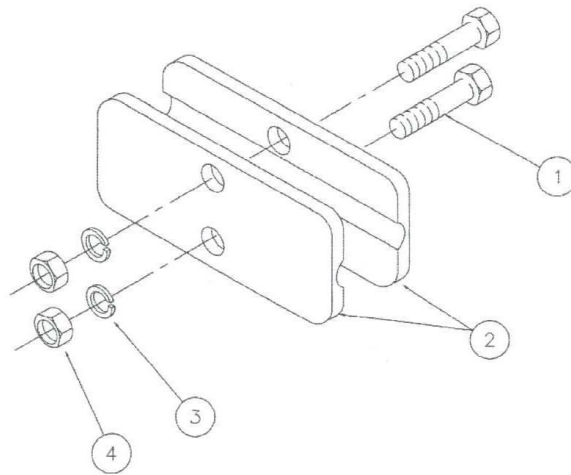
ASSEMBLY SHEET

REF: LEE COUNTY,
FLORIDA

TITLE: STABILIZER BAR ASSY
W/ 3/8" HARDWARE

PELCO NO.: SP-2043-FL

54810m3



ITEM	PART NO.	DESCRIPTION	QTY
1	FS-2017-SS	BOLT, HEX HD 3/8"-16 X 2" STAINLESS STEEL	2
2	SE-0536-M2	STABILIZER BAR, 2" X 6", 2-HOLE, 3/8 HDWR, ALUM	2
3	FS-4205-SS	WASHER, LOCK SPLIT 3/8", STAINLESS	2
4	FS-1003-SS	NUT, HEX 3/8"-16, STAINLESS	2

DRAWN: L ACCORD DATE: 1/4/07 CHK'D: DATE: REV: REV: SHT. 1 OF 1

634 SPAN WIRE ASSEMBLY.
(REV 8-13-07) (FA 10-3-07) (7-08)

SUBARTICLE 634-2.3 (Page 692) is deleted and the following substituted:

634-2.3 Hardware and Fittings: For Utility or Siemens-Martin Grade wires, use the connection hardware as specified herein and in 634-3.3 (f). For installations that use other grades of wire, provide the hardware and fittings indicated on the plans. Provide only hardware and fittings made of galvanized steel or non-corrosive metal unless the fiberglass insulators specified in 634-2.4 are also required. Provide hardware and fittings of sufficient strength to resist the breaking strength of the wire with which they are used.

Connect the automatic compression dead-end clamps of the catenary wire (or wires) to the strain poles with 3/4 inch diameter oval eye bolts, except as noted in 634-3.3 (f). For single point attachments, attach the automatic compression dead-end clamp of the messenger wire to the same oval eye bolt as the catenary wire. For two point attachments, connect the messenger wire to 3/4 inch diameter oval eye bolts at the lower attachment location, except as noted in 634-3.3 (f). Do not use thimbleye bolts for these connections.

Only use thimbleye and oval eye bolts, 3/4 inch in diameter, minimum, to connect the automatic compression dead-end clamps of tether wires to strain poles.

Only use "S" hooks, 5/16 inch in diameter, minimum, when connecting the tether wire to all poles.

Ensure that other hardware and fittings, as required for the attachment of a span wire assembly to support poles or structures, are in accordance with the details shown in the Design Standards.

SUBARTICLE 634-3.3 (Pages 693-695) is deleted and the following substituted:

634-3.3 General Requirements:

(a) Provide a span wire assembly with catenary messenger and tether wires of one continuous length of wire cable with no splices except when an insulator is required by 634-2.4. Connect the insulator, if required, to the cable with automatic compression dead-end clamps.

(b) Attach the span wire assemblies to the support poles or structures by means of automatic compression clamps and accessory hardware.

(c) Assemble the washer and nut on the oval eye bolt with the flat washer next to the pole. Tighten the nut sufficiently to prevent the oval eye bolt from rotating.

(d) For single point attachment, supply tension to the messenger wire with the signal conductor cables attached to eliminate any appreciable sag.

For two point attachments, install the messenger wire with the following tensions per 100 feet. Linearly prorate cable tensions for other lengths from these values:

Cable Size Inch	Wire Tension Lbs.
3/8	340.0
7/16	500.0
1/2	645.0

- (e) Install the catenary wire to the following initial wire tensions:
For 3/8 inch diameter:

Span Feet	Initial Wire Tension Lbs.
0 to 100	50.0
101 to 125	75.0
126 to 150	85.0
151 to 175	100.0
176 to 200	115.0
201 to 225	125.0
226 to 250	140.0
251 to 275	150.0
276 to 300	175.0
over 300	200.0

For 7/16 inch diameter:

Span Feet	Initial Wire Tension Lbs.
0 to 100	75.0
101 to 125	100.0
126 to 150	125.0
151 to 175	150.0
176 to 200	175.0
201 to 225	175.0
226 to 250	200.0
251 to 275	225.0
276 to 300	250.0
over 300	275.0

- (f) Connect a maximum of two 3/8 inch diameter catenary wires to a strain pole with one 3/4 inch diameter oval eye bolt. Connect a maximum of one 7/16 inch diameter catenary wire to a strain pole with one 3/4 inch diameter oval eye bolt.

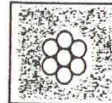
Use a 3/4 inch diameter alloy steel eyebolt (ASTM F 541, Type 2) and a 3/4 inch heavy hex nut ASTM A 563, Grade C or D), both zinc coated in accordance with ASTM A 153, Class C, to connect more than one 7/16 inch diameter catenary wire or one 1/2 inch diameter messenger or catenary wire to a single strain pole. Alternatively, the Engineer may design a special connection for this case.

- (g) Install the span wire assemblies in accordance with the Design Standards, Index No. 17727, and at a height on the support poles which will provide a clearance from the roadway to the bottom of the signal head assemblies as specified in 650-3.

- (h) Connect all span wires to the pole grounding system in accordance with Section 620.

- (i) Obtain and meet all provisions of the National Electric Safety Code (ANSI-C2) regarding clearance from electric lines, contacting of utility owners, and safety requirements prior to span wire installation.

(j) Prior to installation of the span wire assembly, submit the method of providing the required tension in the catenary wire and the messenger wire in two point attachments to the Engineer for approval.



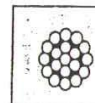
GUY, MESSENGER STRAND and WIRE

Zinc coated guy or messenger strand and wire is produced to comply with applicable ASTM Specifications A-475, A-363 and Class A, Class B and Class C coating weight.

7-WIRE GALVANIZED STEEL STRAND CLASS A, B, and C COATING

NOMINAL STRAND DIA. INCHES	NOMINAL WIRE DIA. INCHES	NET WEIGHT POUNDS PER 1,000 FT	MINIMUM STRENGTH IN POUNDS	% \pm ELONGATION
SIEMENS-MARTIN				
1/4	.080	121	3,150	8
5/16	.104	205	5,350	8
3/8	.120	273	6,950	8
7/16	.145	399	9,350	8
1/2	.165	517	12,100	8
9/16	.188	671	15,700	8
5/8	.207	813	19,100	8
HIGH STRENGTH				
3/16	.062	73	2,850	5
1/4	.080	121	4,750	5
5/16	.104	205	8,000	5
3/8	.120	273	10,800	5
7/16	.145	399	14,500	5
1/2	.165	517	18,800	5
9/16	.188	671	24,500	5
5/8	.207	813	29,600	5
EXTRA HIGH STRENGTH				
3/16	.062	73	3,990	4
1/4	.080	121	6,650	4
5/16	.104	205	11,200	4
3/8	.120	273	15,400	4
7/16	.145	399	20,800	4
1/2	.165	517	26,900	4
9/16	.188	671	35,000	4
5/8	.207	813	42,400	4
UTILITIES				
3/16	.065	80	2,400	10
5/16	.109	225	6,000	10
3/8	.120	273	11,500	4
7/16	.145	399	18,000	4
1/2	.165	517	25,000	4

CATENARY →
MESSENGER →



19-WIRE GALVANIZED STEEL STRAND CLASS A, B, and C COATING

NOMINAL STRAND DIA. INCHES	NOMINAL WIRE DIA. INCHES	NET WEIGHT POUNDS PER 1,000 FT	MINIMUM STRENGTH IN POUNDS	% \pm ELONGATION
SIEMENS-MARTIN				
1/2	.100	504	12,700	8
9/16	.113	637	16,100	8
5/8	.125	796	18,100	8
3/4	.150	1,155	26,200	8
HIGH STRENGTH				
1/2	.100	504	19,100	5
9/16	.113	637	24,100	5
5/8	.125	796	28,100	5
3/4	.150	1,155	40,800	5
EXTRA HIGH STRENGTH				
1/2	.100	504	26,700	4
9/16	.113	637	33,700	4
5/8	.125	796	40,200	4
3/4	.150	1,155	58,300	4



NEW

‡ Minimum Elongation in a 24-in gauge length of galvanized strand.

R.E.A. APPROVALS

Florida Wire & Cable strand products are approved and listed in R.E.A. Bulletin 43-5, Electrification Borrowers and R.E.A. Specification PE-37, Telecommunications.



A DIVISION OF FLORIDA WIRE AND CABLE, INC.

825 N. LANE AVE.

JACKSONVILLE, FLORIDA 32254

(904) 781-9224 (800) 874-0093 FAX (904) 783-4340

PEDESTRIAN HEADS

10.1 - GENERAL

10.1.1 ALL PEDS SHALL BE COUNTDOWN

10.1.2 USE INTERNATIONAL SYMBOL LED COUNTDOWN WITH DIFFUSER HEADS ONLY, WITH EGG CRATE VISOR. NO NEON ACCEPTED UNLESS NOTED ON THE PLANS.

10.1.3 ALL PED HEADS SHALL BE NEW AND UNIFORM FOR EACH INTERSECTION.

10.1.3 ALL ATTACHING HARDWARE SHALL BE STAINLESS STEEL 304 OR 316.

10.1.5 USE PELCO OR EQUAL BREAKAWAY BASES FOR PED POLES WITH LOCKING SET SCREW AND GROUND LUG.

10.1.6 USE FOUR (4) INCH ID ALUMINUM CONDUIT FOR PED POLES.

10.1.7 SHALL BE POLARA EZ COMM NAVIGATOR 2-WIRE (EN2) AND EZ COMMUNICATOR CENTRAL CONTROL UNIT W/ ETHERNET (CCU2EN)

- **POLARA EN2 TO HAVE STREET NOMES PROGRAMMED BY POLARA, AND LEE COUNTY SHALL RECEIVE THE VOICE FILES FOR INTERSECTION.**
- **EACH INSTALL SHALL INCLUDE AN EZ COMM NAVIGATOR CONFIGURATOR.**
- **CONTRATOR SHALL BRING ALL EN2'S AND CCU2EN'S TO LEE COUNTY FOR LEE COUNTY AUDIBLE PED SPECS PROGRAMMING AND SW UPGRADE IF NEEDED AND PROGRAM IP ADDRESS. LEE COUNTY WILL LABEL WHERE EACH EN2'S GOES AFTER BEING PROGRAMMED.**
- **BELDEN CABLE SHALL BE USED TO EACH EN2.**
- **PLEASE CALL LCDOT FOR ANY FURTHER QUESTIONS (239) 533-9500.**

10.2 - INSTALLATION

10.2.1 MOUNTING HEIGHT OF PED HEAD SHALL BE NINE (9) FEET SIX (6) INCHES ABOVE GRADE TO BOTTOM OF HEAD.

10.2.2 MOUNTING HEIGHT OF PED BUTTON SHALL BE FORTY-TWO (42) INCHES TO CENTER OF BUTTON ABOVE GRADE. BUTTON SHOULD BE UNDER THE HEAD IT CALLS.

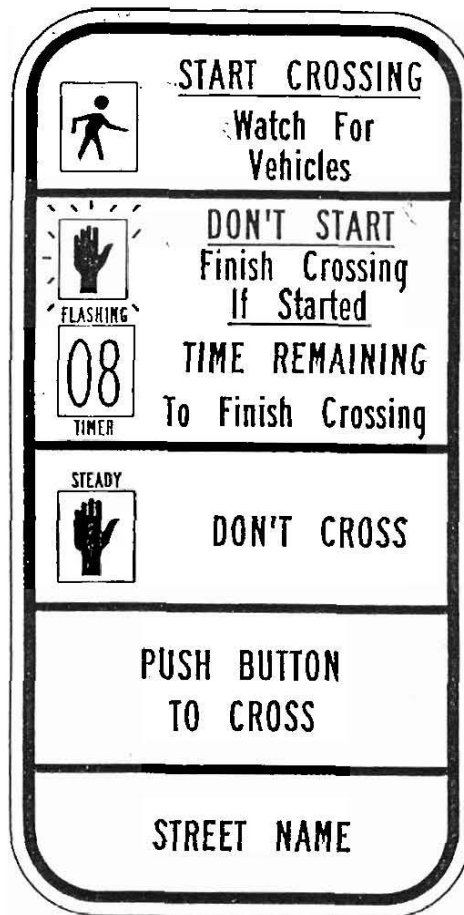
10.2.3 WHEN INSTALLING REMOTE PED BUTTON, IT SHALL BE INSTALLED ON BREAKAWAY BASE WITH FOUR (4) INCH ID ALUMINUM CONDUIT.

10.2.4 SEAL WITH SILICONE AROUND ROSETTE CAPS AND PED BUTTONS.

- 10.2.5 PLACEMENT OF PED SIGNS SHALL BE "PUSH TO WALK" ABOVE BUTTON AND INSTRUCTION BELOW BUTTON.**
- **EXPLANATORY SIGNS BE MOUNTED ABOVE THE BUTTONS**
 - **EACH SIGN IS TO IDENTIFY THE CROSSWALK TO WHICH EACH BUTTON APPLIES**
- 10.2.6 SIGNAL CABLE SHALL BE SPLICED IN BASE OF PED POLE AND NOT IN PED HEAD.**
- 10.2.7 SPLICE CABLE WITH RED BUCANON B2 B-CAP WIRE NUTS.**
- 10.2.8 PED CALL WIRES SHALL BE CONNECTED TO A PED ISOLATOR BOARD AND CHASSIS GROUND IN CABINET.**
- 10.2.9 BELDEN CABLE SHALL BE USED AS PED PUSH BUTTON CALL WIRE**



Typical Countdown Pedestrian Head



FTP-68B-06

Typical Pedestrian Crossing Sign

SPECIFICATION SHEET



PELCO PRODUCTS, INC.

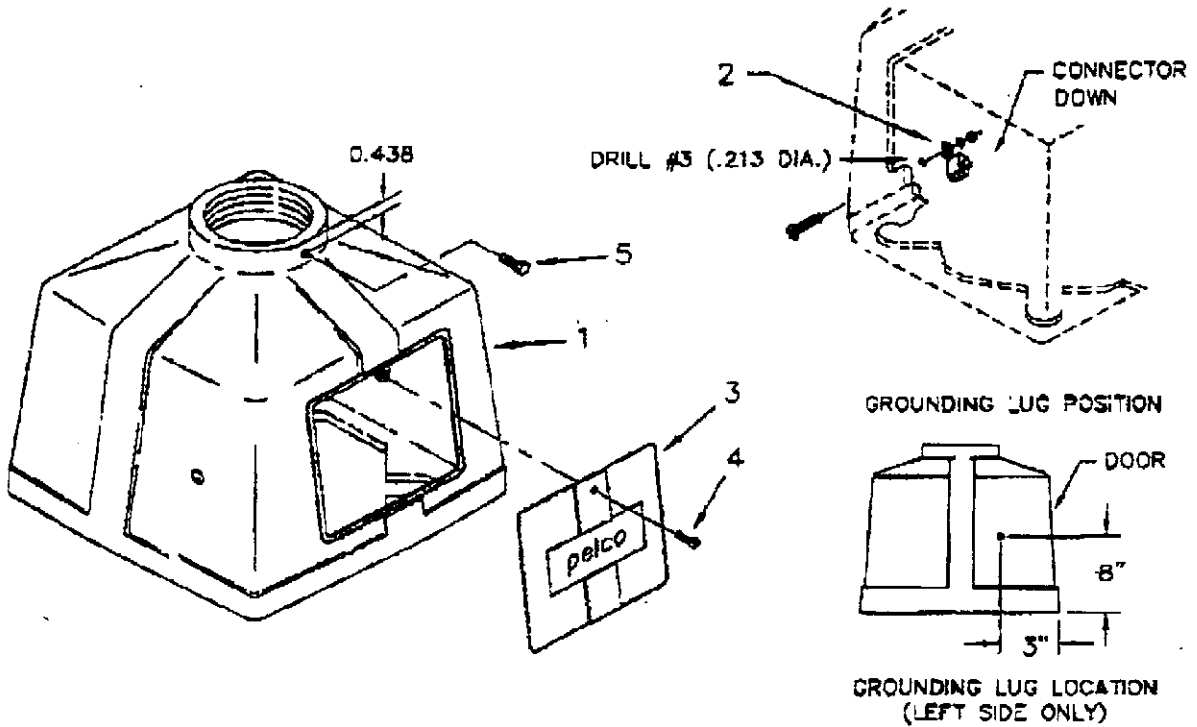
200 S. W. 10TH AVENUE, MIAMI, FLORIDA 33135 (407) 344-5454 FAX (407) 344-3439

AGENCY:

REF.: SQUARE ALUM. BASE ASSEMBLY
W/ PLASTIC DOOR, SETSCREW
& GROUNDING LUG

PELCO NO.:

SP-5326



NOTE LOCATION & POSITION OF GROUNDING LUG.

MATERIAL COATING LEGEND	
COATING	CODE
Aluminum	PXX
Steel Galv	PNC
Iron	PNC
Chrome	SS
Chromed	SS
16 Coating	SS
2000 Series	SS
2024 Series	SS
2025 Series	SS
2026 Series	SS
2027 Series	SS
2028 Series	SS
2029 Series	SS
2030 Series	SS
2031 Series	SS
2032 Series	SS
2033 Series	SS
2034 Series	SS
2035 Series	SS
2036 Series	SS
2037 Series	SS
2038 Series	SS
2039 Series	SS
2040 Series	SS
2041 Series	SS
2042 Series	SS
2043 Series	SS
2044 Series	SS
2045 Series	SS
2046 Series	SS
2047 Series	SS
2048 Series	SS
2049 Series	SS
2050 Series	SS
2051 Series	SS
2052 Series	SS
2053 Series	SS
2054 Series	SS
2055 Series	SS
2056 Series	SS
2057 Series	SS
2058 Series	SS
2059 Series	SS
2060 Series	SS
2061 Series	SS
2062 Series	SS
2063 Series	SS
2064 Series	SS
2065 Series	SS
2066 Series	SS
2067 Series	SS
2068 Series	SS
2069 Series	SS
2070 Series	SS
2071 Series	SS
2072 Series	SS
2073 Series	SS
2074 Series	SS
2075 Series	SS
2076 Series	SS
2077 Series	SS
2078 Series	SS
2079 Series	SS
2080 Series	SS
2081 Series	SS
2082 Series	SS
2083 Series	SS
2084 Series	SS
2085 Series	SS
2086 Series	SS
2087 Series	SS
2088 Series	SS
2089 Series	SS
2090 Series	SS
2091 Series	SS
2092 Series	SS
2093 Series	SS
2094 Series	SS
2095 Series	SS
2096 Series	SS
2097 Series	SS
2098 Series	SS
2099 Series	SS

ITEM	PELCO PART NO.	DESCRIPTION	COAT	QTY
	SP-5326 ←	SQUARE ALUM. BASE ASSY. W/ PLASTIC DOOR, SETSCREW & GROUNDING LUG		1
1	PB-0545	SQUARE BASE, ALUM.	PXX	1
2	PB-5323	GROUNDING LUG W/ MOUNTING HARDWARE	PNC	1
3	PB-0543-PNC	DOOR, PLASTIC FOR SQUARE BASE	PNC	1
4	FS-2039-SS	SCREW, SOC BUTTON HD., 5/16"-18 x 1"	SS	1
5	FS-2035-SS	BOLT, HEX HD., 3/8"-16 x 1"	SS	1

7/16/99

SHEET 1 OF 1



DEPARTMENT OF TRANSPORTATION

600 Duwanee Street, Tallahassee, Florida 32304-0480

DEN O. WATTS
SECRETARY

APRIL 18, 1996

FEID # 73-1237747

APR 23 1996

Mr. Parduhn
Pelco Products, Inc.
320 S.W. 18th
Edmond, OK 73013

Subject: **CERTIFICATE OF CONFORMANCE - Traffic Control Device**

Dear Mr. Parduhn:

Pursuant to Section 316.0745, Florida Statutes, the traffic control device manufactured by you and indicated below has been approved and placed on part 'A' of the Department's Approved Products List of Traffic Control Devices.

<u>APPROVAL NUMBER</u>	<u>DEVICE OR PRODUCT</u>	<u>DESCRIPTION</u>
66513902011091	Pedestrian Detector	SE-2061-08 (ADA)

All correspondence associated with the above device including submittal data for construction projects must refer to the certification number above.


A **CERTIFICATE OF CONFORMANCE** is issued when a traffic control device complies with the Manual On Uniform Traffic Control Devices and also meets or exceeds the Department's Minimum Specifications.

THIS APPROVAL IS NOT AN ENDORSEMENT OF THE DEVICE. The Department reserves the right to remove such device from the Approved Products List if it fails to perform satisfactorily or falls below established standards and specifications. Failure on your part to notify the Department immediately of any modification, alteration, or discontinued device or product may result in removal of that device or product from the Approved Products List.

Any modification or alteration of an approved device including design, materials, or operational improvements, must be resubmitted along with supporting documents for review and, if needed, reevaluation by the Department. A periodic review will be made of products listed on the Approved Products List to ensure continued conformance and to keep an updated listing.

Notify this office within 30 days of any change in address. Please contact Eric Larson at (904) 488-4284 for any correspondence dealing with this approval.

Sincerely,


Cor Jack A. Brown, P.E.
State Traffic Operations Engineer

JAB:jmm
File - TCD-1



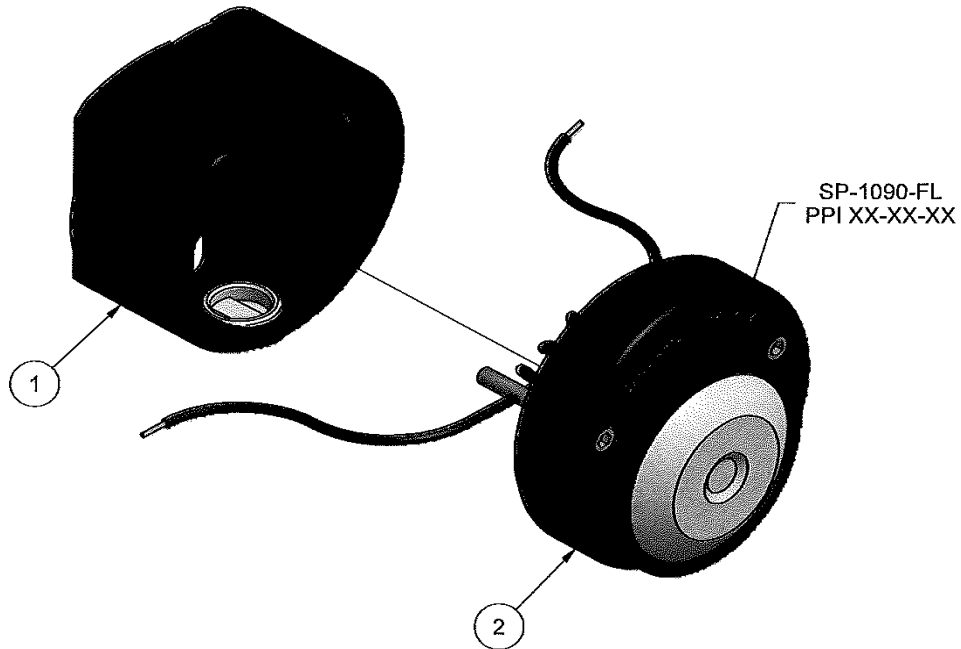
www.pelcoinc.com
 EDMOND, OK 73013
 405-340-3434
 FAX: 405-340-3435

This drawing is for reference only. It is the property of Pelco and is not to be used in whole or in part without Pelco's permission.

ASSEMBLY SHEET

REF: State of Florida	TITLE: Push Button Assy, Round w/2" Plunger w/ Florida Markings, Alum FDOT Certification No. 66513902011101	PART NO.: SP-1090-FL
--------------------------	---	-------------------------

PART NO.
 SP-1090-FL-PXX
 Paint



OPTIONS
 Paint

ITEM	PART NUMBER	DESCRIPTION	QTY
1	SE-2137-PXX	Body Assy, Round Push Button, Alum	1
2	SP-1091-FL-PXX	Cover Assy, Push Button, w/ 2" Plunger w/ Florida Markings, Alum	1

DRAWN: C. MADDEN DATE: 2/10/2010 CHKD: GWA DATE: 2/10/2010 REV: A-03/12/10 CM REV: GWA DATE: 3/17/2010 SHEET 1 OF 1



www.pelcoinc.com
EDMOND, OK 73013
405-340-3434
FAX: 405-340-3435

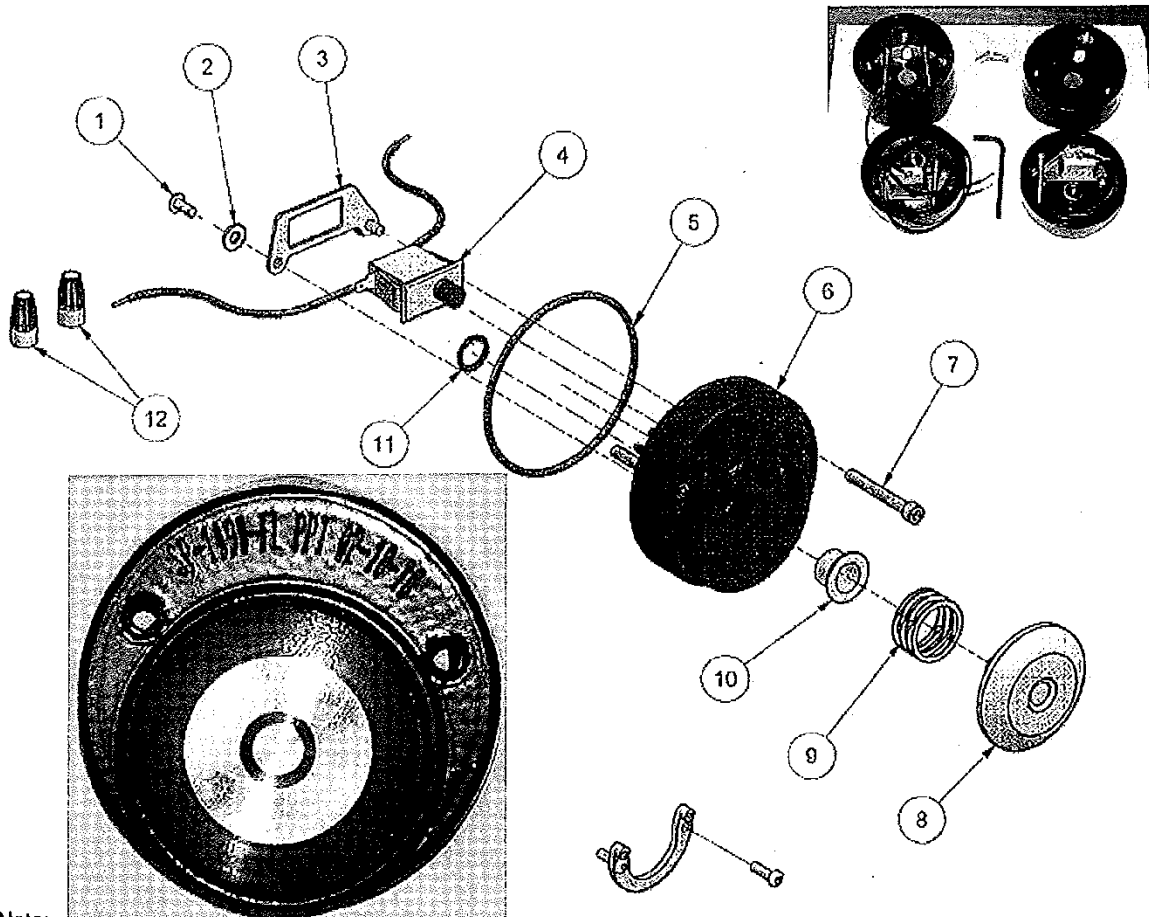
This drawing is for reference only. It is the property of Pelco and is not to be used in whole or in part without Pelco's permission

ASSEMBLY SHEET

REF:

TITLE:
Cover Assy, Push Button w/ 2" Plunger w/ Florida Markings, Alum

PART NO.:
SP-1091-FL



Note:
SE-2507 Adapter Kit Must Be Used When Installing Cover Assembly to Bodies with Mounting Holes on Horizontal Center Line

OPTIONS
Paint

ITEM	PART NUMBER	DESCRIPTION	QTY
1	FS-3935-SS	Screw, Phil Pan Hd, #8-32 x 3/8" Type 23, Type 304 Stainless	2
2	FS-4104-SS	Washer, Flat, #8, Type 304 Stainless	2
3	SE-6092	Plate, Switch Mounting, Push Buttons, Stainless	1
4	SE-0640-M2	Switch, Snap In Panel Mount w/4" Leads	1
5	SE-0215	O-Ring, #151, 70 Duro Neoprene	1
6	SE-6098-M4-P33	Cover, Round Push Button for 2" ADA Plunger w/ Florida Markings, Alum	1
7	FS-2071-SS	Capscrew, Soc Hd, #10-24 x 1-1/2" , Type 304 Stainless	2
8	SE-6114	Plunger, Push Button, CF8 Stainless	1
9	SE-6097	Spring, Wave, Crest To Crest w/ Shlm Ends 1.055 OD x 0.550 HT, Stainless	1
10	FS-4921	Bushing, Flange, 0.510" ID x 0.495" Lg	1
11	FS-9142-SS	Retaining Ring, External, 1/2" Stainless	1
12	SE-2501	Hardware Kit, 2 Wire Nuts, Bagged	1

DWG. NO.
N25ANO-X

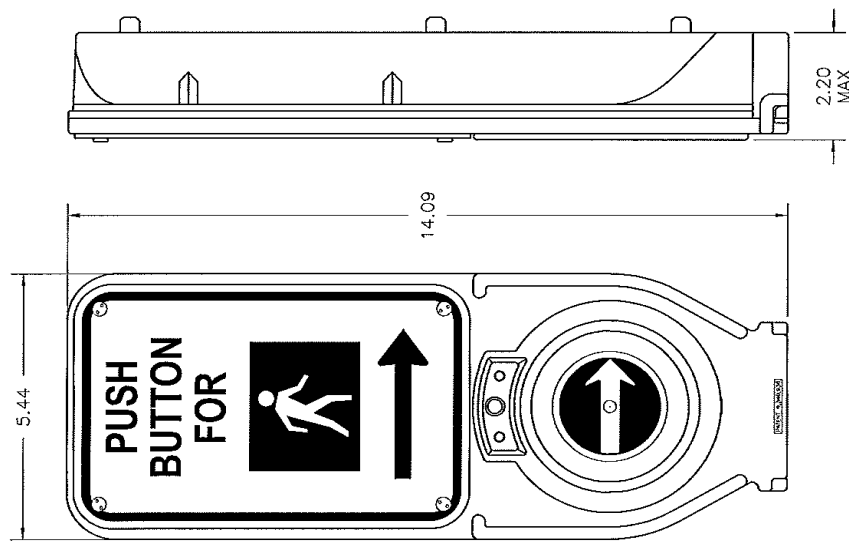
PUSH BUTTON STATION

The 2 Wire Navigator PBS is the pedestrian interface to the Navigator Accessible Pedestrian System. A system includes a Central Control Unit (CCU), a Configurator, and up to 12 Push Button Stations. The PBS provides valuable information and cues via both a vibrating arrow button and audible sounds making the intersection accessible for all pedestrians. All sounds emanate from the back of the unit. The weather-proof speaker is protected by a vandal resistant screen. A sunlight visible red LED latches "ON" to confirm the button has been pushed. PBS includes frame, sign, ADA compliant push button, and mounting hardware.

By interfacing with the Central Control Unit that installs in the traffic control cabinet the PBS can provide the following standard features.

- Confirmation of button push via latching LED, sound, and vibrotactile bounce.
- Direction of travel (with extended button push).
- Standard locating tone during Don't Walk (and clearance if desired).
- Cuckoo, chirp, or standard voice message during walk.
- Vibrating button during walk.
- Standard locating tone, custom sound, or verbal countdown during PED clearance.
- All sounds automatically adjust to ambient over 60dB range.
- Most sounds can have minimum and maximum volume independently set.
- All sounds are synchronized.
- Extended button push can turn on, boost volumes, and/or mute all sounds except those on activated crosswalk.
- Special emergency messages available.

Additional custom options listed on page 2.



Revised - 04/20/06		POLARA ENGINEERING INC. 4115 W. ARTESIA AVE. FULLERTON, CA. 92833	
TOLERANCES: .XXX ±.005 .XX ±.02 (EXCEPT AS NOTED) SCALE 1:3		DRN BY	CHKR
DATE	03-14-03	ENGR. MGR.	ENG. MGR.
DSN. ENG.	WR	LB	FB
O.A. APP.	RVC	FINAL APP.	USE
JMG			
TITLE		DWG. NO.	
2 WIRE NAVIGATOR PUSH BUTTON STATION (PBS)		N25ANO-X	
REV. DATE	LTR	E.C.O. NO.	BY
			CKR ENG DSN MPG QA FNL

INFORMATION ON THIS DOCUMENT IS UNCLASSIFIED EXCEPT WHERE SHOWN OTHERWISE. IT IS NOT TO BE USED, COPIED, REPRODUCED OR DISCLOSED IN WHOLE OR IN PART WITHOUT WRITTEN CONSENT OF POLARA.

Custom message and sound options definable by customer include:

- Custom locating tone
- Informational message
- Custom walk sounds/message
- Custom clearance sound
- Multiple languages (up to three, selectable by user)
- Street name in Braille on the sign

All above features along with many more are field selectable using a Configurator. With the Configurator, a single PBS or all PBS's on the intersection can be changed/updated with a single button push.

Available in three standard colors - Black, Green & Yellow
 -X at end of part number specifies color:
 -B = Black, -G = Green, -Y = Yellow

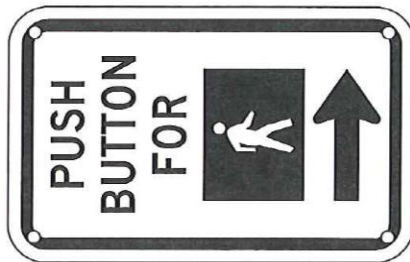
Environmental: -40°F (-40°C) to 150°F (65°C)

Push Button: ADA Compliant, raised tactile arrow on button, solid state switch rated to 20 million actuations minimum.

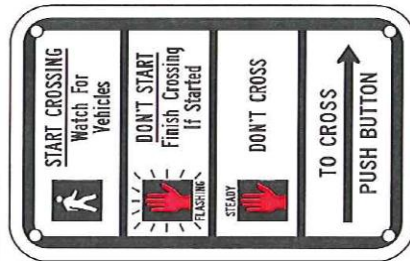
Construction: Die-cast aluminum, powder coated

The 2 Wire Navigator is designed to operate using existing button wires (a pair of wires + and Common) for each phase with from one to a maximum of three Push Button Stations on a phase. If there is not a separate common for each phase, Polara cannot guarantee the system will work properly in all instances. Each case will have to be tried and proven because it depends upon the condition of the wires, splices, etc., and whether the common is shared with the 115V light system. In the event the 2 Wire system does not work, Polara will swap it out for a 4 Wire system as long as there is no damage to the units.

STANDARD SIGN OPTIONS



OPTION A



OPTION B

INFORMATION ON THIS DOCUMENT IS PROPRIETARY TO POLARA AND SHALL NOT BE REPRODUCED, COPIED, OR DISCLOSED IN WHOLE OR IN PART WITHOUT WRITTEN CONSENT OF POLARA.

REV	REV. DATE	TOLERANCES: .XXX ±.005.XX ±.02 (EXCEPT AS NOTED)	TITLE
ECC	04-20-06 DATE CREATED	SCALE 1:3	2 WIRE NAVIGATOR

SHEET 2 OF 2

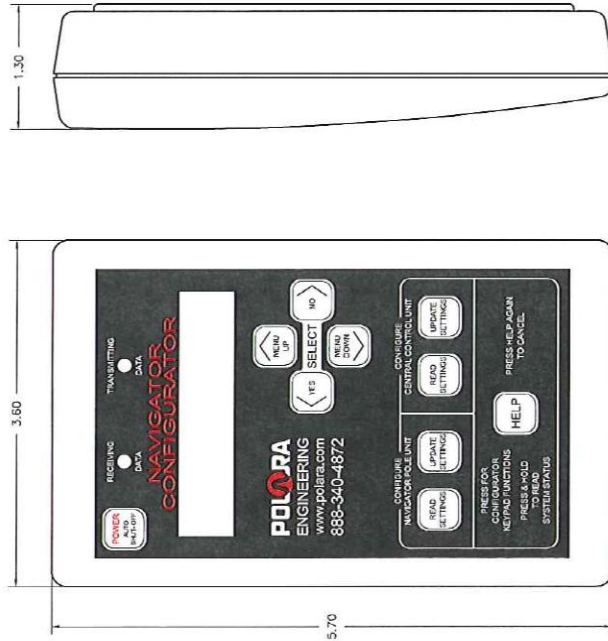
DWG. NO.
CONFIGURATOR

CONFIGURATOR

The Navigator Configurator is a hand held remote used for configuring a Navigator 2 Wire System or individual 4 Wire Navigator Push Button Stations (PBS). Just stand a few feet in front of a PBS, point the Configurator at the PBS, turn it on and select your options. The Configurator communicates via infrared with the PBS (and CCU of 2 Wire system). One Configurator is all you need for maintaining multiple intersections. All of the configuration options in the CCU and the PBS are set with the Configurator. The beauty of the Navigator system is its interactive operation. For example, if you select one of the optional Locate Sounds, you hear your choice as you select it. When adjusting volume levels, you hear the level you select. After configuring the features you want, you can upload your choices to just that PBS or to all of the PBS's on the entire intersection with a single button push. (Access is password protected to prevent unauthorized changes.)

- Display: 2 Line x 16 Character
LCD with backlight, adjustable contrast
- Power: 4 X AA 1.5V Cell, Low battery warning
auto or manual shut-off
- Operating Temp: 0°C – 50°C

See the operation and instruction manual for 2 Wire and 4 Wire Products for more details.



Revised - 01/06/04		POLARA ENGINEERING INC. 4115 W. ARTESIA AVE. FULLERTON, CA. 92833	
TOLERANCES: .XXX ±0.05 .XX ±.02 (EXCEPT AS NOTED)	SCALE 1:1.5	DRAWN BY BB	ENG. MGR. MFG. MGR.
DATE 03-14-03	DSN. ENG. Q.A. APP. FINAL APP. USE	SHEET 1 OF 1	
TITLE NAVIGATOR CONFIGURATOR	DWG. NO. CONFIGURATOR		
REV. DATE LTR E.C.C. NO. BY CKR ENG DSN MFG QA FNL			

INFORMATION ON THIS DOCUMENT IS PROPRIETARY TO POLARA AND SHALL NOT BE USED, COPIED, REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS WITHOUT WRITTEN CONSENT OF POLARA.

DWG. NO.
CCU

CENTRAL CONTROL UNIT (CCU)

The CCU is to be installed inside the Traffic Cabinet and is powered by the AC supply mains (115 VAC). The CCU is the power supply and signaling interface between the existing Intersection Traffic Control Unit and the Push Button Stations which are located in the field. One CCU can control up to 12 Push Button Stations. The CCU controls up to four Pedestrian phases, receiving its timing from the Walk and Don't Walk signals. Additional advanced configurations can be obtained by utilizing its general purpose inputs and Outputs. All Inputs and Outputs have full optical isolation and include Transient Voltage Protection.

Ped Walk / Don't Walk Inputs:

Optically isolated 80-150 Volts AC/DC 5mA Maximum

General Purpose Outputs & Ped Outputs:

Optically isolated 36 Volts AC/DC Peak

.3A Solid State Fused Contact Closure

Fault Output:

Normally Open and Closed Relay Contacts 125 Volts AC/DC 1A Maximum

A, B, C, D PBS Power Outputs:

Nominal 22 Volts DC, Short Circuit Protected - Auto Recovering

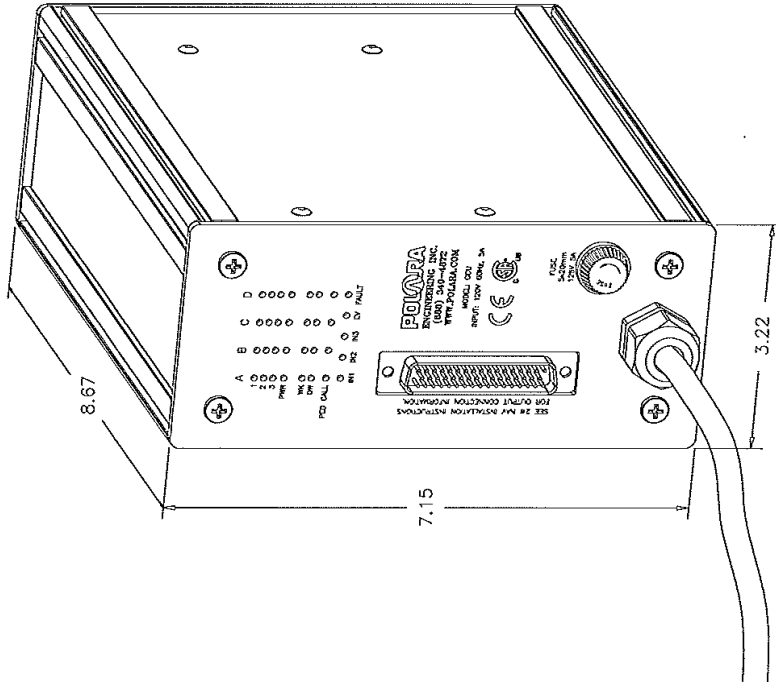
General Purpose Inputs:

10 - 36 Volts AC/DC Peak 10mA Maximum, Optically isolated

Environmental:

Operating and Storage -30°F (-34°C) to 165°F (74°C) 0-100%

Humidity Non-Condensing



Interface cable included
but not shown

INFORMATION ON THIS DOCUMENT IS
PROPRIETARY TO POLARA AND SHALL
NOT BE USED, COPIED, REPRODUCED,
OR TRANSMITTED IN ANY MANNER
WITHOUT WRITTEN CONSENT OF POLARA.

POLARA ENGINEERING INC.				SCALE 1:1	
4115 W. ARTESIA AVE. FULLERTON, CA. 92833				SHEET 1 OF 1	
TOLERANCES: .XXX ±.005 .XX ±.02 (EXCEPT AS NOTED)	CKR.	ENG. MGR.	MFG. MGR.	DATE	USE
DRAWN BY BB	DSN. ENG.	Q.A. APP.	FINAL APP.	03-14-03	2W NAV
REV. DATE	LTR	E.C.O. NO.	BY	CKR	ENG
					DSN
					MFG
					QA
					FNL
TITLE 2 WIRE NAVIGATOR CENTRAL CONTROL UNIT				DWG. NO. CCU	

- 11.1.1 NO SPLICES IN INTERCONNECT CABLE BETWEEN SIGNAL CABINETS.
- 11.1.2 FOUR (4) EACH 1-1/4 INCH SDR 13.5 POLY CONDUIT BLUE, GREEN, ORANGE, YELLOW COLOR. COPPER WIRE MUST BE INSTALLED FOR LOCATING PURPOSES, #10 CU AWG MINIMUM IN ORANGE CONDUIT. #10 AWG SHALL BE CONTINUOUS AND SPLICES SHALL BE IN PULL BOX AND CONNECTED WITH SPLIT BOLT.
- 11.1.3 ALL SPARE CONDUITS TO HAVE PULL STRING AND DUCT SEAL INSTALLED.
- 11.1.4 PULL BOX SHALL BE EQUAL TO QUAZITE LOAD RATED WITH QUAZITE LIDS MARKED "TRAFFIC SIGNAL" (SEE SECTION #3, PULL BOXES) ILLUSTRATION IV. MAXIMUM SPACING BETWEEN BOXES IS 1000 FEET.
- 11.1.5 INTERCONNECT CABLE SHALL BE CORNING BRAND 96 STRAND SINGLE MODE FIBER (ALTOS 8.3/125 LT DUCT/AERIAL .4/.3 DB/KM SMF28E). THIS IS AN ALL-DIELECTRIC, DRY FILLED LOOSE TUBE SINGLE MODE FIBER OPTIC CABLE. INSTALL IN BLUE CONDUIT.
- 11.1.6 INTERCONNECT CABLE SHALL NOT SHARE A PULL BOX WITH ANY OTHER CABLES.
- 11.1.7

LCDOT Interconnect

10-2010

Four 1-1/4 inch SDR 13.5 poly conduits green, blue, orange, and yellow in color. A #10 copper wire shall be installed in the orange conduit for locating purposes.



11.1.8 (A) - INTERCONNECT PULL BOXES SHALL BE 24 X 36 QUAZITE EXCEPT AT SPLICE LOCATIONS. (B) – AT SPLICE LOCATIONS, PULL BOX SHALL BE 30 X 48 QUAZITE WITH ONE (1) INCH APRON. SPLICE LOCATIONS TO BE DETERMINED BY LEE COUNTY.

11.1.9 ALL INTERCONNECT PULL BOXES SHALL HAVE A 1'X6" CONCRETE APRON

11.1.10FOR LOCATING PURPOSES ALL INTERCONNECT PULL BOXES SHALL HAVE A PULL BOX INSTALLED WITHIN 1 FOOT OF INTERCONNECT PULL BOX. THE LOCATE WIRE SHALL BE INSTALLED INTO THIS PULL BOX VIA A 1" CONDUIT

11.2 - INSTALLATION

11.2.1 CABLE SHALL BE TESTED BEFORE INSTALLATION

11.2.2 MINIMUM DEPTH OF CONDUIT SHALL BE THIRTY-SIX (36) INCHES. WHEN UNDER SIDEWALK, A MINIMUM OF 30 INCHES SHALL BE MAINTAINED.

11.2.3 PROPER EQUIPMENT SHALL BE USED TO INSTALL FIBER CABLE.

11.3 - TESTING

11.3.1 FIBER SHALL BE TESTED BY MANUFACTURE

11.3.2 AN ON THE REEL TEST SHALL BE PERFORMED BEFORE INSTALLING FIBER IN CONDUIT

11.3.3 FIBER SHALL BE TESTED AFTER INSTALLATION

11.3.4 ALL FIBER TESTS SHALL BE SUBMITTED TO LEE COUNTY FOR REVIEW

HDPE Conduit Specifications

Specifications

1.0 General

1.1 Carlon HDPE duct is manufactured to the following various industry standards and specifications for dimensional requirements.

ASTM F 2160 Solid Wall High Density Polyethylene (HDPE) Conduit Based on Controlled Outside Diameter (OD).

ASTM D 2239 Polyethylene (PE) Plastic Pipe (SIDR) Based on Controlled Inside Diameter.

ASTM D 3035 Polyethylene (PE) Plastic Pipe (SDR) Based on Controlled Outside Diameter.

NEMA TC-7 Smooth Wall Coilable Polyethylene Electrical Plastic Conduit.

UL 651B Continuous Length HDPE

2.0 Material

Carlon duct is manufactured from a suitable thermoplastic polymer conforming to the minimum standard of PE334470E/C as defined in ASTM D3350. (see table 1)

Carlon® High Density Polyethylene

duct is manufactured in the following configurations:

Smoothwall – Smooth Interior and Smooth Exterior wall.

Rib/Smooth – Ribbed Interior and Smooth Exterior wall.

3.0 Product Description

Polyethylene duct and innerduct is an extruded coilable tubing for use as a single or multiple raceway.

The conduit may be direct buried, encased in concrete and used as innerducts.

Innerducts are used primarily to provide multiple raceways within an existing conduit system.

4.0 Ovality

Conduit 3" or larger needs to be re-rounded

Table 1 – Resin Properties
The resin properties shall meet or exceed the values listed below for HDPE.

ASTM Test	Description	Values HDPE
D-1505	Density g/CM ³	.941 - .955
D-1238	Melt Index, g/10 min Condition E	.05 - .50
D-790	Flexural Modulus, MPa (PSI)	80,000 min.
D-638	Tensile strength at yield (psi)	3000 min.
D-1693	Environmental Stress Crack Resistance Condition B,F ₁₀	96 hrs. min.
D-746	Brittleness Temperature	-75°C

Requests for certifications must be requested at time of quote

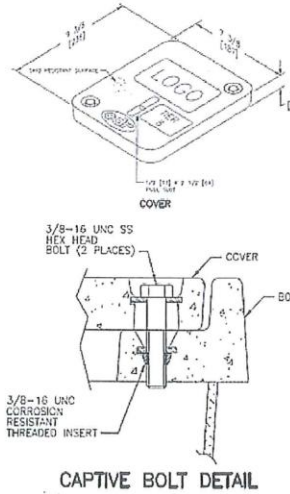
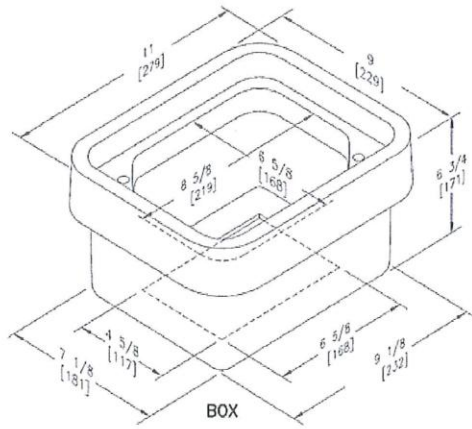
Specifications

Nom. Size	Nom. ID	Nom. OD	Min. Wall	Wt/ 100 Ft.	Pull Tensile Safe lbs.
SDR 7 - ASTM D3035					
1"	0.939	1.315	0.188	28.552	743
1-1/4"	1.186	1.660	0.237	45.448	1183
1-1/2"	1.358	1.900	0.271	59.491	1549
2"	1.697	2.375	0.339	93.012	2421
3"	2.500	3.500	0.500	202.140	5262
4"	3.214	4.500	0.643	334.212	8700
5"	3.972	5.562	0.795	510.709	13295
6"	4.733	6.625	0.946	723.976	18847
8"	6.161	8.625	1.232	1227.418	31953
10"	7.678	10.750	1.536	1907.218	49649
12"	9.108	12.750	1.821	2681.954	69818
14"	10.000	14.000	2.000	3234.240	84195
16"	11.428	16.000	2.286	4224.753	109980
SDR 9 - ASTM D3035 / F2160					
1"	1.023	1.315	0.146	23.000	599
1-1/4"	1.292	1.660	0.184	36.599	953
1-1/2"	1.478	1.900	0.211	48.026	1250
2"	1.847	2.375	0.264	75.102	1955
3"	2.722	3.500	0.389	163.084	4245
4"	3.500	4.500	0.500	269.520	7016
5"	4.326	5.562	0.618	411.745	10719
6"	5.153	6.625	0.736	584.091	15205
8"	6.709	8.625	0.958	989.810	25767
10"	8.362	10.750	1.194	1537.593	40027
12"	9.916	12.750	1.417	2164.092	56336
14"	10.888	14.000	1.556	2609.340	67927
16"	12.444	16.000	1.778	3407.638	88709

Nom. Size	Nom. ID	Nom. OD	Min. Wall	Wt/ 100 Ft.	Pull Tensile Safe lbs.
SDR 11 - ASTM D3035 / F2160					
1/2"	0.688	0.840	0.076	7.825	204
3/4"	0.860	1.050	0.095	12.226	318
1"	1.075	1.315	0.120	19.325	503
1-1/4"	1.358	1.660	0.151	30.706	799
1-1/2"	1.554	1.900	0.173	40.262	1048
2"	1.943	2.375	0.216	62.845	1636
3"	2.864	3.500	0.318	136.360	3550
4"	3.682	4.500	0.409	225.483	5870
5"	4.550	5.562	0.506	344.761	8975
6"	5.421	6.625	0.602	488.619	12720
8"	7.057	8.625	0.784	828.416	21566
10"	8.796	10.750	0.977	1286.718	33496
12"	10.432	12.750	1.159	1810.362	47128
14"	11.454	14.000	1.273	2183.310	56837
16"	13.090	16.000	1.455	2851.923	74242
SDR 13.5 - ASTM D3035 / F2160 / NEMA TC-7 EPEC-B					
1/2"	0.716	0.84	0.062	6.500	169
3/4"	0.894	1.050	0.078	10.217	266
1"	1.121	1.315	0.097	15.921	414
1-1/4"	1.414	1.660	0.123	25.477	663
1-1/2"	1.618	1.900	0.141	33.423	870
2"	2.023	2.375	0.176	52.155	1358
2-1/2"	2.449	2.875	0.213	76.410	1989
3"	2.982	3.500	0.259	113.120	2945
4"	3.834	4.500	0.333	186.994	4868
4-3/4"	4.084	4.750	0.333	198.213	5160
5"	4.738	5.562	0.412	285.934	7444
6"	5.643	6.625	0.491	405.869	10566
8"	7.347	8.625	0.639	687.688	17902
10"	9.158	10.750	0.796	1067.755	27796
12"	10.862	12.750	0.944	1501.882	39098
14"	11.926	14.000	1.037	1811.529	47158
16"	13.630	16.000	1.185	2365.816	61588

(4)
orange
blue
green
yellow

6x8 Straight Wall Style Stackable Assembly (CDR)



[Click Here for Product Cut Sheet](#)

COVERS (Bolt down covers have S.S. Bolts)

Description	Part No.	Old Catalog No.	WEIGHT LBS./kg.	DESIGN/TEST LOAD#
Tier 8 w/2 Bolts	C30060801A	C30-0608-01	5/2	8,000/12,000
Tier 8 No Bolt Down	C0060801A	COO-0608-01	5/2	8,000/12,000

Gasketed covers and bolt grommets must be used with a gasketed box.

Gaskets reduce the inflow of fluids but do not make the enclosure water tight.

BOXES (Stackable with corrosion resistant nuts)

Description	Part No.	Old Catalog No.	WEIGHT LBS./kg.	DESIGN/TEST LOAD#	ANSI Tier
Tier 8 w/2 Bolts	B13060806A	B13-0608-06	6/3	8,000/12,000	8
Tier 8 Solid Bottom	B03060806B	B13-0608-06B	6.5/3	8,000/12,000	8
Tier 8 Open Bottom w/ Gasket*	B13060806G	B 13-0608-06G	6/3	8,000/12,000	8
Tier 8 Solid Bottom w/ Gasket*	B330608500	B 13-0608-06BG	6.5/3	8,000/12,000	8

Gaskets reduce the inflow of fluids but do not make the enclosure water tight.



All contents Copyright© 2001 - 2012 Hubbell Incorporated. All rights reserved. Because Hubbell has a policy of continuous product improvement, we reserve the right to change design specifications without notice.
[Terms of Use](#) | [Contact Us](#) | [Site Map](#)

STREET LIGHTS

12.1 - GENERAL

- 12.1.1 FOUNDATIONS FOR STREET LIGHT POLES SHALL BE PREFORMED CONCRETE - REFERENCE CURRENT FDOT INDEX FOR PREFORM BASES.**
- 12.1.2 CONDUIT RUNS FOR STREET LIGHTING SHALL BE TWO (2) INCH MINIMUM.**
- 12.1.3 STREET LIGHT POLE DESIGN SHALL BE APPROVED BY LEE COUNTY TRAFFIC ENGINEER.**
- 12.1.4 STREET LIGHT FIXTURES SHALL BE HOLOPHANE.**
- 12.1.5 SERVICE EQUIPMENT SHALL BE SQUARE D – NIGHT MASTER D8903 – SQH63 – V06. SEE CUT SHEET**
- 12.1.6 NO SPLICING PERMITTED IN PULL BOXES UNLESS APPROVED BY LEE COUNTY TRAFFIC ENGINEERING. SPLICE ONLY BY USE OF USPA INLINE SPLICE.**
- 12.1.7 ALL CONDUCTORS SHALL BE USE / XLP.**
- 12.1.8 NIGHT MASTER CONTROLLER ENCLOSURES SHALL BE STAINLESS STEEL ONLY (WATERPROOF)**
- 12.1.9 SELF-CONTAINED INSTALLATIONS (600 AMPERES OR LESS) WHERE THE SERVICE VOLTAGE IS 480V TO GROUND (2 WIRE), A 600V RATED SQUARE D NEMA 3R NON-AUTOMATIC DISCONNECT DEVICE SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR ON THE LINE SIDE OF EACH INDIVIDUAL METER. A BYPASS EQUIPPED METER ENCLOSURE IS REQUIRED AND SHALL BE SELECTED FROM THE APPROVED METER EQUIPMENT ENCLOSURE LIST FROM THE ELECTRIC UTILITY.**
- 12.1.10 INTERSECTION LIGHTING SHALL BE 120/240 VOLT HOLOPHNE FIXTURE WITH SMALL L BRACKET OR 20 FOOT STREET LIGHT ARM. SEE CUT SHEET.**

12.2 - INSTALLATION

- 12.2.1 MINIMUM OF TWENTY (20) FEET GROUND ROD AT EACH STREET LIGHT POLE. GROUND RODS MUST READ LESS THAN 15 OHMS.**
- 12.2.2 GROUND WIRE SHALL BE RUN UP POLE TO GROUND THE FIXTURE.**
- 12.2.3 BREAKAWAY RECEPTACLES WITH SET SCREW CONNECTORS AND RUBBER BOOTS SHALL BE INSTALLED IN EACH POLE.**
- 12.2.4 SURGE ARRESTORS SHALL BE INSTALLED IN EACH POLE.**
- 12.2.5 WHEN THERE ARE MORE THAN FOUR (4) LIGHTS, PHOTO CELLS SHALL BE TWIST LOCK. PHOTO CELLS WITH HUBS ARE USED ON LESS THAN FOUR (4) LIGHTS.**

12.2.6 WIRE RUN BETWEEN POLES SHALL NOT BE SPLICED IN PULL BOX.

12.2.7 USE #10 STRANDED WIRE TO FEED STREET LIGHT HEAD FROM POLE BASE, HOT – HOT/NEUTRAL – GROUND.

12.2.8 ALL CONDUCTORS INSTALLED FROM THE LOAD CENTER PULLED THROUGH CONDUITS TO EACH STREET LIGHT POLE ON A 480V 2-WIRE SYSTEM SHALL HAVE THE FOLLOWING COLOR INSULATION DESIGNATIONS:

THE HOT CONDUCTOR SHALL BE BLACK, THE NEUTRAL CONDUCTOR SHALL BE WHITE AND THE GROUNDING CONDUCTOR SHALL BE GREEN.

ALL CONDUCTORS SHALL BE CONTINUOUS IN COLOR FROM THE LOAD CENTER TO EACH STREET LIGHT POLE. UNDER NO CIRCUMSTANCES SHALL PHASE TAPE BE USED TO IDENTIFY A CONDUCTOR.

12.3 - TESTING

12.3.1 MINIMUM OF FIFTY (50) FOOT OF GROUND ROD TO BE DRIVEN AT EACH LOAD CENTER WITH A READING OF 5 OHMS OR LESS

ALLSCAPE®

ARCHITECTURAL LANDSCAPE LIGHTING

2930 South Fairview Street
 Santa Ana, CA 92704
 Phone: 714 668 3660
 Fax: 714 668 1107
 Email: allighting@earthlink.net

Desc SP31_70HPS_240V_LT_BK

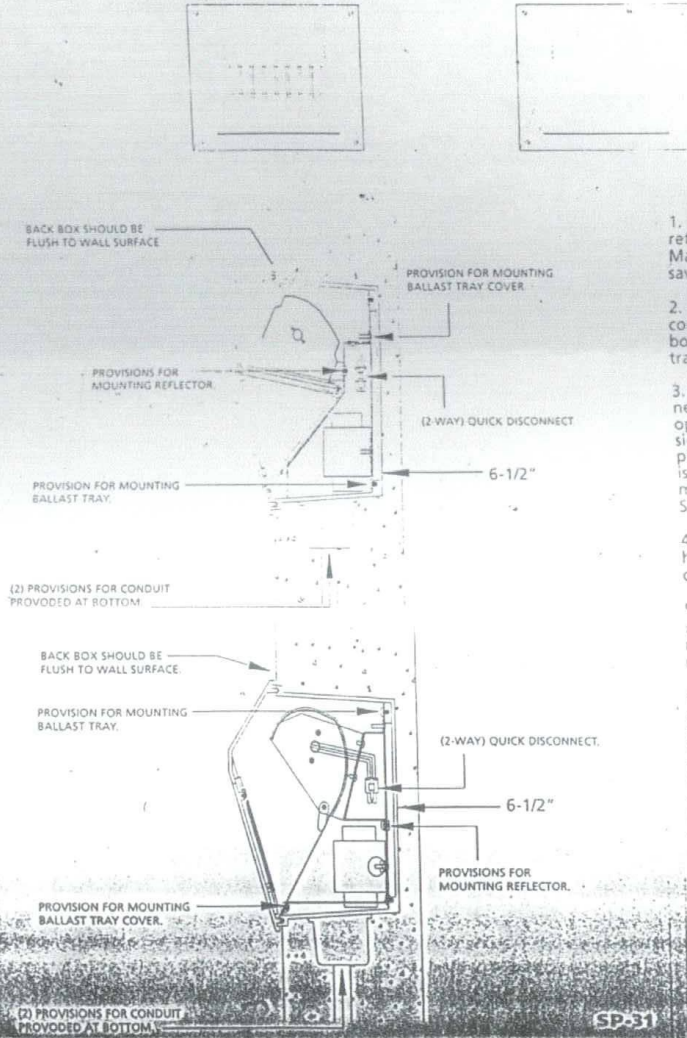
Left

Desc SP31_70HPS_240V_RT_BK

Right

Safety, Warnings and Suggestions

- ¹ Avoid installing fixtures in locations where water collects and stands for prolonged periods.
- ² Make sure that electrical power is disconnected before any work is performed.
- ³ All wiring and installation should meet local, state and national electrical codes.



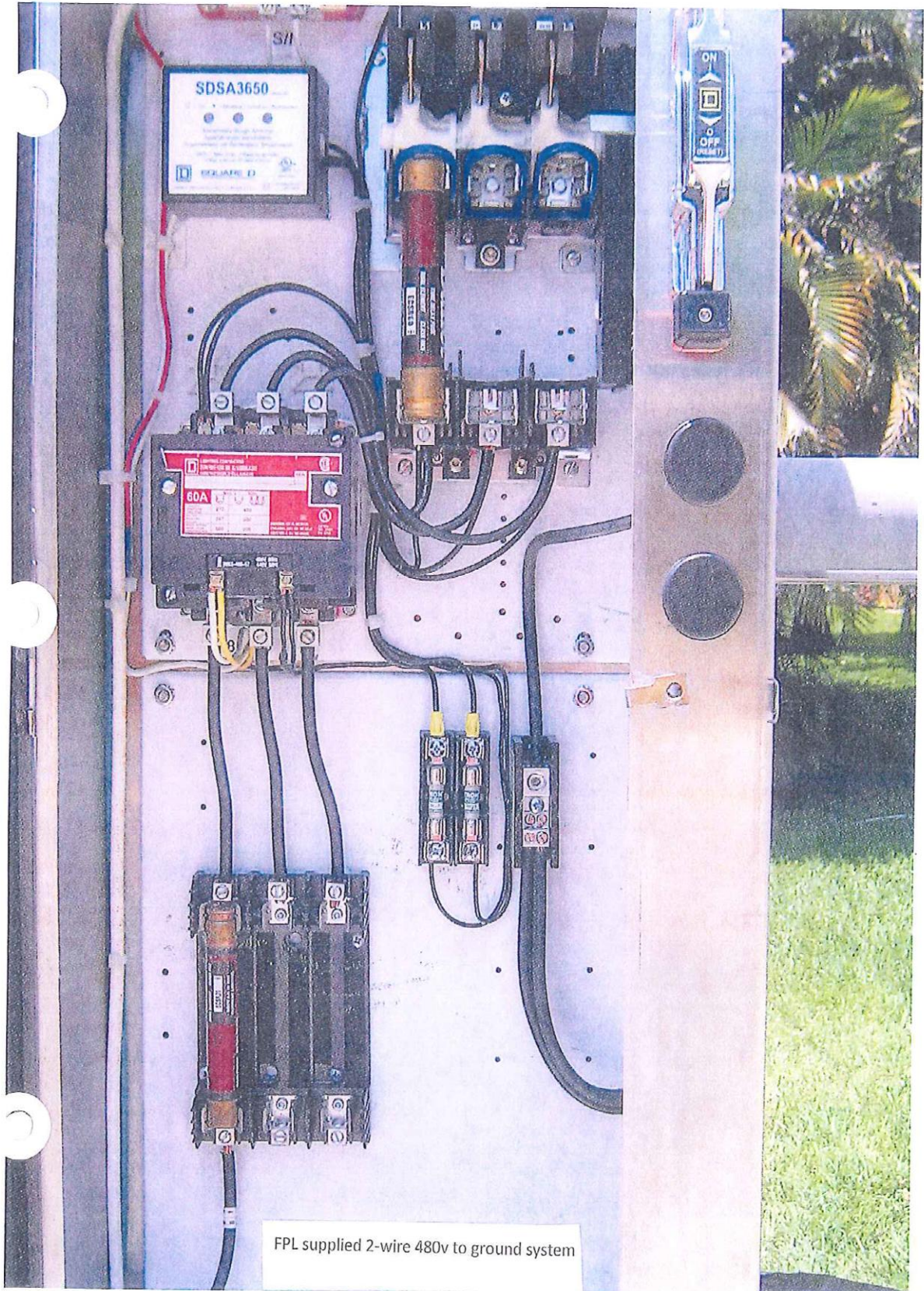
1. Remove face plate, internal reflector and internal ballast tray. Make sure all hardware is carefully saved until needed.
2. With back box by itself, connect conduit to the provisions on the bottom of the back box. See illustration for details.
3. Once the conduit has been connected, secure back box to wall opening or any mounting provisions being used to hold box in place. Make sure that back box is flush to wall or to any other mounting provisions being used. See illustration for details.
4. After all preparations to wall have been finished, carefully clean out any dirt left inside of back box.
5. Install and secure ballast tray with hardware provided. Carefully make all necessary connection using UL listed connectors.
6. Install and secure ballast cover or reflector (Depending on fixture) to ballast tray assembly with hardware provided. Refer to illustrations for details. Make sure to connect the 2-way connectors from the reflector assembly to the ballast assembly to insure proper functioning of the lamp. Install proper lamp source as designated on lamp label.
7. Install face plate onto back box by using screws provided. Safely tighten all screws on faceplate to ensure a good seal all around gasket area. Once face plate has been tightened, make sure it is flush to mounting surface. See illustration for details.

© All Rights Reserved 2002

SP-31

Version 1.0

02/28/02



FPL supplied 2-wire 480v to ground system



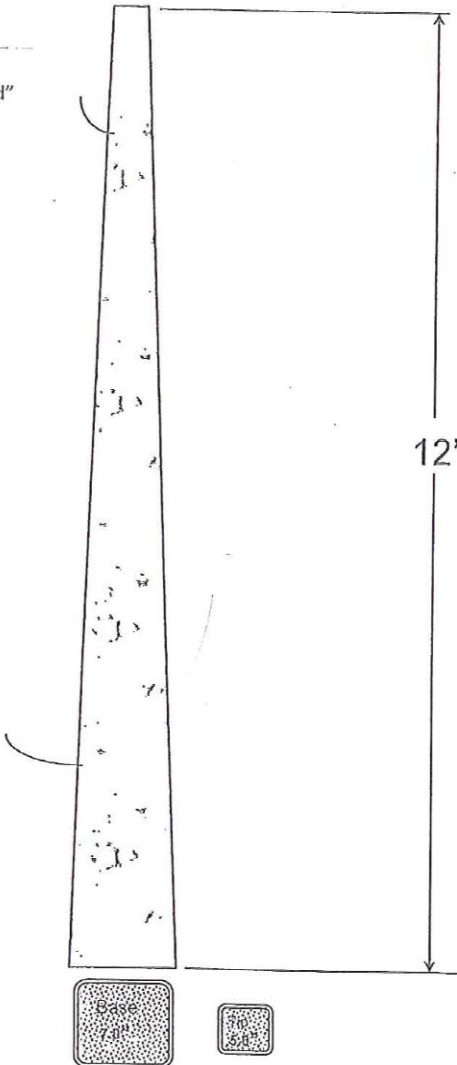
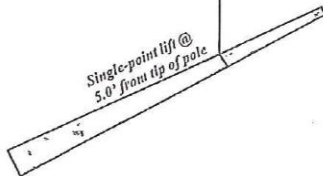
Utilities Structures 1800.798.Pole Inc.

Lee County Street Light Load Center Pole "2 required"

Prestressed Concrete Pole

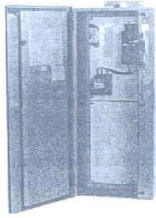
- Pole Weight= 1,595lbs
- EPA capacity= 5.7sq'
- Wind speed= 150 mph
- Exposure "C"
- 2007 FBC 1609
- Importance factor= 0.77
- Gust Factor= 1.2
- Min. Brk. Strength= 1200#
- Concrete= 4,500lbs @ 28 days
- Grd. Wire= #6 str
- Strand= 3/8" @ 70% Ultimate
- Tenon= N/A
- Color= Natural Concrete

TKW Consulting Engineers, Inc.
Shawn R. Anderson, P.E., S.E.



Lighting Control
NIGHT-MASTER® Combination Lighting Contactors
 Class 8903

SQUARE D
 www.SquareD.com
 For the most up-to-date information



Long Version

14 NEMA-DEFINITE PURPOSE TYPE CONTACTORS AND STARTERS



Short Version

NIGHT-MASTER Outdoor Combination Lighting Contactors offer disconnecting means, overcurrent protection and a lighting contactor in one NEMA 3R Rainproof enclosure. These combination units satisfy requirements of the National Electrical Code and UL 508 for service entrance equipment.

Features:

- Solid neutral standard
- Grounding lug standard
- Padlocking provisions
- Short and long versions available
- Electrically held Type S lighting contactor
- Eliminates the need for separate mounted safety switches
- Additional panel space eliminates the need for external mounting of time clocks

NIGHT-MASTER®

Disconnect Switch Type# (3-Pole)

Contactor Ampere Rating	Fuse Clip Size (A)	Fuse Clip Spacing (V)	Short Version				Long Version			
			Class 8903 Type 3R	Price▲	Class 8903 Type 3R Stainless Steel	Price▲	Class 8903 Type 3R	Price▲	Class 8903 Type 3R Stainless Steel	Price▲
30	30	600	SMC61+ SMC62+	\$1343. 1304.	SMH61+ SMH62+	\$2175. 2100.	SMC63+ SMC64+	\$1466. 1451.	SMH63+ SMH64+	\$2400. 2325.
	60	600	SPC61+ SPC62+	1776. 1670.	SPH61+ SPH62+	2850. 2700.	SPC63+ SPC64+	1955. 1883.	SPH63+ SPH64+	3150. 3000.
100	100	600	SQC61+ SQC62+	3047. 2969.	SQH61+ SQH62+	4950. 4800.	SQC63+ SQC64+	3188. 3084.	SQH63+ SQH64+	5250. 5100.
	200	600	SVC61+ SVC62+	5447. 5324.	SVH61+ SVH62+	8350. 8550.	SVC63+ SVC64+	5966. 5812.	SVH63+ SVH64+	9150. 8850.

Circuit Breaker Type# (3-Pole)

Contactor Ampere Rating	Circuit Breaker		Short Version				Long Version			
	Ampere Rating	Maximum Volts	Class 8903 Type 3R	Price▲	Class 8903 Type 3R Stainless Steel	Price▲	Class 8903 Type 3R	Price▲	Class 8903 Type 3R Stainless Steel	Price▲
30	30	600	SMC81+	\$1650.	SMH81+	\$2700.	SMC83+	\$1871.	SMH83+	\$3000.
60	60	600	SPC81+	2106.	SPH81+	3450.	SPC83+	2213.	SPH83+	3750.
100	100	600	SQC81+	3029.	SQH81+	4950.	SQC83+	3227.	SQH83+	5250.
200	200	600	SVC81+	5807.	SVH81+	9450.	SVC83+	6606.	SVH83+	9750.

▲ Price does not include holding circuit contact.
 ■ All lighting contactors are provided with separate control as standard.
 ◆ Coil voltage codes must be specified to order this product. Refer to standard voltage codes listed below.

UL Approved for Service Entrance



NIGHT-MASTER Combination Lighting Contactors

The Class 8903 NIGHT-MASTER Outdoor Combination Lighting Contactor is the only product on the market that is UL Listed for Service Entrance. This allows the contactor to be pole mounted when used to control lighting in remote locations such as parks, monuments, group sports facilities, and streets and highways.

Factory modifications such as photocells, time switches, key operated selector switches, and the combination of photocells and time switches (photocell on, time switch off) allow the NIGHT-MASTER to be located in applications where manual operation of lights is not practical.

NIGHT-MASTER comes in long and short versions in sizes 30 through 200 Amperes. Most common modifications can be provided from the factory, or added in the field to pre-drilled and pre-tapped panels.

Coil Voltage Codes

Voltage		Code	Price Adder
60 Hz	50 Hz		
24*		V01	No Charge
120	110	V02	No Charge
208		V08	No Charge
240	220	V03	No Charge
277		V04	No Charge
480	440	V09	No Charge
Specify	Specify	V25	\$23.70

480V coil →

* 24 volt coils are not available for 200 A devices. Contact your nearest Square D/Schneider Electric sales office for additional information.

D8903-SQH63-V06

For additional information, reference Catalog #8903CT9701.

14-72

CP1 Discount Schedule

© 2003 Schneider Electric
 All Rights Reserved
 9/8/03

SPECIALTY STRUT

LEGEND:

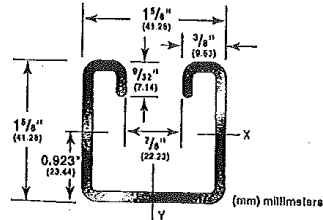
OR: Powder Coated Supr-Green PG: Pre-Galvanized AL: Aluminum HG: Hot Dipped Galvanized PL: Plain SS: Stainless Steel ZTC: Zinc Trivalent Chromium

AS 200 SS

1⁵/₈" x 1⁵/₈"

12 Gauge Channel — wt./100 ft. - 194#

Stocked in 304 Stainless Steel,



PROPERTIES OF SECTION

	Wt./ft.		Area of Section		X-X Axis						Y-Y Axis					
	lbs	kg	sq. in.	sq. cm.	I _x	S _x	r _x	I _y	S _y	r _y	I _p	J	r _z	r _z		
AS 200 SS	1.94	0.88	0.544	3.510	0.180	7.492	0.195	3.195	0.575	1.481	0.233	9.698	0.287	4.703	0.655	1.884
AS 200 BTB SS	3.88	1.76	1.088	7.019	0.896	37.294	0.570	9.341	0.908	2.306	0.468	19.396	0.574	9.406	0.655	1.884

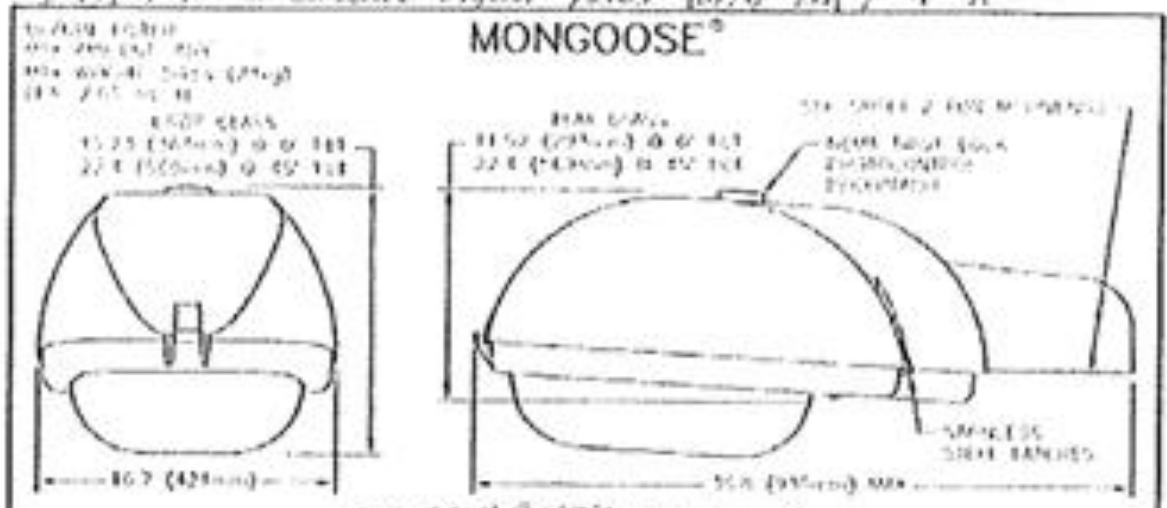
I = Moment of Inertia S = Section Modulus r = Radius of Gyration

AS 200 SS BEAM AND COLUMN LOADS

Span or Column in. / mm	Anvil-Strut™ Catalog #	Max Load of Column Loaded @ C.G.		Static Beam Load (X-X Axis)							
				Allowable Uniform Load @ 25,000 PSI (1758 Kg/cm ²)		Deflection @ 25,000 PSI (1758 Kg/cm ²)		Uniform Load @ 1/240		Uniform Load @ 1/360	
lbs	kg	lbs	kg	lbs	kg	in.	mm	lbs	kg	lbs	kg
12 305	AS 200 SS	7,109	3,225	3,249	1,474	0.014	0.356	**	**	**	**
	AS 200 BTB SS	14,862	6,741	2,610	1,184	0.008	0.203	**	**	**	**
18 457	AS 200 SS	6,549	2,971	2,160	982	0.031	0.787	**	**	**	**
	AS 200 BTB SS	14,402	6,533	2,610	1,184	0.018	0.457	**	**	**	**
24 610	AS 200 SS	5,938	2,693	1,625	737	0.055	1.397	**	**	**	**
	AS 200 BTB SS	13,919	6,314	2,610	1,184	0.032	0.813	**	**	**	**
30 762	AS 200 SS	5,337	2,421	1,300	590	0.086	2.184	**	**	1,257	570
	AS 200 BTB SS	13,473	6,111	2,610	1,184	0.050	1.270	**	**	**	**
36 914	AS 200 SS	4,771	2,164	1,083	481	0.124	3.150	**	**	873	396
	AS 200 BTB SS	13,090	5,938	2,610	1,184	0.072	1.829	**	**	**	**
42 1,067	AS 200 SS	4,242	1,924	928	421	0.169	4.293	**	**	641	291
	AS 200 BTB SS	12,771	5,793	2,610	1,184	0.099	2.515	**	**	**	**
48 1,219	AS 200 SS	3,745	1,699	812	368	0.220	5.588	737	334	491	223
	AS 200 BTB SS	12,511	5,675	1,374	623	0.129	3.277	**	**	**	**
60 1,524	AS 200 SS	3,012	1,366	650	295	0.344	8.738	471	214	314	142
	AS 200 BTB SS	11,685	5,300	1,899	861	0.202	5.131	**	**	1,566	710
72 1,829	AS 200 SS	2,514	1,140	542	245	0.496	12.598	327	148	218	99
	AS 200 BTB SS	10,078	4,571	1,582	718	0.291	7.391	**	**	1,087	493
84 2,134	AS 200 SS	2,136	969	464	210	0.675	17.145	240	109	160	73
	AS 200 BTB SS	8,180	3,710	1,358	615	0.398	10.058	1,199	544	799	362
96 2,438	AS 200 SS	1,834	832	408	184	0.882	22.403	184	83	123	56
	AS 200 BTB SS	6,291	2,854	1,187	538	0.517	13.132	917	416	611	277
108 2,743	AS 200 SS	1,585	719	361	164	1.116	28.346	145	66	97	44
	AS 200 BTB SS	4,971	2,255	1,055	479	0.655	16.657	725	329	483	219
120 3,048	AS 200 SS	*	*	325	147	1.378	35.001	117	53	78	35
	AS 200 BTB SS	4,026	1,826	949	430	0.808	20.523	587	266	391	177
180 4,572	AS 200 SS	*	*	217	98	3.099	78.715	52	24	35	16
	AS 200 BTB SS	*	*	633	287	1.819	46.203	261	118	174	79
240 6,096	AS 200 SS	*	*	163	74	5.510	139.954	29	13	19	9
	AS 200 BTB SS	*	*	474	215	3.233	82.118	147	67	98	44

For Beam and Column Loading Data and load reduction information for channel with holes and concentrated loads, see notes on page 17.

Installed on Cascade Signal Plate with Bk 7-1 X



G250HPMTLEFGP
CATALOG NUMBER

SOURCE AND WATTAGE

<input type="checkbox"/>	100HP	100W E15
<input type="checkbox"/>	150HP	150W E15
<input type="checkbox"/>	250HP	250W E14
<input type="checkbox"/>	400HP	400W E15
<input type="checkbox"/>	175MH	175W E14
<input type="checkbox"/>	250MH	250W E14
<input type="checkbox"/>	400MH	400W E14

VOLTAGE

<input type="checkbox"/>	12	120V
<input type="checkbox"/>	20	200V
<input type="checkbox"/>	24	240V
<input type="checkbox"/>	27	270V
<input type="checkbox"/>	48	480V
<input type="checkbox"/>	34	347V

MOUNTING

<input type="checkbox"/>	MT	MOUNTING FOR 200, 240 & 270V
<input type="checkbox"/>	MA	MOUNTING FOR WIRE TO 120V
<input type="checkbox"/>	MB	MOUNTING FOR WIRE TO 200V
<input type="checkbox"/>	MC	MOUNTING FOR WIRE TO 240V
<input type="checkbox"/>	MD	MOUNTING FOR WIRE TO 270V
<input type="checkbox"/>	VT	MOUNTING FOR 120, 270 & 250V 250W, 400W, 250MH, 400MH ONLY

FINISH

<input type="checkbox"/>	L	LOW REF. 100%
<input type="checkbox"/>	H	HIGH REF. 27% 80%

- OPTICS**
- DC REFLECT FORWARD, CLEAR BOMB GLASS, (H) 100 ONLY
 - DR REFLECT FORWARD, GLASS REFLECTOR, (H) 100 ONLY
 - FC FORWARD BOMB, CLEAR BOMB GLASS, (H) 100 ONLY
 - FE FORWARD BOMB, BOMB GLASS, (H) 100 ONLY
 - NC FORWARD BOMB, CLEAR BOMB GLASS
 - ND FORWARD BOMB, (H) 100 ONLY
 - NF FORWARD BOMB, FINE BOMB, (H) 100 ONLY
 - NR FORWARD BOMB, GLASS REFLECTOR
 - SC SQUARE, CLEAR BOMB GLASS, (H) 100 ONLY
 - SF SQUARE, BOMB GLASS, (H) 100 ONLY
 - WC WIDE FORWARD, CLEAR BOMB GLASS
 - WD WIDE FORWARD, (H) 100 ONLY
 - WT WIDE FORWARD, FINE BOMB, (H) 100 ONLY
 - WR WIDE FORWARD, GLASS REFLECTOR

- MOUNTING**
- A ANGLE-ADJUSTABLE
 - H HORIZONTAL
 - V VERTICAL

- FINISH**
- C COOL
 - K BLACK
 - N GREEN
 - W WHITE
 - Z ZINC

- OPTIONS**
- B TERMINAL BLOCK & NEMA LOCK (NEMA WITH OPTION C)
 - C NEMA LOCK (NEMA WITH OPTION B)
 - P FINISHED STAINLESS (400S ONLY)
 - R NEMA RUSH-LOCK PHOTOCHROME FILTRATION
 - T SPACE RESERVATION FOR BRUSH BRASS (MT, MA, MB, MC, MD & VT ACCEPT ONLY)
 - 3 3" TO 2" BEYOND APPROX
 - 6 6" ONLY

- ACCESSORIES**
- F1 100W 10000 (120, 240, 270 & 347V)
 - F2 100W 10000 (240, 240 & 270V)
 - LAMP
 - BK1-S-G 100W/100V 10000 100W/100V
 - BR-1000-XX 3" TO 2" TERMINAL APPROX

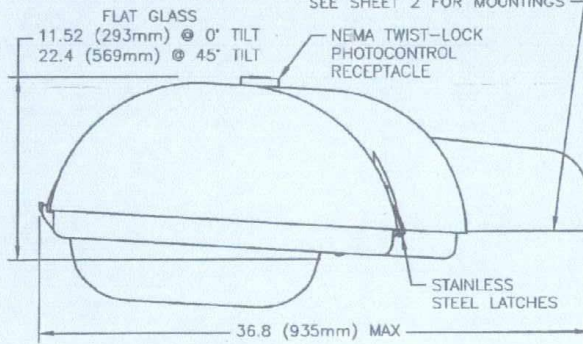
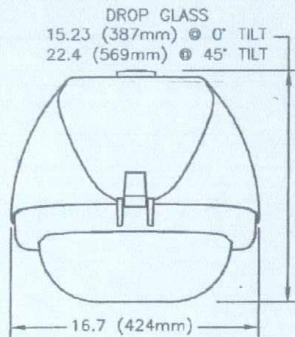


ORDER NO: _____
DATE: _____

DRAWING NO: _____
EPO MODEL: INS20038 DAG
DATE: 9-18-03
Sheet 1 of 2

UL/CUL LISTED
 MAX AMBIENT: 40°C
 MAX WEIGHT: 50lbs (23kg)
 EPA: 2.05 sq. ft.

MONGOOSE®



G 400HP 48 L WF V G P w/LAMP

CATALOG NUMBER

SOURCE AND WATTAGE

- 100HP 100W HPS
- 15AHP 150W HPS
- 250HP 250W HPS
- 25LHP 250W HPS
- 400HP 400W HPS
- 40LHP 400W HPS
- 175MH 175W MH
- 250MH 250W MH
- 25LMH 250W MH
- 400MH 400W MH
- 40LMH 400W MH

VOLTAGE

- 12 120V
- 20 208V
- 24 240V
- 27 277V
- 48 480V
- 34 347V
- MT MULTIVOLT 120,208,240,277V
- MA MULTIVOLT PRE-WIRED (120V)
- MB MULTIVOLT PRE-WIRED (208V)
- MC MULTIVOLT PRE-WIRED (240V)
- MD MULTIVOLT PRE-WIRED (277V)
- VT MULTIVOLT 120, 277, 347V

TILT RANGE

- L LOW TILT, 0°-18°
- H HIGH TILT, 27°-45°

OPTICS

- DC MEDIUM ROADWAY, CLEAR DROP GLASS
- DR MEDIUM ROADWAY, GLASS REFRACTOR
- FC FORWARD THROW, CLEAR DROP GLASS
- FF FORWARD THROW, FLAT GLASS
- NC NARROW ROADWAY, CLEAR DROP GLASS
- ND NARROW FLOOD
- NF NARROW ROADWAY, FLAT GLASS
- NR NARROW ROADWAY, GLASS REFRACTOR
- SC SQUARE, CLEAR DROP GLASS
- SF SQUARE, FLAT GLASS
- WC WIDE ROADWAY, CLEAR DROP GLASS
- WD WIDE FLOOD
- WF WIDE ROADWAY, FLAT GLASS
- WR WIDE ROADWAY, GLASS REFRACTOR

MOUNTING

- A ARCHITECTURAL
- H HORIZONTAL
- V VERTICAL

FINISH

- G GRAY
- K BLACK
- N GREEN
- W WHITE
- Z BRONZE

OPTIONS

- B TERMINAL BLOCK & NEMA DECAL
- C NEMA DECAL
- P PROTECTED STARTER
- R NEMA TWIST-LOCK PHOTOCONTROL RECEPTACLE
- T SPADE TERMINATION FOR BALLAST LEADS
- 3 3" TO 2" TENON ADAPTER
- 6 6' PIGTAIL

ACCESSORIES

- F1 SINGLE FUSING (120, 240, 277 & 347V)
- F2 DOUBLE FUSING (208, 240 & 480V)
- LAMP
- BKT-5-G GALVANIZED WOOD POLE BRACKET
- BR-1091-XX 3" TO 2" TENON ADAPTER



ORDER NO: _____

TYPE: _____

DRAWING NO. _____

CAD MODEL: MONGOOSE.DWG

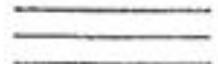
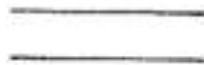
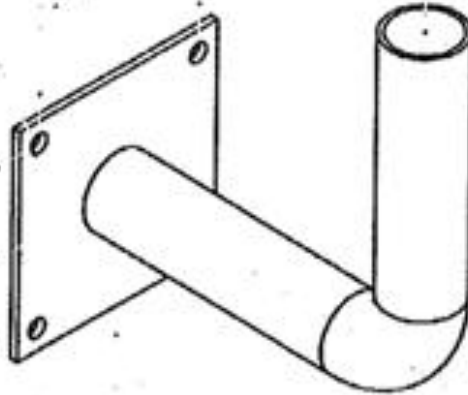
DATE: 12-09-05

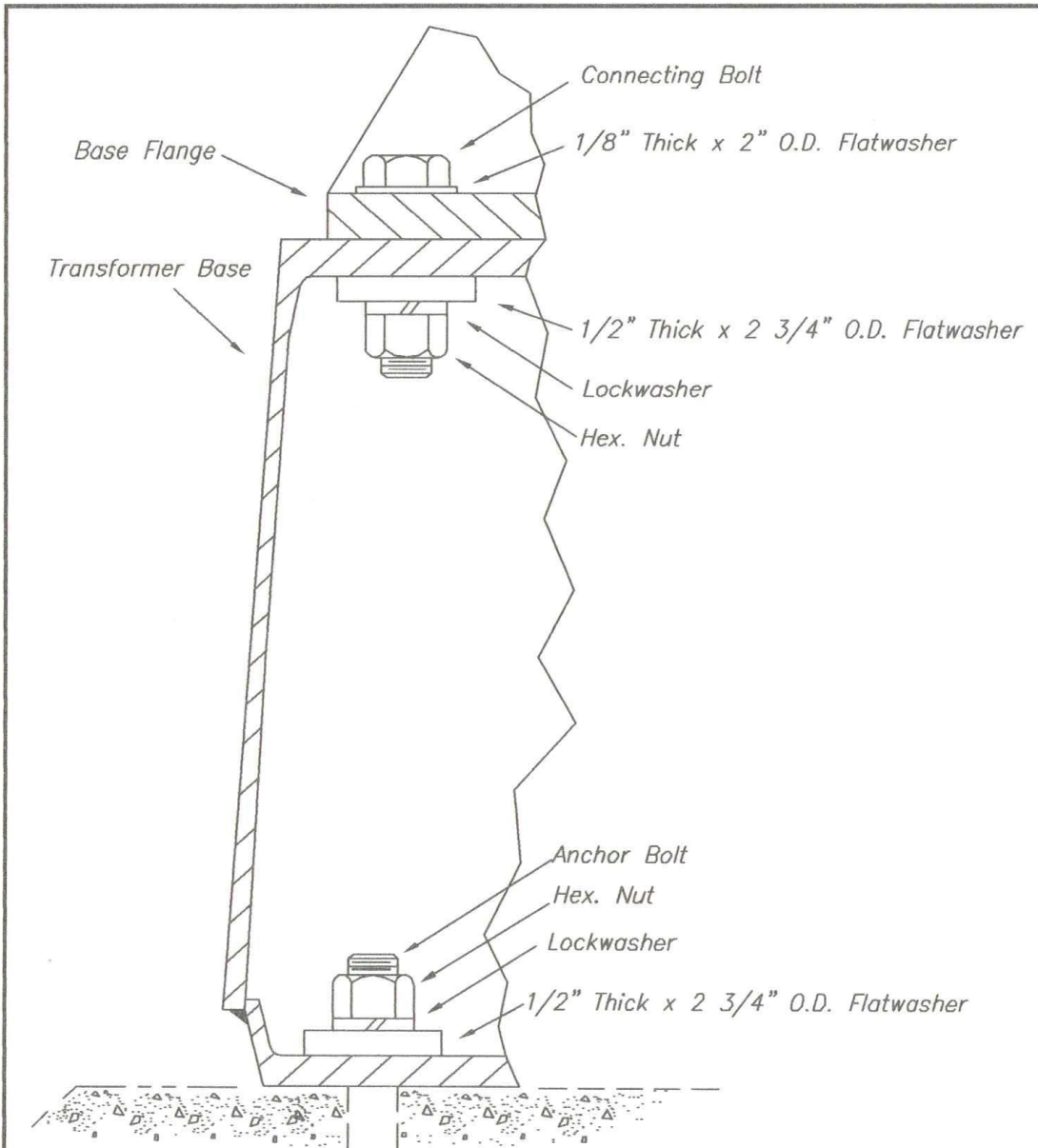
Sheet 1 of 2

©2002 ACUITY LIGHTING GROUP INC., 214 OAKWOOD AVE., NEWARK, OH 43055

WALL BRACKET
BKT-1-X

OPTIONAL FINISHES
X G = GALVANIZED





NO.	REVISIONS	DATE	TITLE
			ASSEMBLY INSTRUCTIONS
			CUSTOMER
			SCALE 2.66 DATE 04/01/1992
			BY LW DWG. NO.
			A72128
			CHK'D

hapco
 Abingdon, Va.

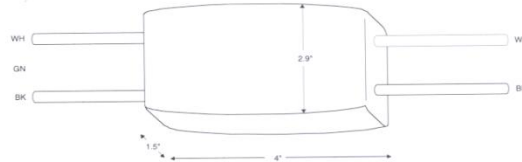
SHA Series

Highway Lighting 120-240-480VAC



MODELS

- SHA-1203
- SHA-2403
- SHA-4803
- SHA-2773*



FEATURES

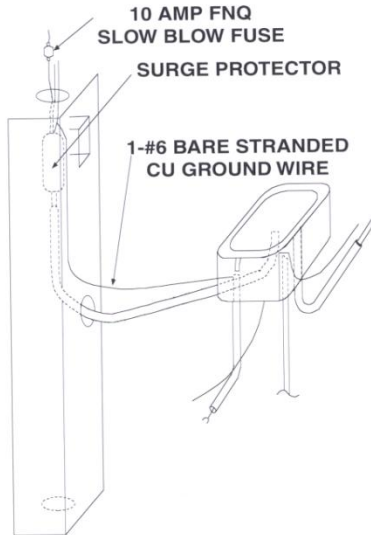
- Weatherproof
- No Follow Current
- Line-to-Ground Protection
- Neutral-to-Ground Protection
- Solid State Design

SPECIFICATIONS

	SHA 1203	SHA 2403	SHA 4803
Peak Surge Current	20kA	20kA	20kA
8x20 μ s (two times)			
Surge Life @ 200 amps	10k	10k	10k
Response Time (nanoseconds)	50	50	50
Clamp Voltage: @ 1ma	240	430	1050
@ 200 amps	425	760	1100
Max. Allowable Voltage (AC RMS)	150	275	550
Current Drain (microamps)	100	100	100
Insulation to Ground (volts)	>600	>600	>600
Used On	120VAC	240VAC	480VAC

*SHA 2773 Available upon request

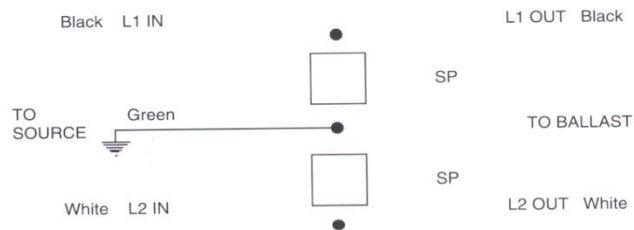
TYPICAL WIRING DETAIL



MOUNTING - SUPPORTED BY LEADS

LEADS LENGTH	GAUGE	COLOR	CONNECTION
22"	6	Green	Ground
12"	10	Black	L-1 (hot)
12"	10	White	L2 (neutral or hot)

SCHEMATICS



2006_12_07

LCDOT

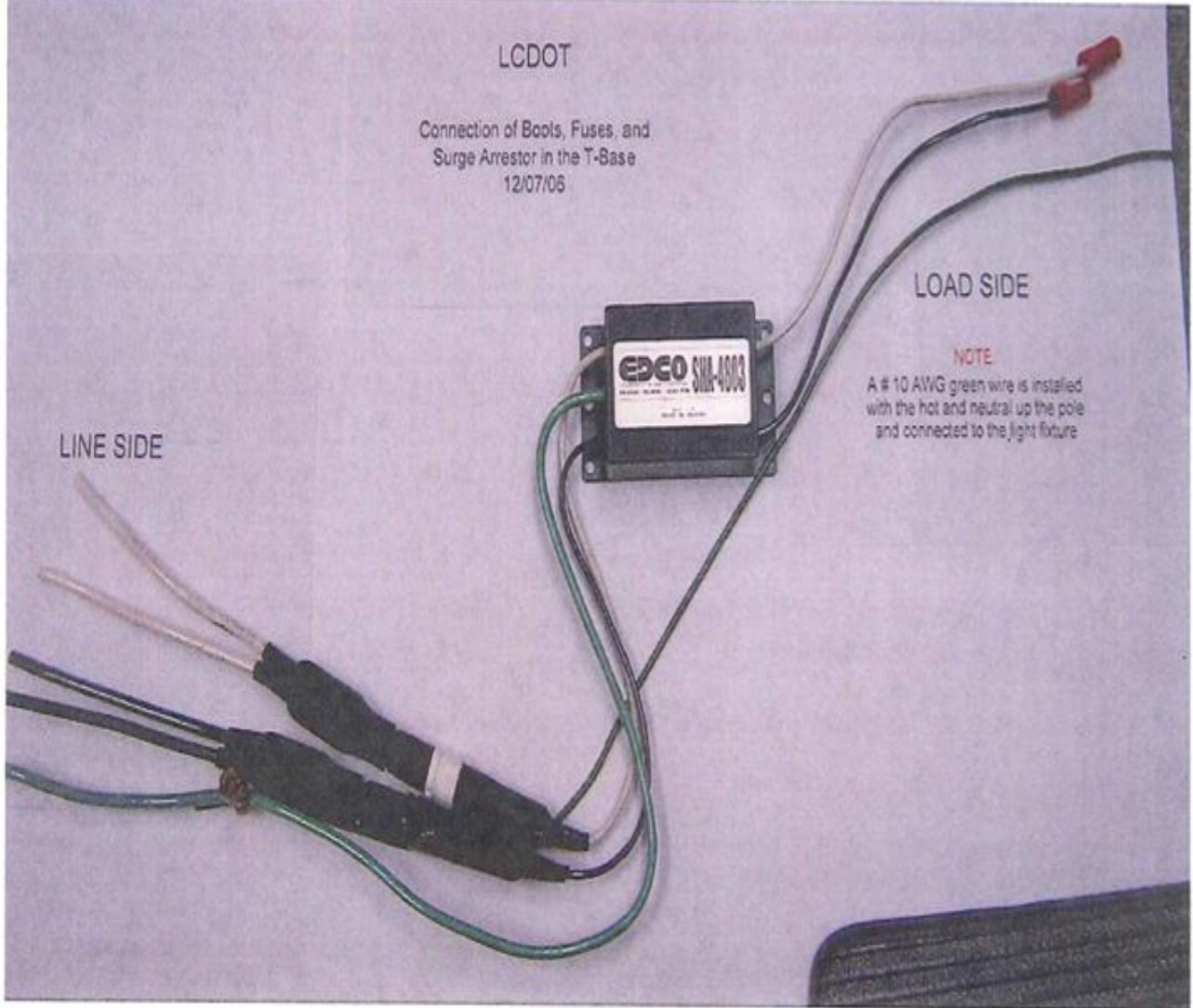
Connection of Boots, Fuses, and
Surge Arrestor in the T-Base
12/07/06

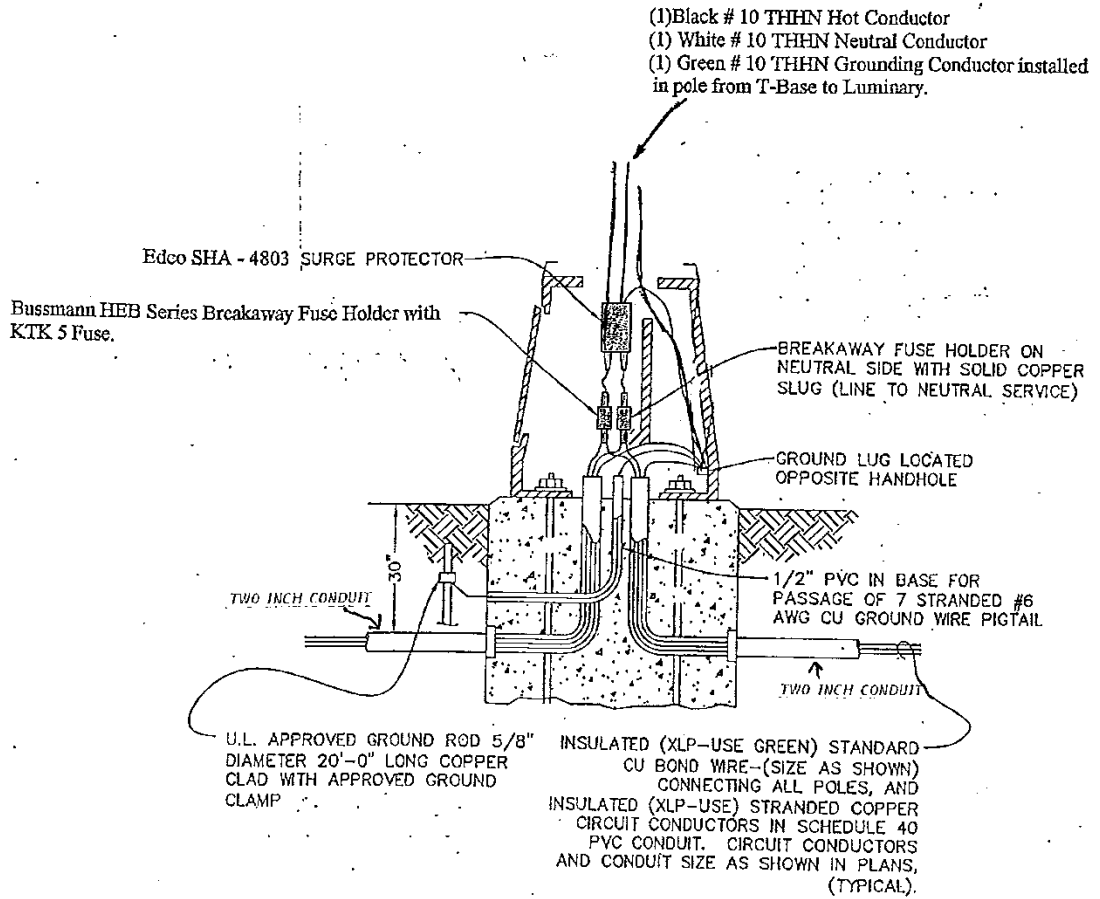
LINE SIDE

LOAD SIDE

NOTE

A # 10 AWG green wire is installed
with the hot and neutral up the pole
and connected to the light fixture





Lee County Aluminum Street Light Pole Wiring Detail

USPA INLINE SPLICE-WTRPRF



- Encapsulated in EPDM rubber with a nominal thickness of 125 Mils and a dielectric strength of 240 Volts per Mil.
- Pre-marked end insert allows broad wire range.
- O-Ring design screw cap inserts.
- Connector is produced from high strength 6061-T6 aluminum alloy.
- For proper installation torques, refer to the stuffer sheet or the recommended torque column below.
- Rated for 600 Volts.
- Dual Rated for Copper and Aluminum Conductor.
- USPA-350SS-DB is UL Listed and CSA Certified for Direct Burial. It is also RUS Listed..
- USPA-750SS-DB is UL Listed and CSA Certified for Direct Burial.
- Connector has solid wire stop.

* Catalog Numbers link to CAD files (if available)

Catalog No.	Fig. No.	Wire Range	Length	Hex Size	Torque (In. Lbs.)	N.A.E.D. No.
USPA-350SS-DB	1	350 MCM-10 STR.	7	5/16	350	78366994110
USPA-500SS-DB	2	500MCM-10 STR.	9-13/16	5/16	450	78366994112
USPA-750SS-DB	3	750MCM-2 STR.	9-13/16	3/8	500	78366994114

Ordering Procedure

Ordering a Tron Fuseholder with or without a break-a-way receptacle requires the specification of an exact identifying catalog number. Although the thousands of possible combinations of terminals makes it impossible to list them, the *Selection Chart* to the right permits the complete catalog number to be easily determined.

To ascertain the make-up of a full catalog number after selection of the desired fuse refer to the Selection Guide and proceed as follows:

- Part 1) Select the type of fuseholder by catalog designation which mounts the fuse.
- Part 2) Select the load-side terminal by catalog designation.
- Part 3) Select the line-side terminal (always "W" if to be mated with a break-a-way receptacle) by catalog designation.
- Part 4) Select break-a-way receptacle (if this option is elected) by catalog designation.

Catalog Numbering System—Typical Examples ("HEB-AB" And "HEB-AW-RLC-C")

Fuseholder Without Break-A-Way Receptacle

Fuseholder Proper (1)	Conductor Terminals		Break-A-Way Receptacle (4)
	Load Side (2)	Line Side (3)	
HEB-	A	B	—
Single Pole For 1/2" x 1 1/2" Fuse	Copper Crimp; Single #10 Wire (Solid)	Copper Crimp; Single #4 Wire (Solid)	None

Fuseholder With Break-A-Way

Fuseholder Proper (1)	Conductor Terminals		Break-A-Way Receptacle (4)
	Load Side (2)	Line Side (3)	
HEB-	A	W	-RLC-C
Single Pole For 1/2" x 1 1/2" Fuse	Copper Crimp; Single #10 Wire (Solid)	Solid Terminal For Break-A-Way Receptacle	Copper Crimp; Single #4 Wire (Solid)

As shown in the typical examples above, the complete catalog number for a fuseholder *without a break-a-way receptacle* consists of three parts:

- Part 1) The basic designation for the type of fuseholder (i.e., HEB-).
- Part 2) The letter designation for the load-side terminal (i.e., "A").
- Part 3) The letter designation for the line-side terminal (i.e., "B").

The full catalog number for example would thus be **HEB-AB**.

Note: The load-side terminal (i.e., "A") (Part 2 of the catalog number) must always appear before the line-side terminal.

If the fuseholder is to be equipped with a *break-a-way receptacle*, the full catalog number will consist of four parts:

- Part 1) Same as above (i.e., HEB-)
- Part 2) Same as above (i.e., "A")
- Part 3) The line-side terminal must always be "W" (Designates the solid copper rod which fits into the female terminal of the break-a-way receptacle).
- Part 4) The letter designation for the wire or cable terminal (always line-side) of the break-a-way receptacle (i.e., -RLC-C)

Catalog and Specification Data

No. of Poles	Fuse Data			Cat. Symbol (Basic Fuse Holder) (1)	
	Size or Type	Amps	Volta (or less)		
1	1/2" x 1 1/2" (any)	30A (max.)	600V	HEB-	
	Non-fused Permanently Attached Solid Neutral	(30A)	(600V)	HEJ-	
	SC-1/2 to 15	15A	300V	HEG-	
	SC-20	20A	300V	HEH-	
	SC-30	30A	300V	HEC-	
	SC-35 to 60	35A-60A	300V	HEJ-	
	HVW-1/2 to 8	1/2A-8A	1200V		
	1/2" x 1 1/2"	30A (max.)	600V	HEX-	
	2	FNQ-R KTK-R (Class CC)	30A (max.)	600V	HEY-

*See back cover for other applicable fuses.

Catalog Data—Insulating Boots







Type	Catalog Number
Single Conductor	1A0512
Two Conductor	1A0513

Note: Must be ordered separately when required for fuseholders without Break-A-Way Receptacles (supplied as standard with Break-A-Way Receptacles).






Tron[®] In-Line Fuseholders

Catalog and Specification Data


Conductor Terminals

Type Terminal	Conductors Size	No. Per Terminal	Solid	Stranded	Cat. Symbol	
					Load Side (2)	Line Side (3)
	#12 to #8	1	✓	✓	A	A
	#12	2	✓	✓		
	#10	2	✓	✓	B	B
	#6	1	✓	✓		
	#4	1	✓	✓		
	#8	2	✓	✓	C	C
	#4	1	✓	✓		
	#6	2	✓	✓	D	D
	#2	1	✓	✓		
	#4	2	✓	✓	E	E
	#12 to #2	1	✓	✓	J	J
	#12 to #2	2	✓	✓	K	K
	#10	1	✓	✓	M	M
	#8	1	✓	✓		
	#8	1	✓	✓	N	N
	#6	1	✓	✓		
	#6	1	✓	✓	P	P
	#4	1	✓	✓		
	#3, #4	1	✓	✓	Q	Q
	#2	1	✓	✓		
	#1, #2	1	✓	✓	R	R
	#1/0	1	✓	✓	T	T
	#2/0	1	✓	✓	V	V
	#12 to #2	1	✓	✓	L	L
	#12 to #2	2	✓	✓	Y	Y
	Solid Break-A-Way					W
(Required with Break-A-Way Receptacle)						

Break-A-Way Receptacles

Type Terminal	Conductor Size	No. Per Terminal	Solid	Stranded	Cat. Symbol (4)	
					Single Pole	Double Pole
	#12 to #8	1	✓	✓	-RLC-A	-DRLC-A
	#6	1	✓	✓	-RLC-B	-DRLC-B
	#4	1	✓	✓	-RLC-C	-DRLC-C
	#12 to #2	1	✓	✓	-RLC-J	-DRLC-J
	#12 to #2	2	✓	✓	-RYC	-DRYC
	#10	1	✓	✓	-RLB-M	-DRLB-M
	#8	1	✓	✓		
	#8	1	✓	✓	-RLB-N	-DRLB-N
	#6	1	✓	✓		
	#6	1	✓	✓	-RLB-P	-DRLB-P
	#4	1	✓	✓		
	#3, #4	1	✓	✓	-RLB-Q	-DRLB-Q
	#2	1	✓	✓		
	#1, #2	1	✓	✓	-RLB-R	-DRLB-R
	#1/0	1	✓	✓	-RLB-T	-DRLB-T
	#2/0	1	✓	✓	-RLB-V	-DRLB-V
	#12 to #2	1	✓	✓	-RLA	-DRLA
	#12 to #2	2	✓	✓	-RYA	-DRYA

*Terminal illustrations show the end views of single pole receptacles and one pole only of the double pole receptacles. Thus, for example, in the case of a double pole, set-screw type receptacle with terminals that accept two conductors, a total of four conductors could be connected to the receptacle per the following drawing.



BUILDING WIRE

FR-XLP VW-1 INSULATION

-Copper Conductor
 -RHW-2 or RHH or USE-2
 -600 Volt UL 90°C



Catalog Number	Size AWG/kcmil	Overall Diameter	No. of Strands	Net Weight lbs/Mft	Insulation Thickness Mils
14-01XLPUSE-2	14	.17	7	22	45
12-01XLPUSE-2	12	.19	7	32	45
10-01XLPUSE-2	10	.21	7	47	45
8-01XLPUSE-2	8	.27	7	71	60
6-01XLPUSE-2	6	.37	7	105	60
4-01XLPUSE-2	4	.38	7	155	60
2-01XLPUSE-2	2	.42	7	240	60
1-01XLPUSE-2	1	.49	19	310	60
1/0-01XLPUSE-2	1/0	.53	19	360	60
2/0-01XLPUSE-2	2/0	.58	19	470	60
3/0-01XLPUSE-2	3/0	.63	19	585	60
4/0-01XLPUSE-2	4/0	.69	19	730	60
250-01XLPUSE-2	250	.76	37	870	95
350-01XLPUSE-2	350	.86	37	1190	95
500-01XLPUSE-2	500	.99	37	1670	95
750-01XLPUSE-2	750	1.20	61	2500	110
1000-01XLPUSE-2	1000	1.35	61	3290	110

Dimensions and weights shown are nominal and are subject to industry tolerances.

Application: For use in harsh environments for general wiring applications for lighting and power in conduits, ducts, cable tray when CT rated, direct burial or other approved race-ways with maximum conductor temperature of 90°C in wet or dry locations. Chemical, gasoline and oil resistant.

Additional Standards: -NEMA WC-70
 -Federal Specification J-C-30B

Conductor: Soft bare annealed copper per ASTM B-3, Class B stranding per ASTM D-8.

Insulation: Flame-retardant cross-linked polyethylene (FR-XLP) per ICEA S-65-656, UL Standard 854 for Type USE-2 and UL Standard 44 for Type RHH and RHW-2, VW-1 conductors.

Flame Test: UL and IEEE 383 70,000 BTU/hr flame test - for CT listed sizes 1/0 AWG and larger. UL VW-1.

USA WIRE AND CABLE, INC.
 CALL 1-800-880-WIRE (9473)

03-Mar-04

Page 3

Buss Fuses for Use With Tron In-Line Holders (See Bulletin SFB)

Application	Fuse Type	Holder	Specifications	Volts (Or Less)	Ampere Ratings
High capacity systems in which short-circuit let-thru currents must be limited for component protection of equipment and conductors	KTK-R	HEY-	Current limiting. Interrupting rating of 200,000A AC. Rejection type, U.L. Listed; Class CC; For branch-circuit protection.	600	1/10, 1/8, 3/10, 1/4, 3/10, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2, 2 1/2, 3, 3 1/2, 4, 5, 6, 7, 8, 9, 10, 12, 15, 20, 25, & 30.
	KTK	HEB- HEX-	Current limiting. Interrupting rating of 100,000A AC. U.L. Listed.		
	SC	HEG- HEH- HEC- HEJ-	Current limiting. Interrupting rating 100,000A AC. U.L. Listed; Class G.	300	1/2, 1, 2, 3, 4, 5, 6, 8, 10, & 15 20 25 & 30 35, 40, 45, 50, & 60
For motor circuits and circuits with mixed loads including motors and controls that draw high starting currents requiring time-delay for the momentary overloads.	FNQ	HEB-	Time-delay type. Dual-element. U.L. Listed (FNQ to 30A; FNM to 15A).	500	1/4, 3/10, 1, 1 1/10, 2, 3 1/10, 3 1/2, 4, 6, 6 1/4, 7, 8, 9, 10, 12, 15, 20, 25, & 30.
	FNM	HEB-	CSA Listed (FNQ to 15A; FNM 12A-15A).	250	1/10, 1 1/100, 2/10, 3/10, 1/2, 3/10, 5/10, 1, 1 1/8, 1 1/4, 1 1/10, 1 1/10, 1 1/10, 2, 2 1/4, 2 1/2, 2 3/10, 3 1/10, 3 1/2, 4, 4 1/2, 5, 5 1/10, 6 1/4, 7, 8, 9, & 10
				125 32	12 & 15 20, 25, & 30
For instrument circuits and apparatus requiring fast-acting fuses and not subject to high surge currents.	BAF	HEB-	Fast-acting, non-time-delay type. U.L. Listed (to 15A).	250	1/2, 1, 1 1/2, 2, 2 1/2, 3, 4, 5, 6, 6 1/4, 7, 8, 9, 10, 12, 15
	AGU	HEB- HEX-	Fast-acting, non-time-delay type. U.L. Listed (to 3A).	250 32	1, 2, & 3 4, 5, 8, 10, 15, 20, 25, & 30
	HVW	HEJ-	Maximum short-circuit KVA-5000.	1200	1/2, 1, 2, 3, 4, 5, & 6.
For lighting applications up to 1200V AC.	BBS	HEH	Non-time-delay type. Type BBS. U.L. Listed (KTU has some time-delay).	600	3/10, 1/2, 3/4, 1/2, 1, 1 1/2, 1 1/10, 1 1/10, 2, 3, 4, & 5
For control, gaseous vapor fixture, and electronic circuits.	KTQ				2, 3, 4, & 5

Crimping Tools for Use With TRON Fuseholders and Break-A-Way Receptacles.

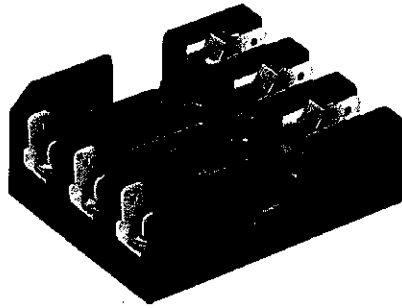
A wide variety of crimping tools can be used with TRON Fuseholders. Some of the tools commercially available are listed in the table below (listing is not intended to exclude the use of other tools which provide similar crimps or indents).

Terminal Size	Crimping Tools T & B	Bundy	Blackburn	Kearney
A	WT-111M	Y14MF		
	Sta-Kon & pliers WT-161			
B	TBM205 (Blue Die)	MR4C		
	TBM5 (Blue Die)	Hypress Y34A (Die N40)		
	Sta-Kon & pliers WT-161 WT-115A (Die O)			
C	TBM205 (Grey Die)	Hypress Y34A (Die N50)		
	TBM5 (Grey Die) WT-115A (Die E)			
D	TBM5 (Brown Die)	Hypress Y34 (Die N100)		
	TBM8 (Brown Die)			
	WT-115A (Die F)			
E	TBM5 (Green Die)	Hypress Y34 (Die N125)		
	TBM8 (Green Die)			
	WT-115A (Die G)			
*M, N, P, Q, R, T, V	TBM8 Die 13462 (Color orange) (2 crimps)	Type "O" Tool MD-6-5/8 Nose Die (3 crimp) Hypress Y35 and Y35L Die U-BG (1 crimp)	Type "O" Tool OD-58-5/8 Nose Die (3 Crimp)	Type "O-60" Mechanical Tool O-62F, 5/8 Nose Die (3 crimps)

*All terminals M to V are standard 3/16" O.D. All tools shown for these terminals apply to the M to V terminals.

Class CC Fuseblocks

■ Class CC ■ U.L. Listed; CSA Certified ■ Thermoplastic base.



600V 1/10 to 30A

Mounting Slots: 1 1/16" (4.4mm) x 7/32" (5.6mm)

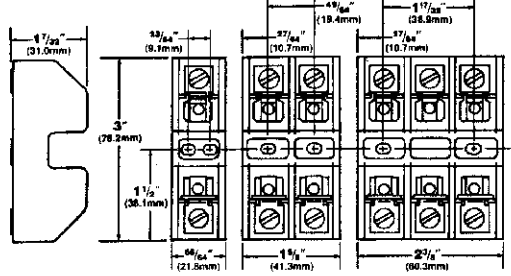
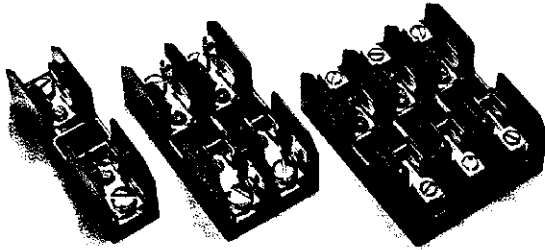


Figure 1. Figure 2. Figure 3.

Buss® Fuse Desig.	Volts	Amps	Poles	Terminal Type				Fig. No.	
				Screw	Screw w/ Quick Connect	Pressure Plate	Pressure Plate w/Quick Connect		Box Lug
KTK-R, FNG-R	600	1/10 to 30	1	BC6031S	BC6031SQ	BC6031P	BC6031PQ	BC6031B	1
			2	BC6032S	BC6032SQ	BC6032P	BC6032PQ	BC6032B	2
			3	BC6033S	BC6033SQ	BC6033P	BC6033PQ	BC6033B	3

Supplementary Fuseblocks (Type M)

■ U.L. Component Recognized; CSA Certified ■ Thermoplastic base.



Mounting Slots: 1 1/16" (4.4mm) x 7/32" (5.6mm)

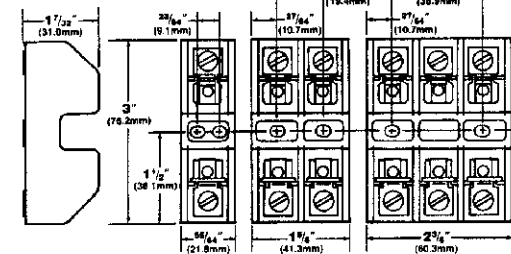
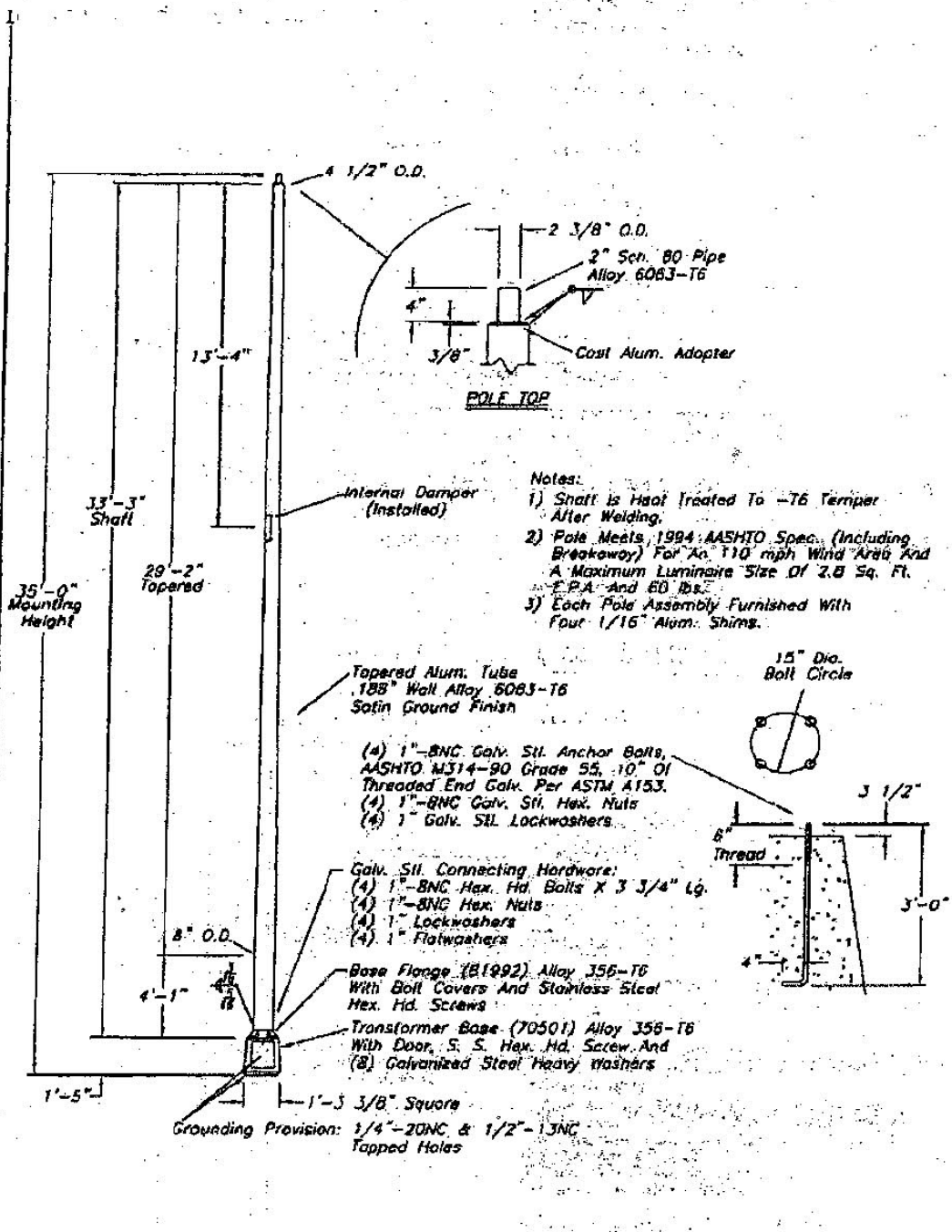


Figure 1. Figure 2. Figure 3.

Buss® Fuse Desig.	Volts	Amps	Poles	Terminal Type			Fig. No.
				Screw With Quick Connect	Pressure Plate w/Quick Connect	Box Lug	
KTK, KLM, FNM, FNG, BAF, BAN	600	1/10 to 30	1	BM6031SQ	BM6031PQ	BM6031B	1
			2	BM6032SQ	BM6032PQ	BM6032B	2
			3	BM6033SQ	BM6033PQ	BM6033B	3



- Notes:
- 1) Shaft is Heat Treated To -T6 Temper After Welding.
 - 2) Pole Meets 1994 AASHTO Spec. (Including Breakaway) For An 110 mph Wind Area And A Maximum Luminaire Size Of 2.8 Sq. Ft. E.P.A. And 60 lbs.
 - 3) Each Pole Assembly Furnished With Four 1/16" Alum. Shims.

Tapered Alum. Tube
 108" Wall Alloy 6063-T6
 Satin Ground Finish

- (4) 1"-BNC Galv. Stl. Anchor Bolts, AASHTO M314-90 Grade 55, 10" Of Threaded End Galv. Per ASTM A153.
- (4) 1"-BNC Galv. Stl. Hex. Nuts
- (4) 1" Galv. Stl. Lockwashers.

- Galv. Stl. Connecting Hardware:
- (4) 1"-BNC Hex. Hd. Bolts X 3 3/4" Lg.
 - (4) 1"-BNC Hex. Nuts
 - (4) 1" Lockwashers
 - (4) 1" Flatwashers

Base Flange (B1992) Alloy 356-T6
 With Bolt Covers And Stainless Steel Hex. Hd. Screws

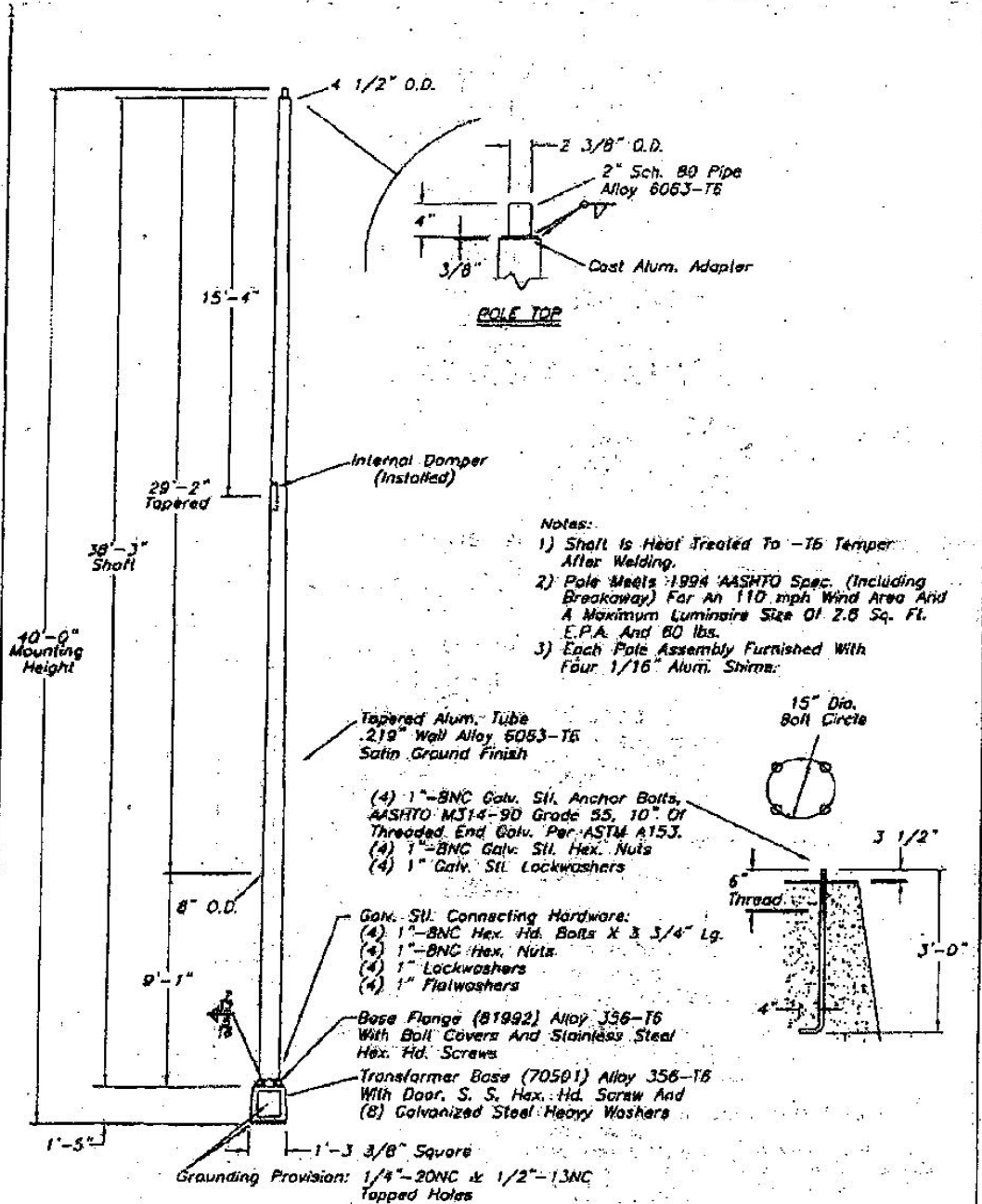
Transformer Base (70501) Alloy 356-T6
 With Door, S. S. Hex. Hd. Screw And
 (8) Galvanized Steel Heavy Washers

Grounding Provision: 1/4"-ZINC & 1/2"-13NC Tapped Holes

REVISIONS		DATE	WARNING: DO NOT INSTALL LIGHTING POLES WITHOUT LUMINAIRES	
NO.			TITLE 35' LIGHTING POLE	
			CUSTOMER FLORIDA DOT	
			SCALE 40	DATE 04/14/2004
			BY PS	DWG. NO.
			DWG.	B85105

hapco

Abingdon, Va.



B85106

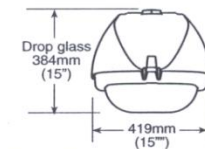
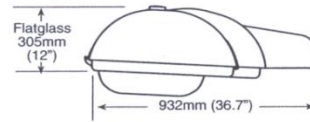
WARNING: DO NOT INSTALL LIGHTING POLES WITHOUT LUMINAIRES	
hapco	
Abingdon, Va.	
TITLE 40' LIGHTING POLE	
CUSTOMER FLORIDA DOT	
SCALE 40	DATE 04/14/2004
BY PS	DWG. NO.
CHK'D	B85106

MONGOOSE®

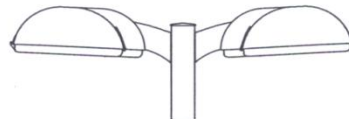
How to construct a catalog number for Mongoose® luminaire: Fixture type _____

EXAMPLE: G — 400HP — 24 — L — NC — V — Z — B
1 2 3 4 5 6 7 8

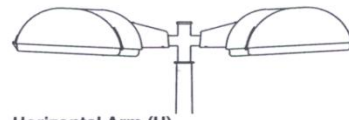
Catalog no.	Description
1	Luminaire type
___ G	Mongoose
2	Source and wattage
___ 100HP	100W HPS, mogul base
___ 15AHP	150W/55 volt, HPS, mogul base
___ 250HP	250W HPS, mogul base
___ 400HP	400W HPS, mogul base
___ 175MH	175W Metal halide, mogul base
___ 250MH	250W Metal halide, mogul base
___ 400MH	400W Metal halide, mogul base
___ 750MH	750W Metal halide, mogul base (Available through TSG with MM optics using compact lamps only)
3	Voltage
___ 12	120 volt
___ 20	208 volt
___ 24	240 volt
___ 27	277 volt
___ 34	347 volt
___ 48	480 volt
___ 08	208 volt, isolated secondary (Available through TSG)
___ 40	240 volt, isolated secondary (Available through TSG)
___ MT	Multi-volt (120, 208, 240, 277 volt)
___ MA	Multi-volt. Wired to 120V tap.
___ MB	Multi-volt. Wired to 208V tap.
___ MC	Multi-volt. Wired to 240V tap.
___ MD	Multi-volt. Wired to 277V tap.
___ VT	Vari-tap (120, 277, 347V); With 250HP, 400HP, 250MH & 400MH only
4	Tilt range
___ L	Low tilt, 0° to 18°
___ H	High tilt, 27° to 45°
5	Optics
___ DC	Medium roadway, clear drop glass (Available with "H" tilt range only)
___ DR	Medium roadway, prismatic refractor (Available with "H" tilt range only)
___ FC	Forward throw, clear drop glass (400W MH requires compact lamp); Available with "L" low tilt range only.
___ FF	Forward throw, flat glass (400W MH requires compact lamp); (Available with "L" low tilt range only.)
___ NC	Narrow roadway, clear drop glass (Low tilt comes with shallow glass optic)
___ NF	Narrow roadway, flat glass (Available with "L" low tilt range only)
___ NR	Narrow roadway, prismatic refractor
___ ND	Narrow flood (Available with "H" high tilt tange only)
___ WD	Wide flood (Available with "H" high tilt tange only)
___ SC	Square distribution, clear drop glass (Available with "L" low tilt range only)
___ SF	Square distribution, flat glass (175W, 250W & 400W MH); 400W MH requires compact lamp. (Available with "L" low tilt range only.)
___ WC	Wide roadway, clear drop glass (Low tilt comes with shallow glass optic)
___ WF	Wide roadway, flat glass (Available with "L" low tilt range Only)
___ WR	Wide roadway, prismatic refractor



Vertical Tenon (V)



Architectural Arm (A)



Horizontal Arm (H)



Yoke Mount (T)

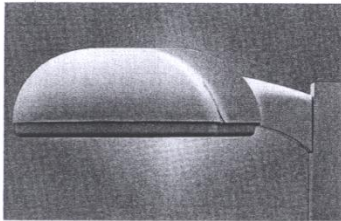
Ordering Data

HOLOPHANE®

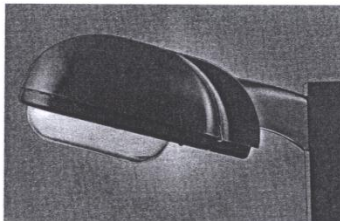
Ordering Data

Catalog no.	Description
6	Mounting
— A	Architectural arm
— H	Horizontal arm
— T	Yoke mount (Available through TSG)
— V	Vertical tenon
7	Finish
— G	Gray
— K	Black
— N	Green
— W	White
— Z	Bronze
8	Options
— B	Terminal block and NEMA decal (Not available with Option C)
— C	NEMA decal (Not available with Option B)
— P	Protected starter (HPS only)
— R	NEMA twistlock photocontrol receptacle
— T	Spade termination for ballast leads (Available with MT, MA, MB, MC, MD and VT ballasts only)
— 3'	3" tenon adapter (Available with "V" mounting only)
— 6	6' pigtail
Accessories	
— F1	Single fuse kit (Available with 12, 24, 27, and 34V units)
— F2	Double fuse kit (Available with 20, 24, and 48V units); NA with 08 and 40V
— Lamp	Ship appropriate lamp as line item
— BKT-5-G	Galvanized wood pole bracket
— BR-1091-XX	3" to 2" tenon adapter bracket

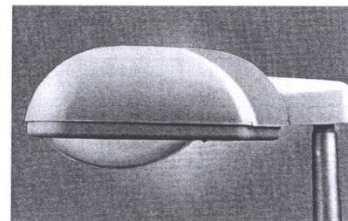
- Notes:**
- 1 Adapter will be painted same color as fixture finish in Step 6.
 - 2 Insert GR-Gray, BK-Black, GN-Green, WH-White, BZ-Bronze for "XX" in catalog number.



Flat glass



Clear drop glass (regular)



Clear drop glass (shallow glass optics)
Standard with low tilt NC and WC optics

MONGOOSE[®]

HOLOPHANE[®]

MONGOOSE®

Photometric test number, IES distribution type, and cutoff classification

Watts/ Lamp	Narrow Roadway			Medium Roadway			Wide Roadway			Extra Wide Roadway	
	Flat Glass	Clear Drop	Prismatic Refractor	Flat Glass	Clear Drop	Prismatic Refractor	Flat Glass	Clear Drop	Prismatic Refractor	Flat Glass	Clear Drop
100 HPS	49293 I,FC	51853 II,C	49498 I,C				49416 III,FC	51851 III,C	49499 II,C		
150 HPS	49274 I,FC	51850 I,C	49506 I,C	51904 III,FC	51903 III,C		49419 III,FC	51854 III,C	49513 II,C	51889 IV,FC	51895 IV,C
175 MH	49488 I,FC	51876 I,C	49518 I,C	51880 II,FC	51879 II,C		49449 II,FC	51875 II,C			51894 IV,NC
250 HPS	49260 II,FC	51562 II,C	49527 II,C	51901 III,FC	51900 III,C	49524 II,C	49395 III,FC	51844 III,C		51890 IV,FC	51891 IV,SC
250 MH	49296 I,FC	51868 II,C		51905 III,FC	51906 III,C					51898 IV,FC	51893 IV,SC
400 MH COMPACT										51896 IV,FC	51892 IV,NC
400 HPS	49257 II,FC	51561 II,C	49482 II,C	51902 III,FC	50347 III,NC	50346 III,NC	49396 III,FC	51843 III,C	49484 II,C	51888 IV,FC	51887 IV,SC
400 MH	50281 II,FC	52307 II,C	50278 II,C				50276 II,FC	49624 III,C	50279 II,C		

* IES Distribution: FC = Full Cutoff; C = Cutoff; SC = Semi-Cutoff; NC = Non Cutoff
All lamps are clear

Photometric test number, IES distribution type, and cutoff classification

Watts/ Lamp	Forward Throw		Offset - Narrow*		Offset - Wide*		Square	
	Flat Glass	Clear Drop	Clear Drop	Prismatic Refractor	Clear Drop	Prismatic Refractor	Flat Glass	Clear Drop
150 HPS	51431 IV,FC	51444 IV,NC	49739 IV,NC	49738 IV,NC	49922 IV,NC	49923 IV,NC		51151 IV,SC
175 MH	51449 IV,FC	51443 IV,NC	49747 III,NC	49745 IV,NC	49983 IV,NC	49984 IV,NC	51048 III,FC	51039 IV,NC
250 HPS	51437 IV,FC	51440 IV,SC	49736 III,NC	49734 III,NC	49986 IV,NC	49985 III,NC		51135 IV,SC
250 MH	51452 IV,FC	51442 IV,NC	49757 II,C	49758 IV,NC	50000 IV,NC	49999 IV,NC	51046 III,FC	51041 III,SC
400 MH COMPACT	51448 IV,FC	51441 IV,NC					51055 III,FC	51037 III,NC
400 HPS	51419 IV,FC	51417 IV,SC	49730 III,C	49732 III,NC	49899 IV,NC	49900 IV,NC		51132 IV,SC
400 MH	51034 IV,FC	51028 IV,C	49291 II,NC	49530 II,NC	49982 III,NC	49981 III,NC		51031 IV,NC

IES Distribution: FC = Full Cutoff; C = Cutoff; SC = Semi-Cutoff; NC = Non Cutoff

* All units tested at 0° tilt except offset types
All lamps are clear

Example: IV, FC = IES Type IV, Full Cutoff

Photometric Test Matrix

HOLOPHANE®



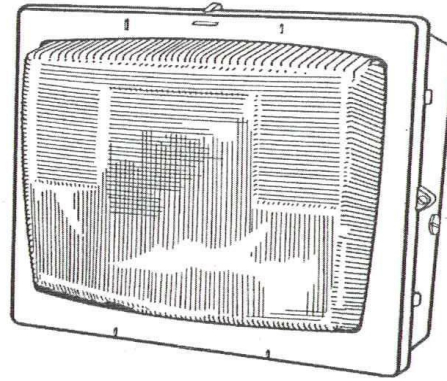
WALLIGHTER 400 LUMINAIRE

APPLICATIONS

Underpasses, loading docks, building perimeter security or other applications where a high wattage building mounted luminaire is needed. Also may be mounted horizontally for signs and building facades.

SPECIFICATION FEATURES

- UL1572 Listed SUITABLE FOR WET LOCATIONS
- Standard construction is IP55
- Sealed and charcoal filtered optical assembly
- Die-cast aluminum back ballast housing protected inside and out with dark bronze electrocoat paint finish
- ALGLAS® finish on aluminum reflector
- Heat resistant prismatic glass refractor
- Pre-wired terminal board and integral ballast
- 3/4-inch NPT conduit entrances sides and top
- Photoelectric receptacle available
- Optional 1.25-inch (32mm) pipe mounting
- Mogul base socket



ORDERING NUMBER LOGIC



PRODUCT ID. XXXX	WATTAGE XX	LIGHT SOURCE X	VOLTAGE X	BALLAST TYPE X	PE FUNCTION X	IES DISTRIBUTION TYPE X X X	COLOR XX	OPTIONS XXX
W40L = Wallighter 400	15 = 150 (55V) 17 = 175 20 = 200 25 = 250 40 = 400	S = HPS M = MH C = Merc Standard: Lamp not included	0 = 120/208/ 240/277 Multivolt 1 = 120 2 = 208 3 = 240 4 = 277 5 = 480 D = 347	See Ballast and Photometric Selection Table A = Autoreg C = Merc-Reg H = HPF Reactor or Lag K = Hot Restart M = Mag-Reg N = NPF Reactor or Lag	1 = None 2 = PE Recep- tacle NOTE: Receptacle connected same voltage as unit. Vertical mounting only. Order PE control separately.	See Ballast and Photometric Selection Table 3 = Type III 4 = Type IV	DB = Dark Bronze	B = Time Delay Automatically Switched Quartz F = Fusing (Not available with multivolt) L = Latch on door Q = Non-Time Delay Automatically Switched Quartz S = Slipfitter (internal 1-1/4 in. [32mm] pipe mounted)

S = Short
N = Non-cutoff

The catalog numbers, options and modifications on this page are UL Listed unless otherwise noted. Data subject to change without notice.

Page 2 5014 Dec. 1995

Summerlin & Gladwin flyovers/overpass
W40L15S0H1SN4DB



MINIMITE® LUMINAIRE

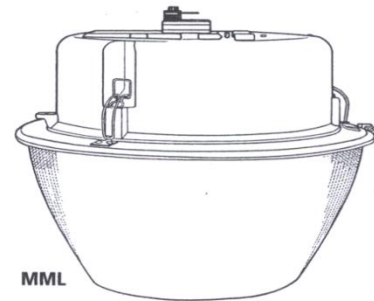
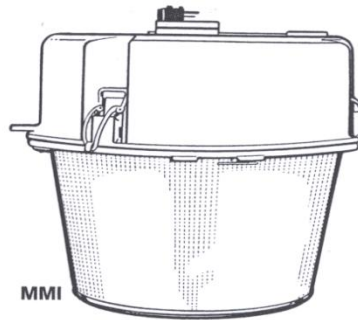
LOW BAY ENCLOSED OR OPEN

APPLICATIONS

Low mounting height 8-20 ft (2-6 meter) applications, parking garages, aisles, entranceways, catwalks, warehouses (low ceilings), other areas with existing incandescent circuits.

SPECIFICATION FEATURES

- UL1572 Listed SUITABLE FOR DAMP LOCATIONS
- Enclosed units UL1572 Listed SUITABLE FOR WET LOCATIONS DEPENDING ON MOUNTING RECEPTACLE USED
- Enclosed units UL1572 Listed for metal halide lamps in polymeric lamp containment barriers
- CSA Certified for indoor locations
- Standard construction is IP52 for enclosed units, IP22 for open
- Precision-designed refractor for low brightness
- Heavy-duty die-cast aluminum ballast housing with electrocoat gray paint finish
- Primary quick disconnect for easy mounting
- Safety chain provisions
- Mogul base socket (medium base socket available in 100 watt metal halide)
- Shipped as components: Ballast, Optical, Mounting Receptacle



ORDERING NUMBER LOGIC

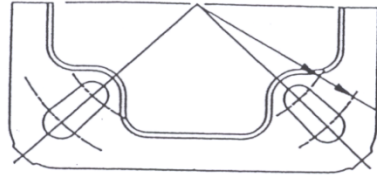


MMI 07 S O H X E5A 2 Q

PRODUCT ID. XXX	WATTAGE XX	LIGHT SOURCE X	VOLTAGE X	BALLAST TYPE X	AMBIENT °C X	OPTICAL REFRACTOR XXX	MOUNTING RECEPTACLE XX	OPTIONS XXX
MMI = Minimite Luminaire MML = Minimite Luminaire with 16 inch (406mm) diameter refractor (acrylic and polycarbonate only)	07 = 70 10 = 100 15 = 150 (55V) 17 = 175 25 = 250	S = HPS M = MH or Merc NOTE: Lamp is vertical base up Standard. Lamp not included.	0 = 120/208/240/277 Multivolt 1 = 120 2 = 208 3 = 240 4 = 277 5 = 480 D = 347 F = 120X347	See Ballast, Optical, Ambient and Photometric Selection Table A = Autoreg C = Merc Reg G = Mag-Reg with grounded socket shell H = HPF Reactor or Lag K = Hot Restart M = Mag-Reg	See Ballast, Optical, Ambient and Photometric Selection Table X = Ambient determined by Optical	See Ballast, Optical, Ambient and Photometric Selection Table E2A = Enclosed Type 2 Acrylic* E5A = Enclosed Type 5 Acrylic* E5G = Enclosed Type 5 Glass. Cannot be used with MML E5L = Enclosed Type 5 polycarbonate* DO NOT USE OPEN REFRACTORS WITH MH V1A = Open Type 1 Acrylic V2A = Open Type 2 Acrylic V5A = Open Type 5 Acrylic	Select from Mounting Receptacle Selection Table Example: 2 = 3/4-in. Pendant Rigid NOTE: For Wet Locations, select mounting receptacle for Wet Locations NOTE: *150W max with MMI 250W max with MML	B = Time Delay Automatically Switched Quartz (Use only with enclosed optics) F = Fusing (Not available with multivolt or 120X347V) Q = Non-Time Delay Automatically Switched Quartz (Use only with enclosed optics.)

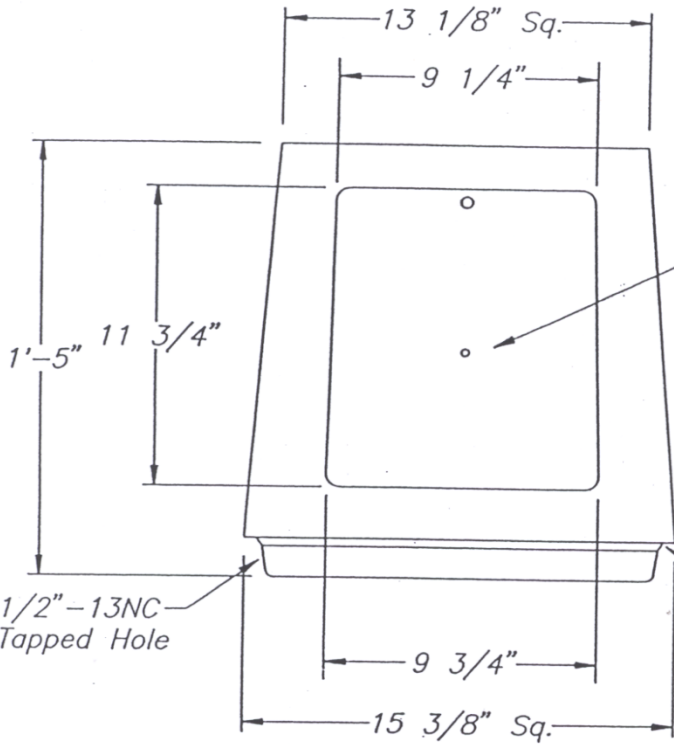
= Most commonly ordered

The catalog numbers, options and modifications on this page are UL Listed unless otherwise noted.
 © Registered Trademark of General Electric Company
 Data subject to change without notice



BASE SUPPLIED WITH:
 (1) Door And 1/4"-20NC S.S. Screw
 (2) Eight 1" Washers 1/2" Thick x 2 3/4" O.D. (Washers Mechanical Galvanized Per ASTM B454)

10 1/2" To 13 1/2" Dia.
 Bolt Circle

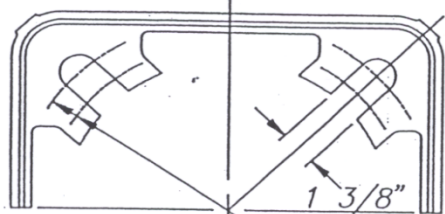


1/4"-20NC Tapped Hole
 (Back Wall)

1/2"-13NC
 Tapped Hole

4043 Weld Wire (Heat
 Treat After Welding)

AKRON FOUNDRY TB1-AF 1315-17 I.W.
 (TB1-17")



13" To 15" Dia.
 Bolt Circle

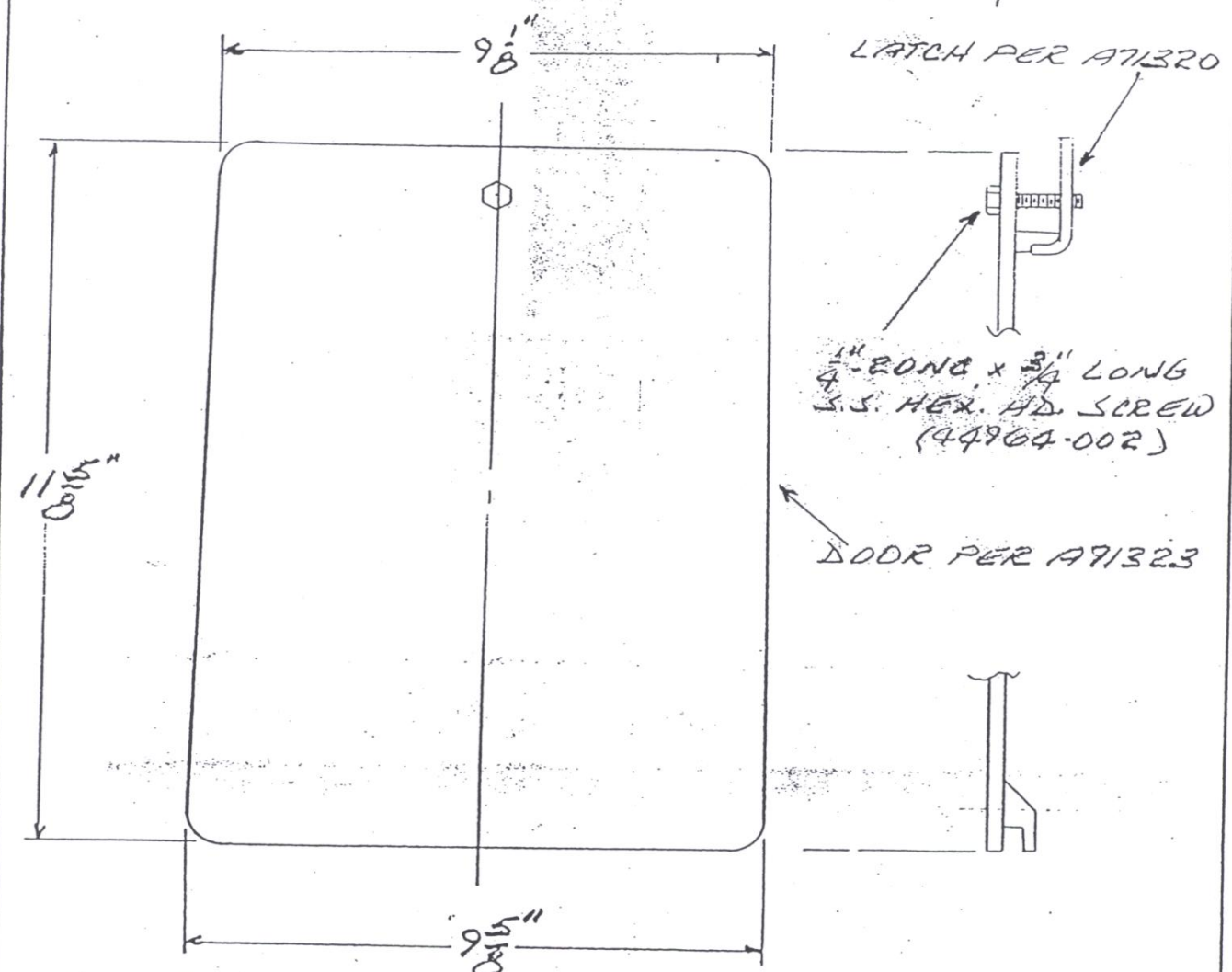
MATERIAL: Alum. Alloy 356-T6

NO.	REVISIONS	DATE	TITLE	
			BREAKAWAY T-BASE	
			CUSTOMER	
			SCALE	DATE 09/15/93
			BY IW	DWG. NO.
			CHK'D	A70501

hapco
 COMPANY DIVISION OF KEARNEY NATIONAL, INC.
 P. O. BOX 247 AKRON, OHIO 44308-0247

C&B Brining, Inc. 79495 Form 9873

PURCHASE FROM ALCON FOUNDRY

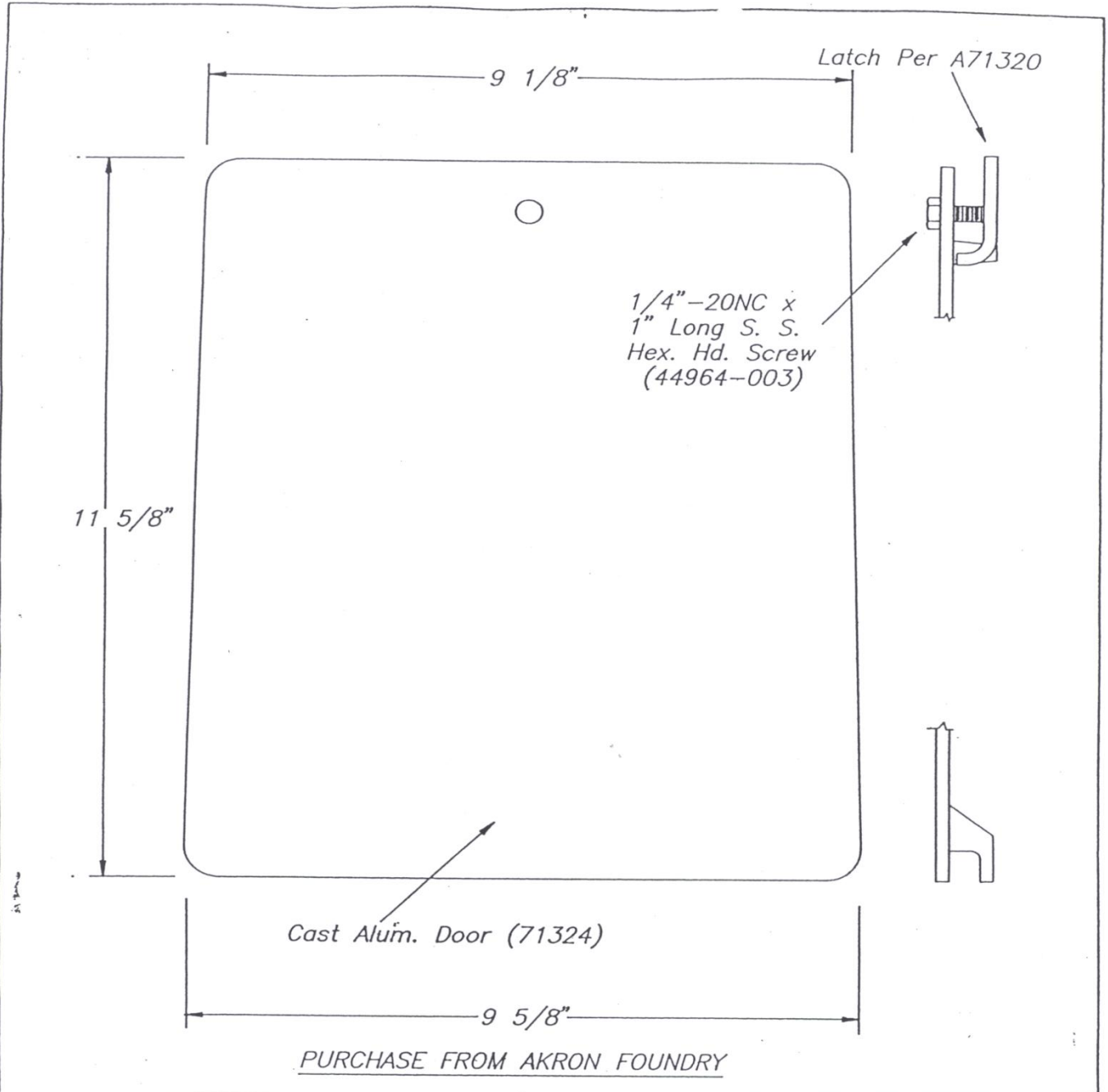


MATERIAL.

ABS PLASTIC WITH U.V. INHIBITORS AND MOLDED IN ALUMINUM GREY COLOR. NOMINAL THICKNESS 3/16" WITH 1/4" THICK REINFORCEMENT AROUND OUTSIDE EDGE AND IN CENTER.

NO.	REVISIONS	DATE	TITLE	
			TEANS. BASE DOOR	
			CUSTOMER	
			SCALE N.T.S.	DATE 11-28-90
			BY L.W.	DWG. NO.
			CHKD	A70502





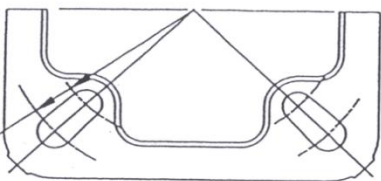
PURCHASE FROM AKRON FOUNDRY

Océ Bruning, Inc. 79-099 Form 9873

NO.	REVISIONS	DATE
1	Redrawn: LW	5/91
2	Was 3/4" Lg Screw	8/96

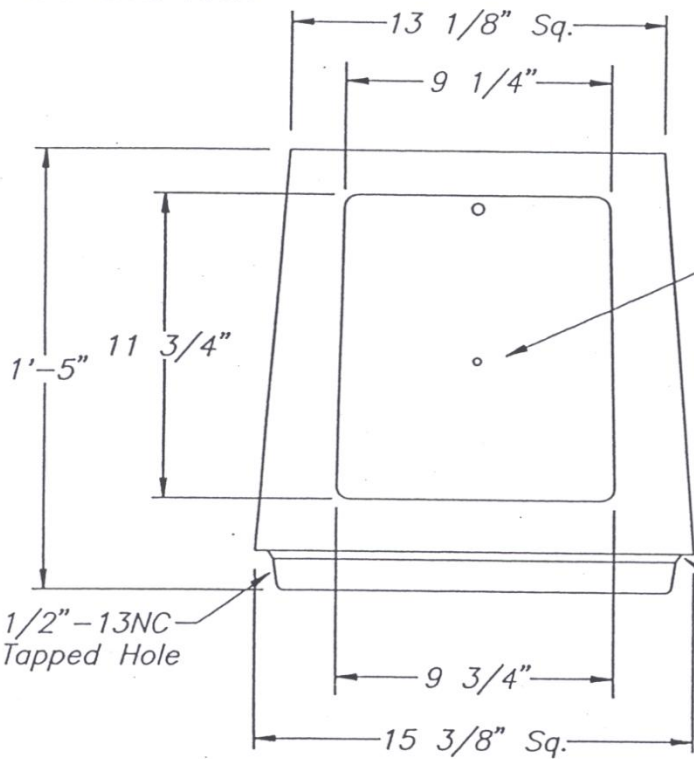
hapco
 COMPANY DIVISION OF KEARNEY-NATIONAL, INC.
 P. O. BOX 347 ABRIDGEON, VA. 24218

TITLE TRANSFORMER BASE DOOR	
CUSTOMER	
SCALE 2.00	DATE 08/09/90
BY PRS	DWG. NO.
CHK'D	A70776



BASE SUPPLIED WITH:
 (1) ABS Plastic Door And 1/4"-20NC S.S. Hex. Hd. Screw
 (2) Eight 1" Washers, 1/2" Thk. X 2 3/4" O.D., Galvanized Per ASTM B454.

10 1/2" To 13 1/2"
 Dia. Bolt Circle

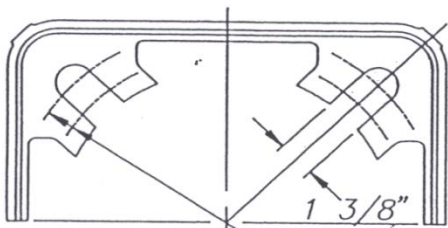


1/4"-20NC Tapped Hole
 (Back Wall)

4043 Weld Wire (Heat Treat After Welding)

1/2"-13NC Tapped Hole

AKRON FOUNDRY TB1-AF 1315-17 I.W.
 (TB1-17")



13" To 15" Dia.
 Bolt Circle

MATERIAL: Alum. Alloy 356-T6

NO.	REVISIONS	DATE	TITLE	
			TRAN. BASE ASSEMBLY	
			CUSTOMER	
			SCALE 6.0	DATE 10/31/92
			BY IW	DWG. NO.
			CHK'D	A-72748

hapco

COMPANY DIVISION OF KEARNEY-NATIONAL, INC.
 P. O. BOX 547 ABRINGTON, VA. 24210

Oca Bruning, Inc. 79499 Form 9873

SCHOOL FLASHERS

13.1 GENERAL

- 13.1.1 ELTEC TIME CLOCKS SHALL BE USED. MODEL NUMBERS NTC-17E(AC) OR NTC-17E(DC) DEPENDING ON THE APPLICATION.
- 13.1.2 PELCO BREAKAWAY BASES SHALL BE USED FOR SIGNALS MOUNTED OFF EDGE OF ROAD.
- 13.1.3 TWENTY (20) FEET OF GROUND ROD SHALL BE DRIVEN AT EACH FLASHER POLE IN AN ADJACENT PULL BOX AND NOT IN THE POLE BASE. GROUND RODS SHALL READ 15 OHMS OR LESS WHEN TESTED AFTER INSTALLATION.
- 13.1.4 FLASHER CABINET SHALL BE FDOT TYPE I ALUMINUM WITH ALUMINUM BACKBOARD. CABINET SHALL HAVE A CONTINUOUS HINGED DOOR WITH WEATHER PROOF GASKET AND BE ACCESSED USING A PPI SKELETON KEY.
- 13.1.5 SIGNAL HEADS SHALL BE TWELVE (12) INCH YELLOW LED WIDE VIEW WITH TUNNEL VISORS AND SHALL OPERATE ON AN ALTERNATING FLASHING CIRCUIT.

13.2 AC SCHOOL FLASHERS

- 13.2.1 ELTEC BRAND AC POWERED SCHOOL FLASHERS SHALL BE USED.
- 13.2.2 TEN (10) FEET LONG, FOUR (4) INCH ID ALUMINUM CONDUIT SHALL BE USED TO MOUNT FLASHER ASSEMBLY AND SIGNAGE.
- 13.2.3 ELECTRIC SERVICE SHALL BE MOUNTED ON A CONCRETE SERVICE POLE OR ON AN UNDERGROUND SERVICE PEDESTAL. ELECTRIC SERVICE SHALL NEVER BE MOUNTED ON THE FLASHER ASSEMBLY.

13.3 SOLAR SCHOOL FLASHERS

- 13.3.1 ELTEC BRAND SCHOOL FLASHERS SHALL BE USED. FDOT CERTIFICATION NUMBER 67014360805011.
- 13.3.2 SIXTEEN (16) FEET LONG, FOUR (4) INCH ID ALUMINUM CONDUIT SHALL BE USED TO MOUNT FLASHER ASSEMBLY AND SIGNAGE.

Programmable Time Clocks - NTC 17E Series



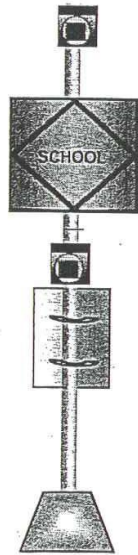
[Click Image for Larger View](#)

- Clocks can be ordered as AC, DC, or AC/DC.
- AC and DC can have up to 4 relays, AC/DC has only one relay.
- Enables user to establish default school year program based on school calendar.
- Allows user to establish exceptions to annual program such as holidays, early dismissals, late starts, and similar events.
- AC clocks synchronize to line to ensure accurate time.
- User may also use DLPRO software to program clock and transfer program from PC or laptop to time clock.
- Uses a 2 x 16 alpha numeric LCD lighted display.
- Can be programmed for momentary operation of up to 255 seconds.
- Non-volatile memory retains program information for life of clock.
- Provides automatic leap year and daylight savings time compensation.

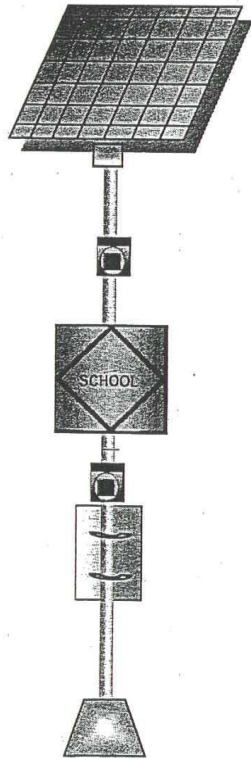
Specifications:

- Size: 8 1/4" H x 4 1/4" W x 1 3/4" D
- Alpha numeric backlit LCD
- Keypad is telephone style with audible feedback
- Outputs are 4 SPDT rated at 16 A/120 VAC
- Backup power - Capacitive, 168 hours minimum
- Time Base on backup: +/- .0025% crystal
- Crystal Temp Coefficient: - .04 ppm/deg C2
- Line Voltage 95-135 VAC, 60 Hz
- Power - 2.5 Watts
- Temperature range: - 30 deg C to + 74 deg C
- Electrical Connection - CPC with 48² Cable (Standard)

AC POWERED SCHOOL FLASHER



SOLAR SCHOOL FLASHER



ELECTRIC SERVICE

14.1 - GENERAL

14.1.1 SERVICE SHALL BE MINIMUM 60 AMP, 120/240 VOLT THREE-WIRE.

14.1.2 DISCONNECT SHALL BE A SQUARE D Q06-12L100RB.

14.1.3 ALL SERVICES SHALL BE METERED. A BY-PASS METER CAN SHALL BE INSTALLED ON EACH ELECTRIC SERVICE WHERE POWER IS SUPPLIED BY LCEC. INSTALL A JOSLYN LDP20-120-2 OR EQUIVALENT SURGE ARRESTOR TO ELECTRIC SERVICE DISCONNECT.

14.1.4 GALVANIZED RIGID CONDUIT SHALL BE USED FOR RISER AND WHERE EXPOSED ABOVE GROUND. MINIMUM OF 1" CONDUIT FOR RISERS.

14.1.5 WHEN AN ELECTRICAL SERVICE IS MORE THAN 50 FEET FROM THE TRAFFIC SIGNAL CABINET, OR STREET LIGHT CABINET, A DISCONNECT MEANS SHALL BE INSTALLED ON A CONCRETE METER POST ADJACENT TO THE CABINET. THIS ALSO APPLIES TO SERVICES ACROSS THE STREET.

14.1.6 CIRCUIT BREAKER FOR CABINET SHALL BE 110V, 30 AMP BRAKER; CIRCUIT BREAKER FOR LIGHTED SIGNS SHALL BE 110V, 15 AMP BREAKER; CRICUIT BREAKER FOR STREET LIGHTS SHALL BE 120/240V, 15 AMP. EACH 15 AMP BREAKER TO HAVE OWN PHOTOCCELL. PHOTOCCELL SHALL BE A MINIMUM OF 1800 WATTS.

14.2 - INSTALLATION

14.2.1 TWENTY FEET OF 5/8 COPPER WELD GROUND ROD SHALL BE INSTALLED FOR EACH ELECTRIC SERVICE.

14.2.2 GROUND WIRE SHALL BE IN 1/2 INCH SCHEDULE 80 PVC OR 1/2 INCH RIGID GALVANIZED CONDUIT. CONDUIT SHALL EXTEND MINIMUM OF 6 INCHES BELOW FINISH GRADE.

14.2.3 RISER CONDUIT SHALL BE CONNECTED TOGETHER BY USE OF GALVANIZED THREADED COUPLINGS OR COMPRESSION NO-THREAD COUPLINGS.

14.3 - NATIONAL ELECTRICAL CODE 820.10

14.3.1 DISTANCE OF WEATHERHEAD FROM POWER LINES.

14.3.2 DRAWING.

14.4 - TESTING

14.3.1 GROUND ROD READINGS MUST READ LESS THAN 15 OHMS.

14.3.2 GROUND ROD READINGS SHALL BE RECORDED AT 10 FOOT INTERVALS (620-3.2).

AC SURGE PROTECTOR

LDP

LIGHT DUTY

MODEL NUMBER SCHEME

Available Configurations

Model Number	Voltage	Configuration
LDP20-120-2	120/240 VAC	1-Phase, 3-Wire 50-60 Hz

SPECIFICATIONS

Maximum Surge Current	
Single Pulse, 8/20 μ s	20 kA

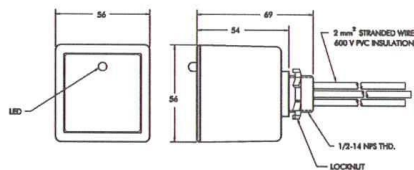
Suppression Voltage, L-N, N-PE using ANSI/IEEE C62.41 WaveShapes			
500 A,	100 kHz	(6 kV)	445 V
500 A,	8/20 μ s	(6 kV)	420 V
3 kA,	8/20 μ s	(6 kV)	480 V
10 kA,	8/20 μ s	(20 kV)	690 V

UL Suppression Voltage, L-N	
Surge Energy Capability, total	1360 joules
Surge Life, 120 Vac L-N applied,	

3 kA, 8/20 μ s	3,000 times
10 kA, 8/20 μ s	75 times

Component Response Time	<1 ns
Operating Temperature	-40° to +80° C
Operating Altitude	5000 m
Shipping Weight	.5 kg
Approvals: UL1449 2nd Edition 2005 Revision (effective 2/9/2007)	

DIMENSIONS



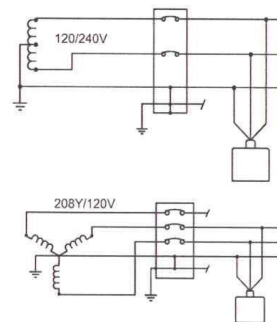
SYSTEM FEATURES AND BENEFITS

- SPD Category and Type – Service entrance or service panel, permanently connected. Intended for use on U.S., TN-C, TN-C-S and TNS neutral grounding. The protector should be installed <10 m from neutral ground point.
- Technology – Multiple Metal Oxide Varistors. Individual current fusing and thermal disconnects for each MOV. LED indicates proper functioning of protection for each line.
- Service Amperage/ Fault Current – 200A max/10,000A max short circuit current. If a dedicated breaker is used, it should be \geq 20A at main panel or \geq 10A at subpanel.

CHARACTERISTICS

Connection Means	In parallel across mains or behind breaker
Maximum Continuous Operating Voltage, 50-60 Hz, L-N	138 Vac
Protection Modes	L-N
Varistor MCOV	150 VAC
Varistor Voltage at 1 mA _{dc}	240 V
Leakage, L-N at 120 Vac	NA

TYPICAL USES



5900 Eastport Boulevard Richmond, VA 23231-4453 USA
 TEL: 804.236.3300 800.238.5000 FAX: 804.236.4047

ELECTRIC FOR SPRINKLERS

If the existing service for Street Lights or Traffic Signals is 120 or 240 volt single phase and there is space available to install a circuit breaker in the Traffic Signal or Street Light disconnect and the existing service pole has space available to install a disconnect for the sprinkler system, Lee County Traffic Signals will install a single pole 30 amp breaker in the existing service disconnect. This breaker will feed the main lugs of the disconnect which will be supplied by the Sprinkler Contractor. Under no circumstances will the Sprinkler Contractor be allowed to install a circuit breaker or connect conduit into an existing Street Light or Traffic Signal service disconnect.

The Sprinkler Contractor will supply a 2 circuit 70 amp outdoor rated disconnect and a 15 amp single pole breaker to Lee County Traffic Signals and Lee County will install the disconnect and wire into the existing electric service. Under no circumstances will a disconnect be installed on a Mast Arm Pole or a Traffic Signal Cabinet.

It will be the Sprinkler Contractors responsibility to install his conduit and field wiring for the sprinkler system. All work shall meet the requirements of the NEC and shall be approved by Lee County. A proper sized breaker shall be installed to protect the field wiring.

If there is not an existing service or the service in the area is not 120 or 240 volt single phase or there is no space on the service pole or in the Traffic Signal disconnect then the Sprinkler Contractor will have to install a separate service pole or pedestal and build a new electric service. This service shall be inspected by Lee County Code Enforcement, comply with the requirements of the NEC, and FDOT Roadway and Traffic Design Standards, latest edition.

Lee County DOT Traffic will address each installation on a case by case basis and should be contacted in the initial design stage of the project. Instances where Traffic Signal services are relocated on a FDOT or a Lee County rebuild project the Sprinkler Contractor shall be responsible for moving his equipment to the new service pole location if space is available. If space is not available then the Sprinkler Contractor shall install a new electrical service and shall comply with the requirements as stated above.



Thompson Sales

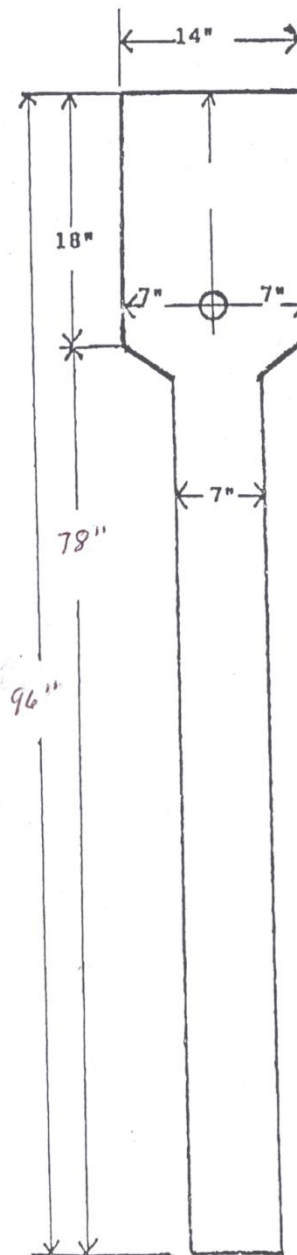
2700 Evans Avenue, Unit 2
Fort Myers, Florida 33901
(813) 332-0448
FAX: (813) 332-7132

CAT# U.S.I. 04 MP

PRECAST CONCRETE METER POST

NOTES

1. Direct burial under ground service.
2. 2" 3/8" hole for chase from meter to panel.
3. Post weight 168 pounds.
4. Post thickness 3".
5. Reinforced with 4 5/8" rebar.



Uilities
Structures
nc.

P.O. Box 9303
Ft. Myers, FL 33902

820.3 Other Articles. Circuits and equipment shall comply with 820.3(A) through (G).

(A) Hazardous (Classified) Locations. CATV equipment installed in a location that is classified in accordance with 500.5 shall comply with the applicable requirements of Chapter 5.

(B) Ducts, Plenums, and Other Air-Handling Spaces. Section 300.22, where installed in ducts, plenums, or other spaces used for environmental air, shall apply.

Exception: As permitted in 820.154(A).

(C) Installation and Use. Section 110.3 shall apply.

(D) Installations of Conductive and Nonconductive Optical Fiber Cables. Article 770 shall apply.

(E) Communications Circuits. Article 800 shall apply.

(F) Network-Powered Broadband Communications Systems. Article 830 shall apply.

(G) Alternate Wiring Methods. The wiring methods of Article 830 shall be permitted to substitute for the wiring methods of Article 820.

FPN: Use of Article 830 wiring methods will facilitate the upgrading of Article 820 installations to network-powered broadband applications.

820.15 Power Limitations. Coaxial cable shall be permitted to deliver power to equipment that is directly associated with the radio frequency distribution system if the voltage is not over 60 volts and if the current is supplied by a transformer or other device that has power-limiting characteristics.

Power shall be blocked from premises devices on the network that are not intended to be powered via the coaxial cable.

820.21 Access to Electrical Equipment Behind Panels Designed to Allow Access. Access to electrical equipment shall not be denied by an accumulation of coaxial cables that prevents removal of panels, including suspended ceiling panels.

820.24 Mechanical Execution of Work. Community television and radio distribution systems shall be installed in a neat and workmanlike manner. Coaxial cables installed exposed on the surface of ceiling and sidewalls shall be supported by the building structure in such a manner that the cables will not be damaged by normal building use. Such cables shall be secured by hardware including straps, staples, cable ties, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also conform to 300.4(D) and 300.11.

FPN: Accepted industry practices are described in ANSI/NECA/BICSI 568-2006, *Standard for Installing Commercial Building Telecommunications Cabling*; ANSI/TIA/EIA-568-B.1 2004 — *Part 1, General Requirements Commercial Building Telecommunications Cabling Standard*; ANSI/TIA-569-B 2004, *Commercial Building Standard for Telecommunications Pathways and Spaces*; ANSI/TIA-570-B, *Residential Telecommunications Infrastructure*, and other ANSI-approved installation standards.

820.25 Abandoned Cables. The accessible portion of abandoned coaxial cables shall be removed. Where cables are identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.

820.26 Spread of Fire or Products of Combustion. Installations of coaxial cables and CATV raceways in hollow spaces, vertical shafts, and ventilation or air-handling ducts shall be made so that the possible spread of fire or products of combustion will not be substantially increased. Openings around penetrations of coaxial cables and CATV raceways through fire-resistant-rated walls, partitions, floors, or ceilings shall be firestopped using approved methods to maintain the fire resistance rating.

FPN: Directories of electrical construction materials published by qualified testing laboratories contain many listing installation restrictions necessary to maintain the fire-resistive rating of assemblies where penetrations or openings are made. Building codes also contain restrictions on membrane penetrations on opposite sides of a fire resistance-rated wall assembly. An example is the 600-mm (24-in.) minimum horizontal separation that usually applies between boxes installed on opposite sides of the wall. Assistance in complying with 820.26 can be found in building codes, fire resistance directories, and product listings.

II. Coaxial Cables Outside and Entering Buildings

820.44 Overhead Coaxial Cables. Coaxial cables, prior to the point of grounding, as defined in 820.93, shall comply with 820.44(A) through (F).

(A) On Poles. Where practicable, conductors on pole shall be located below the electric light, power, Class 1, or non-power-limited fire alarm circuit conductors and shall not be attached to a cross-arm that carries electric light or power conductors.

(B) Lead-in Clearance. Lead-in or aerial-drop coaxial cables from a pole or other support, including the point of initial attachment to a building or structure, shall be kept away from electric light, power, Class 1, or non-power-limited fire alarm circuit conductors so as to avoid the possibility of accidental contact.

Exception: Where proximity to electric light, power, Class 1, or non-power-limited fire alarm circuit service conductors cannot be avoided, the installation shall be such as to provide clearances of not less than 300 mm (12 in.) from light, power, Class 1, or non-power-limited fire alarm circuit service drops. The clearance requirement shall apply at all points along the drop, and it shall increase to 1.02 m (40 in.) at the pole.

(C) On Masts. Aerial coaxial cables shall be permitted to be attached to an above-the-roof raceway mast that does not enclose or support conductors of electric light or power circuits.

(D) Above Roofs. Coaxial cables shall have a vertical clearance of not less than 2.5 m (8 ft) from all points of roofs above which they pass.

Exception No. 1: Auxiliary buildings such as garages and the like.

Exception No. 2: A reduction in clearance above only the overhanging portion of the roof to not less than 450 mm (18 in.) shall be permitted if (1) not more than 1.2 m (4 ft) of communications service drop conductors pass above the roof overhang, and (2) they are terminated at a raceway mast or other approved support.

Exception No. 3: Where the roof has a slope of not less than 100 mm in 300 mm (4 in. in 12 in.), a reduction in clearance to not less than 900 mm (3 ft) shall be permitted.

(E) Between Buildings. Coaxial cables extending between buildings and also the supports or attachment fixtures shall be acceptable for the purpose and shall have sufficient strength to withstand the loads to which they may be subjected.

Exception: Where a coaxial cable does not have sufficient strength to be self-supporting, it shall be attached to a supporting messenger cable that, together with the attachment fixtures or supports, shall be acceptable for the purpose and shall have sufficient strength to withstand the loads to which they may be subjected.

(F) On Buildings. Where attached to buildings, coaxial cables shall be securely fastened in such a manner that they will be separated from other conductors in accordance with 820.44(F)(1), (F)(2), and (F)(3).

(1) Electric Light or Power. The coaxial cable shall have a separation of at least 100 mm (4 in.) from electric light, power, Class 1, or non-power-limited fire alarm circuit conductors not in raceway or cable, or shall be permanently separated from conductors of the other system by a continuous and firmly fixed nonconductor in addition to the insulation on the wires.

(2) Other Communications Systems. Coaxial cable shall be installed so that there will be no unnecessary interference in the maintenance of the separate systems. In no case shall the conductors, cables, messenger strand, or equipment of one system cause abrasion to the conductors, cable, messenger strand, or equipment of any other system.

(3) Lightning Conductors. Where practicable, a separation of at least 1.8 m (6 ft) shall be maintained between any coaxial cable and lightning conductors.

FPN: For additional information regarding overhead wires and cables, see ANSI C2-2007, *National Electric Safety Code*, Part 2, Safety Rules for Overhead Lines.

820.47 Underground Circuits Entering Buildings. Underground coaxial cables entering buildings shall comply with 820.47(A) and (B).

(A) Underground Systems with Electric Light and Power Conductors. Underground coaxial cables in a duct, pedestal, handhole enclosure, or manhole that contains electric light or power conductors or Class 1 circuits shall be in a section permanently separated from such conductors by means of a suitable barrier.

(B) Direct-Buried Cables and Raceways. Direct-buried coaxial cable shall be separated at least 300 mm (12 in.) from conductors of any light or power or Class 1 circuit.

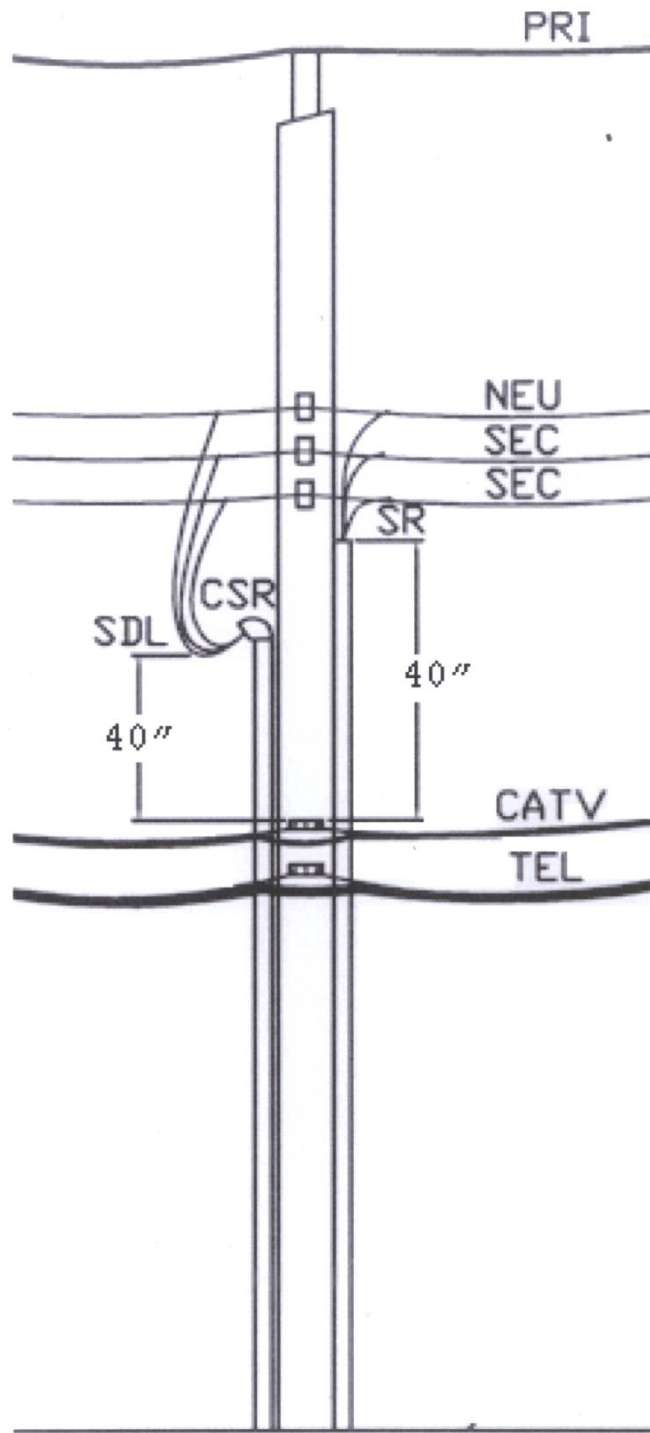
Exception No. 1: Where electric service conductors or coaxial cables are installed in raceways or have metal cable armor.

Exception No. 2: Where electric light or power branch-circuit or feeder conductors or Class 1 circuit conductors are installed in a raceway or in metal-sheathed, metal-clad, or Type UF or Type USE cables; or the coaxial cables have metal cable armor or are installed in a raceway.

820.48 Unlisted Cables Entering Buildings. Unlisted outside plant coaxial cables shall be permitted to be installed in locations as described in 820.154(D), where the length of the cable within the building, measured from its point of entrance, does not exceed 15 m (50 ft) and the cable enters the building from the outside and is terminated at a grounding block.

III. Protection

820.93 Grounding of the Outer Conductive Shield of Coaxial Cables. Coaxial cables entering buildings or attached to buildings shall comply with 820.93(A) or (B). Where the outer conductive shield of a coaxial cable is grounded, no other protective devices shall be required. For purposes of this section, grounding located at mobile home service equipment located within 9.0 m (30 ft) of the exterior wall of the mobile home it serves, or at a mobile home



damage the cable. In addition, the location of the cable should be carefully evaluated to ensure that activities and processes within the building do not cause damage to the cable.

II. Cables Outside and Entering Buildings

820.10 Outside Cables.

Coaxial cables, prior to the point of grounding, as defined in 820.33, shall comply with 820.10(A) through (F).

(A) **On Poles.** Where practicable, conductors on poles shall be located below the electric light, power, Class 1, or non-power-limited fire alarm circuit conductors and shall not be attached to a crossarm that carries electric light or power conductors.

(B) **Lead-in Clearance.** Lead-in or aerial-drop cables from a pole or other support, including the point of initial attachment to a building or structure, shall be kept away from electric light, power, Class 1, or non-power-limited fire alarm circuit conductors so as to avoid the possibility of accidental contact.

Exception: Where proximity to electric light, power, Class 1, or non-power-limited fire alarm circuit service conductors cannot be avoided, the installation shall be such as to provide clearances of not less than 300 mm (12 in.) from light, power, Class 1, or non-power-limited fire alarm circuit service drops. The clearance requirement shall apply at all points along the drop, and it shall increase to 1.02 m (40 in.) at the pole.

(C) **On Masts.** Aerial cable shall be permitted to be attached to an above-the-roof raceway mast that does not enclose or support conductors of electric light or power circuits.

(D) **Above Roofs.** Cables shall have a vertical clearance of not less than 2.5 m (8 ft) from all points of roofs above which they pass.

Exception No. 1: Auxiliary buildings such as garages and the like.

Exception No. 2: A reduction in clearance above only the overhanging portion of the roof to not less than 450 mm (18 in.) shall be permitted if (1) not more than 1.2 m (4 ft) of communications service drop conductors pass above the roof overhang, and (2) they are terminated at a raceway mast or other approved support.

Exception No. 3: Where the roof has a slope of not less than 100 mm (4 in.) in 300 mm (12 in.), a reduction in clearance to not less than 900 mm (3 ft) shall be permitted.

(E) **Between Buildings.** Cables extending between buildings and also the supports or attachment fixtures shall be acceptable for the purpose and shall have sufficient strength to withstand the loads to which they may be subjected.

Wind and ice loads, which can be excessive, should be considered.

Exception: Where a cable does not have sufficient strength to be self-supporting, it shall be attached to a supporting messenger cable that, together with the attachment fixtures or supports, shall be acceptable for the purpose and shall have sufficient strength to withstand the loads to which they may be subjected.

(F) **On Buildings.** Where attached to buildings, cables shall be securely fastened in such a manner that they will be separated from other conductors in accordance with 820.10(F)(1), (F)(2), and (F)(3).

(1) **Electric Light or Power.** The coaxial cable shall have a separation of at least 100 mm (4 in.) from electric light, power, Class 1, or non-power-limited fire alarm circuit conductors not in raceway or cable or be permanently separated from conductors of the other system by a continuous and firmly fixed nonconductor in addition to the insulation on the wires.

(2) **Other Communications Systems.** Coaxial cable shall be installed so that there will be no unnecessary interference in the maintenance of the separate systems. In no case shall the conductors, cables, messenger strand, or equipment of one system cause abrasion to the conductors, cable, messenger strand, or equipment of any other system.

(3) **Lightning Conductors.** Where practicable, a separation of at least 1.8 m (6 ft) shall be maintained between any coaxial cable and lightning conductors.

FPN: For additional information regarding overhead wires and cables, see ANSI C2-1997, *National Electric Safety Code*, Part 2, Safety Rules for Overhead Lines.

820.11 Entering Buildings.

(A) **Underground Systems.** Underground coaxial cables in a duct, pedestal, handhole, or manhole that contains electric light or power conductors or Class 1 circuits shall be in a section permanently separated from such conductors by means of a suitable barrier.

(B) **Direct-Buried Cables and Raceways.** Direct-buried coaxial cable shall be separated at least 300 mm (12 in.) from conductors of any light or power or Class 1 circuit.

CABINET ASSEMBLY

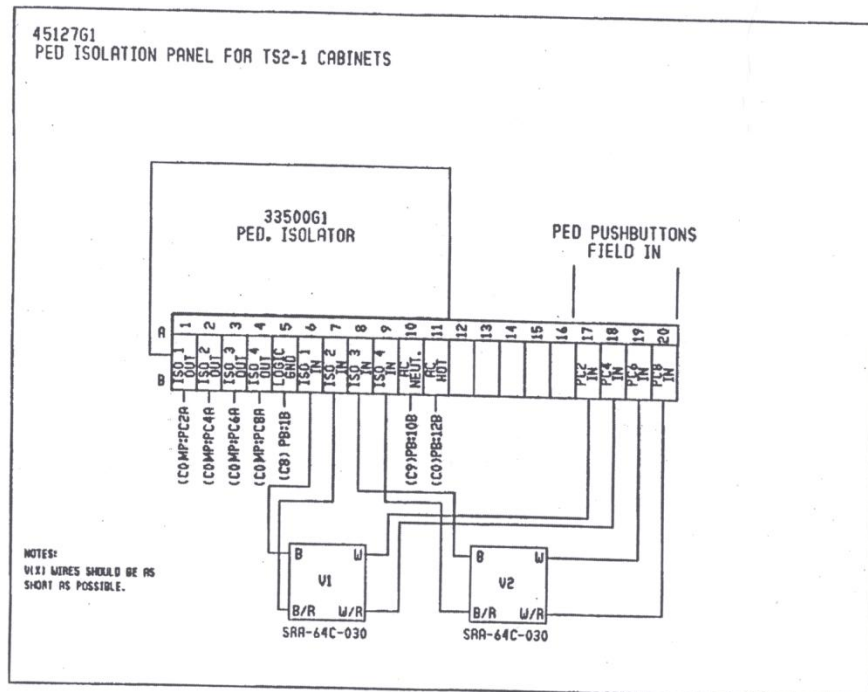
15.1 - GENERAL

15.1.1 CONTROLLER SHALL BE ECONOLITE ASC-3/1000 WITH TELEMETRY.

15.1.2 CONFLICT MONITOR SHALL BE MMU-16LEip.

15.1.3 CABINET SHALL BE 16 POSITION TS-2 TYPE 1 WITH 8 PHASES, 4 OVERLAPS, AND 4 PEDS TO BE CHANNELS 13 THRU 16, SHALL HAVE ALL PANELS REQUIRED TO CONNECT TO LEE COUNTY ECONOLITE CLOSED LOOP SYSTEM. SHALL INCLUDE A PED ISOLATION BOARD, RACK DETECTORS WITH MINIMUM OF 16 CHANNELS OF DETECTION AND 2-CHANNELS OF PRE-EMPTION OR USE TERRA INTERFACE PANEL AND TERRA ACCESS POINT ON INTERSECTION WITH VIDEO LOAD RESISTORS ON ALL OUTPUTS. PENDENT HARD WIRED.

15.1.4 CABINET SPEC



EBERLE DESIGN INC.

3811 E. East, La Grange, Arizona
Phoenix, AZ 85042-1150
www.EDIttraffic.com

TEL: 480.368.5407 FAX: 480.368.4007
TEL: 480.368.5407 FAX: 480.368.4007



CONTACT OUR SALES, 480-368-5407 PAGE 1 OF 1 JULY 2006

MMU-16LEip SmartMonitor PROVIDES A 10/100MBPS ETHERNET PORT FOR REMOTE WAN COMMUNICATIONS CAPABILITY



(Phoenix, AZ, USA) – Eberle Design Inc (EDI) has now added the option of a 10/100Mbps Ethernet communications port to the new industry standard MMU-16LEip SmartMonitor™ Multifunction Management Unit, for both NEMA TS-2 and TS-1 users.

The use of Ethernet to communicate with the SmartMonitor™ makes remote diagnosis even easier to accomplish. By furnishing the monitor with an IP address, the unit can be integrated into a wide area network (WAN). Communications may originate from a remote Traffic Management Center, local Controller Unit, or a direct connection to a laptop PC network adaptor.

EDI ECom™ software provides a user with the capability to retrieve, display, store, and print real-time status and historical data, as well as multiple Signal Sequence logs providing a graphical view of the signal states for up to 30 seconds prior to a fault event.



The MMU-16LEip SmartMonitor™ includes a built-in Setup Wizard to quickly and accurately configure the monitor parameters simply by answering a short series of questions related to the intersection geometry and cabinet wiring. The built-in context sensitive HELP System and Diagnostic Wizard then automatically pinpoints faulty signals, thus providing technicians with an unprecedented amount of assistance and data feedback quickly with a push of the Help button. The MMU-16LEip SmartMonitor™ menu driven operation presents signal voltages, data logs and vital cabinet information displayed directly on the MMU-16LEip SmartMonitor™ front panel displays.

The advanced capabilities of the MMU-16LEip SmartMonitor™ increase the operational level of safety of the intersection and enhances the diagnostic features available. *Why guess when you can know!*

To receive further information on the MMU-16LEip SmartMonitor™ and our CD-ROM product catalog including a free copy of ECom™ software, please call 480-368-5407 or visit our website at www.EDIttraffic.com.

About EBERLE DESIGN, INC.
An ISO 9001:2000 Registered Company – Celebrating 25 Years of Excellence!

EDI is recognized as a world wide developer and manufacturer of reliable high-performance component products designed to enhance and augment traffic control systems. The EDI array of products including signal monitors, vehicle detectors, power supplies, fashers, load switches, and other vital infrastructure devices enables transportation professionals to integrate, automate, and manage traffic highways and intersections easily, efficiently and safely. EDI is a proud member of ITSA, NEMA, ITE, IMEA, IPI, IDA, and AFA industry organizations.

ECom and SmartMonitor are trademarks of Eberle Design, Inc.

MMU-16LE

General Programming Guide

Main Menu status:

- At the top level, the NEXT button selects whether Current Status or the Main Menu is displayed.
- The NEXT button is used to scroll through the different selections that each menu level provide.
- The SELECT button will invoke the function that the cursor (▼) points at .
- At any time the EXIT button may be pressed to back out of menu selection.

Status:

1. Pressing the SELECT button from the top level provides further details like the current state including Field Check, BND, Field and Cabinet Voltages

Set up menu:

Pressing NEXT button follow by SELECT button from the top level provides the Menu structure.

To set up a new intersection:

1. pressing NEXT button follow by SELECT button
2. Press NEXT two times, this will take you to SET-UP WIZARD
3. Press SELECT button it will show a brief explanation of the button use an the cursor (▼)
4. Answer all the screen questions by pressing NEXT to move to the next phase.
5. Press SELECT to Enable or Disable the channels.
6. Press EXIT to move to the next screen.
7. Choose NEXT, CANCEL or EDIT by pressing SELECT.
8. Repeat step four thru seven until all programming is complete

SET / VIEW CONFIG

1. Pressing NEXT button follow by SELECT button
2. Press NEXT one time, this will take you to SET / VIEW CONFIG
3. Press SELECT to move to the next screen.
4. Press NEXT three times to UNIT OPTIONS and press SELECT
5. These setting should be ON
 - Recurrent pulse, PGM card Memory and LED Guard
6. The rest should be off
7. Reset

Transfer Switches & UPS units for Traffic Signals

All new or remodeled signalized intersections shall have a transfer switch installed on the right hand side of the signal cabinet as you face the door.

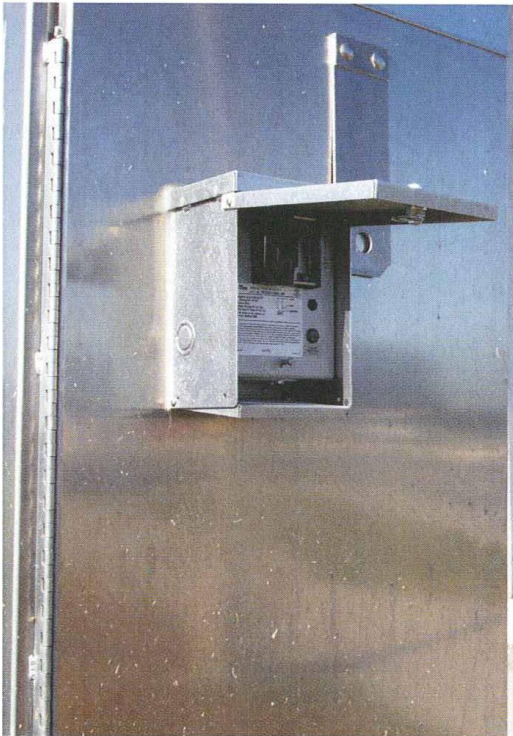
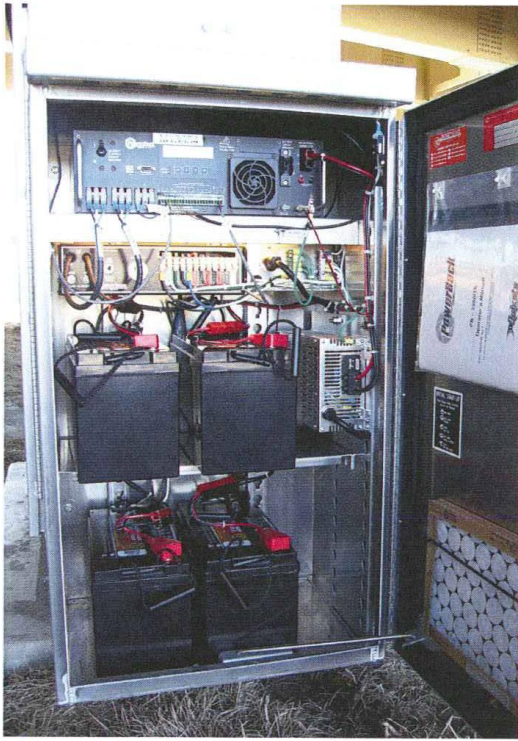
The transfer switch shall be an FDOT approved unit:
“Gen-Tran” model # TS 300130 PL-30 or approved equal.
The signal service shall have a 30 amp circuit breaker.

When specified on the plans an FDOT approved UPS unit shall be installed.
The following is the preferred unit that is used in Lee County:
“US Traffic Corp Powerback 2000 Model # PB 2000 ITS”

The above UPS unit shall be secured to the right hand side of the signal cabinet, and will be supported on the bottom by the quazite base or an approved independent means.

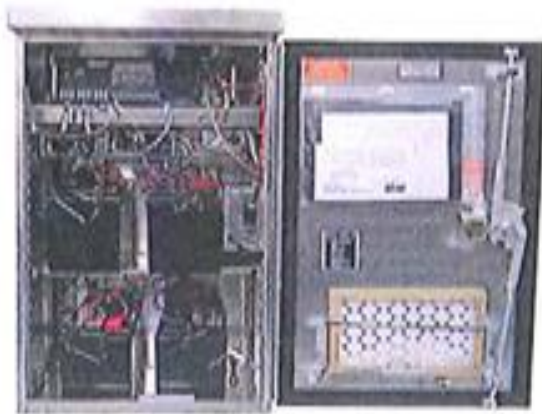
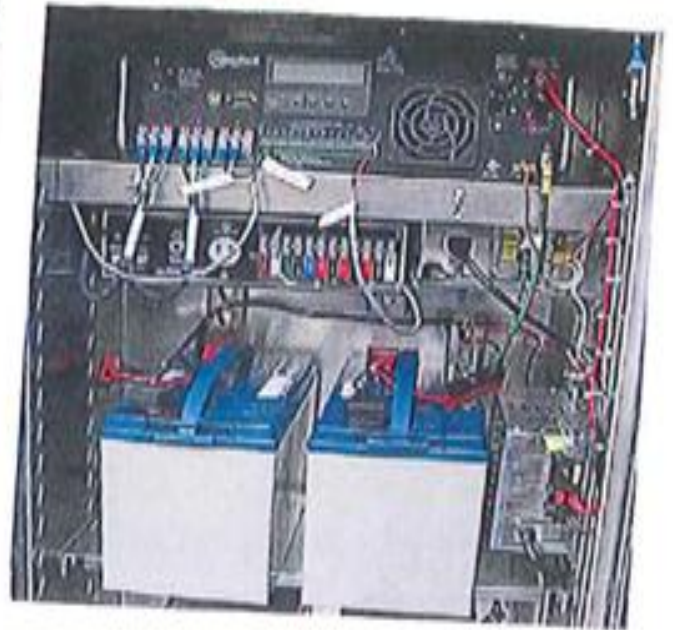
The contractor is encouraged to ship the above equipment to the Lee County signal shop along with the new signal cabinet. In doing so, the contractor will have the assistance of the Signal Staff in the start-up operation of the UPS unit along with the signal control equipment.

Advance notice to the signal supervisor is required, 48 hour minimum.
239-533-9500





UPS Cabinet



Piggyback UPS Cabinet





Traffic Control Battery Backup

Overview

- The PowerBack automatically provides emergency backup power to traffic signals and controls whenever normal electric power is lost.
- Increases or decreases voltage to maintain normal operation during brownouts and power spikes.
- Reduces dangerous intersection collisions due to "dark" signals.
- Saves law enforcement and emergency personnel resources.
- Minimizes component damage and signal tech callouts due to power quality.
- Provides full signal operation, signal flash operation for an even longer period of time, or both.
- Reduces traffic jams that waste fuel and increase pollution when one dark intersection disrupts an entire coordinated urban corridor.



ITS Series-The New Standard

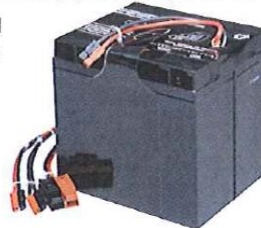
The PowerBack ITS Series represents the next generation in UPS/battery backup design for traffic applications. PB-2000 ITS includes advanced logging/programming capability, real-time status reporting, and fully programmable dry contacts. Traffic control battery backup from a traffic control company - the logical choice for reliable intersection operation.

- Local Keypad Programmability - including status monitoring, setting/testing of various parameters, dry contact programming, and more. No laptop necessary.
- Backlit LCD Display - easily readable in all light conditions.
- Six Fully Programmable Dry Contacts - for control and reporting.
- Remote access via RS-232 serial interface, USB, or optional Ethernet.
- Provides fully interactive program and status reporting using built-in, Windows™ - compatible software.
- Time/Date Stamp of Events and Alarms - up to 100 events with download and print capability.
- External cabinet LED indicator for ON BATTERY

Battery Options

PowerBack batteries use commercially available UPS applications and are completely sealed. These absorbed glass mat, valve regulated lead acid (AGM/VRLA) batteries can withstand extreme temperatures, are rated non-spillable by ICAO/IATA/DOT and available in a variety of ampere-hour ratings. Battery harnesses with "quick-connect" cables are included. Example run times are listed on the back of this sheet. They are based on a single string (4 batteries) at 25°C.

Battery run time and recharging depends on load requirements and battery configurations. A 'Required Power & Run Times' spreadsheet is provided separately for more details. Configurations of four or eight 12V batteries with varying amperage capacities available. For custom configurations, contact Peek Traffic Corporation.



Designed for rugged applications. Sealed and maintenance free. Secure connectors for safe operation (17Ah battery shown)

```

PowerBack - PB2000ITS
[0-main menu]
1 Unit specification
2 Input / Output values
3 Maintenance
4 Line Slow Detection Setup
5 Programmable Contacts Setup
6 Event Log View
7 Load Setup Defaults

Date & Time : 02/05/07 , 09:18
Serial Type : Normal
Line Status : Normal
Output Status : Line mode
Contact Status :
CONTACT C1 ==> [ON BATT]/[Not Activated]
CONTACT C2 ==> [ON BATT]/[Not Activated]
CONTACT C3 ==> [LOW BATT : 47.5 Volts]/[Not Activated]
CONTACT C4 ==> [LOW BATT : 47.5 Volts]/[Not Activated]
CONTACT C5 ==> [TIMER : 2.00 Hours]/[Not Activated]
CONTACT C6 ==> [TIMER : 2.00 Hours]/[Not Activated]
Ext_Pan Status :
Faults: NONE
Alarms: NONE
    
```

Interactive Data using Windows™ tools

Standard Features

- Provides power automatically to traffic signals and controls during blackouts
- Intelligent Buck/Boost Operation for surge/brownout protection
- Fits in all types of traffic enclosures or can be mounted in an electrical service or custom pedestal
- Low harmonic AC sine wave output
- Fully programmable AC threshold voltages; ie, NEMA, Caltrans or Custom
- Transient voltage protection from damaging line spikes
- External connections are front panel accessible
- Form C dry contacts close on low battery or 4 other user-selectable events
- LCD display for online, on battery, multiple real-time status, alarms, and faults
- Keypad, RS-232 serial interface, USB, or optional Ethernet for easy monitoring & control
- Power conditioning insures reliable power
- Back-up power provided by sealed AGM/VRLA batteries
- Temperature-compensated charging maximizes battery life in harsh, outside environments
- Noise suppression, FCC Class A
- Meets Caltrans BBS specifications

Three Basic Back-up Power Modes

PowerBack - Normal Operation

- Normal Operation supporting full functions for intersections not exceeding module's specified output.*

PowerBack - Flash Operation

- Red/Amber flash operations for intersections that exceed module's specified output for Normal Operation.*

PowerBack - Normal/Flash Combination

- Provides normal operation then reverts to flash after 2 hours or when 40% battery capacity is reached (factory default), thereby prolonging operating time. ITS Series is fully programmable including duration, percentage, and dry contact assignment.

*Total load cannot exceed unit's maximum output for any operation.

Total Power Required (Watts)	1 String 17AH @ 25°C	1 String 33AH @ 25°C	1 String 55AH @ 25°C	1 String 85AH @ 25°C	1 String 79AH @ 25°C	1 String 92AH @ 25°C	1 String 105AH @ 25°C
1500	N/A	0 hr. 30 min.	0 hr. 50 min.	1 hr. 05 min.	1 hr. 20 min.	1 hr. 45 min.	2 hr. 00 min.
1200	N/A	0 hr. 40 min.	1 hr. 05 min.	1 hr. 20 min.	1 hr. 40 min.	2 hr. 15 min.	2 hr. 30 min.
1000	N/A	0 hr. 55 min.	1 hr. 20 min.	1 hr. 40 min.	2 hr. 00 min.	2 hr. 40 min.	3 hr. 05 min.
875	0 hr. 28 min.	1 hr. 11 min.	1 hr. 50 min.	2 hr. 15 min.	2 hr. 40 min.	3 hr. 30 min.	4 hr. 00 min.
750	0 hr. 32 min.	1 hr. 17 min.	2 hr. 05 min.	2 hr. 35 min.	3 hr. 05 min.	3 hr. 55 min.	4 hr. 30 min.
650	0 hr. 32 min.	1 hr. 27 min.	2 hr. 25 min.	2 hr. 50 min.	3 hr. 20 min.	4 hr. 35 min.	5 hr. 10 min.
550	0 hr. 48 min.	1 hr. 40 min.	3 hr. 00 min.	3 hr. 20 min.	3 hr. 40 min.	5 hr. 10 min.	5 hr. 55 min.
450	0 hr. 58 min.	1 hr. 55 min.	3 hr. 30 min.	3 hr. 45 min.	4 hr. 05 min.	5 hr. 45 min.	6 hr. 45 min.
350	1 hr. 09 min.	2 hr. 10 min.	4 hr. 05 min.	4 hr. 10 min.	4 hr. 30 min.	6 hr. 25 min.	7 hr. 25 min.
250	1 hr. 20 min.	2 hr. 25 min.	4 hr. 40 min.	4 hr. 47 min.	4 hr. 55 min.	7 hr. 05 min.	8 hr. 05 min.
100	2 hr. 30 min.	6 hr. 00 min.	9 hr. 10 min.	12 hr. 30 min.	15 hr. 50 min.	20 hr. 00 min.	24 hr. 10 min.

Specifications

Input / output	Voltage (VAC) nominal 120/240** Frequency (Hz) nominal 60/50-60**
Input current	20 (A) maximum
Input voltage variation	-23% to +17%
Voltage waveform	sine
Typical line efficiency	95-97%
Output waveform THD	<3% THD %
Max charge current	10 (ADC)
Max transfer time	60 (ms)
Audible noise	<32 at 1m (dBA) - entire system, including transfer switch
Unit operating temp	-37°C to +74°C
Battery operating temp	-25°C to +74°C
Lightning / surge protection	Passes ANSI/IEEE C.62.41/C.62.45 Cat A & B ** PB-2000 ITS-E

Output Ratings

PB-2000 ITS	Output Power (VA)	2000
	Active Output Power (watts)	1500

Dimensions

PB-2000 ITS	Width (inches/mm)	17 / 432
	Height (inches/mm)	5.25 / 133
	Depth (inches/mm)	11 / 279
	Weight (lbs/kg)	46.2 / 21
PTS (Power Transfer Switch)	Width (inches/mm)	17.5 / 463
	Width (with flange)	19.0/483
	Height (inches/mm)	3.5 / 89
	Depth (inches/mm)	8.5 / 216
	Weight (lbs/kg)	7 / 3

Options

- Manual Bypass Switch
- Generator Kit: bypass switch, receptacle w/cover
- Separate battery enclosures
- Battery heater mats


A Signal Group Company
Peek Traffic Corporation
2906 Corporate Way, Palmetto, FL 34221
Phone: (941) 845-1200 • Fax: (941) 365-0837



Copyright © 2010 Peek Traffic Corporation. All rights reserved. Printed in the United States. Specifications are subject to change without notice to reflect improvement and upgrades.

www.peaktraffic.com

96-191-4

SPECIFICATION

TS2 TYPE 1 “PLUG-N-GO” MODULAR CABINET ASSEMBLY

LEE COUNTY

TABLE OF CONTENTS

1.	INTRODUCTION.....	98
2.	CABINET DESIGN & CONSTRUCTION.....	98
3.	TERMINALS & FACILITIES/MAIN PANEL DESIGN & CONSTRUCTION.....	100
4.	POWER PANEL DESIGN & CONSTRUCTION.....	104
5.	POWER BUS ASSEMBLY.....	105
6.	AUXILIARY CABINET EQUIPMENT.....	105
7.	VEHICLE DETECTION	106
8.	CABINET TEST SWITCHES & POLICE PANEL	107
9.	AUXILIARY DEVICES.....	108
10.	TESTING & WARRANTY	110

SPECIFICATION
TS2 TYPE 1 "PLUG-N-GO" MODULAR CABINET ASSEMBLY

1. INTRODUCTION

THIS SPECIFICATION SETS FORTH THE MINIMUM REQUIREMENTS FOR A TS2 TYPE 1 TRAFFIC CONTROL MODULAR CABINET ASSEMBLY. THE CABINET ASSEMBLY SHALL MEET, AS A MINIMUM, ALL APPLICABLE SECTIONS OF THE NEMA STANDARD PUBLICATION NO. TS2-1998. WHERE DIFFERENCES OCCUR, THIS SPECIFICATION SHALL GOVERN.

2. CABINET DESIGN AND CONSTRUCTION

2.1 THE CABINET SHALL BE CONSTRUCTED FROM TYPE 5052-H32 ALUMINUM WITH A MINIMUM THICKNESS OF 0.125 INCHES.

2.2 THE CABINET SHALL BE DESIGNED AND MANUFACTURED WITH MATERIALS THAT WILL ALLOW RIGID MOUNTING, WHETHER INTENDED FOR POLE, BASE OR PEDESTAL MOUNTING. THE CABINET MUST NOT FLEX ON ITS MOUNT.

2.2.1 A RAIN CHANNEL SHALL BE INCORPORATED INTO THE DESIGN OF THE MAIN DOOR OPENING TO PREVENT LIQUIDS FROM ENTERING THE ENCLOSURE. THE CABINET DOOR OPENING MUST BE A MINIMUM OF 80 PERCENT OF THE FRONT SURFACE OF THE CABINET. A STIFFENER PLATE SHALL BE WELDED ACROSS THE INSIDE OF THE MAIN DOOR TO PREVENT FLEXING.

2.2.2 THE TOP OF THE CABINET SHALL INCORPORATE A 1-INCH SLOPE TOWARD THE REAR TO PREVENT RAIN ACCUMULATION.

2.3 UNLESS OTHERWISE SPECIFIED, THE CABINET SHALL BE SUPPLIED WITH A NATURAL ALUMINUM FINISH. SUFFICIENT CARE SHALL BE TAKEN IN HANDLING TO ENSURE THAT SCRATCHES ARE MINIMIZED. ALL SURFACES SHALL BE FREE FROM WELD FLASH. WELDS SHALL BE SMOOTH, NEATLY FORMED, FREE FROM CRACKS, BLOWHOLES AND OTHER IRREGULARITIES. ALL SHARP EDGES SHALL BE GROUND SMOOTH.

WHERE PAINTED CABINETS ARE SPECIFIED, THE EXTERIOR SHALL BE DEGREASED AND PRIMED WITH A FOUR-STAGE IRON PHOSPHATE COAT PRIOR TO PAINTING. THE FINAL COAT SHALL CONSIST OF A POWDER COAT PAINT (TGIC OR EQUIVALENT) APPLIED WITH A MINIMUM THICKNESS OF 2 MILS. CABINET INTERIOR SHALL BE WHITE WITH RAILS UNPAINTED

2.4 ALL SEAMS SHALL BE SEALED WITH RTV SEALANT OR EQUIVALENT MATERIAL ON THE INTERIOR OF THE CABINET.

- 2.5 ALL CABINETS SHALL BE SUPPLIED WITH A MINIMUM OF TWO REMOVABLE SHELVES MANUFACTURED FROM 5052-H32 ALUMINUM. SHELVES SHALL BE A MINIMUM OF 10 INCHES DEEP.
- 2.6 THE SHELF SHALL HAVE HORIZONTAL SLOTS AT THE REAR AND VERTICAL SLOTS AT THE FRONT OF THE TURNED DOWN SIDE FLANGE. THE SHELF SHALL BE INSTALLED BY FIRST INSERTING THE REAR EDGE OF THE SHELF ON THE CABINET REAR SIDEWALL MOUNTING STUDS, THEN LOWERING THE SHELF ON THE FRONT SIDEWALL MOUNTING STUDS. THE SHELF SHALL BE HELD IN PLACE BY A NYLON TIE-WRAP INSERTED THROUGH HOLES ON THE FRONT EDGE OF THE SHELF AND AROUND THE FRONT SIDEWALL MOUNTING STUDS.
- 2.7 THE FRONT EDGE OF THE SHELF SHALL HAVE HOLES PUNCHED EVERY 6 INCHES TO ACCOMMODATE TIE-WRAPPING OF CABLES/HARNESSES. MUST HAVE ONE LAPTOP SHELF AND DRAWER (344448G1) OR EQUAL.
- 2.8 A MINIMUM OF ONE SET OF VERTICAL "C" CHANNELS SHALL BE MOUNTED ON EACH INTERIOR WALL OF THE CABINET FOR THE PURPOSE OF MOUNTING THE CABINET COMPONENTS. THE CHANNELS SHALL ACCOMMODATE SPRING MOUNTED NUTS OR STUDS. ALL MOUNTING RAILS SHALL EXTEND TO WITHIN 7 INCHES OF THE TOP AND BOTTOM OF THE CABINET. SIDEWALL RAIL SPACING SHALL BE 7.88 INCHES CENTER-TO-CENTER. REAR WALL RAIL SPACING SHALL BE 18.50 INCHES CENTER-TO-CENTER.
- 2.9 THE MAIN DOOR AND POLICE DOOR-IN-DOOR SHALL CLOSE AGAINST A WEATHERPROOF AND DUST-PROOF, CLOSED-CELL NEOPRENE GASKET SEAL. THE GASKET MATERIAL FOR THE MAIN DOOR SHALL BE A MINIMUM OF 0.250 INCHES THICK BY 1.00 INCH WIDE. THE GASKET MATERIAL FOR THE POLICE DOOR SHALL BE A MINIMUM OF 0.250 INCHES THICK BY 0.500 INCHES WIDE. THE GASKETS SHALL BE PERMANENTLY BONDED TO THE CABINET.
- 2.10 THE LOWER SECTION OF THE CABINET SHALL BE EQUIPPED WITH A LOUVERED AIR ENTRANCE. THE AIR INLET SHALL BE LARGE ENOUGH TO ALLOW SUFFICIENT AIR FLOW PER THE RATED FAN CAPACITY. LOUVERS MUST SATISFY THE NEMA ROD ENTRY TEST FOR 3R VENTILATED ENCLOSURES. A NON-CORROSIVE, VERMIN- AND INSECT-PROOF, REMOVABLE AIR FILTER SHALL BE SECURED TO THE AIR ENTRANCE. THE FILTER SHALL FIT SNUGLY AGAINST THE CABINET DOOR WALL.
- THE ROOF OF THE CABINET SHALL INCORPORATE A DIVIDED EXHAUST PLENUM, WHICH WILL PREVENT AIR FLOW THRU SECOND FAN WHEN NOT ENERGIZED AND A VENT SCREEN. PERFORATIONS IN THE VENT SCREEN SHALL NOT EXCEED 0.125 INCHES IN DIAMETER.*
- 2.11 THE MAIN DOOR ON A SIZE 3 OR LARGER CABINET SHALL BE EQUIPPED WITH A THREE-POINT LATCHING MECHANISM.
- 2.12 THE HANDLE ON THE MAIN DOOR OF A SIZE 4 OR LARGER CABINET SHALL UTILIZE A SHANK OF 5/8 INCHES MINIMUM DIAMETER. THE HANDLE SHALL INCLUDE A HASP FOR THE ATTACHMENT OF AN

OPTIONAL PADLOCK. THE CABINET DOOR HANDLE SHALL ROTATE COUNTER-CLOCKWISE TO OPEN. THE HANDLE SHALL NOT EXTEND BEYOND THE PERIMETER OF THE MAIN DOOR AT ANY TIME. THE LOCK ASSEMBLY SHALL BE POSITIONED SO THAT THE HANDLE SHALL NOT CAUSE ANY INTERFERENCE WITH THE KEY WHEN OPENING THE CABINET DOOR.

- 2.13 THE MAIN DOOR HINGE SHALL BE A ONE-PIECE, CONTINUOUS PIANO HINGE WITH A STAINLESS STEEL PIN RUNNING THE ENTIRE LENGTH OF THE DOOR. THE HINGE SHALL BE ATTACHED IN SUCH A MANNER THAT NO RIVETS OR BOLTS ARE EXPOSED.**
- 2.14 THE MAIN DOOR OF A SIZE 5 OR LARGER CABINET SHALL INCLUDE A MECHANISM CAPABLE OF HOLDING THE DOOR OPEN AT APPROXIMATELY 90, 125, AND 150 DEGREES UNDER WINDY CONDITIONS. MANUAL PLACEMENT OF THE MECHANISM SHALL NOT BE REQUIRED BY FIELD PERSONNEL .**
- 2.15 MINIMUM OF TWO KEY BLANKS SHALL BE SUPPLIED.**
- 2.16 THE POLICE DOOR-IN-DOOR SHALL BE PROVIDED WITH A TREASURY TYPE LOCK CORBIN NO. R357SGS OR EXACT EQUIVALENT AND A MINIMUM OF ONE KEY.**
- 2.17 ALL BASE MOUNTED CABINETS REQUIRE ANCHOR BOLTS TO PROPERLY SECURE THE CABINET TO ITS BASE. THE CABINET FLANGE FOR SECURING THE ANCHOR BOLTS SHALL NOT PROTRUDE OUTWARD FROM THE BOTTOM OF THE CABINET. WHEN A SIZE 3, 4, OR 5 CABINET IS BASE MOUNTED, TWO ANCHOR BOLTS SHALL BE REQUIRED FOR PROPER INSTALLATION. SIZE 6 AND 7 CABINETS, FOUR ANCHOR BOLTS SHALL BE REQUIRED FOR PROPER INSTALLATION. LIFTING HOOKS SHALL BE INSTALLED ON EACH SIDE OF CABINET.**
- 2.18 EACH CABINET SHALL BE OF SUFFICIENT SIZE TO ACCOMMODATE ALL EQUIPMENT. AT A MINIMUM, THE MINIMAL CABINET SIZES ARE AS FOLLOWS:**
 - TYPE 4 CABINETS SHALL BE A MINIMUM OF – 48” H X 29” W X 16” D**
 - TYPE 5 CABINETS SHALL BE A MINIMUM OF - 55” H X 44” W X 24” D**

3. TERMINALS AND FACILITIES/MAIN PANEL DESIGN AND CONSTRUCTION

- 3.1 THE MAIN PANEL SHALL BE CONSTRUCTED FROM 5052-H32 BRUSHED ALUMINUM OF 0.125 INCHES MINIMUM THICKNESS AND INSTALLED SO AS TO MINIMIZE FLEXING WHEN PLUG-IN COMPONENTS ARE INSTALLED.**
- 3.2 ALL 16-POSITION MAIN PANELS ARE PROVIDED WITH A MOUNTING MECHANISM WHICH ALLOWS EASY ACCESS TO ALL WIRING ON THE REAR OF THE PANEL WITHOUT THE REMOVAL OF ANY CABINET SHELVES. LOWERING OR COMPLETE REMOVAL OF THE MAIN PANEL CAN BE ACCOMPLISHED WITHOUT THE USE OF HAND TOOLS.**

- 3.3 THE TERMINALS AND FACILITIES SHALL BE AVAILABLE AS A MINIMUM IN THE FOLLOWING CONFIGURATION:**
- 3.3.1. CONFIGURATION #1 - SIXTEEN LOAD SWITCH SOCKETS, SIX FLASH TRANSFER RELAY SOCKETS, ONE FLASHER SOCKET, TWO MAIN PANEL BIU RACKS WITH TWO BIUS, ONE 16 CHANNEL DETECTOR RACK WITH ONE BIU, AND ONE TYPE-16 MMU.**
- 3.4 ALL LOAD SWITCH AND FLASH TRANSFER RELAY SOCKET REFERENCE DESIGNATORS SHALL BE SILK-SCREEN LABELED ON THE FRONT AND REAR OF THE MAIN PANEL TO MATCH DRAWING DESIGNATIONS. SOCKET PINS SHALL BE MARKED FOR REFERENCE ON THE REAR OF THE PANEL.**
- 3.5 SIXTEEN LOAD SWITCH SOCKETS SHALL BE POSITIONED HORIZONTALLY ON THE MAIN PANEL.**
- 3.6 ALL LOAD SWITCHES SHALL BE SUPPORTED BY A BRACKET, EXTENDING AT LEAST HALF THE LENGTH OF THE LOAD SWITCH.**
- 3.7 RACK STYLE MOUNTING SHALL BE PROVIDED TO ACCOMMODATE THE REQUIRED BIUS PER THE CONFIGURATION LISTED IN SECTION 3.3 ABOVE. A DUAL-ROW, 64-PIN FEMALE DIN 41612 TYPE B CONNECTOR SHALL BE PROVIDED FOR EACH BIU RACK POSITION. CARD GUIDES SHALL BE PROVIDED FOR BOTH EDGES OF THE BIU. TERMINAL AND FACILITIES BIU MOUNTING SHALL BE AN INTEGRAL PART OF THE MAIN PANEL. DETECTOR RACK BIU MOUNTING SHALL BE AN INTEGRAL PART OF THE DETECTOR RACK.**
- 3.7.1 ALL BIU RACK CONNECTORS SHALL HAVE PRE-WIRED ADDRESS PINS CORRESPONDING TO THE REQUIREMENTS OF THE TS2 SPECIFICATION. THE ADDRESS PINS SHALL CONTROL THE BIU MODE OF OPERATION. BIUS SHALL BE CAPABLE OF BEING INTERCHANGED WITH NO ADDITIONAL PROGRAMMING.**
- 3.8 THE 16-LOAD SWITCH POSITION MAIN PANELS SHALL HAVE ALL FIELD WIRES CONTAINED ON ONE ROW OF HORIZONTALLY MOUNTED TERMINAL BLOCKS.**
- 3.9 ALL FIELD OUTPUT CIRCUITS SHALL BE TERMINATED ON A NON-FUSED BARRIER TYPE TERMINAL BLOCK WITH A MINIMUM RATING OF 10 AMPS.**
- 3.10 ALL FIELD INPUT/OUTPUT (I/O) TERMINALS SHALL BE IDENTIFIED BY PERMANENT ALPHANUMERICAL LABELS. ALL LABELS SHALL USE STANDARD NOMENCLATURE PER THE NEMA TS2 SPECIFICATION.**
- 3.11 IT SHALL BE POSSIBLE TO FLASH EITHER THE YELLOW OR RED INDICATION ON ANY VEHICLE MOVEMENT AND TO CHANGE FROM ONE COLOR INDICATION TO THE OTHER BY USE OF A SCREWDRIVER.**

FIELD TERMINAL BLOCKS SHALL BE WIRED TO USE FOUR POSITIONS PER VEHICLE OR OVERLAP PHASE (GREEN, YELLOW, RED, FLASH). IT SHALL NOT BE NECESSARY TO DE-BUS FIELD TERMINAL BLOCKS FOR FLASH PROGRAMMING.

- 3.12 THE MAIN PANEL SHALL CONTAIN AT LEAST ONE FLASHER SOCKET (SILK SCREEN LABELED) CAPABLE OF OPERATING A 15-AMP, 2-POLE, NEMA SOLID-STATE FLASHER. THE FLASHER SHALL BE SUPPORTED BY A BRACKET, EXTENDING AT LEAST HALF ITS LENGTH.
- 3.13 ONE RC NETWORK SHALL BE WIRED IN PARALLEL WITH EACH GROUP OF THREE FLASH-TRANSFER RELAYS AND ANY OTHER RELAY COILS.
- 3.14 ALL LOGIC-LEVEL, NEMA-CONTROLLER AND MALFUNCTION MANAGEMENT UNIT INPUT AND OUTPUT TERMINATIONS ON THE MAIN PANEL SHALL BE PERMANENTLY LABELED. CABINET PRINTS SHALL IDENTIFY THE FUNCTION OF EACH TERMINAL POSITION.
- 3.15 AT A MINIMUM, THREE 20-POSITION TERMINAL BLOCKS SHALL BE PROVIDED AT THE TOP OF THE MAIN PANEL TO PROVIDE ACCESS TO THE CONTROLLER UNIT'S PROGRAMMABLE AND NON-PROGRAMMABLE I/O. TERMINAL BLOCKS FOR DC SIGNAL INTERFACING SHALL HAVE A NUMBER 6-32 X 7/32 INCH SCREW AS MINIMUM.
- 3.16 ALL MAIN PANEL WIRING SHALL CONFORM TO THE FOLLOWING WIRE SIZE AND COLOR:

GREEN/WALK LOAD SWITCH OUTPUT	- BROWN WIRE - 14 GAUGE
YELLOW LOAD SWITCH OUTPUT	- YELLOW WIRE - 14 GAUGE
RED/DON'T WALK LOAD SWITCH OUTPUT	- RED WIRE - 14 GAUGE
MMU (OTHER THAN AC POWER)	- VIOLET WIRE - 22 GAUGE
CONTROLLER I/O	- BLUE WIRE - 22 GAUGE
AC LINE (POWER PANEL TO MAIN PANEL)	- BLACK WIRE - 8 / 10 GAUGE
AC LINE (MAIN PANEL)	- BLACK WIRE - 10 GAUGE
AC NEUTRAL (POWER PANEL TO MAIN PANEL)	- WHITE WIRE - 8 / 10 GAUGE
AC NEUTRAL (MAIN PANEL)	- WHITE WIRE - 10 GAUGE
EARTH GROUND (POWER PANEL)	- GREEN WIRE - 8 GAUGE
LOGIC GROUND	- GRAY WIRE - 22 GAUGE

FLASH PROGRAMMING

**- ORANGE WIRE
FLASHER
TERMINAL**

**- BLACK WIRE RED
OR YELLOW FIELD
TERMINAL**

- 14 GAUGE

3.17 ALL WIRING, 14 AWG AND SMALLER, SHALL CONFORM TO MIL-W-16878/1, TYPE B/N, 600V, 19-STRAND TINNED COPPER. THE WIRE SHALL HAVE A MINIMUM OF 0.010 INCHES THICK PVC INSULATION WITH CLEAR NYLON JACKET AND RATED TO 105 DEGREES CELSIUS. ALL 12 AWG AND LARGER WIRE SHALL HAVE UL LISTED THHN/THWN 90 DEGREES CELSIUS, 600V, 0.020 INCHES THICK PVC INSULATION AND CLEAR NYLON JACKETED.

3.18 CONNECTING CABLES SHALL BE SLEEVED IN A BRAIDED NYLON MESH OR POLY-JACKETED. THE USE OF EXPOSED TIE-WRAPS OR INTERWOVEN CABLES ARE UNACCEPTABLE.

ALL TERMINALS AND FACILITIES CONFIGURATIONS SHALL BE PROVIDED WITH SUFFICIENT RS-485 PORT 1 COMMUNICATION CABLES TO ALLOW FOR THE INTENDED OPERATION OF THAT CABINET. EACH COMMUNICATION CABLE CONNECTOR SHALL BE A 15-PIN METAL SHELL D SUBMINIATURE TYPE. THE CABLE SHALL BE A SHIELDED CABLE SUITABLE FOR RS-485 COMMUNICATIONS.

3.19 ALL MAIN PANELS SHALL BE PRE-WIRED FOR A TYPE-16 MALFUNCTION MANAGEMENT UNIT.

3.20 ALL WIRING SHALL BE NEAT IN APPEARANCE. ALL CABINET WIRING SHALL BE CONTINUOUS FROM ITS POINT OF ORIGIN TO ITS TERMINATION POINT. BUTT TYPE CONNECTIONS/SPLICES ARE NOT ACCEPTABLE.

3.21 ALL CONNECTING CABLES AND WIRE RUNS SHALL BE SECURED BY MECHANICAL CLAMPS. STICK-ON TYPE CLAMPS ARE NOT ACCEPTABLE.

3.22 THE GROUNDING SYSTEM IN THE CABINET SHALL BE DIVIDED INTO THREE SEPARATE CIRCUITS (AC NEUTRAL, EARTH GROUND, AND LOGIC GROUND). THESE GROUND CIRCUITS SHALL NOT BE CONNECTED TOGETHER AT A SINGLE POINT.

3.23 THE MAIN PANEL SHALL INCORPORATE A RELAY TO REMOVE +24 VDC FROM THE COMMON SIDE OF THE LOAD SWITCHES WHEN THE INTERSECTION IS PLACED INTO MECHANICAL FLASH. THE RELAY SHALL HAVE A MOMENTARY PUSHBUTTON TO APPLY POWER TO THE LOAD SWITCH INPUTS FOR EASE OF TROUBLESHOOTING.

- 3.24 ALL PEDESTRIAN PUSH BUTTON INPUTS FROM THE FIELD TO THE CONTROLLER SHALL BE OPTO-ISOLATED THROUGH THE BIU AND PED DETECTOR ISOLATION PANEL (45127G1) OR EQUAL AND OPERATE AT 12 VAC. PED SIGNALS SHALL BE WIRED ON OUTPUTS 13 THRU 16.
 - 3.25 ALL WIRE (SIZE 16 AWG OR SMALLER) AT SOLDER JOINTS SHALL BE HOOKED OR LOOPED AROUND THE EYELET OR TERMINAL BLOCK POST PRIOR TO SOLDERING TO ENSURE CIRCUIT INTEGRITY. LAP JOINT SOLDERING IS NOT ACCEPTABLE.
4. POWER PANEL DESIGN AND CONSTRUCTION
- 4.1 THE POWER PANEL SHALL CONSIST OF A SEPARATE MODULE, SECURELY FASTENED TO THE RIGHT SIDE WALL OF THE CABINET. THE POWER PANEL SHALL BE WIRED TO PROVIDE THE NECESSARY FILTERED POWER TO THE LOAD SWITCHES, FLASHER(S), AND POWER BUS ASSEMBLY. IT SHALL BE MANUFACTURED FROM 0.090-INCH, 5052-H32 ALUMINUM WITH A REMOVABLE PLASTIC FRONT COVER. THE PANEL SHALL BE OF SUCH DESIGN SO AS TO ALLOW A TECHNICIAN TO ACCESS THE MAIN AND AUXILIARY BREAKERS WITHOUT REMOVING THE FRONT COVER.
 - 4.2 THE POWER PANEL SHALL HOUSE THE FOLLOWING COMPONENTS:
 - 4.2.1 A 30-AMP SQUARE D MAIN BREAKER. BREAKERS SHALL BE AT MINIMUM, A THERMAL MAGNETIC TYPE, U.L. LISTED FOR HACR SERVICE, WITH A MINIMUM OF 10,000 AMP INTERRUPTING CAPACITY
 - 4.2.2 A 20-AMP SQUARE D BREAKER FOR 16- POSITION CABINETS . THIS BREAKER SHALL SUPPLY POWER TO THE CONTROLLER, MMU, SIGNALS, CABINET POWER SUPPLY AND AUXILIARY PANELS. BREAKERS SHALL BE AT MINIMUM, A THERMAL MAGNETIC TYPE, U.L. LISTED FOR HACR SERVICE, WITH A MINIMUM OF 10,000 AMP INTERRUPTING CAPACITY.
 - 4.2.3 A 15-AMP SQUARE D AUXILIARY BREAKER. THIS BREAKER SHALL SUPPLY POWER TO THE FAN, LIGHT AND GFI UTILITY OUTLET. BREAKERS SHALL BE, AT MINIMUM, A THERMAL MAGNETIC TYPE, U.L. LISTED FOR HACR SERVICE, WITH A MINIMUM OF 10,000 AMP INTERRUPTING CAPACITY.
 - 4.2.4 NON-GFI, DUPLEX RECEPTICAL MOUNTED ON THE LEFT SIDE OF CABINET.
 - 4.2.5 AN EDCO MODEL SHA-1250 OR EXACT APPROVED EQUIVALENT SURGE ARRESTER WITH PLUG IN SOCKET.
 - 4.2.6 A 50 AMP, 125 VAC RADIO INTERFERENCE LINE FILTER.

- 4.2.7 A NORMALLY-OPEN, 60-AMP, MERCURY CONTACTOR DURAKOOL MODEL BBC-7032 OR S&D SOLID STATE SWITCH MODEL 4188XXL-120VAC OR EXACT EQUIVALENT.
- 4.2.8 A MINIMUM OF 8-POSITION NEUTRAL BUS BAR CAPABLE OF CONNECTING THREE #12 WIRES PER POSITION. INSTALL ADDITIONAL NEUTRAL BAR UNDER POWER PANEL. NEUTRAL BUS BARS ARE INSULATED FROM CABINET SHELL.
- 4.2.9 A MINIMUM OF 6-POSITION GROUND BUS BAR CAPABLE OF CONNECTING THREE #12 WIRES PER POSITION. INSTALL ADDITIONAL CHASSIS GROUND BAR LOCATED UNDER LOOP PANEL.
- 4.2.10 FOR CABINET BONDING, USE A BURNDY K2A25V OR EQUIVALENT.
- 4.2.11 A NEMA TYPE 5-15R GFI UTILITY OUTLET. IN A MASTER CABINET INSTALL AN ADDITIONAL FUSED 15 AMP GFI OUTLET. PROTECTION FOR THE GFI OUTLET IN THE MASTER CABINET WILL BE CIRCUIT BREAKER PROTECTION. NO FUSES.
- 4.2.12 A 4-POSITION PLUG-IN CONNECTOR FOR WIRING TO THE POWER BUS ASSEMBLY.

5. POWER BUS ASSEMBLY

- 5.1 THE POWER BUS ASSEMBLY SHALL BE MANUFACTURED FROM 0.090", 5052-H32 ALUMINUM. IT SHALL PROVIDE FILTERED POWER FOR THE CONTROLLER, MALFUNCTION MANAGEMENT UNIT, CABINET POWER SUPPLY, AND ALL AUXILIARY EQUIPMENT. IT SHALL INCLUDE THE SDLC BUS CONNECTING CABLES WIRED INTO A SURFACE MOUNTED COMPRESSION TERMINAL BLOCK.
- 5.2 THE POWER BUS ASSEMBLY SHALL HOUSE THE FOLLOWING COMPONENTS:
 - 5.2.1 A MINIMUM OF THREE AND A MAXIMUM OF SIX POWER CONNECTORS.
 - 5.2.2 TWO TERMINAL STRIPS TO HARDWIRE THE POWER CONNECTIONS.
 - 5.2.3 SDLC TERMINAL BLOCK WITH PRE-WIRED CABLES.
- 5.3 ALL CABINET EQUIPMENT REQUIRING FILTERED POWER TO OPERATE, SHALL BE CONNECTED TO THE POWER BUS ASSEMBLY BY A BURNDY CONNECTOR # SMS12PDH1 OR EXACT EQUIVALENT, OR HARDWIRED DIRECTLY TO THE SUPPLIED TERMINAL BLOCKS.

6. AUXILIARY CABINET EQUIPMENT

- 6.1 THE CABINET SHALL BE PROVIDED WITH TWO THERMOSTATICALLY CONTROLLED (ADJUSTABLE BETWEEN 80-150 DEGREES FAHRENHEIT) AND TWO VENTILATION FANS IN THE TOP OF THE CABINET PLENUM. THE FAN PLATE SHALL BE REMOVABLE WITH THE USE OF SIMPLE HAND TOOLS FOR SERVICEABILITY. A MINIMUM OF TWO EXHAUST FAN SHALL BE PROVIDED. THE FAN SHALL BE A BALL BEARING TYPE FAN AND SHALL BE CAPABLE OF DRAWING A MINIMUM OF 100 CUBIC FEET OF AIR PER MINUTE. THE FAN/THERMOSTAT ASSEMBLY SHALL BE CONNECTED TO THE POWER PANEL BY MEANS OF A 4 POSITION PLUG-IN CABLE.
- 6.2 A 24" FLUORESCENT 20 WATT LIGHTING FIXTURE SHALL BE MOUNTED ON THE INSIDE TOP OF THE CABINET NEAR THE FRONT EDGE. THE FIXTURE SHALL BE RATED TO ACCOMMODATE AT MINIMUM A F15T8 LAMP OPERATED FROM A NORMAL POWER FACTOR UL OR ETL LISTED BALLAST. THE LAMP SHALL BE WIRED TO A DOOR ACTIVATED SWITCH MOUNTED NEAR THE TOP OF THE DOOR.
- 6.3 A RESEALABLE PRINT POUCH SHALL BE MOUNTED TO THE DOOR OF THE CABINET. THE POUCH SHALL BE OF SUFFICIENT SIZE TO ACCOMMODATE ONE COMPLETE SET OF CABINET PRINTS.
- 6.4 A MINIMUM OF TWO SETS OF COMPLETE AND ACCURATE CABINET DRAWINGS SHALL BE SUPPLIED WITH EACH CABINET.
- 6.5 MALFUNCTION MANAGEMENT UNIT AND VEHICLE DETECTOR AMPLIFIERS SHALL BE SUPPLIED WITH EACH CABINET.

7. DETECTION

- 7.1 A MINIMUM OF ONE VEHICLE DETECTOR AMPLIFIER RACK SHALL BE PROVIDED IN EACH CABINET. DETECTOR RACKS SHALL BE AVAILABLE IN TWO CONFIGURATIONS UNLESS VIDEO DETECTION IS BEING USED.
 - 7.1A CONFIGURATION #1 - SHALL SUPPORT UP TO 16 CHANNELS OF LOOP DETECTION (EITHER EIGHT 2 CHANNEL DETECTORS OR FOUR 4 CHANNEL DETECTORS), TWO 2 CHANNEL PREEMPTION DEVICES AND ONE BIU.
- 7.2 EACH CABINET SHALL CONTAIN DETECTOR INTERFACE PANELS FOR THE PURPOSE OF CONNECTING FIELD LOOPS AND VEHICLE DETECTOR AMPLIFIERS. THE PANELS SHALL BE MANUFACTURED FROM FR4 G10 FIBERGLASS, 0.062 INCHES THICK, WITH A MINIMUM OF 2 OZ. OF COPPER FOR ALL TRACES.
- 7.3 ONE 16-POSITION INTERFACE PANEL SHALL BE PROVIDED FOR A 16-CHANNEL RACK CABINET. THE INTERFACE PANEL SHALL BE SECURED TO A MOUNTING PLATE AND ATTACHED TO THE LEFT SIDE OF THE CABINET.
- 7.4 EACH INTERFACE PANEL SHALL ALLOW FOR THE CONNECTION OF SIXTEEN INDEPENDENT FIELD LOOPS. A GROUND BUS TERMINAL SHALL BE PROVIDED BETWEEN EACH LOOP PAIR TERMINAL TO

PROVIDE A TERMINATION FOR THE LOOP LEAD-IN CABLE GROUND WIRE.

- 7.5 EACH INTERFACE PANEL SHALL PROVIDE A 10-POSITION TERMINAL BLOCK TO TERMINATE THE FIELD WIRES FOR UP TO TWO 2-CHANNEL PREEMPTION DEVICES.**
- 7.6 LIGHTNING PROTECTION DEVICE MOUNTING HOLES SHALL BE PROVIDED TO ACCOMMODATE AN EDCO SRA-16C LIGHTNING PROTECTION DEVICE. LIGHTNING PROTECTION DEVICES SHALL BE PROVIDED.**
- 7.7 A CABLE CONSISTING OF 20 AWG TWISTED PAIR WIRES SHALL BE PROVIDED TO ENABLE CONNECTION TO AND FROM THE PANEL TO A DETECTOR RACK. THE TWISTED PAIR WIRES SHALL BE COLOR CODED RED AND WHITE WIRE.**
- 7.8 ALL TERMINATION POINTS SHALL BE IDENTIFIED BY A UNIQUE NUMBER AND SILK SCREENED ON THE PANEL.**

EACH DETECTOR RACK SHALL ACCOMMODATE RACK MOUNTABLE PREEMPTION DEVICES SUCH AS EMTRAC OR OPTICOM.

- 7.9 EACH DETECTOR RACK SHALL BE POWERED BY THE CABINET POWER SUPPLY AND BE CONNECTED TO THE POWER BUS ASSEMBLY BY MEANS OF BURNDY CONNECTOR # SMS12PDH1.**

8. CABINET TEST SWITCHES AND POLICE PANEL

- 8.1 A TEST SWITCH PANEL SHALL BE MOUNTED ON THE INSIDE OF THE MAIN DOOR. THE TEST SWITCH PANEL SHALL PROVIDE AS A MINIMUM THE FOLLOWING:**

- 8.1.1 AUTO/FLASH SWITCH. WHEN IN THE FLASH POSITION, POWER SHALL BE MAINTAINED TO THE CONTROLLER AND THE INTERSECTION SHALL BE PLACED IN FLASH. THE CONTROLLER SHALL NOT BE STOP TIMED WHEN IN FLASH. IF REQUIRED BY THE PLANS AND SPECIFICATIONS, AN OPTIONAL RC NETWORK SHALL BE PROVIDED TO GIVE THE CONTROLLER AN EXTERNAL START PULSE WHEN SWITCH IS RETURNED TO THE AUTO POSITION. THIS WILL FORCE THE CONTROLLER TO INITIATE THE START UP SEQUENCE WHEN EXITING FLASH.**

- 8.1.2 CONTROL EQUIPMENT POWER ON/OFF. THIS SWITCH SHALL CONTROL THE CONTROLLER, MMU, AND CABINET POWER SUPPLY AC POWER.**

- 8.1.2.1 MOMENTARY TEST PUSH BUTTONS FOR ALL VEHICLE AND PEDESTRIAN INPUTS TO THE CONTROLLER ARE NOT REQUIRED. THE TS2 CONTROLLER TO BE PROVIDED WITH THE CABINET ASSEMBLY SHALL PROVIDE VEHICULAR AND PEDESTRIAN CALL INPUTS FROM ITS KEYBOARD WHILE IN THE STANDARD STATUS DISPLAY.**

- 8.1.3. SIGNALS ON/OFF SWITCH. IN THE OFF POSITION, POWER SHALL BE REMOVED FROM SIGNAL HEADS IN THE INTERSECTION. THE CONTROLLER SHALL CONTINUE TO OPERATE. WHEN IN THE OFF POSITION, THE MMU SHALL NOT CONFLICT OR REQUIRE RESET.
- 8.2 THE POLICE DOOR SWITCH PANEL SHALL CONTAIN THE FOLLOWING:
 - 8.2.2 AUTO/FLASH SWITCH. IN THE FLASH POSITION, POWER SHALL NOT BE REMOVED FROM THE CONTROLLER AND STOP TIME SHALL BE APPLIED. IF REQUIRED BY THE PLANS AND SPECIFICATIONS, AN OPTIONAL RC NETWORK SHALL BE PROVIDED TO GIVE THE CONTROLLER AN EXTERNAL START PULSE WHEN SWITCH IS RETURNED TO THE AUTO POSITION. THIS WILL FORCE THE CONTROLLER TO INITIATE THE START UP SEQUENCE WHEN EXITING FLASH.
 - 8.2.3 AUTO/MANUAL SWITCH. CABINET WIRING SHALL INCLUDE PROVISIONS FOR AN AUTO/MANUAL SWITCH AND A MOMENTARY PUSH BUTTON OR HAND CORD. THE AUTO/MANUAL SWITCH AND PUSH BUTTON OR HAND CORD SHALL BE PROVIDED. THE HAND CORD SHALL BE HARD WIRED IN THE CABINET.
- 8.3 ALL TOGGLE TYPE SWITCHES SHALL BE HEAVY DUTY AND RATED 15 AMPS MINIMUM. SINGLE- OR DOUBLE-POLE SWITCHES MAY BE PROVIDED, AS REQUIRED.
- 8.4 ANY EXPOSED TERMINALS OR SWITCH SOLDER POINTS SHALL BE COVERED WITH A NON-FLEXIBLE SHIELD TO PREVENT ACCIDENTAL CONTACT.
- 8.5 ALL SWITCH FUNCTIONS MUST BE PERMANENTLY AND CLEARLY LABELED.
- 8.6 ALL WIRE ROUTED TO THE POLICE DOOR-IN-DOOR AND TEST SWITCH PUSH BUTTON PANEL SHALL BE ADEQUATELY PROTECTED AGAINST DAMAGE FROM REPETITIVE OPENING AND CLOSING OF THE MAIN DOOR.
- 8.7 ALL TEST SWITCH PANEL WIRING SHALL BE CONNECTED TO THE MAIN PANEL VIA A 36-PIN BURNDY CONNECTOR #SMS36R1, OR EXACT EQUIVALENT.

ALL WIRING FROM THE MAIN PANEL TO THE TEST SWITCH PANEL SHALL BE CONNECTED TO THE SWITCH PANEL VIA A 24-PIN BURNDY CONNECTOR #SMS24R1 OR EXACT EQUIVALENT.

9. AUXILIARY DEVICES

9.1 LOAD SWITCHES

- 10.1.1 LOAD SWITCHES SHALL BE SOLID STATE AND SHALL CONFORM TO THE REQUIREMENTS OF SECTION 6.2 OF THE NEMA TS2 STANDARD.

- 9.1.2 SIGNAL LOAD SWITCHES SHALL HAVE A MINIMUM RATING OF 10 AMPERES AT 120 VAC FOR AN INCANDESCENT LAMP LOAD.
- 9.1.3 THE FRONT OF THE LOAD SWITCH SHALL BE PROVIDED WITH THREE INDICATORS TO SHOW THE INPUT SIGNAL FROM THE CONTROLLER TO THE LOAD SWITCH, AND THREE INDICATORS FOR OUTPUT SIGNAL TO FIELD TERMINAL
- 9.1.4 LOAD SWITCHES SHALL BE DEDICATED PER PHASE. THE USE OF LOAD SWITCHES FOR OTHER PARTIAL PHASES IS NOT ACCEPTABLE.
- 9.1.5 THE FULL COMPLEMENT OF LOAD SWITCHES SHALL BE SUPPLIED WITH EACH CABINET TO ALLOW FOR MAXIMUM PHASE UTILIZATION FOR WHICH THE CABINET IS DESIGNED. (16) EACH OUTPUT SHALL HAVE LOAD RESISTORS AND MOV'S INSTALLED. LOAD RESISTORS SHALL BE MOUNTED ON A SEPARATE PANEL ON THE RIGHT SIDE OF THE CABINET.

9.2. FLASHERS

- 9.2.1 THE FLASHER SHALL BE SOLID STATE AND SHALL CONFORM TO THE REQUIREMENTS OF SECTION 6.3 OF THE NEMA TS2 STANDARD.
- 9.2.2 FLASHING OF FIELD CIRCUITS FOR THE PURPOSE OF INTERSECTION FLASH SHALL BE ACCOMPLISHED BY A SEPARATE FLASHER.
- 9.2.3 THE FLASHER SHALL BE RATED AT 15 AMPERES, DOUBLE POLE WITH A NOMINAL FLASH RATE OF 60 FPM.

9.3 FLASH TRANSFER RELAYS

- 9.3.1 ALL FLASH TRANSFER RELAYS SHALL MEET THE REQUIREMENTS OF SECTION 6.4 OF THE NEMA TS2 STANDARD.
- 9.3.2 THE COIL OF THE FLASH TRANSFER RELAY MUST BE DE-ENERGIZED FOR FLASH OPERATION.
- 9.3.3 THE FULL COMPLEMENT OF RELAYS SHALL BE SUPPLIED WITH EACH CABINET TO ALLOW FOR MAXIMUM PHASE UTILIZATION FOR WHICH THE CABINET IS DESIGNED.

9.4 MALFUNCTION MANAGEMENT UNITS

- 9.4.1 EACH CABINET ASSEMBLY SHALL BE SUPPLIED WITH ONE MALFUNCTION MANAGEMENT UNIT (MMU) AS DEFINED BY THE REQUIREMENTS OF SECTION 4 OF THE NEMA TS2 STANDARD.
- 9.4.2 MALFUNCTION MANAGEMENT UNITS SHALL BE A TYPE 16. THE MMU SHALL BE AN ECONOLITE CONTROL PRODUCTS, INC. MODEL MMU-16 (EDI MODEL MMU-16LEip).

9.4 BUS INTERFACE UNITS

- 9.5.1 ALL BUS INTERFACE UNITS (BIUS) SHALL MEET THE REQUIREMENTS OF SECTION 8 OF THE NEMA TS2 STANDARD.**
- 9.5.2 THE FULL COMPLEMENT OF ECONOLITE CONTROL PRODUCTS, INC. MODEL 32860G1 BUS INTERFACE UNITS SHALL BE SUPPLIED WITH EACH CABINET TO ALLOW FOR MAXIMUM PHASE AND FUNCTION UTILIZATION FOR WHICH THE CABINET IS DESIGNED.**
- 9.5.3 EACH BUS INTERFACE UNIT SHALL INCLUDE POWER ON, TRANSMIT AND VALID DATA INDICATORS. ALL INDICATORS SHALL BE LEDS.**

9.6 CABINET POWER SUPPLY

- 9.6.1 THE CABINET POWER SUPPLY SHALL MEET THE REQUIREMENTS OF SECTION 5.3.5 OF THE NEMA TS2 STANDARD.**
- 9.6.2 THE CABINET POWER SUPPLY SHALL PROVIDE LED INDICATORS FOR THE LINE FREQUENCY, 12 VDC, 12 VAC, AND 24 VDC OUTPUTS.**
- 9.6.3 THE CABINET POWER SUPPLY SHALL PROVIDE (ON THE FRONT PANEL) JACK PLUGS FOR ACCESS TO THE +24 VDC FOR TEST PURPOSES.**
- 9.6.4 ONE ECONOLITE CONTROL PRODUCTS, INC. MODEL 33510G1 CABINET POWER SUPPLY SHALL BE SUPPLIED WITH EACH CABINET ASSEMBLY, AND SHALL BE WIRED DIRECTLY TO THE POWER BUS ASSEMBLY VIA A BURNDY 12-POS #SMS12PDH1 CONNECTOR OR EXACT EQUIVALENT.**

10. TESTING AND WARRANTY

10.1 TESTING

- 10.1.1 EACH CONTROLLER AND CABINET ASSEMBLY SHALL BE TESTED AS A COMPLETE ENTITY UNDER SIGNAL LOAD FOR A MINIMUM OF 48 HOURS.**
- 10.1.2 EACH ASSEMBLY SHALL BE DELIVERED WITH A SIGNED DOCUMENT DETAILING THE CABINET FINAL TESTS PERFORMED.**
- 10.1.3 THE CABINET SHALL BE ASSEMBLED AND TESTED BY THE CONTROLLER MANUFACTURER OR AUTHORIZED LOCAL DISTRIBUTOR TO ENSURE PROPER COMPONENT INTEGRATION AND OPERATION.**

10.2 WARRANTY

10.2.1 THE CONTROLLER AND MALFUNCTION MANAGEMENT UNIT SHALL BE WARRANTED BY THE MANUFACTURER AGAINST MECHANICAL AND ELECTRICAL DEFECTS FOR A PERIOD OF 2 YEARS FROM DATE OF SHIPMENT. THE MANUFACTURER'S WARRANTY SHALL BE SUPPLIED IN WRITING WITH EACH CABINET AND CONTROLLER. SECOND PARTY EXTENDED WARRANTIES ARE NOT ACCEPTABLE.

10.3 THE CABINET ASSEMBLY AND ALL OTHER COMPONENTS SHALL BE WARRANTED FOR A PERIOD OF ONE YEAR FROM DATE OF SHIPMENT.

10.3.1 ANY DEFECTS SHALL BE CORRECTED BY THE MANUFACTURER OR SUPPLIER AT NO COST TO THE OWNER.

CONCRETE POLES

16.1 - GENERAL

- 16.1.1 EACH SIGNAL OR SIGN POLE SHALL HAVE A MINIMUM OF THREE (3) EACH TWO (2) INCH CONDUITS INSTALLED IN EACH POLE, STOP 1 INCH BELOW HANDHOLE.**
- 16.1.2 CONCRETE FOR FOUNDATION SHALL BE KEPT TWELVE (12) INCHES BELOW EXISTING GRADE. FOR CONCRETE POLES, MAST ARM AND STEEL POLE FOUNDATIONS SHALL BE AS PER PLAN ELEVATION.**
- 16.1.3 CALCULATIONS FOR DESIGN SHALL BE SUBMITTED TO TRAFFIC ENGINEER FOR APPROVAL PRIOR TO ORDERING OF POLES.**
- 16.1.4 SIGNAL POLES SHALL COMPLY WITH TYPICAL DRAWINGS, AS TO PLACEMENT OF ATTACHMENT POINTS, NIPPLE PLACEMENT, HANDHOLE AND MOUSE HOLE SIZE. MOUSE HOLE SHALL BE CUT AT 45° TO FACILITATE INSTALLATON OF CONDUITS.**
- 16.1.5 IT IS THE CONTRACTOR'S REPOSIBILITY TO ENSURE ALL CONCRETE SIGNAL POLES COMPLY WITH STANDARD DESIGN, AND LEE COUNTY SPECIFICATIONS PRIOR TO INSTALLING.**

16.2 - SIGNAL SUPPORTS

- 16.2.1 CONCRETE POLES AND SPAN WIRE OFFER SUFFICIENT LONGEVITY AND STRUCTURAL SUPPORT FOR TRAFFIC SIGNAL INSTALLATIONS AND ARE LEE COUNTY'S PREFERRED STANDARD. CONDITIONS AT A GIVEN INTERSECTION OR AT ADJACENT INTERSECTIONS MAY NECESSITATE THE USE OF STEEL POLES AND MAST ARMS. THE CHIEF TRAFFIC ENGINEER SHALL RECOMMEND ANY CHANGES OR ADJUSTMENTS IN THE DESIGN OF AN INDIVIDUAL INTERSECTION OR A SERIES OF INTERSECTIONS.**
- 16.2.2 STEEL POLES AND MAST ARMS MAY BE INSTALLED ON FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) JURISDICTION ROADS AT FDOT OR PRIVATE DEVELOPER EXPENSE. WHERE STEEL POLES AND MAST ARMS ARE FOUND TO NOT BE FEASIBLE, THE USE OF CONCRETE POLES AND SPAN WIRE IS LEE COUNTY'S PREFERRED DESIGN.**
- 16.2.3 THE PREFERRED STANDARD CONFIGURATION IS A "BOX SPAN", HOWEVER, THE SIZE OF THE ITNERSECTION, OVERHEAD POWER LINES, UNDERGROUND UTILITIES, RIGHT-OF-WAY LIMITATIONS OR OTHER FACTORS MAY IMPACT POLE PLACEMENT AND NECESSITATE A "DIAGONAL" OR OTHER CONFIGURATION.**
- 16.2.4 CONCRETE POLES ARE TO BE DESIGNED BY THE POLE MANUFACTURER TO MEET FDOT STANDARDS AND LEE COUNTY'S SPECIFICATIONS AND DETAILS.**
- 16.2.5 UPON INSTALLATON OF SIGNAL POLES, IF SURROUNDING SOIL HAS POTENTIAL FOR CAVE IN AROUND POLE, CONTRACTOR SHALL USE CORRUGATED PIPE OR SLEEVE THE LENGTH OF THE DRILLED HOLE.**

Effective March 7, 1994
Reorder 2EP10

Inside Sales

Region	Phone	Fax
East	(800) 572-3462	(216) 831-5579
Central	(405) 672-3296/3340	(405) 670-5108
West	(916) 666-1681	(916) 666-0603

Carlton P & C FLEX® Corrugated Flexible Conduit

Carlton P & C FLEX corrugated flexible conduit is designed for power and communications applications to protect cable, and facilitate cable replacement, if needed.


Versatile Carlton P & C FLEX corrugated conduit is ideal for:

- Underground residential distribution
- Street and highway lighting
- Traffic signal installations
- Sweeps and elbows
- Under roadway applications
- Relining old-fashioned clay tile conduit systems
- Secondary service runs
- And many more applications.

**Meets
NEMA TC-12
Specifications**


Produced to IPS dimensions, Carlton P & C FLEX corrugated conduit is formulated for sunlight resistance, is grey in color, and may be used with existing conduit, couplings, adapters, end bells, and plugs. The corrugated design provides maximum flexibility, for easy handling and installation.

P & C FLEX corrugated flexible conduit is packaged in 250 foot lengths. Longer lengths on reels are available on special order. Pre-installed pull tape is available in 1½" and 2" sizes only.



Nom. Size	Part No.	I.D.	O.D.	Wt. Per 100 Ft.	Coil Length*	Price Per 100 Ft.
1½"	11810	1.570	1.900	20 lbs.	250'	\$104.96
1½"	11810T (Tape)	1.570	1.900	20 lbs.	250'	123.85
2"	11811	2.045	2.375	25 lbs.	250'	127.56
2"	11811T (Tape)	2.045	2.375	25 lbs.	250'	148.60

*Other lengths available on special order.



Nom. Size	Part No.	I.D.	O.D.	Wt. Per 100 Ft.	Coil Length*	Price Per 100 Ft.
2½"	11812	2.469	2.875	28 lbs.	250'	\$139.44
3"	11813	3.058	3.500	54 lbs.	250'	235.76
4"	11815	4.026	4.500	74 lbs.	250'	312.36

*Other lengths available on special order.

P & C FLEX Reel Capacities (For special orders prices vary according to size.)

Reel Size	Part Number	1½"	2"	2½"	3"	4"
48" x 30"	RE12046	750	500	—	—	—
48" x 46"	RE12048	1,200	700	—	—	—
65"	RE12065	2,300	1,400	750	500	350
78"	RE12078	3,000	1,800	1,200	700	450
88"	RE12088	4,400	2,500	1,500	1,100	600
96"	RE12096	5,500	3,200	2,100	1,400	800

Shaded area indicates part numbers which are available on special order only — Carlton Electrical Products non-stock item.

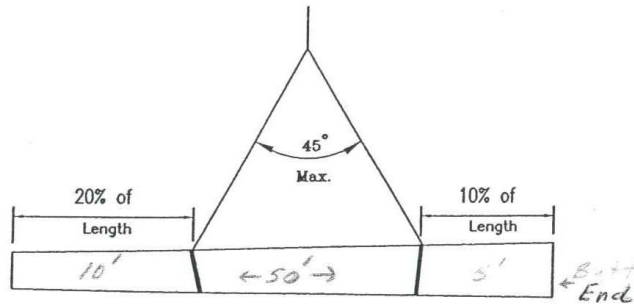
ATTENTION: FIELD ERECTION PERSONNEL

Prestressed concrete poles have been damaged due to improper methods of handling by contractor personnel at the jobsite location. It is suggested that you make available our recommendations and these illustrations to your field erection personnel to assist them in the proper method to unload and erect the prestressed concrete poles, minimizing the possibility of damage to the poles.

It is extremely difficult to provide supervision at jobsite or at various storage locations to insure against the possibility of contractor's personnel using a ONE POINT PICK-UP to lift the entire weight of the pole or attempting to stack the prestressed poles on uneven ground near the middle of the pole. These practices can cause hairline cracks to appear in the face of the pole and the manufacturer cannot be held responsible for this type of damage.

In view of above explanation we are pleased to offer recommended procedures for the proper method of lifting the prestressed concrete poles and storage at jobsite for future installation.

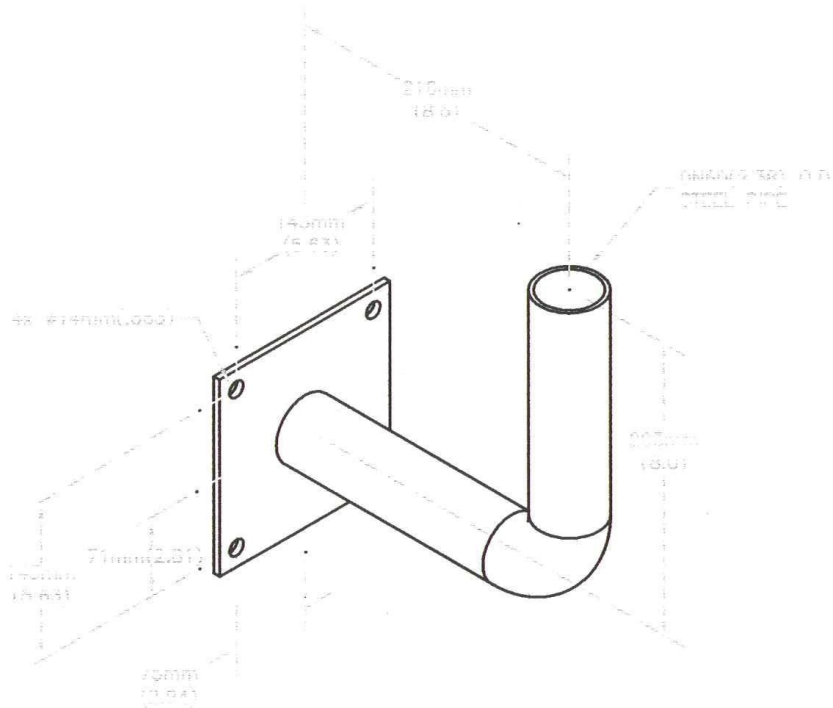
Illustrations for the correct method of lifting:



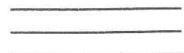
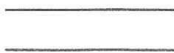
Example: 50' pole

WALL BRACKET BKT-1-X

OPTIONAL FINISHES
X G = GALVANIZED



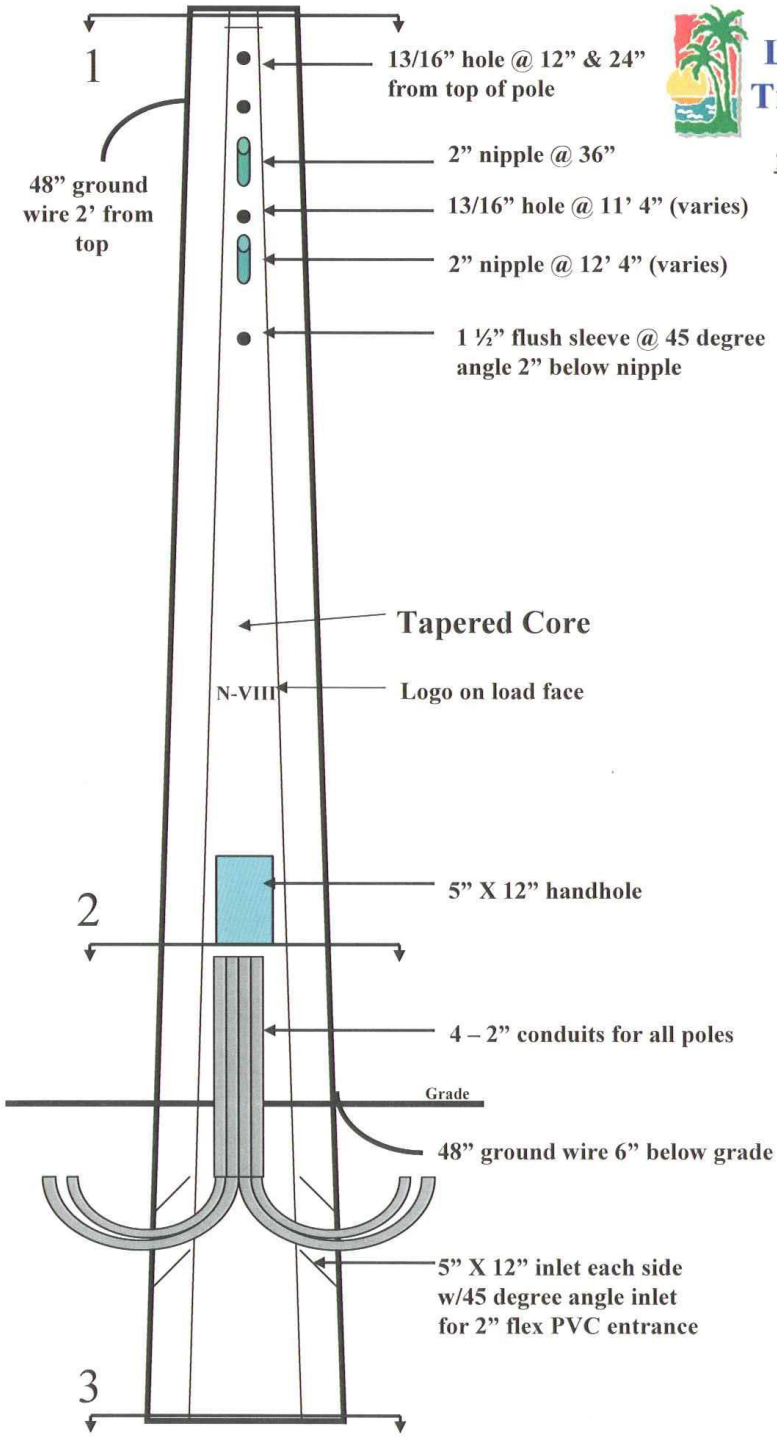

HOLOPHANE[®]
LEADER IN LIGHTING SOLUTIONS
An Acuity Brands Company





LEE County D.O.T. Traffic Signal Section

Typical Prestressed Concrete Traffic Signal Pole

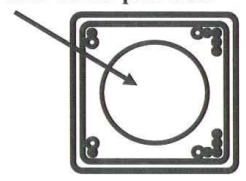


Section 1

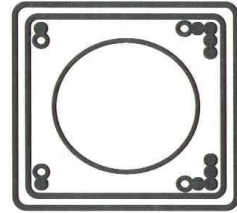


Section 2

Void in all poles shall be large enough to accommodate 4 - 2" flex pipes extended from 1" below handhole through entry hole out to pull box.



Section 3



STEEL POLES

17.1 - GENERAL

- 17.1.1 EACH SIGNAL POLE SHALL HAVE A MINIMUM OF THREE (3) EACH TWO (2) INCH CONDUITS AND ONE (1) EACH ONE (1) INCH CONDUIT INSTALLED IN EACH FOUNDATION.**
- 17.1.2 THE DESIGN AND USE OF TWO (2) PIECE STEEL SIGNAL POLES IS NOT PERMITTED FOR USE IN LEE COUNTY**
- 17.1.3 PROPER SIZE HANGER CLAMPS SHALL BE USED ON CATENARY AND MESSENGER CABLE. (SEE SECTION #9 DISCONNECTS).**
- 17.1.4 SIGN HANGERS SHALL HAVE PROPER SIZE CLAMP FOR CATENARY AND MESSENGER CABLE.**
- 17.1.5 LEE COUNTY WOULD LIKE A COPY OF ALL STEEL POLE SUBMITTAL AND CALCULATION SHEETS PRIOR TO INSTALLATION.**
- 17.1.6 MAST ARMS SHALL BE GALVINIZED STEEL ONLY, UNLESS MAINTENANCE AGREEMENT IS IN PLACE (SEE ATTACHED MAINTENANCE AGREEMENT)**

Lee County DOT Maintenance Requirements
Painted Steel Strain & Mast Arm Poles

Upon final acceptance, Lee County will be responsible for the maintenance of the basic traffic signal facility, with exception of the painted finish on the steel strain or mast arm poles. Upon expiration of the pole manufacturers' painted finish warranty, _____ will be responsible for the maintenance of the finish on the steel strain or mast arm poles. If the painted finish on the steel strain or mast arm poles fades, cracks and/or peels off, or becomes chalky, as determined by Lee County DOT inspection, _____ will be fully responsible for the cost of repainting the finishes in accordance with the manufacturer and Lee County DOT standard specifications and procedures. If it is determined during the inspection of the interior surface of the structure, that iron oxide (steel corrosion) is present and has caused sufficient damage to cause structural failure as determined by a licensed professional structural engineer; the structure must be replaced at _____ expense also to include all fees and costs associated with the structural engineers' analysis.

In order to discharge the responsibility for maintaining the painted finish, _____ can either engage a licensed and certified contractor to accomplish the necessary surface preparation and painting; or, if the County enters into a contract for steel strain and or mast arm pole painting in the future, _____ may utilize the County's contract. All finish repair, rust removal and painting work must be accomplished in accordance with the manufacturer's recommendations and Lee County DOT's standard requirements. All activities associated with rust removal, repairs, and repainting the steel strain and or mast arm poles must be coordinated with Lee County DOT. If _____ fails to provide the required maintenance of the painted finish within sixty (60) calendar days after official notification from Lee County, the County, at its option, may perform maintenance activity that Lee County determines is necessary and shall invoice _____ for all costs incurred in accordance with the latest edition of the External Fees Manual.

January 18, 2012

649 GALVANIZED STEEL STRAIN POLES, MAST ARMS AND MONOTUBE ASSEMBLIES.

(REV 5-10-07) (FA 6-6-07) (9-07)

SECTION 649 (Pages 701-705) is deleted and the following substituted:

**SECTION 649
GALVANIZED STEEL STRAIN POLES, MAST
ARMS AND MONOTUBE ASSEMBLIES**

649-1 Description.

The work in this Section consists of furnishing and installing galvanized steel strain poles, galvanized steel mast arm(s) and galvanized steel monotube assemblies in accordance with the details shown in the Contract Documents, subject to a five year warranty period as defined herein. The warranty period will apply only when strain poles, mast arms or steel monotube assemblies are painted as called for in the Contract Documents.

649-2 Materials.

Use strain poles, mast arm and monotube assemblies listed on the Department's Qualified Products List (QPL) for all standard configurations shown in the Design Standards.

Provide shop drawings and signed and sealed calculations, as needed, in accordance with Section 5 for configurations shown in the plans and denoted as special.

Use coating products meeting the requirements of Section 975.

Use grouts meeting the requirements of Section 934 listed on the QPL.

Use water meeting the requirements of Section 923.

Use membrane curing compounds meeting the requirements of Section 925.

649-3 Fabrication.

Fabricate strain poles, mast arm and monotube assemblies and miscellaneous hardware in accordance with the Contract Documents. Cut all materials to the final dimensions and complete all welding prior to galvanizing. Obtain all components for individual strain poles, mast arm and monotube assemblies from the same fabricator. Obtain the luminaire and bracket from other sources, when necessary.

Affix an aluminum identification tag which will be visible from the handhold or located inside the terminal box containing the information described in the Design Standards.

Before shipping, assemble mast arm and monotube assemblies including luminaire and bracket, to assure proper fit. The mast arm and monotube assemblies may be separated for shipment.

Ensure all components are protected from damage during shipping and handling by wrapping or other effective methods. Replace any component, which the Engineer determines is damaged beyond repair, at no additional cost to the Department. If components are wrapped for shipment, remove wrappings no later than five days after receipt of components or immediately if the wrappings become saturated. Post these instructions in brightly colored wording on the wrapper. Failure to comply with these instructions may lead to damage of the coating system and will be cause for the rejection of the component.

649-4 Coatings.

649-4.1 Galvanizing: Galvanize all components in accordance with ASTM A 123, except galvanize all fastener assemblies in accordance with ASTM A 153. Use galvanizing methods which provide surfaces suitable for painting.

649-4.2 Surface Preparation: Prepare all galvanized surfaces to be painted in accordance with ASTM D 6386 and the manufacturer of the coating system's specifications. Provide a clean and suitable galvanized surface that maximizes coating system adhesion.

Measure the thickness of the zinc coating after completion of surface preparation using a magnetic thickness gage in accordance with ASTM A 123. Ensure sufficient galvanizing remains on the substrate to meet the requirements of ASTM A 123 and the Contract Documents. Correct any deficient areas to the satisfaction of the Engineer at no additional cost to the Department.

649-4.3 Painting:

649-4.3.1 General: When required by the Contract Documents, provide painted strain poles, mast arms and monotube assemblies. Provide products from a fabricator on the Department's list of Prequalified Fabricators of Painted Galvanized Steel Strain Poles, Mast Arms and Monotube Assemblies. Provide products that will meet specification requirements throughout the warranty period. Meet the color requirement as specified in the Contract Documents. Provide the Engineer with two metal sample coupons, a minimum of 2 x 4 inches, painted concurrently and with the same paint as was used on the first lot of any strain poles, mast arms and monotube assemblies delivered to the jobsite. Provide sample coupons and manufacturer product data sheets to the Engineer along with the delivery of the first shipment of any painted strain poles, mast arms or monotube assemblies delivered to the jobsite. At the time of their delivery, the sample coupons described in this paragraph shall match the color of the strain poles, mast arms and monotube assemblies to within 1ΔE measured as specified in 975-7. If the delivered sample coupons exhibit a difference in color from the strain poles, mast arms and monotube assemblies greater than 1ΔE then the sample coupons will be considered unacceptable and no payment shall be made for the materials which the sample coupons represent. Those materials shall not be accepted by the Department until acceptable representative sample coupons in accordance with the requirements of this Section have been delivered to the Engineer.

649-4.3.2 Responsible Party Warranty: When the Contract Documents call for painted galvanized steel strain poles, mast arms or monotube assemblies, the Contractor shall designate a Responsible Party to accept responsibility. The Responsible party designated by the Contractor must execute and deliver to the Department a form, provided by the Department, prior to the first delivery to the jobsite of any painted strain poles, mast arms or monotube assemblies, stipulating that the Responsible Party accepts responsibility for ensuring the coating system adhesion and color retention requirements as specified in 975-7 are met for a period of five years after final acceptance in accordance with 5-11. The Responsible Party shall also bear the continued responsibility for performing all remedial work associated with repairs of any adhesion or color retention failure as defined in Section 975, as to which notice was provided to the Responsible Party within the five year warranty period. Failure to timely designate the Responsible Party will result in the Contractor being the Responsible Party unless otherwise agreed to in writing by the Department. The responsible Party shall be either the Contractor or the Fabricator. When the Responsible Party is the Fabricator, the Responsible Party shall be one of the Fabricators listed on the "Prequalified Fabricators of Painted Galvanized Steel Strain Poles, Mast Arms and Monotube Assemblies." This list may be viewed on the Department's website at the following URL:

www.dot.state.fl.us/construction/ .

Upon final acceptance of the Contract in accordance with 5-11, the Contractor's responsibility to ensure that the coating system adhesion and color retention requirements specified in 975-7 will terminate. The obligations of the Responsible Party set forth in this Section shall start at final acceptance of the Contract in accordance with 5-11 and continue thereafter until expiration of the five year warranty period.

649-5 Installation.

Install foundations for strain poles, mast arm and monotube assemblies in accordance with Section 455. Do not install the mast arm pole, strain poles or monotube pole until the foundation has cured for a minimum of seven days. Before erecting the pole clean the top of the foundation of any laitance, oils, grease or any other deleterious materials. Erect strain poles in an orientation which considering the rake and the application, cable forces will produce a plumb pole. Erect monotubes plumb at the time of installation. Plumb the pole supporting mast arms after the mast arms, traffic signals or sign panels have been placed.

If the traffic signals and/or sign panels are not in place within two working days after the mast arm is erected, furnish and install a 3 by 2 foot blank sign panel on the bottom of each mast arm within 6 feet of the mast arm tip and plumb the pole. Re-plumb the pole supporting mast arms after installation of traffic signals and sign panels.

Install bolt, nut and washer assemblies, except nuts on anchor rods, in accordance with Section 460. Install nuts on anchor rods in accordance with the following: use anchor bolt assemblies that are free of rust and corrosion, and lubricate these assemblies prior to installation so that the nut moves freely by hand through the full length of the thread. Bring the lower top anchor nuts on the anchor rods to a "snug tight" condition defined as: the tightness that is attained with a few impacts of an impact wrench or the full effort of an ironworker using an ordinary spud wrench such that more than 75% of the faying surfaces are in firm contact. Before snugging the lower top anchor nuts, all bottom leveling nuts shall be leveled. After snugging the lower top anchor nuts, all bottom leveling nuts shall be tightened to the base plate by full effort of an ironworker using an ordinary spud wrench. Use a beveled washer if outer face of the base plate is sloped more than 1:40 or if necessary to attain "snug tight" condition. After attaining "snug tight" condition, additionally tighten the lower top anchor nuts on the anchor rods in accordance with Table A. Nut rotation is relative to anchor rod, tolerance is plus 20 degrees. Install the upper top anchor nuts on the anchor rods on top of the lower top anchor nuts using the tightness that is attained with a few impacts of an impact wrench or the full effort of an ironworker using an ordinary spud wrench. During the tightening of the upper top anchor nuts, the lower top anchor nuts shall be restrained from movement by using an ordinary spud wrench.

Anchor Rod Diameter (in.)	Nut Rotation from snug Tight Condition
≤ 1 1/2	1/3 turn
> 1 1/2	1/6 turn

649-6 Grouting.

649-6.1 Alternatives to Grouting: Optional alternatives to grouting may be allowed by the Engineer where such alternatives are described as an option in the contract plans.

649-6.2 Preparation: Flush the top of the foundation with clean water to remove any dirt and debris. Immediately before grouting, saturate the concrete surfaces by ponding or by

placement of saturated rags for a minimum period of two hours. Remove all freestanding water before beginning the grouting operation.

649-6.3 Forming: Use watertight non-absorbent forms with a form release agent applied to all interior surfaces. Maintain a 1 inch clearance between the forms and the base plate. Extend the form a minimum of 1 inch above the bottom of the base plate. Attach a head box with a 45 degree slope on the form for grout placement.

649-6.4 Mixing: Use only fresh unopened full bags of grout. Mix the grout in a clean, power driven mortar mixer or with a heavy duty drill (850 RPM maximum) using a commercial mixing paddle. Mix the grout in accordance with the manufacturer's instructions. Test the fluidity of the grout using the ASTM C 939 Flow Cone Method. Use grouts that meet the efflux time of 20 to 30 seconds. Do not remix grouts that have begun to set.

649-6.5 Placing and Curing: Pour the grout from only one side of the base plate through the head box until the grout has filled the entire form and extends a minimum of 1/4 inch above the bottom of the base plate. Do not allow the grout to overtop the base plate. Do not vibrate grout. Clean excess grout off the base plate after the grout has reached initial set (two to four hours). Cure the grout for a minimum of six hours by covering the entire grout surface with clean saturated rags. Remove the forms after verifying the grout is self supporting by penetration with a pointed masons trowel or other sufficient tool. Cure all exposed grout with a membrane curing compound.

649-7 Remedial Work.

During the warranty period, the Responsible Party shall perform all remedial work necessary to meet the requirements of this Specification at no cost to the Department. Such remedial work shall be performed within 180 days of notification of a failure by the Department. Failure to perform such remedial work within the time frame specified will result in the work being performed by other forces at the Responsible Party's cost.

If the Responsible Party is the Fabricator, the Fabricator will be removed from the list of "Prequalified Fabricators of Painted Galvanized Steel Strain Poles, Mast Arms and Monotube Assemblies" for a minimum of six months or until payment in full for the correction of the deficiencies or defects has been made, whichever is longer.

If the Responsible Party is the Contractor, the Department will suspend, revoke or deny the Responsible Party's certificate of qualification under the terms of Section 337.16(d)(2), Florida Statutes, for a minimum of six months or until payment in full for the correction of the deficiencies or defects has been made, whichever is longer.

649-8 Statewide Disputes Review Board.

A Statewide Disputes Review Board will resolve any and all disputes that may arise involving administration and enforcement of this Specification. The Responsible Party and the Department acknowledge that use of the Statewide Disputes Review Board is required, and the determinations of the Statewide Disputes Review Board for disputes arising out of this Specification will be binding on both the Responsible Party and the Department, with no right of appeal by either party.

649-9 Method of Measurement.

649-9.1 General: Measurement for payment will be in accordance with the following work tasks.

649-9.2 Furnish and Install: The Contract unit price each for strain poles, mast arm and monotube assemblies, furnished and installed, will include all materials specified in the Contract Documents, including the foundation, cover plates, caps, clamps, blank sign panel, luminaire bracket, all labor, equipment, miscellaneous materials and hardware necessary for a complete and acceptable installation.

649-9.3 Furnish: The Contract unit price each for strain poles, mast arm and monotube assemblies, furnished, will include all materials, all shipping and handling costs involved in delivery as specified in the Contract Documents.

649-9.4 Install: The Contract unit price each for strain poles, mast arm and monotube assemblies, installed, will include the foundation, blank sign panel, all labor, equipment, miscellaneous materials and hardware necessary for a complete and acceptable installation. The Engineer will supply materials as specified in the Contract Documents.

649-10 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section. Sign panels and/or signal assemblies will be paid for separately.

Payment will be made under:

Item No. 649-	Steel Mast Arm Assembly - each.
Item No. 649-	Steel Monotube Assembly - each.
Item No. 649-	Steel Strain Pole - each.

DIRECTIONAL BORE

18.1 - GENERAL

18.1.1 CONDUIT SHALL BE A MINIMUM OF SDR 13.5 AND SHALL BE GRAY IN COLOR. BLACK CONDUIT CAN BE SUBSTITUTED IF APPROVED BY THE LEE COUNTY TRAFFIC ENGINEER. NO OTHER CONDUIT COLOR CAN BE USED UNLESS APPROVED BY LEE COUNTY TRAFFIC ENGINEER, EXCEPTION IS FOR INTERCONNECT.

ALL MINOR STREET ROAD CROSSINGS SHALL HAVE A MINIMUM OF FOUR (4) TWO (2) INCH PVC CONDUIT. ALL MAJOR ROAD CROSSINGS SHALL HAVE A MINIMUM OF FIVE (5) TWO (2) INCH PVC CONDUIT.

18.1.2 NO POTHoles CUT IN PAVEMENT ARE ALLOWED TO LOCATE EXISTING UTILITIES UNLESS APPROVAL IS OBTAINED FROM ENGINEERING SERVICE DIRECTOR.

18.1.3 ANY BORES THAT FAIL ARE TO BE REMOVED. IF REMOVAL IS NOT POSSIBLE, ENDS SHALL BE CUT OFF AT A DEPTH OF 36" BELOW GROUND AND THE PIPES GROUTED.

18.2 - INSTALLATION

18.2.1 ALL ROAD AND DRIVEWAY CROSSINGS SHALL BE A MINIMUM OF 36" DEEP.

18.2.2 ALL HOLES CAUSED BY EQUIPMENT SHALL BE BACKFILLED AND GROUND RESTORED.

18.2.3 IF THE DISTANCE IS TOO FAR TO COMPLETE THE BORE IN ONE ATTEMPT, THEN THE CONTRACTOR SHALL USE "E LOCK" COUPLINGS TO CONNECT THE BORES TOGETHER.

18.3 - TERMINATION

18.3.1 IF CONTRACTOR IS INSTALLING CONDUIT IN A PULL BOX, RIDGED GALVANIZED 90 DEGREE SWEEPS SHALL BE INSTALLED ON ALL CONDUIT LARGER THAN TWO (2) INCH, AND A THREADED PLASTIC BUSHING SHALL BE INSTALLED ON SWEEP.

18.3.2 IF CONDUIT IS INSTALLED IN A PULL BOX, OR CABINET, DUCT SEAL SHALL BE USED TO SEAL THE ENDS.

FLASHERS

19.1 - GENERAL

19.1.1 PELCO BREAKAWAY BASES FOR SIGNALS MOUNTED OFF EDGE OF ROAD. (SEE CUT SHEET, PAGE 27)

19.1.2 FOUR (4) INCH ID ALUMINUM CONDUIT TO MOUNT FLASHER AND SIGNS.

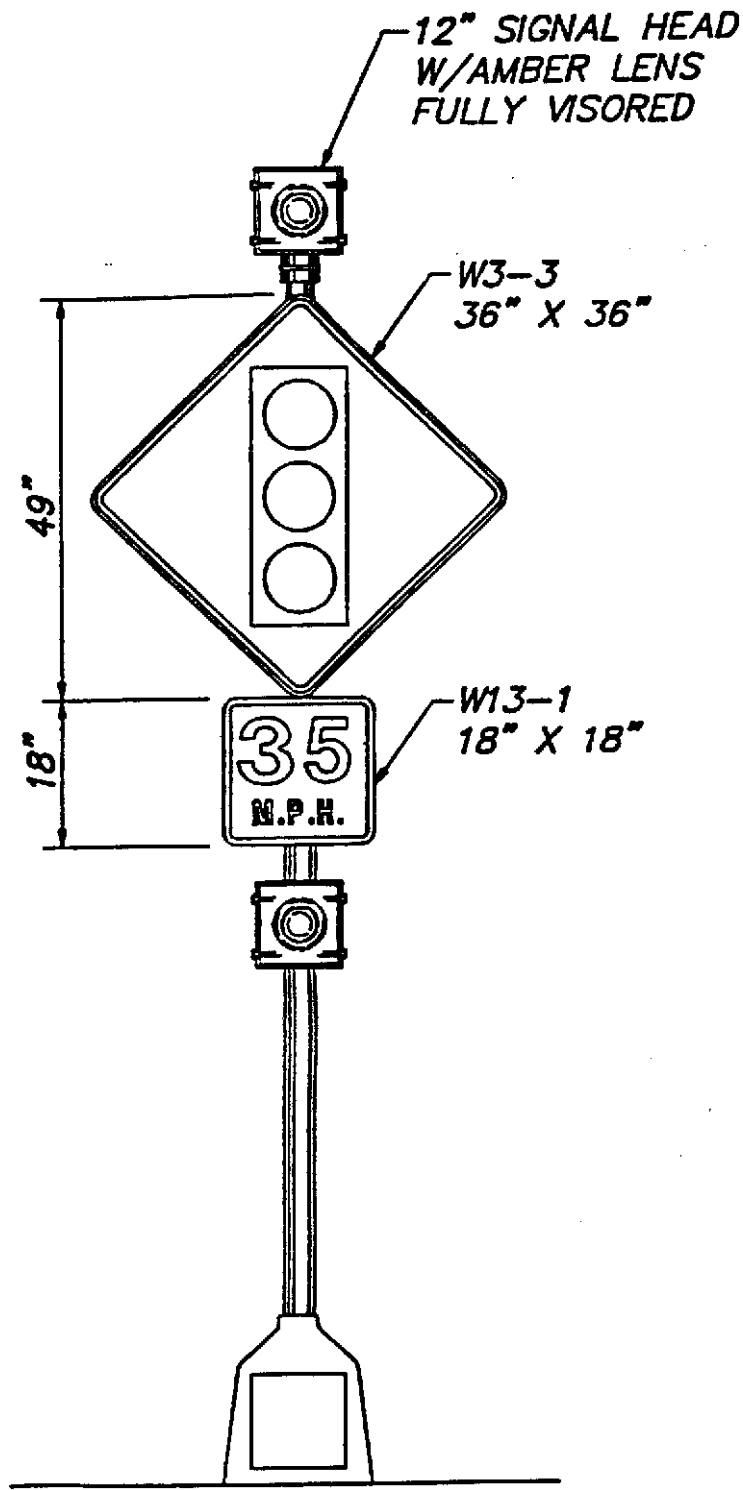
19.1.3 ELECTRIC SERVICE SHALL BE MOUNTED ON A CONCRETE SERVICE POLE, OR ON AN UNDERGROUND SERVICE PEDESTAL. NO SERVICE ON FLASHER POLE.

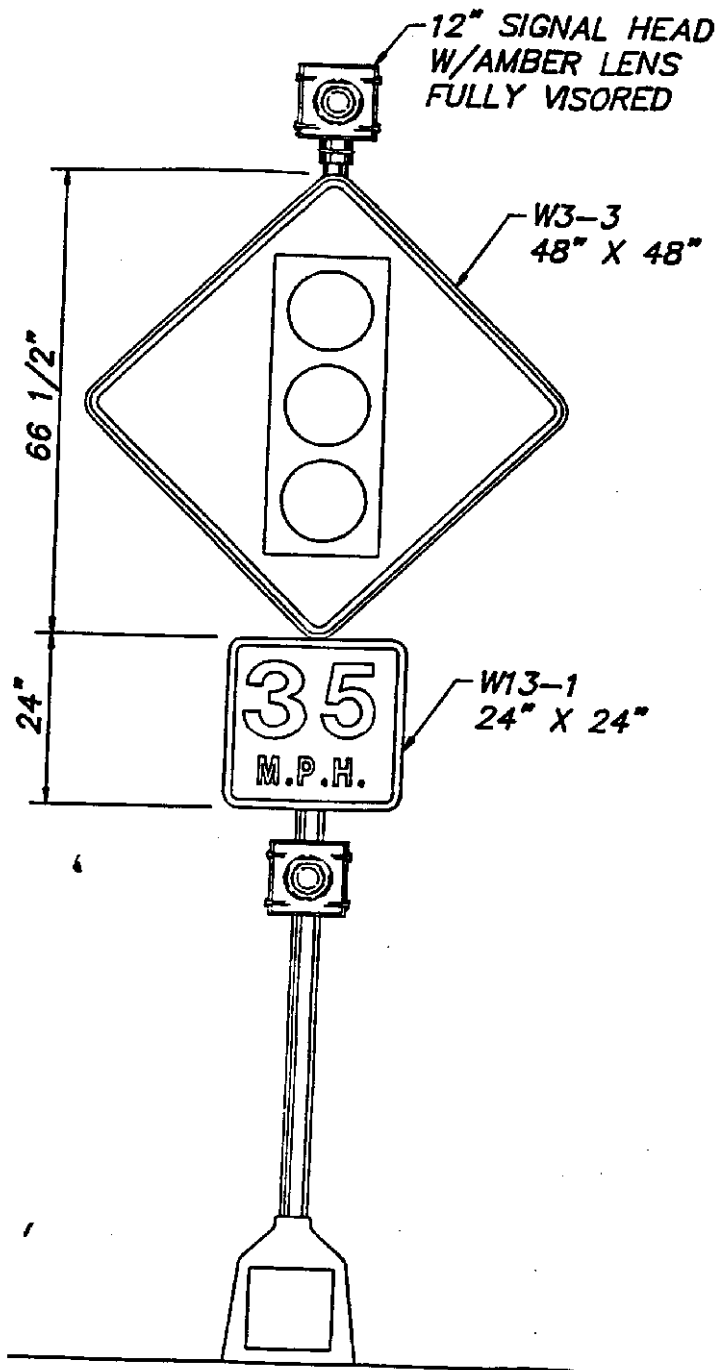
19.1.4 TWENTY (20) FEET OF GROUND ROD SHALL BE INSTALLED AT EACH FLASHER POLE. GROUND RODS MUST READ LESS THAN 15 OHMS WHEN TESTED AFTER INSTALLATION.

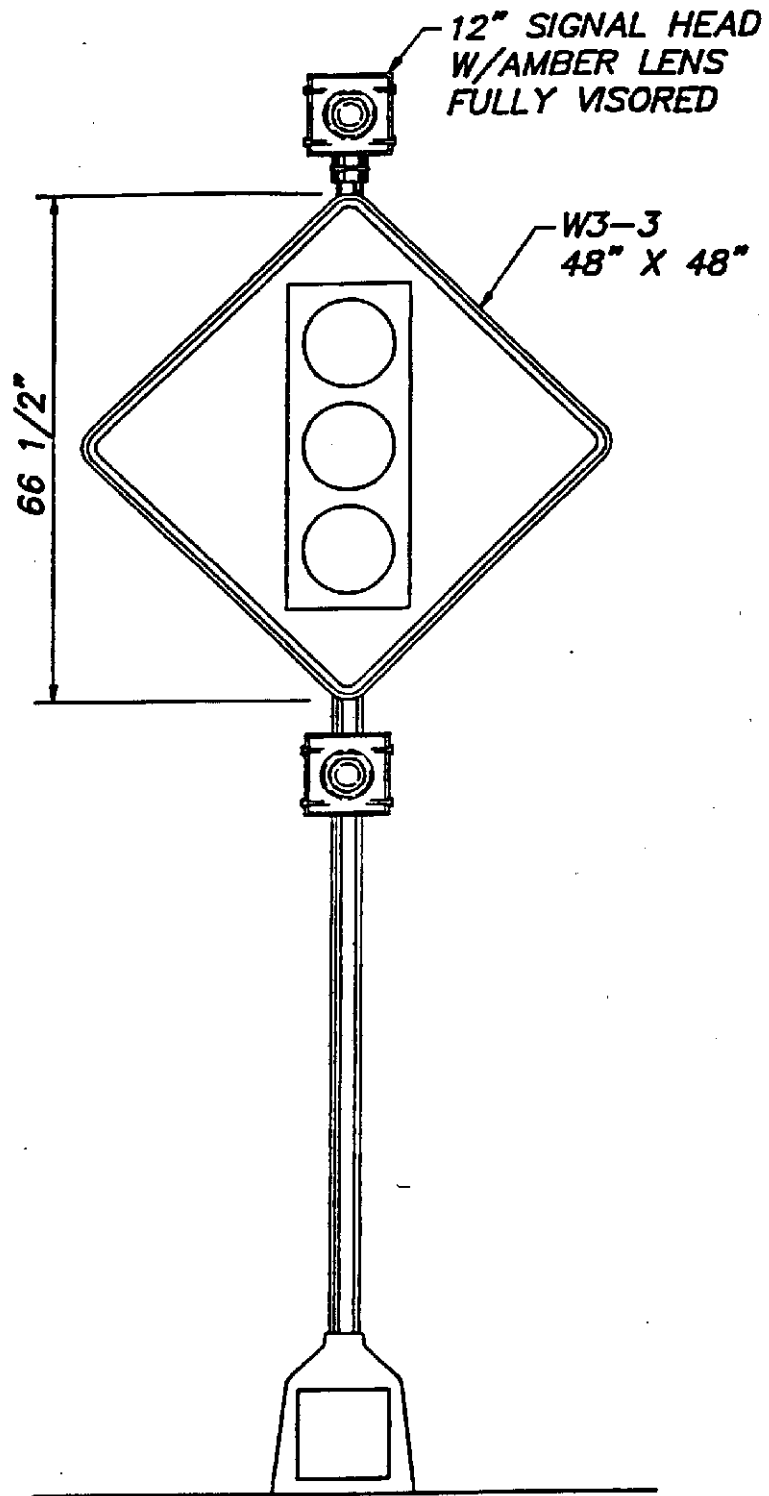
19.1.5 SIGNAL HEADS SHALL BE YELLOW 12" LEDS, WIDE VIEW ONLY.

19.2 - INSTALLATION

19.2.1 BOTTOM OF SIGN SHALL BE 7 FEET ABOVE GRADE.







HAZARD BEACON SIGN DIMENSIONS

OVERHEAD SIGNS

20.1 - GENERAL – NO SPAN WIRE STREET NAME SIGNS ALLOWED. REGULATORY SIGNS ONLY.

20.1.1 ADJUSTABLE SPAN WIRE SIGN HANGER, 16 INCH CTC WILL BE USED TO INSTALL OVERHEAD SIGNS, WITH 3/8 INCH STAINLESS STEEL HARDWARE.

20.1.2 SIGNS 48 INCHES AND LARGER SHALL HAVE 2 SPAN WIRE HANGERS ON EACH SIGN AS A MINIMUM WHEN SUSPENDED FROM A BOX SPAN.

20.1.3 ATTACH SIGN TO HANGER WITH 304 OR 316 STAINLESS STEEL BOLTS, WASHERS, AND NUTS.

20.1.4 ALL LIGHTED STREET NAME SIGNS SHALL BE LED

20.1.5 LIGHTED SIGNS SHALL BE CONNECTED TO THE ELECTRICAL SERVICE. SEPARATE CONDUCTORS SHALL FEED EACH SIGN. NO SIGNAL CABLE CONDUCTORS SHALL BE USED TO POWER STREET NAME SIGNS. A SEPARATE BREAKER AND PHOTO CONTROL SHALL BE INSTALLED

20.1.6 NO BELDEN CABLE SHALL BE USED TO FEED A LIGHTED SIGN. THREE (3) CONDUCTOR #14 AWG SO CABLE.

20.1.7 ALL CABLE FOR LIGHTED SIGNS SHALL BE KEPT SEPARATE FROM THE SIGNAL CABINET.

20.1.8 A SEPARATE BREAKER AND ONE PHOTO CELL TO CONTROL ALL LIGHTED SIGNS AT INTERSECTION, INSTALLED IN SERVICE DISCONNECT.

20.1.9 PELCO ARM FOR LIGHTED STREET SIGN SHALL BE USED, ATTACHED TO CONCRETE OR STEEL POLE ON SPAN WIRE INSTALLATIONS. RIGIDLY MOUNTED ON ARM, NO FREE SWINGING.

20.1.10 BRACKET FOR MAST ARM MOUNTED LIGHTED STREET SIGN SHALL BE MOUNTED RIGIDLY ON ARM, NO FREE SWINGING.

20.2 - INSTALLATION

20.2.1 FOR CONCRETE AND STEEL STRAIN POLES SHALL HAVE POWER CABLES SPLICED IN BASE OF POLES. THHN #10 WIRE FROM BREAKER TO BASE OF POLE S/O CORD THROUGH WEATHER HEAD CABLE FROM SPLICE TO LIGHTED SIGN. DO NOT ROUTE S/O CORD THROUGH "POLE HOLES."

20.2.2 FOR MAST ARM POLES POWER CABLES SPLICES IN BASE, S/O CORD INSIDE POLE AND ARM. EXIT ARM TO SIGN. EXIT S/O CORD USING CORD GRIPS. MAXIMUM THREE (3) FEET S/O CORD FROM BOX TO SIGN.

SPECIFICATION SHEET

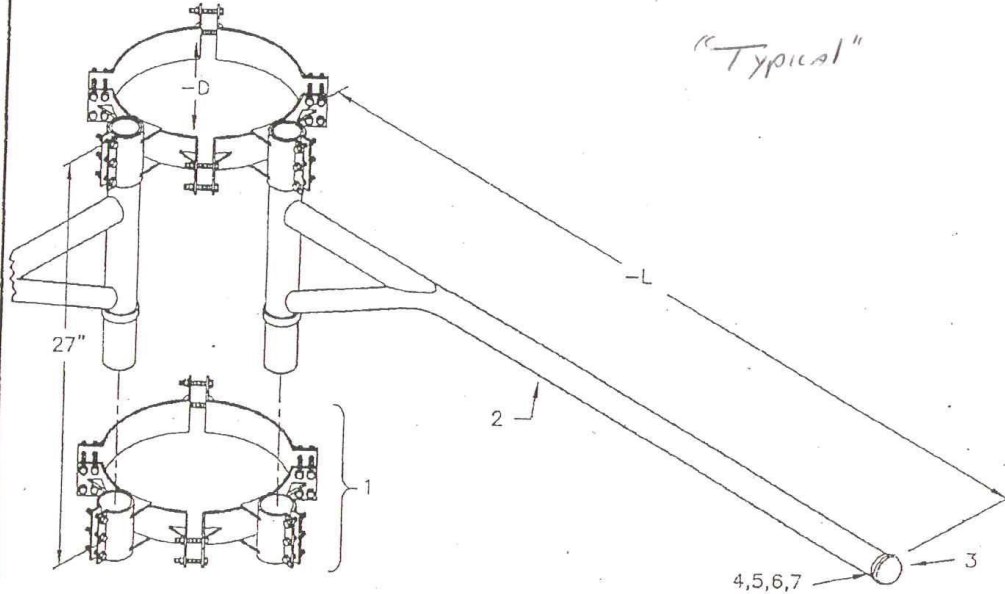


320 S. W. 18TH CORNO, OKLAHOMA 73013 (405) 340-3434 FAX (405) 340-3435

AGENCY:
FLORIDA

REF.: DOUBLE ADJUSTABLE CLAMP ASSY.
FOR ROUND POLE &
DOUBLE CANTILEVER ARM

PELCO NO.:
SP-1039-FL-D-L



NOTE:
-D = POLE DIA.
-L = ARM LENGTH

MATERIAL COATING LEGEND	
COATING	CODE
Alodine	ALO
Black Oxide	BOX
Bronze	BRS
Chrome	CRW
Galvanized	GLV
No Coating	PNC
Zinc, Bright	2N1
Zinc, Yellow	2N2
Zinc, Ultra-Seal	2N5
Painted	PXX

ITEM	PELCO PART NO.	DESCRIPTION	COAT	QTY
	SP-1039-FL-D-L	DOUBLE ADJ. CLAMP ASSY. FOR ROUND POLE, (-D = POLE SIZE)		1
1	SP-5314-D-GLV	ADJUSTABLE CLAMP FOR ROUND POLE & SINGLE CANTILEVER ARM.....	GLV	2
2	SP-5312	CANTILEVER ARM (-L = ARM LENGTH).....	GLV	2
3	PB-5403	ACORN POST CAP, 3" O.D. POLE.....	GLV	2
4	FS-4102-SS	FLATWASHER, 1/4".....	SS	4
5	FS-4208-SS	LOCKWASHER, SPLIT, 1/4".....	SS	2
6	FS-1004-SS	NUT, HEX, 1/4"-20.....	SS	2
7	FS-2123-SS	BOLT, HEX HD., 1/4"-20 x 4".....	SS	2

6/21/99

SHEET 1 OF 1

SPECIFICATION SHEET

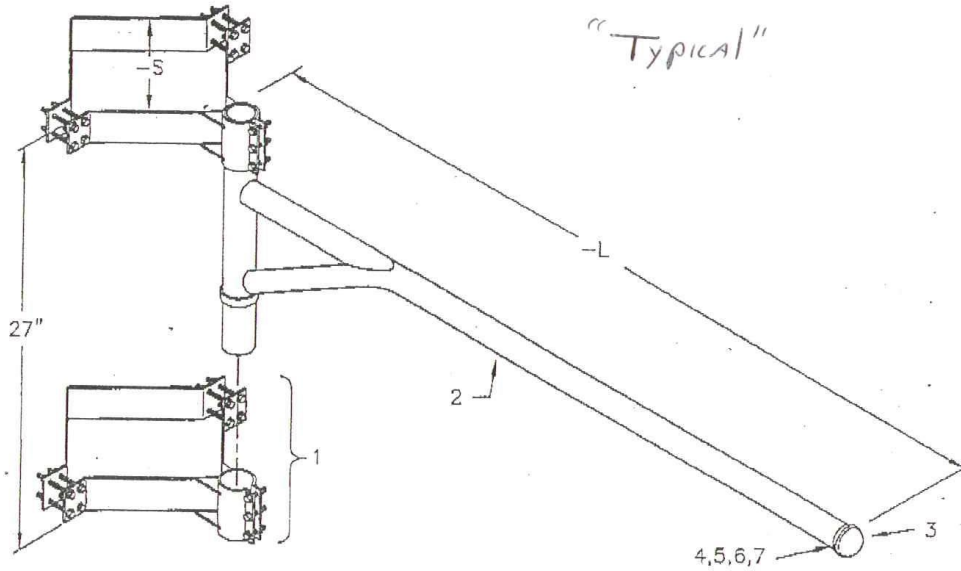


PELCO PRODUCTS, INC.
328 S. W. 14TH EDMOND, OKLAHOMA 73013 (405) 340-3436 FAX (405) 340-3435

AGENCY:
FLORIDA

REF.: ADJUSTABLE CLAMP ASSY.
FOR SQUARE POLE &
SINGLE CANTILEVER ARM

PELCO NO.:
SP-3005-FL-S-L



NOTE:
-S = POLE SIZE
-L = ARM LENGTH

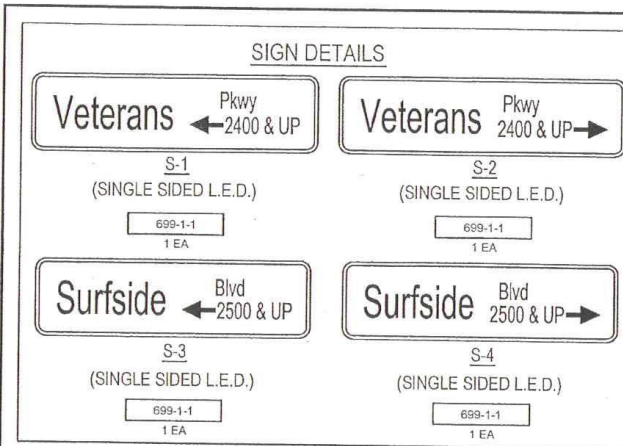
MATERIAL COATING LEGEND	
COATING	CODE
Aluminum	ALO
Black Oxide	BOX
Bronze	BRS
Chrome	CRW
Galvanized	GLV
No Coating	FNC
Zinc, Bright	ZM1
Zinc, Yellow	ZM2
Zinc, Ultra-Spec	ZM3
Painted	PXX

ITEM	PELCO PART NO.	DESCRIPTION	COAT	QTY
1	SP-3005-FL-S-L SP-5222-S-GLV	ADJ. CLAMP ASSY. FOR SQUARE POLE, (-S = POLE SIZE) ADJUSTABLE CLAMP FOR SQUARE POLE & SINGLE CANTILEVER ARM.....	GLV	1
2	SP-5312	CANTILEVER ARM (-L = ARM LENGTH).....	GLV	2
3	PB-5403	ACORN POST CAP, 3" O.D. POLE.....	GLV	1
4	FS-4102-SS	FLATWASHER, 1/4".....	SS	2
5	FS-4208-SS	LOCKWASHER, SPLIT, 1/4".....	SS	1
6	FS-1004-SS	NUT, HEX, 1/4"-20.....	SS	1
7	FS-2123-SS	BOLT, HEX HD., 1/4"-20 x 4".....	SS	1

5/20/00

SHEET 1 OF 1

Typical
Sign
Detail



630-1-12
641-16-148
663-74-11
715-5-11

STA. 10+0.64-80.23 Lt.
BASE ELEV=8.00

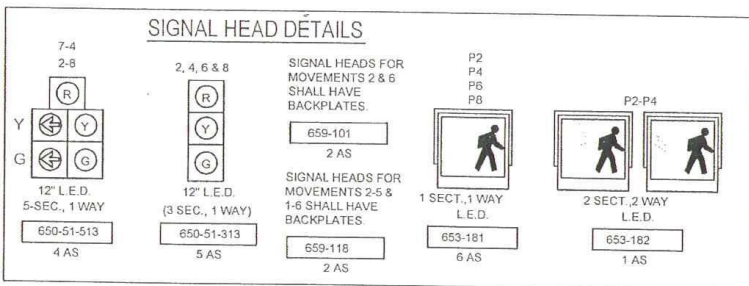
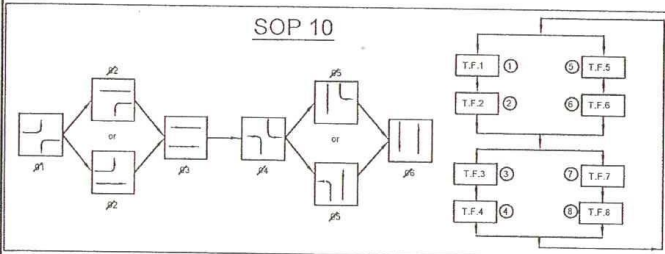
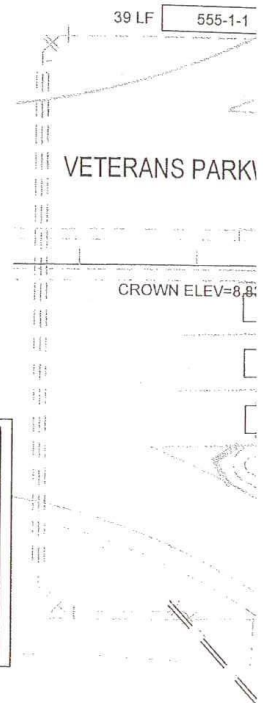
CONTROLLER TIMINGS

MOVEMENT NO.	1	2	3	4	5	6	7	8
MIN. GREEN (INT.)	4	15	6	6	4	15	6	6
EXT. (PASS)	2	6	3	3	2	6	2	3
MAX. GRN. I	20	50	20	20	20	50	20	20
MAX. GRN. II	30	75	30	30	30	75	30	30
YELLOW CLR.	4.0	4.7	4.0	4.0	4.0	4.7	4.0	4.0
ALL RED CLR.	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
PED WALK	7	7	7	7	7	7	7	7
PED CLR	20	20	20	20	20	20	20	20
RECALL		MIN			MIN			

TIMINGS ARE INITIAL AND MAY REQUIRE FIELD ADJUSTMENT AS DIRECTED BY THE PROJECT ENGINEER. TIMINGS ARE FOR SOP 10

CAMERA / ZONE

CAMERA NUMBER	CONNECT TO ZONE	CONNECT TO TIMING FUNCTION
1	4	4
1	7	7
2	1	1
2	6	6
3	3	3
3	8	8
4	2	2
4	5	5



66 LF	630-1-
1 EA	641-16-
1 EA	663-74
1 EA	715-5-

STA. 8+10.08-70.1
BASE ELEV=7.00

JOB NO. F0605.25	DATE 11/15/07	BY R.C.F.	REVISIONS MODIFIED PER L.C.D.O.T. COMMENTS.	DESIGNED BY R.C.F.	APPROVED BY: REID C. FELLOWES
				CHECKED BY R.C.F.	P.E. 61873

VIDEO DETECTION



Autoscope® ENCORE

Description

The advances in digital video and broadband communication technologies continue to open doors to new applications for Intelligent Transportation Systems (ITS) - enhancing traffic networks and inspiring new ITS capabilities. Whether for surveillance, vehicle detection, data collection, or traffic monitoring systems, digital video and broadband communications are increasing ITS performance. Improving cost efficiencies and access to strategic traffic information is helping transportation professionals improve safety, reduce vehicle emissions, and mitigate traffic congestion.

Autoscope ENCORE features EasyLink connectivity, providing simple installation to the traffic cabinet and integration to an agency's IP-based communications network. A standard CAT-5 cable connects *ENCORE* sensors into a network providing easy user access to video, traffic data, and legendary *Autoscope* vehicle detection.

ENCORE technology uses IP-based addressing with a unique Ethernet MAC address. *ENCORE* sensors employ a dual-core processor with sophisticated image analysis and Advanced RISC Machine (ARM) general-purpose processing in a small SoC package for exceptional performance and low power consumption. Multi-threaded software processes video images in real-time to detect vehicles, extract traffic data, identify incidents, and transmit detector outputs, while simultaneously streaming quality MPEG-4 video.

Safe and secure, password-protected *ENCORE* sensors are accessible via common Internet browsers. The embedded web server represents a convenient way for authorized users to view streaming video, modify configurations, and monitor system performance remotely. Configuration Wizards are present for programming both intersection and highway applications through the Network Browser or the web interface.

Each *ENCORE* sensor is accessed and powered by "3-wires-only", broadband-over-power cable, no coaxial cable required. An environmentally

protected connector simplifies the task of completing secure field terminations. Zoom control and detector configuration may be conducted remotely or at the cabinet. The unique aperture helps keep the faceplate clean for longer periods of time between routine maintenance.

Benefits

- Cost-effective ITS solutions for traffic management
- Field-proven detection accuracy and reliability
- Easy to install and configure
- Flexible design meets a variety of detection and surveillance applications
- Superior to other detection systems in value and performance

Features

- EasyLink connectivity for IP-addressable broadband communications
- Web server interface for easy setup
- Streaming digital MPEG-4 video output
- User-definable password protection
- Vehicle detection, traffic data measurement, speed, and incident detection
- Bicycle detection
- Smoke/Fire detection
- Integrated color camera, zoom lens, and dual-core processor for advanced image processing
- Direct real-time iris and shutter speed control
- Fail-safe detector outputs with the *Autoscope TAP*
- Non-volatile memory data storage
- High energy transient protection
- Local language support



ECONOLITE®
www.econolite.com

Setup & Operation

The *Autoscope ENCORE* unit makes it easier than ever to set up and customize to meet application requirements. The *Autoscope Configuration Wizard*[®] quickly sets up intersection or highway incident detection applications. Simple mouse or keyboard operations allow custom positioning for virtual detectors per field-of-view. Detection zones provide traffic count, presence, speed, and incident detection alarms. Incident types include freeway congestion, stopped vehicles, wrong direction vehicles, slow-moving vehicles, bicycles, pedestrians, smoke/fire, debris, or other customized alarms. Real-time polling or stored data include volume, occupancy, five vehicle classes by length, density, and other traffic data for selected periods or by phase.

Detector outputs can be assigned to interface with NEMA TS1/TS2, Type 170/179 and 2070 ATC controller via the optional *TAP*. Traffic data is quickly integrated into proprietary software applications with the optional *Auto-*

scope Software Developer's Kit (SDK). Extensive Boolean Logic capabilities provide flexibility in detector layouts to help validate an event or incident alarm.

Applications

- Traffic incident management for highways, tunnels, and bridges
- Junction control
- Traffic data collection
- Work-zone safety and traffic control
- Traveler information systems
- Bicycle detection
- Remote video surveillance
- Sub-system of ATMS system

Power

- 15W
- 110/220 VAC 50/60 Hz

Video

- Digital streaming MPEG-4 video output

Lens

- 10x continuous focus lens
- Standard configuration:
 - Horizontal: 5° to 46°
 - Vertical: 3.8° to 34.8°
 - Focal Length: 0.16 in. to 1.65 in. (4 mm to 42 mm)

Camera

- CCD ¼ in. diam. (4.5 mm)
- Horizontal resolution: NTSC > 470 TVL
- Sensitivity (at lens, full video, AGC off, 1/60 sec) 2.0 lux (color)
- Signal-to-noise > 50 dB
- Synchronization: Crystal lock

Effective Pixels

- NTSC: 380K (768 x 494)

Housing & Sunshield

- Image sensor and processor sealed in a water-proof and dust-tight NEMA-4 housing (IP 67)
- Thermostatically controlled faceplate heater
- Adjustable weather and sunshield with drip guard
- Weatherproof rear connector

Communications

- EasyLink (broadband communications (up to 5 Mb/sec) with RJ-45 connection from required *ENCORE/Terra Interface Panel (TIP)*)

Environmental

- -29°F to +140°F (-34°C to +60°C)
- Up to 100% relative humidity per MIL-E-5400T paragraph 4.3.24.4

Dimensions and Weight

- Overall H x W x L (with sunshield and bracket): 9.5 in x 4.75 in. x 10.75 in. (24 cm x 11 cm x 27 cm)
- 3.7 lb (1.6 kg)
- Mounting: Standard camera bracket tilt-top provided

Options

- Paint color

Warranty

- Three-year warranty
- Extended warranty package to six years

Regulatory

- EN 55022
- FCC Part 15, Class A

Product Support

- Product support and training by team of factory-trained *Autoscope* technical support specialists

© 2013 Econolite Control Products, Inc. All rights reserved. Econolite Control Products, Inc. reserves the right to change or update these specifications at any time without prior notification

3360 E. La Palma Ave., Anaheim, CA 92806
Tel: (714) 630-3700 • Fax: (714) 630-6349
E-mail: sales@econolite.com
38203E0707-9

ECONOLITE[®]
An Econolite Group Company

21.1 - GENERAL

21.1.1 AUTOSCOPE ENCORE OR ALDIS GRID SMART ARE THE PREFERRED VIDEO DETECTION FOR LEE COUNTY.

21.1.2 WHERE CAMERAS ARE TO BE INSTALLED ON FINAL PROJECT. CONTRACTOR IS TO PURCHASE AT BEGINNING OF PROJECT AND INSTALL BEFORE DETECTION IS LOST AS TEMPORARY DETECTION.

21.1.3 THESE ARE GENERAL SPECIFICATIONS ON ALL SOLO TERRA OR ALDIS GRID SMART INSTALLATION ON AN AVERAGE INTERSECTION, IF ANY QUESTIONS CALL LCDOT AT (239) 533-9500.

21.2 - AUTOSCOPE ENCORE POWER CABLE INSTALLATION

21.2.1 TYPICAL CONNECTION:

USE A 3 CONDUCTOR # 18 STRANDED CABLE WITH POLYETHYLENE JACKET FOR INDIVIDUAL RUNS FROM THE TERRA INTERFACE PANEL (TIP) TO EACH CAMERA. MUST USE SJOOW # 18 (FROM YOUR LOCAL ELECTRICAL SUPPLY HOUSE) OR ECONOLITE PART # 1175-011. ABOVE SHALL BE USE FOR CAMERA POWER CABLES FOR DISTANCES OF UP TO 1000 FT.

SPLICES ARE NOT NECESSARY HOWEVER IF A SPLICE IS NEEDED; ONLY ONE SPLICE IS ALLOWED PER EACH RUN.

MAST ARMS

SPLICES MUST BE MADE IN THE BASE OF THE UPRIGHT. MUST USE CORD GRIP TO SUPPORT CABLE FROM UPRIGHT TO MAST ARM ACCESS POINT.

YELLOW WIRE NUTS (NOT SILICONE FILL) MUST BE USED IN ALL SPLICES.

LABEL ALL CABLES IN HAND HOLE.

CONCRETE POLES

A WEATHER HEAD AND A DRIP LOOP MUST BE USED COMING FROM THE CONCRETE POLE TO THE SPAN.

LABEL ALL CABLES ENTERING THE HAND HOLE AND CABINET SO THAT IT CORRESPONDS TO THE SOLO TERRA TO WHICH IT IS CONNECTED. YELLOW WIRE NUTS (NOT SILICONE FILL) MUST BE USED IN ALL SPLICES.

IN THE CABINET, USE THE TERMINAL STRIP PROVIDED ON THE TIP. UP TWO TERRAS CAN BE INSTALLED ON EACH CONNECTION.

ON THE AUTOSCOPE ENCORE CAMERA CONNECTION USE THE "EASY LOCK" POWER CONNECTOR SUPPLIED WITH EACH CAMERA. FOLLOW AUTOSCOPE SOLO TERRA INSTALLATION GUIDE CHAPTER NUMBER 4 OR ECONOLITE BULLETIN # AN2098.

21.3 - VIDEO DETECTION CAMERA MOUNT

21.3.1 MAST ARMS USE:

PELCO AB- 0170-2-L

GUSSET TUBE SHALL BE 72".

USE BAND LENGTH AS REQUIRED.

21.3.2 LUMINARIE ARMS OR TENON MOUNT USE:

PELCO SP-1060

GUSSET TUBE SHALL BE 72”.

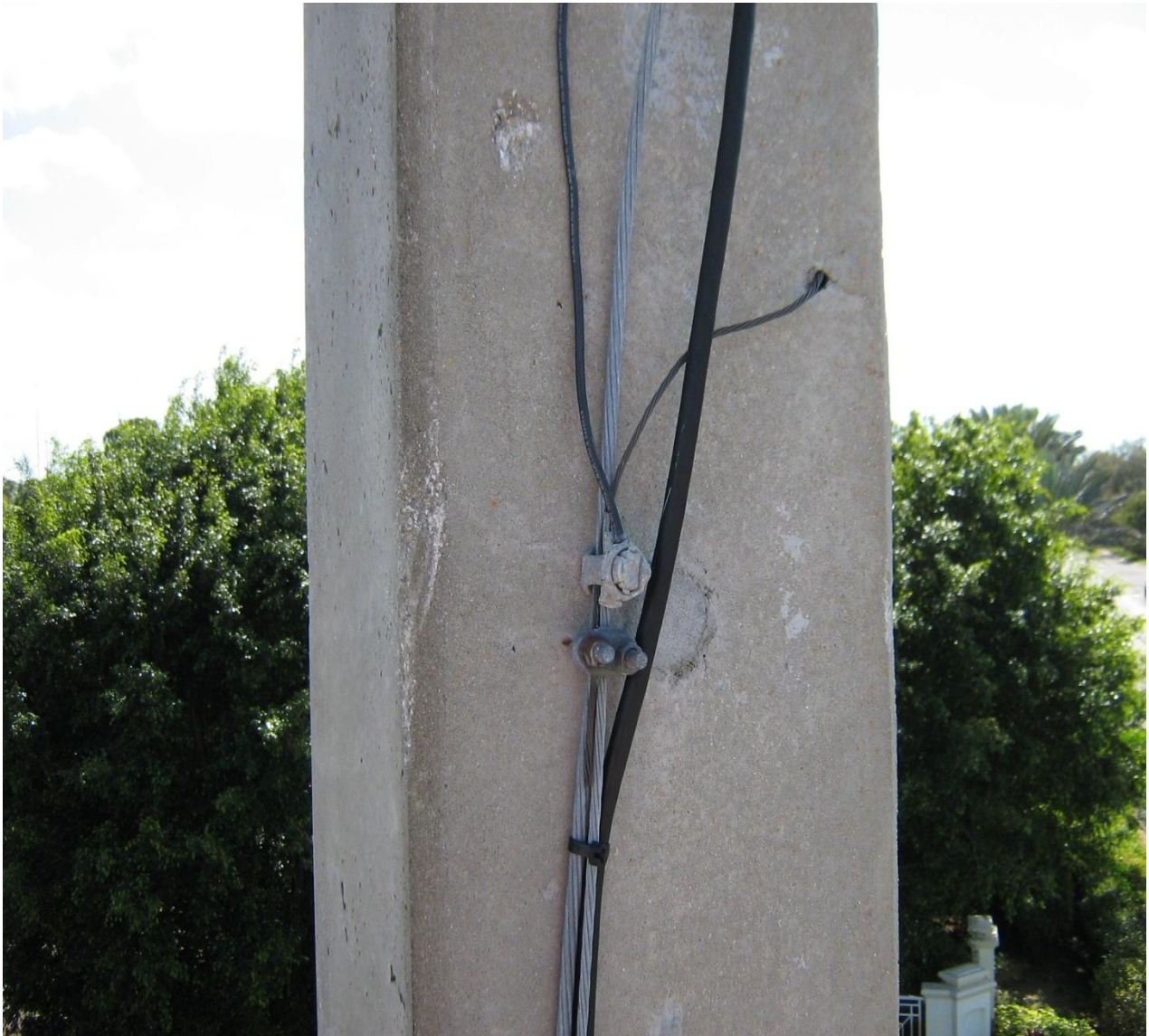
LUMINARIE ARM MUST BE BONDED TO SPAN WIRE.

IF THERE IS NOT A LUMINARIE ARM USE 1 ½” ALUMINUM PIPE. (SEE PICTURES BELOW).

PIPE SHALL BE BONDED TO SPAN USING ONE GROUNDING CLAMP IN ONE END AND A SPLIT BOLT AT THE SPAN END.

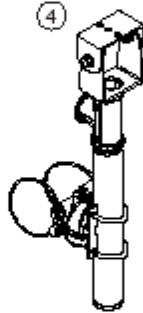
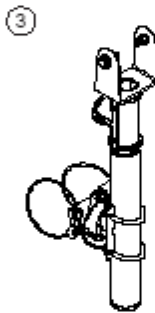
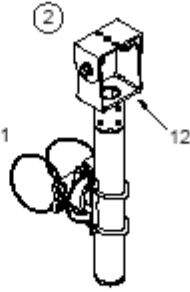
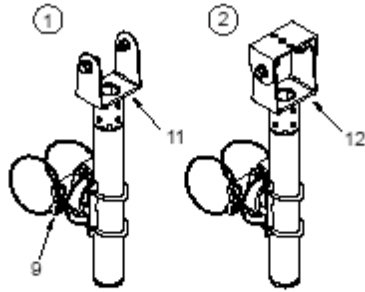
THHN OR SOLID GAUGE # 8 OR SMALLER SHOULD BE USED

IF THE PIPE IS PAINTED, REMOVE THE PAINT IN THE AREA WHERE THE CLAMP WILL BE INSTALLED. USE PHOTO BELOW AS REFERENCE.

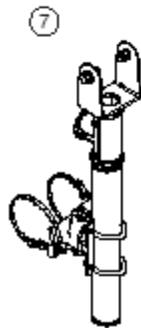
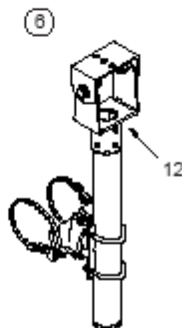
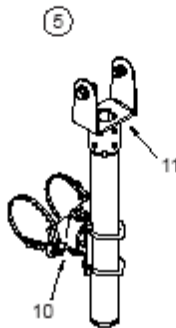








ITEM 1-4 OPTIONS	
TUBE LENGTH:	23", 37", 46", or 74"
CABLE LENGTH:	62", 84", or 96"
PAINT	



ITEM 5-8 OPTIONS	
TUBE LENGTH:	23", 37", 46", or 74"
BAND LENGTH:	29", 36", 42", 48", or 56"
STAINLESS UPGRADE	
PAINT	

ITEM	DESCRIPTION	PART NO.
VIDEO DETECTION CAMERA BRACKET		
Extended Tilt & Pan, Stellar Series:		
①	Cable Mount, 1-Piece	AS-0175
②	Cable Mount, 2-Piece	AS-0169
③	Cable Mount w/ Service Wire Outlet, 1-Piece	AS-0166
④	Cable Mount w/ Service Wire Outlet, 2-Piece	AS-0164
⑤	Band Mount, 1-Piece	AS-0170
⑥	Band Mount, 2-Piece	AS-0172
⑦	Band Mount w/ Service Wire Outlet, 1-Piece	AS-0177
⑧	Band Mount w/ Service Wire Outlet, 2-Piece	AS-0173
ASTRO-BRAC CLAMP KIT, Stellar Series:		
9	Cable Mount	AS-3009
10	Band Mount	AS-3004
CAMERA MOUNTING BRACKET:		
11	1-Piece, Alum.	SH-0514
12	2-Piece, Alum.	SH-0515

Notes:

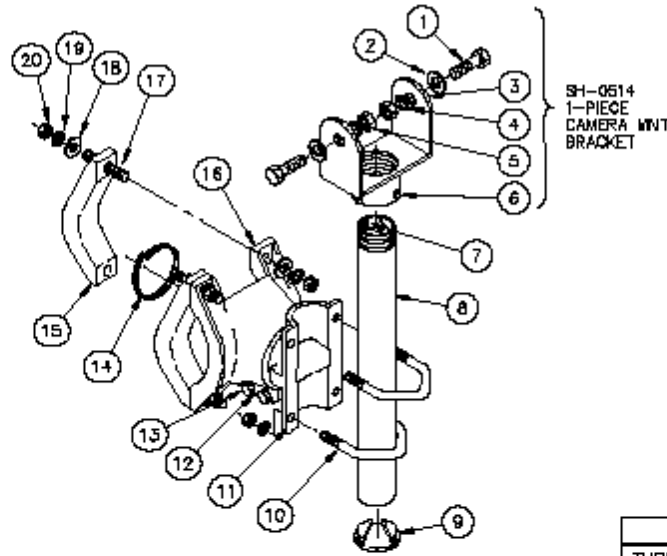
- All assemblies are supplied standard with stainless steel fasteners. Stainless steel upgrade shall include stainless clamp screw kit where applicable.
- 1-piece bracket for mounting Iteris, Odetics, or Econolite Solo Pro type cameras. 2-piece bracket for mounting Burie type cameras.
- Please specify options when ordering.



www.pelcoinc.com
 320 W. 18TH ST., EDWARDS, OK 73013
 405-340-3434 FAX 405-340-3435

ASSEMBLY SHEET

REF.: STATE OF FLORIDA	TITLE: BRACKET, VIDEO DETECTION CAMERA EXTENDED TILT & PAN W/ TENON MOUNT ASTRO-BRAC	PELCO NO.: SP-1068-FL
------------------------	--	-----------------------



SH-0614
 1-PIECE
 CAMERA MNT
 BRACKET

OPTIONS
TUBE LENGTHS: 23", 37", 46", 58" & 74"
PAINT

ITEM	PART NO.	DESCRIPTION	QTY
1	FS-2035-SS	BOLT, HEX HD 3/8"-16 x 1", STAINLESS	2
2	FS-4100-SS	WASHER, FLAT 3/8", STAINLESS	2
3	SH-1507	BRACKET, MALE WELDMENT 1 1/2"-11 1/2" NPS	1
4	FS-4205-SS	WASHER, LOCK SPLIT 3/8", STAINLESS	2
5	FS-1003-SS	NUT, HEX 3/8"-16, STAINLESS	2
6	FS-3218-SS	SCREW, SET SQ HD 1/4"-20 x 1/2", STAINLESS	2
7	AB-0233-L	INSERT, BLACK VINYL	1
8	AB-0306-L	GUSSET TUBE, 1 1/2"-11 1/2" NPS, TOE, ALUM	1
9	AB-0260	TUBE CAP, PLASTIC	1
10	AB-0256-SS	V-BOLT KIT, 5/16"-18, STAINLESS	1
11	AB-0265-M1	CLAMP, MALE, ALUM	1
12	FS-4201-SS	WASHER, SPLIT LOCK, 5/16", STAINLESS	2
13	FS-2002-SS	BOLT, HEX HD 5/16"-18 X 1-3/4", STAINLESS	2
14	AB-0311-SS	RETAINING RING, SPIRAL 2-7/8", 302 STAINLESS	1
15	AB-0291-M1	BACK CLAMP, ASTRO-BRAC, ALUM	2
16	AB-0290-M1	CLAMP, FEMALE TENON MOUNT, ALUM	1
17	FS-3306-SS	ALL THREAD, 3/8"-16 x 5 1/4", STAINLESS	4
18	FS-4100-SS	WASHER, FLAT, 3/8", STAINLESS	8
19	FS-4205-SS	WASHER, SPLIT LOCK, 3/8", STAINLESS	8
20	FS-1003-SS	NUT, HEX, 3/8"-16, STAINLESS	8

Y:\Product\pelco\Design\SP-1068-FL.dwg, 2/16/2006 4:31:30 PM, cancelled document valid for 72 hours

7/23/03

SHEET 1 OF 1

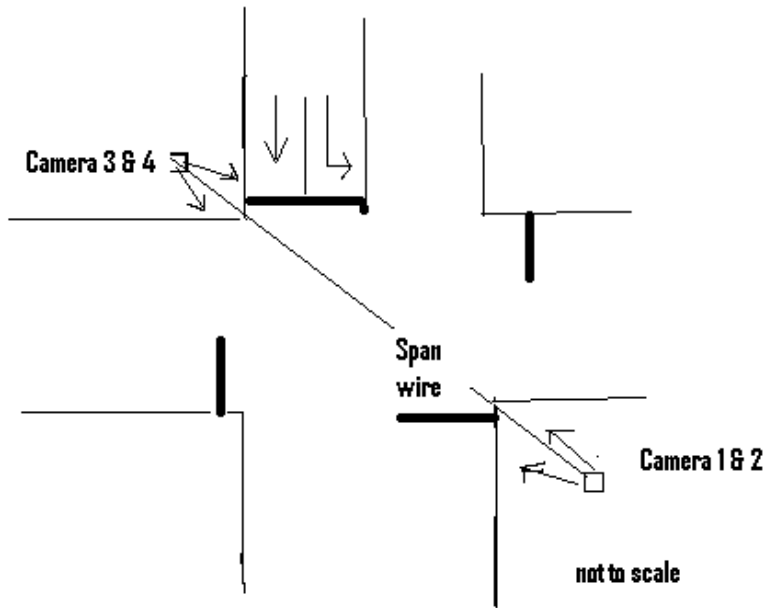
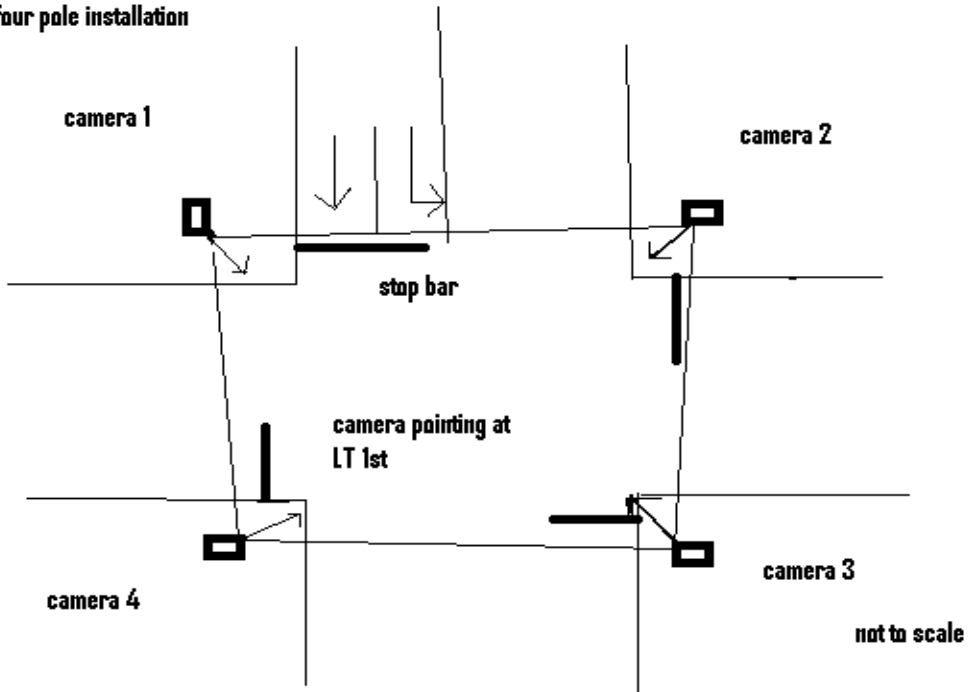
21.4 - CAMERA LOCATION

21.4.1 ON MAST ARMS CAMERAS SHALL BE INSTALLED BETWEEN THE INSIDE THRU LANE AND THE LEFT TURN.

21.4.2 IF THE SPAN WIRE INTERSECTION HAS FOUR POLES, USE ONE PER POLE MOUNTED DIAGONALLY FROM THE STOP BAR. IF TWO POLES ARE USE, INSTALL TWO CAMERAS PER POLE. ONE DIAGONAL TO THE STOP BAR AND THE OTHER ONE POINTING TO THRU MOVEMENT STOP BAR.

21.4.3 FOR ANY QUESTION IN CAMERA PLACEMENT CALL LCDOT AT (239) 533-9500 BEFORE INSTALLATION.

four pole installation



21.5 - TERRA INTERFACE PANEL

21.5.1 TERRA INTERFACE PANEL RUNS IN 120 VAC

Traffic Management Center

Communications



Terra MVP



Terra MVP Backplate

3-wire

Terra Interface Panel

21.6 - TERRA ACCESS POINT

21.6.1 TERRA ACCESS POINT (TAP) CAN BE INSTALLED IN A PRE-EXISTING DETECTOR RACK, OR IN A POWERED STAND ALONE ENCLOSURE.

21.6.2 ONE EASY LINK CONNECTOR



21.7 - ENERGIZING CAMERAS

21.7.1 CONNECT AUTOSCOPE ENCORE TO THE THREE WIRES.

21.7.2 TIP CAN TAKE TWO CAMERAS PRE CONNECTION.

21.7.3 USE ETHERNET PORT USED FOR PROGRAMMING AND REMOTE COMMUNICATIONS.

21.7.4 TAP HAS SDLC (TS2) AND HARDWIRE (TS1) CONNECTIONS FOR I/O TO CONTROLLER. DO NOT APPLY POWER TO ENCORE'S OR TAP UNTIL YOU ARE READY TO PROGRAM

21.7.5 TAP WHEN POWERED UP FOR THE FIRST TIME WILL PROGRAM DEFAULT IP ADDRESSES FOR TAP AND ENCORES.

21.7.6 TURN TERRA POWER SWITCHES ON, ONE SWITCH AT THE TIME, WAITING 30 SECOND IN BETWEEN EACH.

21.7.7 FIRST ONE TURNED ON WILL BE 192.168.11.201 NB
SECOND ONE WILL BE 192.168.11.202 SB
THIRD ONE WILL BE 192. 168.11.203 EB
FOURTH ON WILL BE 192.168.11.204 WB
TAP WILL BE 192.168.11.200

NOW CONTINUE PROGRAMMING CAMERAS USING AUTOSCOPE CONFIGURATION WIZARD.

21.8 ALDIS GRID SMART

21.8.1 INSTALLATION

- 21.8.1.1- USE A CAT 5E (PN 5E-04P24-BK-R-ESS-NR) OR IT'S EQUIVALENT GS-3-CAT5 (Aldis) & 04-001-58 (Superior Essex) OUTDOOR USE (WITH PVC JACKET) # 24- 4 PAIR PHONE CABLE FOR ONE (1) INDIVIDUAL RUN FROM THE CAMERA TO THE CPU INSIDE THE CABINET.
- 21.8.1.2- ABOVE SHALL BE USED FOR CAMERA POWER CABLES FOR DISTANCES UP TO 328'. IN ANY INSTALLATION LONGER THAT 328' A REPEATER BOARD ASSEMBLY IS REQUIRED, (Aldis # GS-3-RBA)
- 21.8.1.3- CAMERA SHALL BE INSTALLED ON THE SIGNAL POLE CLOSEST TO THE SIGNAL CABINET. THE CAMERA SHALL BE MOUNTED APPROX. 30' ABOVE FINISH GRADE AND AIMED TO THE CENTER OF THE INTERSECTION
- 21.8.1.4- SPLICES ARE ONLY ALLOWED ON THE LB, LL, LR AND INSIDE THE SIGNAL CABINET
- 21.8.1.5- USE THE GEL FILLED SPLICE PROVIDED WITH THE CAMERA



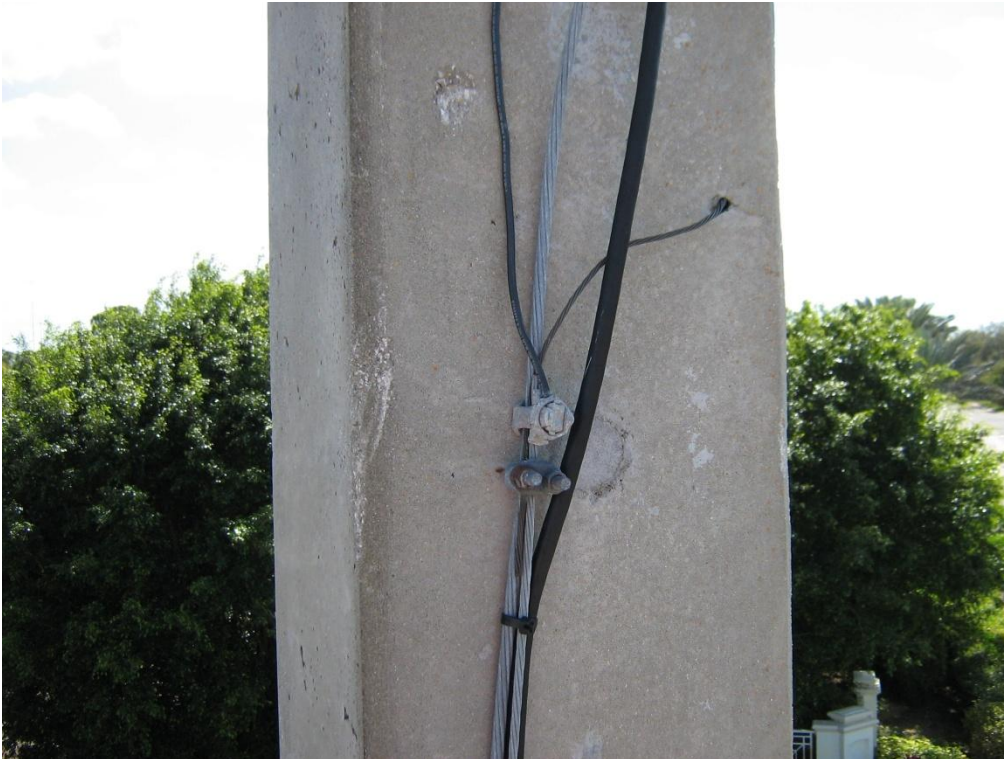
- 21.8.1.6- FOR INSTALLATION OR SPLICES USE THE PICTURE BELOW AS A REFERENCE



21.9 ALDIS CAMERA MOUNTING

21.9.1- CONCRETE POLES

- 21.9.1.1- IF THERE IS NO LUMINARIE ARM PRESENT, A 20' LUMINARIE ARM SHALL BE SUPPLIED. INSTALL ACCORDINGLY TO MANUFACTURE RECOMMENDATIONS OR USE ADJUSTABLE CLAMP ASSEMBLY FOR A SQUARE POLE WITH SINGLE CANTILEVER. PELCO PART# SP-3005-FL-S-12
- 21.9.1.2- LUMINARIE ARM SHALL BE BONDED TO THE SPAN WIRE. USE THE GROUND CLAMP ON THE ARM AND A SPLIT BOLT ON THE SPAN
- 21.9.1.3- THHN OR SOLID GAUGE # 8 OR SMALLER SHOULD BE USED
- 21.9.1.4- MOUNT (1) 1 1/2" METAL LB, LR OR LL TO AN ASTRO BRAC CLAMP KIT PELCO PART# AB3034 AT THE END OF THE LUMINARIE OR CANTILEVER ARM
- 21.9.1.5- ALL SPLICES SHALL BE MADE INSIDE THE LB
- 21.9.1.6- IF THE PIPE IS PAINTED, REMOVE THE PAINT IN THE AREA WHERE THE GROUND CLAMP WILL BE INSTALLED. USE PHOTOS BELOW AS A REFERENCE
- 21.9.1.7- LABEL ALL CABLES IN THE HAND HOLE OF THE POLE AND IN THE SIGNAL CABINET SO THAT IT CORRESPONDS TO THE ALDIS CABLE.





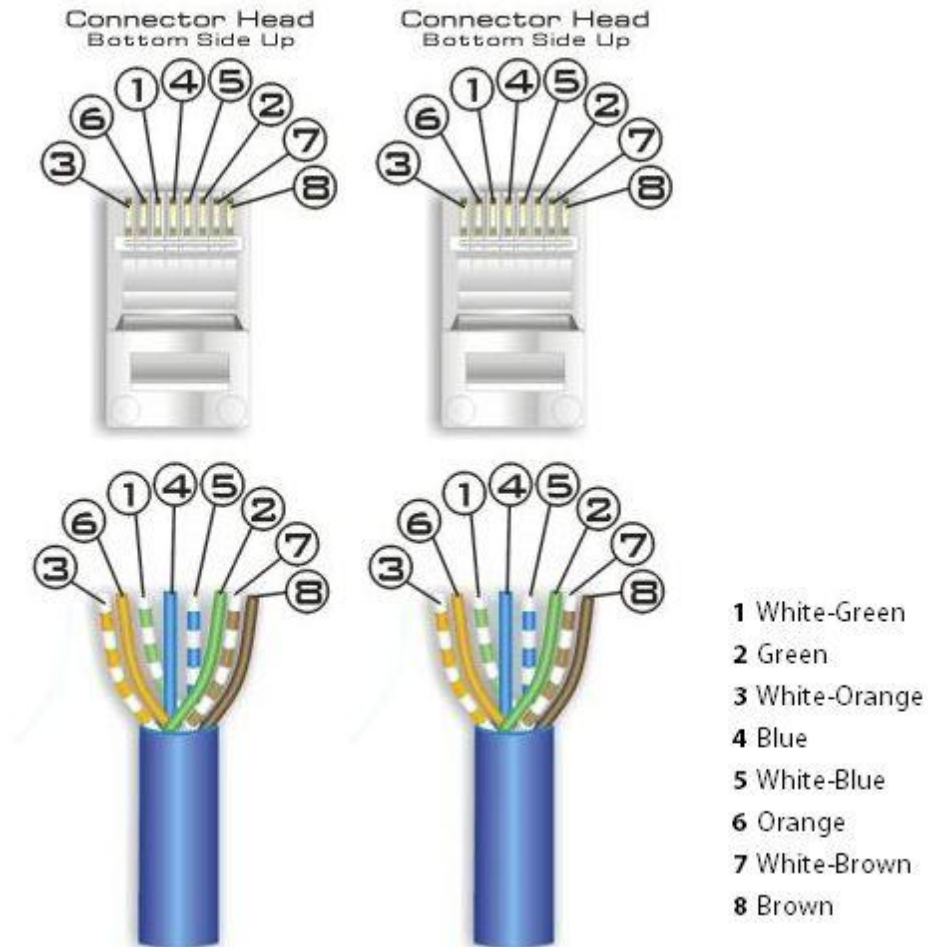
21.9.2 MAST ARM OR METAL POLES

- 21.9.2.1- USE A CAT 5E (PN 5E-04P24-BK-R-ESS-NR) OR IT'S EQUIVALENT GS-3-CAT5 (Aldis) & 04-001-58 (Superior Essex) OUTDOOR USE (WITH PVC JACKET) # 24- 4 PAIR PHONE CABLE FOR ONE (1) INDIVIDUAL RUN FROM THE CAMERA.**
- 21.9.2.2- IF THERE IS NO LUMINARIE ARM PRESENT, A 20' LUMINARIE ARM SHALL BE SUPPLIED. INSTALL ACCORDINGLY TO MANUFACTURE RECOMMENDATIONS OR USE ADJUSTABLE CLAMP ASSEMBLY FOR A ROUND POLE WITH SINGLE CANTILEVER ARM. PELCO PART# SP-1039-FL-D-12**
- 21.9.2.3- MOUNT (1) 1 ½" METAL LB, LR OR LL TO AN ASTRO BRAC CLAMP KIT PELCO PART# AB3034 AT THE END OF THE LUMINARIE OR CANTILEVER ARM**
- 21.9.2.4- ALL SPLICES SHALL BE MADE INSIDE THE LB**
- 21.9.2.5- CONTRACTOR SHALL USE ANIT-SEIZING AGENT ON ALLTHREADED PARTS**
- 21.9.2.6- SHALL USE A CORD GRIP TO SUPPORT CABLE FROM UPRIGHT TO MAST ARM ACCESS POINT**
- 21.9.2.7- A WEATHER HEAD SHALL BE INSTALLED ON UPRIGHT OR METAL POLE**
- 21.9.2.8- A DRIP LOOP SHALL BE USED IN BETWEEN ARM AND UPRIGHT OR POLE**
- 21.9.2.9- LABEL ALL CABLES IN THE HAND HOLE OF THE POLE AND IN THE SIGNAL CABINET SO THAT IT CORRESPONDS TO THE ALDIS CABLE.**

21.10 SPLICES AND ENERGIZING THE ALDIS CAMERA

21.10.1-ONCE CABLE IS INSIDE THE SIGNAL CABINET, INSTALL RJ45 CONNECTOR SUPPLIED WITH THE CAMERA TO INSTALL. CONNECT THE RJ45 CONNECTOR TO THE ETHERNET PROTECTION MODULE (EPM). THEN PLUG THE ALDIS # G5-3-EPM CABLE INTO THE CAMERA PORT ON THE CPU USING THE COLOR CODE BELOW FOR RJ45 CONNECTIONS. USE CAT 5 FROM EPM TO CAMERA PORT ON ALDIS CPU

Standard Patch Cable B
EIA/TIA 568B Color Scheme (AT&T)



OSP Broadband Category 5e

BBD_e, BBDN_e and BBDG_e

PRODUCT DESCRIPTION

BBD Category 5e Outside Plant (OSP) cables are designed to provide extension of the LAN beyond the premises. The core is filled with PFM™ thixotropic filling compound to prevent water ingress. PFM gel will not drip even in cell tower applications at elevated temperatures. A variety of constructions are available to suit multiple environmental needs. Shielded designs feature dry water block between the shield and the core jacket to prevent water ingress. All designs are suitable for buried applications.

APPLICATIONS

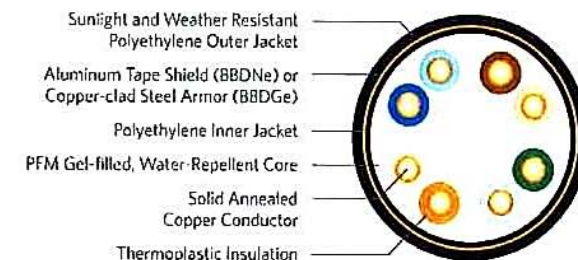
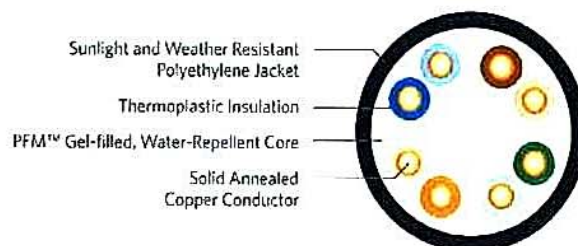
- 10BASE-T through 1000BASE-T Ethernet
- Power over Ethernet (PoE) - IEEE 802.3af
- PoE+ - IEEE 802.3at Type 1 and 2
- ATM and token ring
- WiMAX cell towers
- BBDN_e: Lashed aerial, underground conduit or low-risk direct burial
- BBDG_e: Direct burial where additional mechanical protection is required

FEATURES

- Transmission performance characterized to 350 MHz
- BBD_e: Unshielded
- BBDN_e: Aluminum tape shield
- BBDG_e: Copper-clad steel armor
- Dry block between shield/armor and inner jacket
- PFM gel-filled core construction
- OSP-grade black polyethylene jacket
- ColorTip™ circuit identification system

BENEFITS

- OSP rated cable connections for work area and backbone LAN
- Small, robust design for unshielded applications
- Protection against EMI/RFI
- Protection against EMI/RFI and provides rodent resistance
- Prevents water ingress between shield in inner cable preventing damage to equipment
- Prevents intrusion of moisture and easily wipes clean during installation
- Outside plant rated cable for years of reliable performance
- Easily identifiable conductor mates even in low-light environments



PREMISES CABLE

SPECIFICATIONS

Pair Count	4
Conductor	Solid annealed copper
AWG (mm)	24 (0.51)
Filling Compound	PFM™ thixotropic gel
Insulation	Solid polyolefin
Shield/Armor	BBD _e : Unshielded BBDN _e : Electrically continuous 0.008 in (0.20 mm) polymer coated smooth aluminum tape, applied with an overlap BBDG _e : Electrically continuous 0.005 in (0.13 mm) corrugated copper-clad steel armor, applied with an overlap
Dry Water Block	BBDN _e : SAP powder BBDG _e : SAP yarn
Jacket	Black, sunlight and weather resistant polyethylene
Characteristic Impedance (Ohms)	100 ± 15
Nominal Velocity of Propagation (%)	65
Performance Compliance	ANSI/TIA-568-C.2 ANSI/ICEA S-107-704-2006 RoHS-compliant



TECHNICAL GUIDELINE

Special connectivity is required for these cable designs. Refer to the "OSP Broadband Installation Guidelines" on our site for more information: SuperiorEssex.com/TechTip.aspx

PART NUMBERS AND PHYSICAL CHARACTERISTICS

Part Number	Product Code	Shield/Armor	Nominal Diameter in (mm)	Approx. Weight lbs/kt (kg/km)	Package
04-001-58	BBD _e	None	0.26 (6.6)	30 (45)	1,000' Plywood reel
04-002-58	BBD _e	None	0.26 (6.6)	30 (45)	2,500' Plywood reel
04-003-58	BBD _e	None	0.26 (6.6)	30 (45)	5,000' Plywood reel
04-601-58	BBD _e	None	0.26 (6.6)	30 (45)	Cut to length
04-001-54	BBDN _e	Coated aluminum tape	0.36 (9.1)	55 (82)	1,000' Plywood reel
04-002-54	BBDN _e	Coated aluminum tape	0.36 (9.1)	55 (82)	2,500' Plywood reel
04-003-54	BBDN _e	Coated aluminum tape	0.36 (9.1)	55 (82)	5,000' Plywood reel
04-601-54	BBDN _e	Coated aluminum tape	0.36 (9.1)	55 (82)	Cut to length
04-001-55	BBDG _e	Copper-clad steel	0.36 (9.1)	64 (95)	1,000' Plywood reel
04-002-55	BBDG _e	Copper-clad steel	0.36 (9.1)	64 (95)	2,500' Plywood reel
04-003-55	BBDG _e	Copper-clad steel	0.36 (9.1)	64 (95)	5,000' Plywood reel
04-601-55	BBDG _e	Copper-clad steel	0.36 (9.1)	64 (95)	Cut to length

- 21.10.2 ALDIS CPU shall have a data module installed on it.
- 21.10.3 Use a SDLC cable to make connections from the ALDIS box to the controller.
- 21.10.4 Plug CAT5 connector from the camera into the EPM, then from EPM into CPU camera port
- 21.10.5 Connect the power cable to the Aldis CPU to APC PRO 8T2 power strip. (do not use a GFCI receptacle)
- 21.10.6 proceed to programming cameras. For programming help use the following link: http://support.aldiscorp.com/install_manuals permanent count station loops

22.1 - Radar Vehicle Sensing Device

- 22.1.1 The radar vehicle sensing device shall be wavetronix smart sensor 125 hd or lee county approved equivalent

22.2 - Loop Installation Style Count Stations

22.2.1 Two lane loop layout

2-Lane (1 Loop/Lane)

NB/SB roadway – loops 1 SB; loop 2 NB

EB/WB roadway – loops 1 WB; loop 2 EB

2-lane (2 Loops/Lane)

NB/SB roadway – loops 1 & 2 SB; loop 3 & 4 NB

EB/WB roadway – loops 1 & 2 WB; loop 3 & 4 EB

22.2.2 Four Lane Loop Layout

4 - Lane (1 Loop/Lane)

NB/SB roadway – loops 1 outside SB; loop 2 inside SB;

loop 3 inside NB; loop 4 outside NB

EB/WB roadway – loops 1 outside WB; loop 2 inside WB;

loop 3 inside EB; loop 4 outside EB

4 - Lane (2 loops/lane)

NB/SB roadway – loops 1 & 2 outside SB; loop 3 & 4 inside

SB; loop 5 & 6 inside NB; loop 7 & 8 outside NB

EB/WB roadway – loops 1 & 2 outside WB; loop 3 & 4 inside

WB; loop 5 & 6 inside EB; loop 7 & 8 outside EB

22.2.3 Six Lane Loop Layout

6 - Lane (1 Loop/Lane)

NB/SB roadway

loop 1 outside SB; loop 2 middle SB; loop 3 inside SB;

loop 4 inside NB; loop 5 middle NB; loop 6 outside NB

EB/WB roadway

loop 1 outside WB; loop 2 middle WB; loop 3 inside WB;

loop 4 inside EB; loop 5 middle EB; loop 6 outside EB

6 - Lane (2 Loops/Lane)

NB/SB roadway

loop 1 & 2 outside SB; loop 3 & 4 middle SB; loop 5 & 6
inside SB; loop 7 & 8 inside NB; loop 9 & 10 middle NB; loop

11 & 12 outside NB, EB/WB roadway

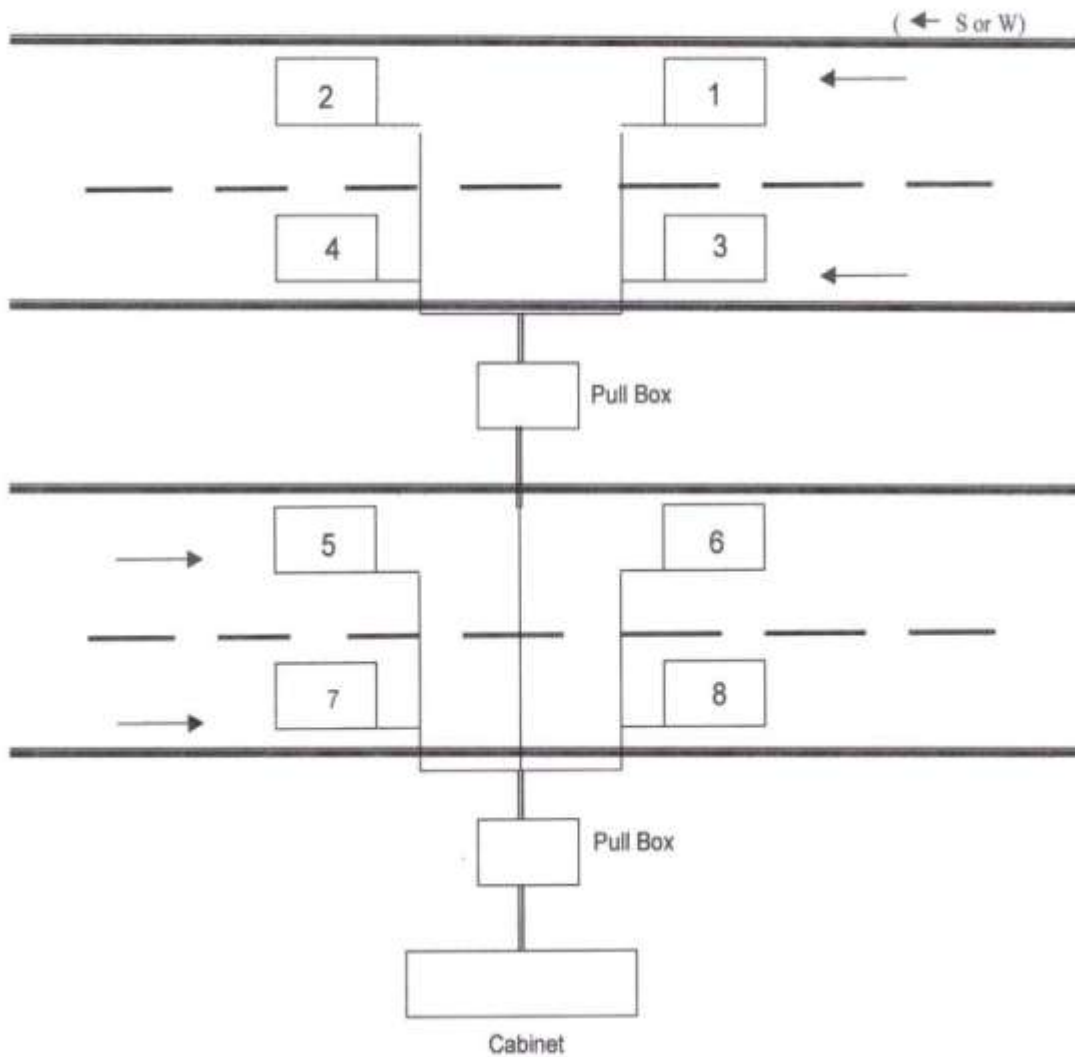
loop 1 & 2 outside WB; loop 3 & 4 middle WB; loop 5 & 6

inside WB; loop 7 & 8 inside EB; loop 9 & 10 middle EB;

loop 11 & 12 outside EB

22.2.4 Equipment shall be compatible with existing lee county equipment (refer to attached diagrams)

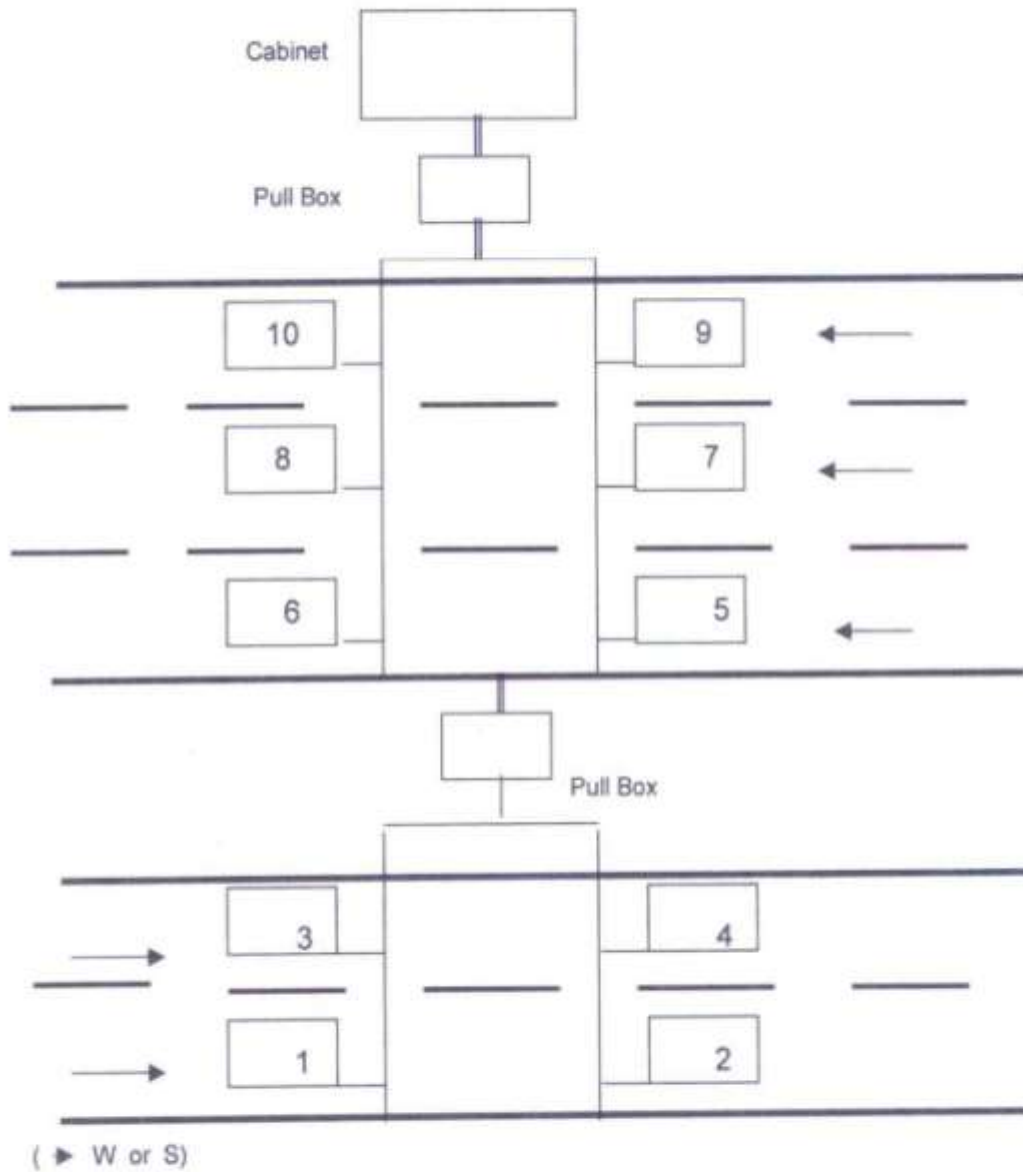
FOUR LANE LOOP LAYOUT



Note:

1. All loops are 6 ft. by 6 ft. and centered in each lane.
2. Loop spacing is 16 ft. from leading edge to leading edge.
3. Mark all loops as indicated.
4. Lanes 1 and 2 are to be in the direction of either south or west

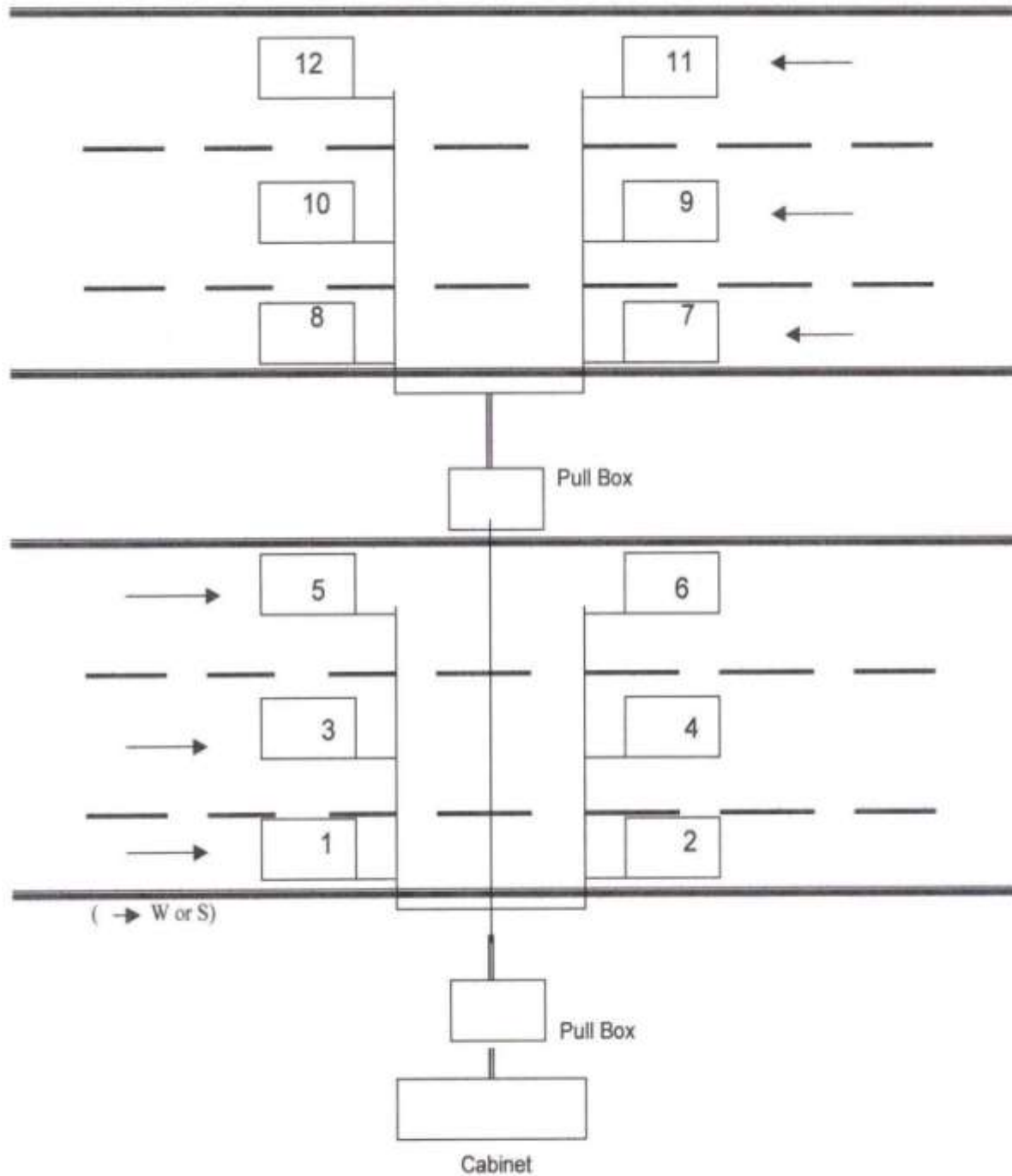
FIVE LANE LOOP LAYOUT



Note:

1. All loops are 6 ft. by 6 ft. and centered in each lane.
2. Loop spacing is 16 ft. from leading edge to leading edge.
3. Mark all loops as indicated.
4. Lanes 1 and 2 are to be in the direction of either south or west.

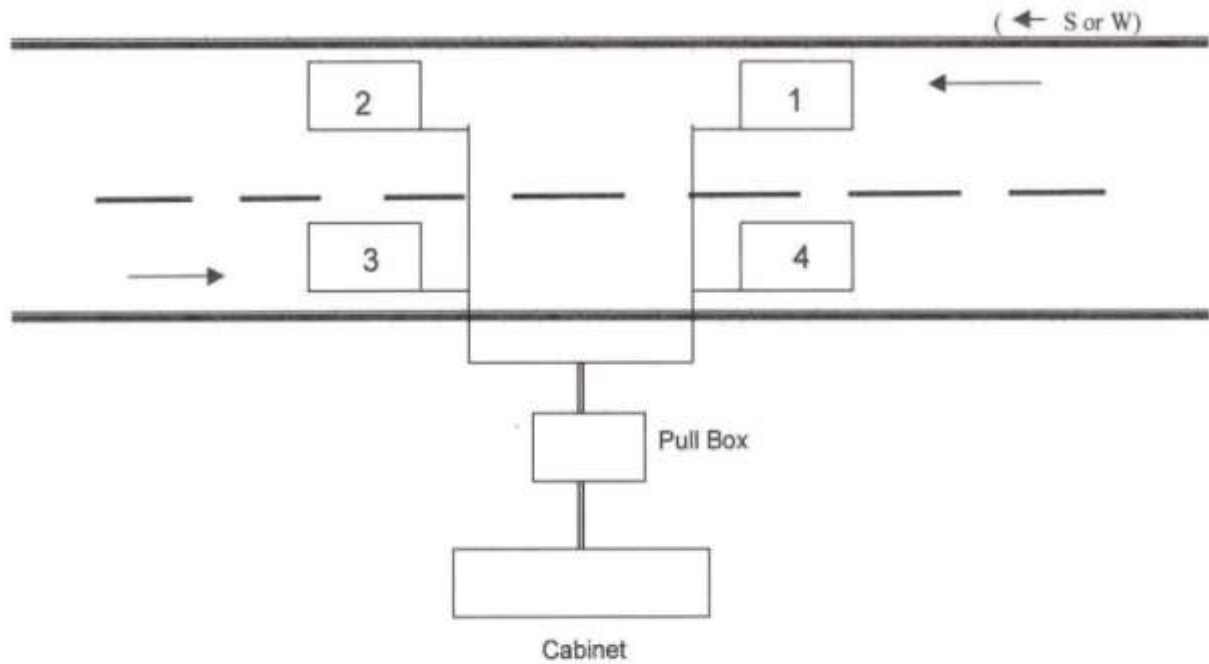
SIX LANE LOOP LAYOUT



Note:

1. All loops are 6 ft. by 6 ft. and centered in each lane.
2. Loop spacing is 16 ft. from leading edge to leading edge.
3. Mark all loops as indicated.
4. Lanes 1 and 2 are to be in the direction of either south or west.

TWO LANE LOOP LAYOUT



Note:

1. All loops are 6 ft. by 6 ft. and centered in each lane.
2. Loop spacing is 16 ft. from leading edge to leading edge.
3. Mark all loops as indicated.
4. Lanes 1 and 2 are to be in the direction of either south or west

Wavetronix SmartSensor HD™ Model 125

High-definition, true ten-lane detection delivers consistently accurate data for traffic monitoring systems, even in slow or stopped traffic.



Advantages:

PRELIMINARY

EASY TO USE

- Patented auto-configuration process for PC and Pocket PC®
- Easiest to install and operate
- Integrates with Wavetronix Click!™ products

ACCURATE

- Patented Digital Wave Radar II™ technology
- Detects and reports up to ten lanes of traffic
- Works over barriers, guardrails, medians and gores
- Accurately detects lane-changing vehicles

RELIABLE

- Requires no "tweaking" or "tuning"
- All-weather, all-condition performance
- Flash memory protects data storage
- Automated manufacturing process

EASY TO MAINTAIN

- Remote accessible for easy management
- Flash upgradeable
- No performance variance due to temperature

The Wavetronix SmartSensor HD uses the latest technology to collect consistently accurate traffic data in high definition. Patented Digital Wave Radar II™ measures traffic volume, individual vehicle speed, average speed, 85th percentile speed, headway, gap, lane occupancy, vehicle classification and presence. Operating at five times the bandwidth, SmartSensor HD has five times the resolution of the original SmartSensor, a detection range of 250 feet and the ability to detect up to 10 lanes of traffic simultaneously.

SmartSensor HD offers many high performance advantages:

1. More precise control of radar signal and noise enables greater range and detection accuracy
2. Five times resolution in range for greater accuracy
3. Improved detection performance even with slow or stopped traffic
4. Dual radar design for more accurate speed measurements



SmartSensor HD's unique Dual Radar design is incredibly accurate, providing individual vehicle speeds to within four miles per hour as well as more precise vehicle classifications. Digital Wave Radar II reduces "spillover"; works over barriers, guardrails, medians and gores; and accurately detects partially occluded vehicles. Armed with high definition radar, SmartSensor HD sees all vehicles in its field of view, and not just those in pre-defined zones.

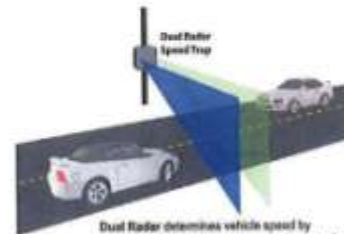
These vehicle-based detections help raise the performance bar for SmartSensor HD. Sensor configuration is made even easier because configuration no longer affects detection, only the reporting of vehicles. SmartSensor HD's vehicle-based detection even sees lane-changing vehicles that are often missed by other radar sensors.

SmartSensor HD is easy to install and includes a pointing assistant for precise alignment. Like

all SmartSensors, SmartSensor HD's patented auto-configuration process is quick and simple. HD Manager™ detects lanes by observing traffic flow, and immediately provides visual confirmation of a successful configuration. This unique auto-configuration and operation software has been developed especially for Pocket PC® handheld devices and laptops.

After installation, SmartSensor HD requires little or no on-site maintenance. Traffic data and configuration settings are stored in Flash memory, so the sensor can be remotely reconfigured for optimal performance. And SmartSensor HD is manufactured using a modern, automated process, with surface-mounted components and integrated antennas that provide consistent production and performance.

SmartSensor HD integrates seamlessly with existing legacy systems and is reverse compatible with the original SmartSensor. Dual communication ports enable SmartSensor HD to integrate with different systems simultaneously, and flexible connectivity options make it possible to directly retrofit SmartSensor HD into any existing radar deployment. This, combined with high definition radar and consistent accuracy, makes SmartSensor HD the most accurate, most cost effective traffic monitoring solution.



Dual Radar determines vehicle speed by measuring the delay from one radar beam to the next. This also determines vehicle direction.

380 South Technology Court
Lindon, UT 84042 USA
tel: (801) 764-0277 fax: (801) 764-0208
email: sales@wavetronix.com
www.wavetronix.com

WAVETRONIX™

Copyright © 2005 by Wavetronix, LLC. All rights reserved. SmartSensor HD, HD Manager, Digital Wave Radar II and associated logos are trademarks of Wavetronix, LLC. SmartSensor is a product of U.S. Patent Nos. 6,598,208 and 6,801,557. Other U.S. and international patents are pending.

SmartSensor HD™ Model 125 Specifications

SmartSensor HD is a 24 GHz Frequency Modulated Continuous Wave (FMCW) radar. It rapidly configures using its patented Lane Configuration software, and it is uniquely suited for long term ITS and arterial monitoring applications with its network connectivity and its ability to be remotely configured and upgraded.

Measured Quantities:	Volume, speed, 85th percentile speed, headway, gap, occupancy, classification and presence
Detection Zones:	Up to 10 traffic lanes simultaneously
Detection Range:	6 to 250 ft (1.8 m to 76.2 m)
Zone Resolution	1 foot (0.3 m)
Time Resolution	2 msec
Elevation 3 dB beamwidth:	65°
Azimuth 3 dB beamwidth:	7°
Operating frequency	24.0 to 24.25 GHz (K-band)
Communications	RS-232 and RS-485 connection
Power	8.0 watts @ 9-36 VDC
Ambient operating temperature:	-40°C to 75°C
Humidity:	Up to 95% RH
Shock:	10 g 10ms half sine wave
Physical dimensions (h×w×d):	13.2 in x 10.6 in x 3.3 in (33.5 cm x 27 cm x 8.3 cm)
Weight	less than 5 lbs. (2.27 kg)

Full specifications available upon request.

SmartSensor HD is fully compatible with all Wavetronix products:

- SmartSensor Advance™, the industry's only auto-configuring radar device that manages dilemma zones and efficiently controls intersections.
- Wavetronix DataCollector™, the data management solution that easily integrates into any ATMS environment.
- Wavetronix Click™ products: Simple connectivity solutions for contact closure, power and surge protection, data conversion and wireless & Ethernet communications.

**SMART
SENSOR™
IQ
HD**



Wavetronix SmartSensor HD™

The industry's only patented auto-calibrating, auto-configuring traffic sensor.

Represented by:

Wavetronix Click!™ 200 Series

Surge Protection and Power Modules

Simple connectivity brings power conversion and surge protection solutions to the Wavetronix SmartSensor™ and other ITS deployments.



Advantages:

Click! 200™ SURGE PROTECTION MODULE

- Three-stage suppression design protects SmartSensor and other devices from surges originating with other sources
- Convenient, hot-swappable power and communication buses
- DIN rail mounted for quick installation
- Pluggable screw terminals for easy installation
- Includes unprotected communication connectors
- Designed for use with other Click! devices

Click! 201 and 202™ AC to DC POWER CONVERTERS

- Primary-switch mode power supply
- Slim design
- Input voltage from 85 to 264 VAC (90 to 350 VDC)
- Output voltage 24 VDC at 1 or 2 Amps
- Frequency range from 45 to 65 Hz

The simple connectivity of the Click! 200™ power and surge protection series makes it easy to integrate the Wavetronix SmartSensor™ into existing traffic data networks. As part of the Wavetronix Click!™ family, the 200 series offers easy-to-use power solutions that help ITS systems collect and deliver the most accurate traffic data possible.

Click! 200 series modules mount to a DIN rail and are equipped with pluggable screw terminals to ensure proper wiring. The modules are designed to operate as stand-alone products or in conjunction with other Wavetronix Click! devices.

The Click! 200 Surge Protection Module has a three-stage surge suppression design that protects the SmartSensor and other devices from power surges over DC power lines, RS-232 and RS-484 communication lines. The 200's surge protected power and communication buses are hot-swappable, and the modules also include unprotected connections for RS-232 and RS-485 communications. The Click! 200 has passed NEMA TS2-1998 environmental testing and IEC 61000-4-5 electrical surge testing.



The Click! 200 includes unprotected connections for RS-232 and RS-485 communications. Protected connections are hot swappable for easy installation.

The Click! 201 and 202 AC to DC Power Converters provide 24 VDC at currents of

1-Amp (Click! 201) or 2-Amps (Click! 202). These modules offer a primary-switched mode power supply in a slim design, housed in casings that are only 22.5 or 45 mm wide.

With a 100 percent power reserve, the Click! 201 and 202 are the most effective remedy for static voltage dips, transient failures of supply voltage or continuous phase failures. Generously dimensioned capacitors guarantee a mains buffering of more than 20 ms under full load. Click! 201 and 202 devices are approved for international use, according to standards established in the CB scheme, UL 60 950 and UL 508.



Pluggable screw terminals provide simple connectivity, making the Click! 200 series power solutions the most cost effective power devices in the industry.

Simple connectivity makes the Click! 200 series the most reliable and most cost-effective ITS power solution available. Ask for a free demonstration and let us prove to you how our simple connectivity defines the standard in traffic detection.

Click!™

SIMPLE CONNECTIVITY

WAVETRONIX™

380 South Technology Court
Lindon, UT 84042 USA
tel: (801) 764-0277 fax: (801) 764-0208
email: sales@wavetronix.com
www.wavetronix.com

Copyright © 2008 by Wavetronix, LLC. All rights reserved. Wavetronix, Click! Simple Connectivity, Click! 200, Click! 201, Click! 202, Click! 200, SmartSensor and associated logos are trademarks of Wavetronix, LLC. Wavetronix is powered by U.S. Patent Nos. 6,492,098 and 6,495,697. Other U.S. and international patents are pending.

Click!™ 200 Series Specifications

Click! 200

Weight:	.3 lbs
Physical Dimensions (HxWxD):	11.4 cm x 10.2 cm x 2.5 cm 4.5 in x 4 in x 0.9 in
Ambient Operating Temp:	-34°C to +74°C
Humidity:	Up to 95% RH
Lines Protected:	RS-485, RS-232 DTE w/ CTS/RTS, DC Power
Protected Types:	Multi-Stage Differential and Common Modes Differential and Common Modes up to 4kV Clamping Voltage 8 VDC Differential and Common Modes up to 4kV Clamping Voltage 11 VDC Differential Mode up to 4kV Common Mode up to 4kV
RS-485 Surge:	
RS-232 Surge:	
DC Power:	
Peak Surge Current:	10kA (8 X 20 µs)

Click! 201 and 202

Weight:	Click! 201 - .46 lbs Click! 202 - .55 lbs
Physical Dimensions (HxWxD):	Click! 201 - 2.25 x 9.9 x 11.45 cm (.89 x 3.9 x 4.5 in) Click! 202 - 4.5 x 9.9 x 11.45 cm (1.7 x 3.9 x 4.5 in)
Ambient Operating Temp:	-34°C to +74°C
Humidity:	Up to 95% RH
Nominal Input Voltage:	100 - 240 VAC
Input Voltage Range:	85 - 264 VAC (90 - 350 VDC)
Frequency:	45 - 65 Hz
Mains buffering:	> 20 ms (120 VAC)
Nominal Output Voltage:	24 VDC
Nominal Output Current:	
-34°C to 60°C:	1.3 A (201) and 2 A (202)
60°C to 74°C:	0.85 A (201) and 1 A (202)
Efficiency:	> 80%
Transient Surge Protection:	Varistor
Internal Input Fuse:	Click! 201 - T1.25 AL 250 V Click! 202 - 2.5 AT

Full specifications available upon request.



Simple Connectivity by Wavetronix

Fully compatible with SmartSensor™, SmartSensor Advance™, Wavetronix DataCollector™ and other Click! products.



Represented by:

SS125 Mounting Height Guidelines

Offset from first Detection Lane (feet)	Recommended Mounting Height (feet)	Minimum Mounting Height (feet)	Maximum Mounting Height (feet)
6	12	9	15
7	12	9	15
8	12	9	15
9	12	9	15
10	12	9	15
11	12	9	16
12	13	10	16
13	13	11	17
14	14	11	17
15	15	12	18
16	15	12	18
17	16	13	18
18	17	14	19
19	17	14	19
20	18	15	20
21	19	15	22
22	20	16	25
23	22	16	28
24	24	16	31
25	26	17	33
26	26	17	34
27	27	18	35
28	27	18	35
29	27	18	36
30	29	19	37
31	29	19	37
32	29	19	38
33	30	19	39
34	30	19	39
35	30	20	40
36	30	20	41
37	30	20	41
38	31	21	42
39	31	21	43
40	33	22	43
41	33	22	44
42	34	22	44
43	34	22	45
44	35	23	46
45	35	23	47
46	36	23	48
47	36	24	48
48	38	24	48
49	38	24	49
50 to 230	39	25	Height must be less than the offset.

Recommended Offset

NOTE: Depending on the site and type of traffic, the sensor may tend to over count or under count. If the sensor is over counting, reduce the height of the sensor by 3 ft and reconfigure the sensor. If the sensor is under counting, increase the height of the sensor by 3 ft. Reducing the height of the sensor normally improves performance.

The RVSD shall be mounted with its cable connector pointing towards the ground and tilted so that the RVSD is aimed at the center of the lanes to be monitored.

Wavetronix SmartSensor HD™

Wavetronix, SmartSensor, SmartSensor HD and Click! are trademarks of Wavetronix LLC. All other product or brand names are trademarks or registered trademarks of their respective holders.

#08-08-2007

POWER SONIC

PG-12V103 FR 12 Volt 103 AH

Rechargeable Sealed Lead Acid Battery



We've Got The Power.™

SUBMITTAL
APPROVED

JAN 12 2012

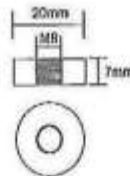


Initials:
Better Roads, Inc.

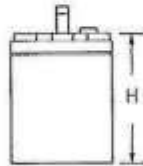
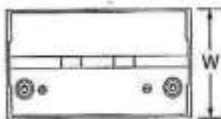


Terminals (mm)

• T11 - THREADED
INSERT - 8mm STUD



Physical Dimensions: in (mm)



L: 13.00 (330) W: 6.80 (173) H: 8.35 (212) HT: 6.66 (169)

Tolerances are +/- 0.04 in. (+/- 1mm) and +/- 0.08 in. (+/- 2mm) for height dimensions. All data subject to change without notice.

Features

- **Long Service Life** - Thick plate design and efficient gas recombination yield a service life expectancy of up to 10 years in standby mode.
- **Low Internal Resistance** - Superb high-rate discharge characteristics ensure reliable performance in UPS and Telecom applications.
- **Maintenance-Free, Non-Spillable** - Proven VRLA technology guarantees safe operation without maintenance and 'non-restricted article' status for transportation.
- **Handle** - Detachable ABS carrying handle.
- **Low Self-Discharge** - Lead-calcium alloy grids and use of high purity lead account for superior shelf-life characteristics permitting storage for extended periods of time.
- **Designed-in Reliability** - Cutting-edge manufacturing and process control combined with meticulous quality assurance procedures guarantee consistent and dependable performance.

Performance Specifications

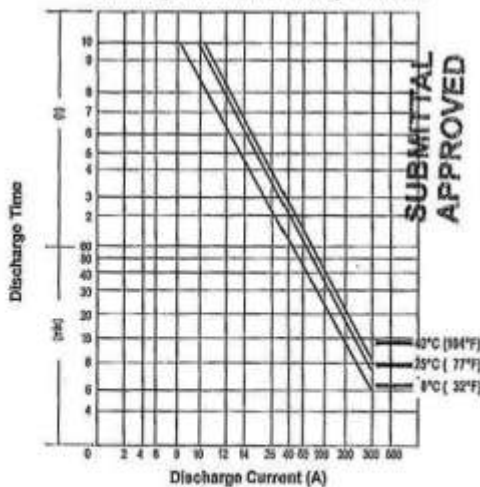
Nominal Voltage	12 volts (6 cells)
Nominal Capacity	
20-hr. (6.85A to 10.80 volts)	111.0 AH
10-hr. (10.3A to 10.80 volts)	103.0 AH
8-hr. (12.4A to 10.50 volts).....	99.2 AH
6-hr. (17.70A to 10.50 volts)	88.5 AH
3-hr. (26.80A to 10.50 volts)	80.4 AH
1-hr. (61.8A to 9.60 volts)	61.8 AH
Approximate Weight	70 lbs. (31.8 kg)
Energy Density (10-hr. rate)	1.67 W-h/in ³ (102.18 W-h/l)
Specific Energy (10-hr. rate)	17.66 W-h/lb (38.93 W-h/kg)
Internal Resistance (approx.)	4.0 milliohms
Max Short-Duration Discharge Current (10 Sec.).....	650 amperes
Shelf Life (% of nominal capacity at 68°F (20°C))	
1 Month	97%
3 Months.....	91%
6 Months	83%
Operating Temperature Range	
Charge	-4°F (-20°C) to 122°F (50°C)
Discharge	-40°F (-40°C) to 140°F (60°C)
Case	ABS Plastic (UL94 V-0 flame retardant)
Power-Sonic Chargers	PSC-1210000A-C

To ensure safe and efficient operation always refer to the latest edition of our Technical Manual, as published on our website. All data subject to change without notice.

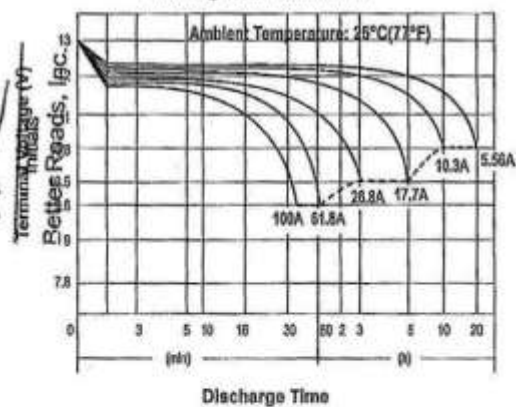
www.power-sonic.com

		Constant Current & Power Discharge Ratings													
MODEL	FINAL VOLTAGE	AMPS/WATTS PER CELL @ 25° C													
		5 MIN		10 MIN		15 MIN		20 MIN		30 MIN		45 MIN		60 MIN	
		A	W	A	W	A	W	A	W	A	W	A	W	A	W
PG-12V103 FR	1.80	194	632	166	468	144	355	127	298	104	221	75	158	61	123
	1.75	222	638	180	471	158	368	139	301	110	226	81.5	162	61	126
	1.67	253	703	206.6	502	180	386	152	312	116.7	234	80.7	168	61.8	130
	1.60	313	730	228	515	187	396	152	321	118.5	240	82.4	173	61.2	134

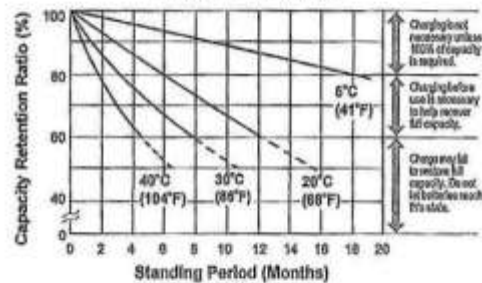
Discharge Time vs. Discharge Current



Discharge Characteristics



Shelf Life & Storage



Charging

Cycle Applications: Limit initial current to 25.0A. Charge until battery voltage (under charge) reaches 14.4 to 14.7 volts at 68°F (20°C). Hold at 14.4 to 14.7 volts until current drops to under 1.03A. Battery is fully charged under these conditions, and charger should be disconnected or switched to "float" voltage.

"Float" or "Stand-By" Service: Hold battery across constant voltage source of 13.5 to 13.8 volts continuously. When held at this voltage, the battery will seek its own current level and maintain itself in a fully charged condition.

Note: Due to the self-discharge characteristics of this type of battery, it is imperative that they be charged within 6 months of storage, otherwise permanent loss of capacity might occur as a result of sulfation.

Chargers

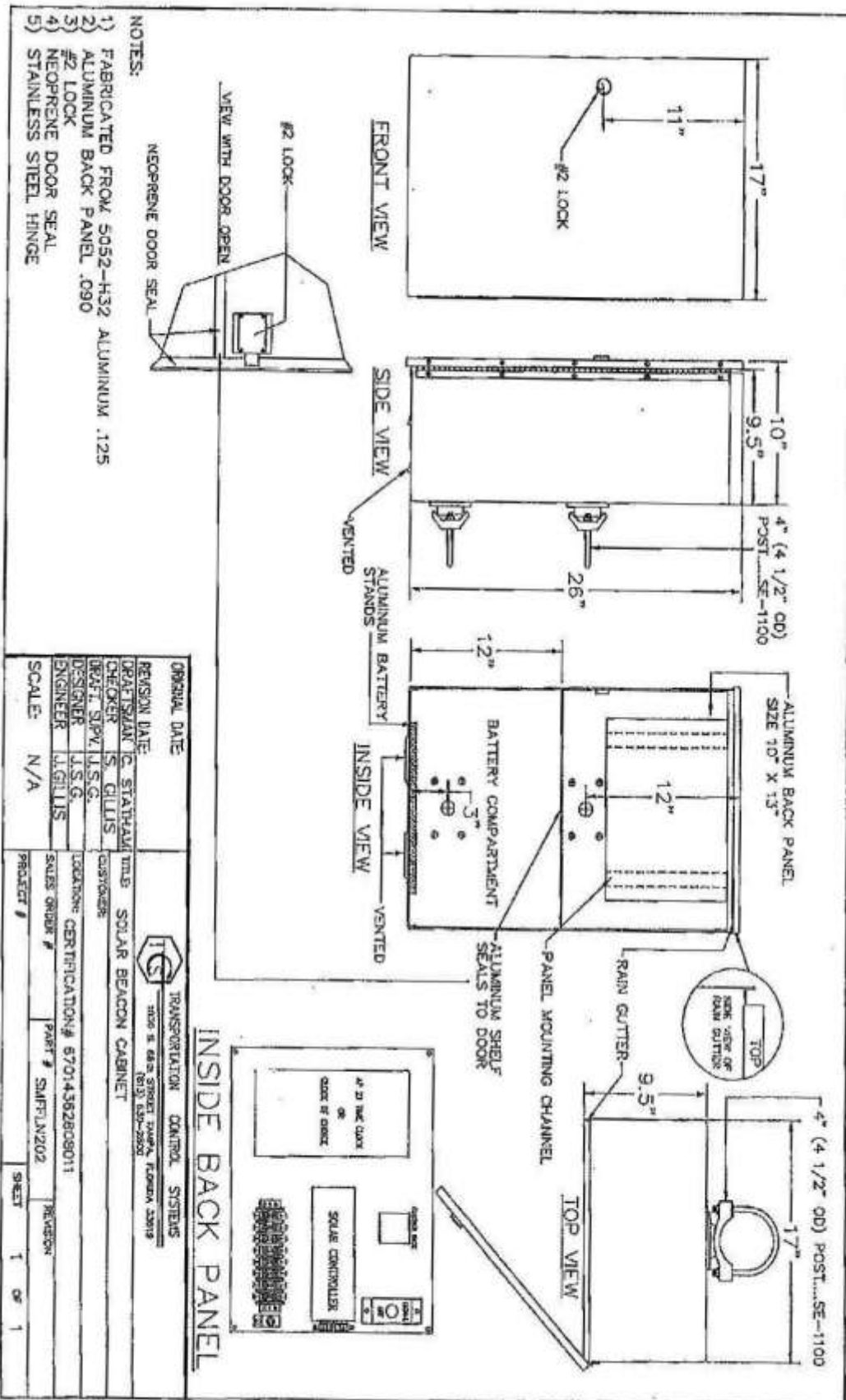
Power-Sonic offers a wide range of chargers suitable for batteries up to 100AH. Please refer to the Charger Selection Guide in our specification sheets for "C-Series Switch Mode Chargers" and "Transformer Type A and F Series". Please contact our Technical department for advice if you have difficulty in locating suitable models.

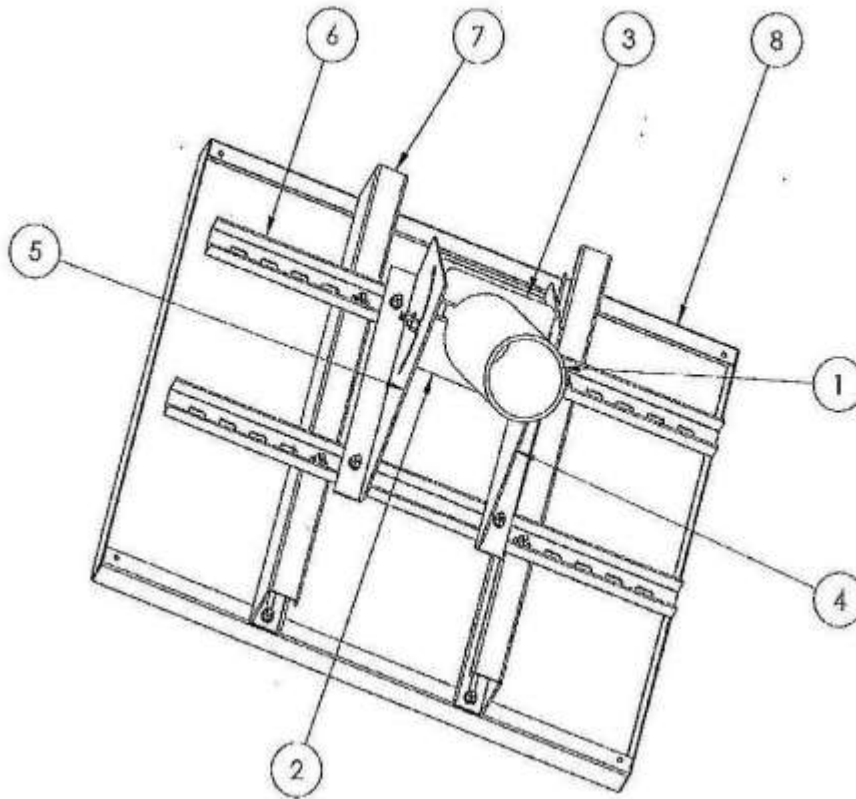
Further Information

Please refer to our website www.power-sonic.com for a complete range of useful downloads, such as product catalogs, material safety data sheets (MSDS), ISO certification, etc.

Contact Information

			www.power-sonic.com
DOMESTIC SALES Tel: +1-619-661-2020 Fax: +1-619-661-3650 national-sales@power-sonic.com	CUSTOMER SERVICE Tel: +1-619-661-2030 Fax: +1-619-661-3648 customer-service@power-sonic.com	TECHNICAL SUPPORT Tel: +1-619-661-2020 Fax: +1-619-661-3648 support@power-sonic.com	INTERNATIONAL SALES Tel: +1-650-364-5001 Fax: +1-650-365-3662 battery@power-sonic.com





SOLAR PANEL WATTAGE USED FOR ILLUSTRATION PURPOSES. YOUR PANEL MAY DIFFER IN WATTAGE BUT INSTALLATION AND PARTS WILL STILL WORK.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	4" sch 40 Pipe	NOT PROVIDED	1
2	Major Bracket	has (4) 3/8" x 1" studs & post top	1
3	Minor Bracket		1
4	Left Glide		1
5	Right Glide		1
6	Glide Rails		2
7	Solar Panel Channel		2
8	65 Watt Solar Panel		1

THIRD ANGLE PROJECTION DIMENSIONS ARE IN INCHES TOLERANCES: X = ±.125 Y = ±.0625 Z = ±.03125 ANGULAR: ±1 Degree		DATE 06/20/2011	
BRAND	DR	ISS	
CHECKED	PERM APPR	SM	DATE
DATE	DESIGNED BY	EN	PROJECT
DATE	APPROVED BY	EN	LOCATION
DATE	AL 6052-H32		PROJECT
DATE	PROPRIETARY AND CONFIDENTIAL		REV.
DATE	ALL RIGHTS RESERVED		REV. A
DATE	NO REUSE OR REPRODUCTION OF THIS DRAWING IS PERMITTED WITHOUT THE WRITTEN PERMISSION OF TRANSPORTATION CONTROL SYSTEMS		SALES ORDER
DATE			QWS, INC.
DATE			TG222418-1_assembly
DATE			SCALE: 1:1
DATE			DATE: 06/20/11
DATE			SHEET 1 OF 2

H:\Solar Panel\TC222418-1.dwg



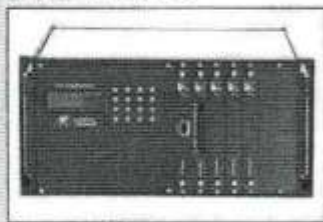
PAT

TRS

Traffic Recording Systems

The TRS product line has been designed to add superior flexibility to data collection. The standard display is a four line by twenty character LCD. The 16 alphanumeric keys allow the user the option to program the unit without the use of a computer. Depending on the application, the unit can be packaged in three different housings. The TRS and Mini TRS, a condensed version with limited expansion capabilities, may be used as portable or permanent units. The Rack II version is used strictly as a permanent unit.

TRS RACK II



Mini TRS & TRS



Features

- Up to 24 inputs
- Piezo, tube, loop, contact and environmental
- 20 Character by 4 line display
- Binned and event data
- Portable and permanent housings
- Real time clock
- Piezo Weigh-In-Motion
- Fiber optic sensor interface

Display and keypad



Mini TRS inputs



Data card



The TRS can be operated via the integrated keypad and display or via a serial link with a computer or modem. Upon power up, the TRS is completely menu driven for ease of use in the field. To serve the special needs of many different users, the TRS options include: solar panel, pcmcia interface, expandable memory, environmental sensors, WIM, fiber optic and additional inputs.

Technical Data TRS

Enclosure:	Cast aluminum (powder coat) Sheet metal card cage
Time periods:	1 Minute to 24 hour intervals
Data Storage:	256K flash standard
Power:	Typically 45 days per charge On/Off switch standard
Dimensions:	17.8 cm x 34.3 cm x 15.2 cm 7 in x 13.5 in x 6 in Mini: 22.9 cm x 17.8 cm x 12.7 cm 9 in x 7 in x 5 in Rack II: 48.3 cm card cage 19 in card cage
Weight:	Less than 15 lbs Mini: Less than 10 lbs
Display:	20 Character by 4 line
Accuracy:	Self adjusting airswitches Meets or exceeds TMG and ASTM standards
Communications:	RS232 serial comms from 300 to 38,400 baud



PAT America, Inc.
2402 Spring Ridge Dr, Ste E, Spring Grove, IL 60081
815-675-1430 * FAX 815-675-1530
e-mail: info@patamerica.com * www.patamerica.com



LOW POWER MODEMS

300bps through 33.6Kbps
AC and DC Powered
Solar Compatible

There are a growing number of remote communications applications where power consumption is a major issue. Often, these environments are solar powered and require that equipment operate over a wide voltage range. The StarComm 1442L and 3342L are designed to address these specific requirements.

Since all StarComm communications products are designed to withstand the rigors of industrial use, you can expect years of trouble-free operation from the 1442L and 3342L. From traffic monitoring applications, in the heat of the Arizona desert to weather surveillance installations in Alaska, StarComm has developed a reputation for performance, quality and unique feature sets:

- **AUTOMATIC POWER UP ON RING DETECT** – StarComm Low Power Modems remain in a low power standby mode until an incoming call presents a ring signal to the device. When the ring signal is detected, the device powers on and accepts the call. After the call has completed, the device will return to a low power standby mode.
- **EXTERNAL POWER SEQUENCING ON RING DETECT** – All models provide relay contacts for sequencing power to other devices. The relay is activated after the first ring cycle and deactivated when the modem returns to low power standby mode.
- **FLEXIBLE POWER SUPPLY OPTIONS** – All models offer power options to meet a wide range of AC and DC requirements.
- **FLEXIBLE PACKAGE OPTIONS** – All models are available in our standard stand alone package or at the board level for OEM applications.
- **COMPATIBLE WITH ALL STANDARD MODEMS FROM 300bps THROUGH 33.6Kbps**
- **ENGINEERED AND MANUFACTURED TO COMMERCIAL STANDARDS**

IDEAL FOR USE IN:

- Solar powered applications
- Battery powered applications
- Traffic monitoring systems
- Control systems
- Supervisory systems



FEATURES AND SPECIFICATIONS

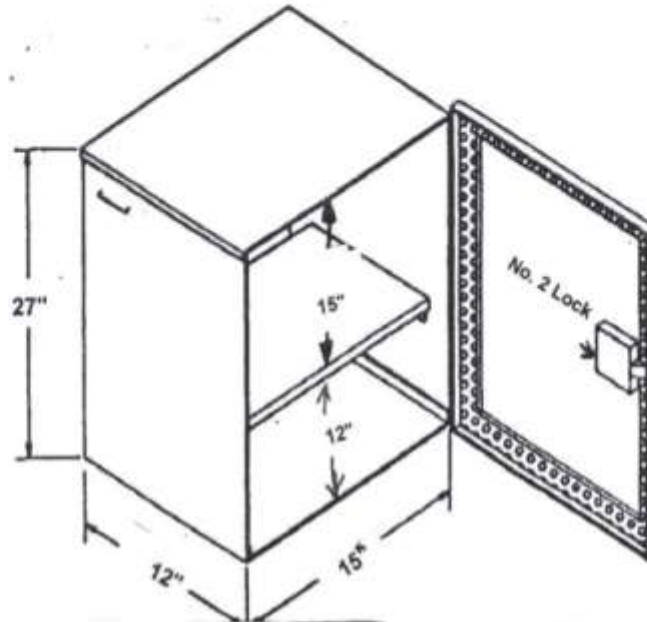
- **COMPATIBILITY (3342L)** – V.34, V.32bis, V.32, V.22bis, V.22, V.23, V.21, BELL 212A, BELL 103J.
 - **COMPATIBILITY (1442L)** – V.32bis, V.32, V.22bis, V.22, V.23, V.21, BELL 212A, BELL 103J.
 - **FAX COMPATIBILITY** – Group 3 send/receive rates to 14.4Kbps. Class 1 and 2 support.
 - **DTE INTERFACE (3342L)** – RS-232C (V.24). Autobaud or fixed data rates to 115.2Kbps.
 - **DTE INTERFACE (1442L)** – RS-232C (V.24). Autobaud or fixed data rates to 57.6Kbps.
 - **AUTO DIAL MODES** – Standard AT compatible dial commands or DTR dial of stored number.
 - **ANSWER MODES** – Standard auto answer or manual answer under DTE control.
 - **ERROR CORRECTION** – V.42 and MNP 2-4 error correction. MNP 10 extended cellular services.
 - **DATA COMPRESSION** – V.42bis and MNP5 data compression.
 - **CONFIGURATION CONTROL** – Standard AT commands.
 - **DIAGNOSTICS** - V.54 through AT commands.
 - **LINE INTERFACE** – 2-wire, pulse or DTMF dial. XMT level: -12dBm, RCV sensitivity: -43dBm.
 - **POWER** – Standard wide range DC supply operates from 5.5-14VDC. Optional supply automatically adjusts to 9VAC or 9-14VDC. Current consumption in low power standby mode: < 5ma. Operating current at 12VDC - 1442L: 180ma. 3342L: 240ma.
 - **ENVIRONMENTAL** – Operating temperature range: -20C to +70C. Humidity: 90% non-condensing.
 - **APPROVALS** – FCC Part 68 & Part 15, Class A. Optional: International approvals available.
 - **PHYSICAL** - Dimensions: 5.30"L x 5.05"W x 1.53"H. Weight: 12oz.
-

DI		NazTech Inc.	
St		23436 Hobdy Road	
		Sorrento, Fl 32776-9237	92649
		(352) 385-1661 Fax:(352)385-1663	
Pt		E-Mail VNazworth@aol.com	nm.com



NIZIETT INC.
23436 Hobby Road
Sorrento, FL 32776-9237
(352) 385-1661 Fax: (352) 385-1663
E-Mail VNazworth@aol.com

TYPE II
TRAFFIC CONTROL CABINET



CABINET SPECIFICATIONS

MATERIAL - .125 THICK 5052 ALLOY, SHEET ALUMINUM, ALL SURFACES TO HAVE MILL FINISH AS STANDARD FINISH

VENTILATION - VENT LOUVERS, ONE LOUVER ON THE RIGHT SIDE 3" FROM THE BOTTOM OF THE CABINET, AND ONE LOUVER ON THE LEFT SIDE 2 1/2" FROM THE TOP OF THE CABINET

NOTE: CABINET DIMENSIONS MAY VARY PLUS/MINUS ONE INCH

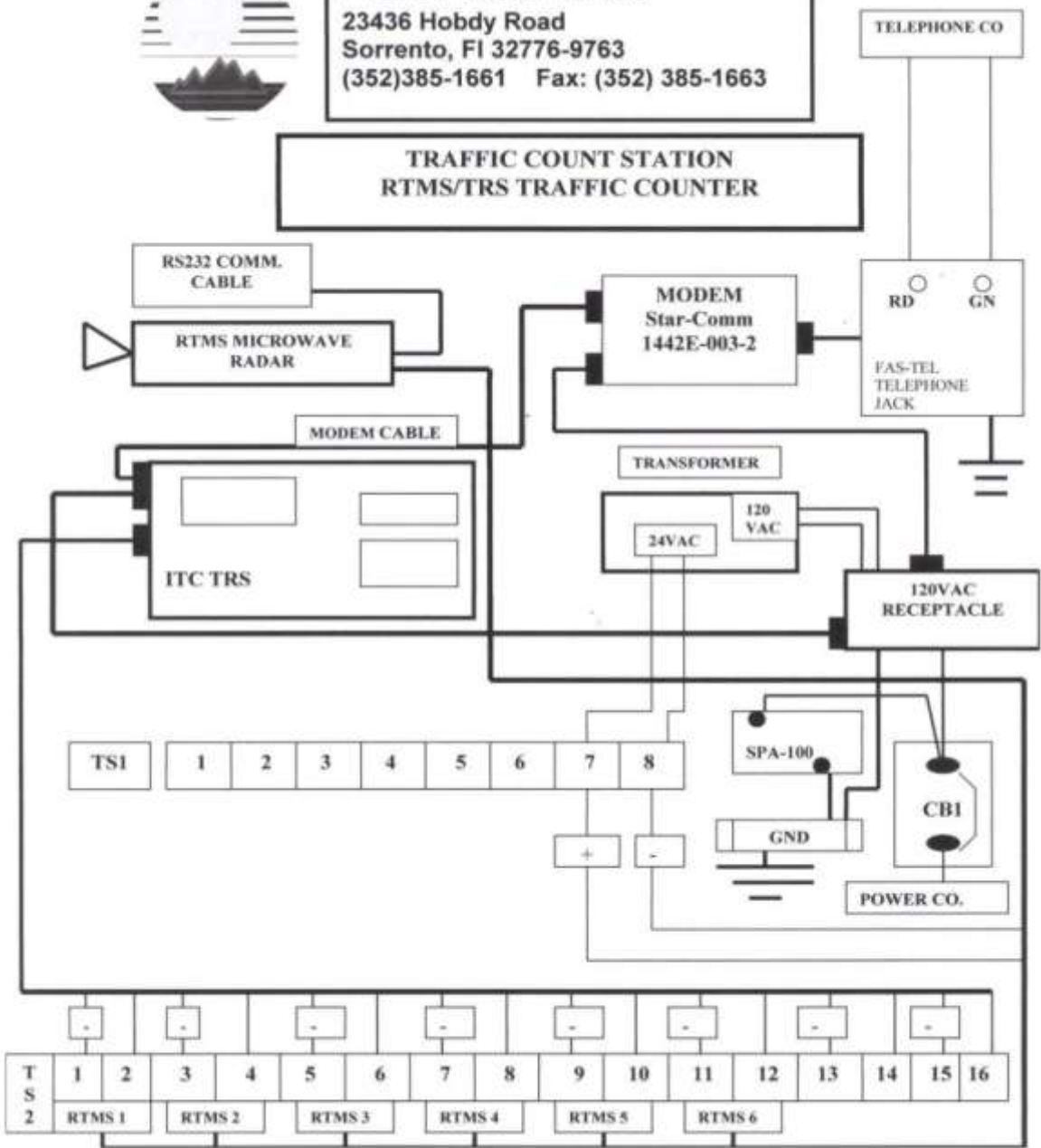
DOOR & LOCK - DOOR HAS A 14 Ga. STAINLESS STEEL CONTINUOUS HINGE, CLOSE CELL NEOPRENE GASKET AROUND THE INTERIOR DOOR FOR WATER INTEGRITY, A CORBIN #2 LOCK & KEY LOCKING SYSTEM

BACK PANEL - 15" FROM TOP OF CABINET CONSTRUCTED OF .125 ALUMINUM AND PUNCHED WITH 5/16" HOLES, 1" FROM ALL FOUR CORNERS FOR MOUNTING BACK PANEL IN CABINET WITH 3/16" STAINLESS STEEL SCREWS



NazTech Inc.
 23436 Hobdy Road
 Sorrento, FL 32776-9763
 (352)385-1661 Fax: (352) 385-1663

**TRAFFIC COUNT STATION
 RTMS/TRS TRAFFIC COUNTER**



REMOTE
TRAFFIC
MICROWAVE
SENSOR



R
T
M
S

ELECTRONIC
INTEGRATED
SYSTEMS
INC.



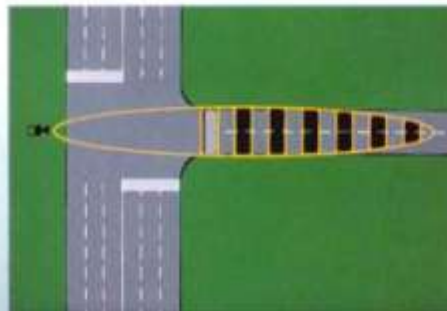
TYPICAL APPLICATIONS



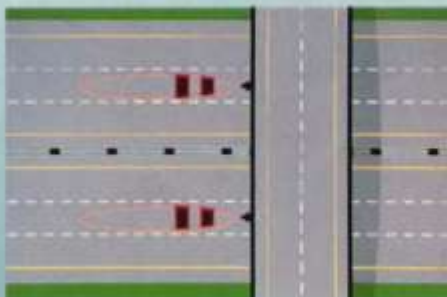
SIDE-FIRED HIGHWAY



FULLY ACTUATED INTERSECTION SYSTEM DETECTION



OFF-RAMP QUEUE CONTROL



FORWARD LOOKING HIGHWAY

FEATURES

The RTMS was designed to eliminate many of the costs and inconveniences caused by present-day traffic monitoring devices. Highly reliable with a low life-cycle cost, the RTMS is powerful and intelligent. It provides the user with a choice of 8 user-definable detection zones. The side-fired mode supplies data on multi-lane traffic and the forward-looking mode monitors a long stretch of road or single lane, measuring vehicle speed, queue length and size.

The RTMS is both a valuable short-term asset and a significant component of Advanced Traffic Monitoring Systems of the future. Users can tie its contact outputs directly to NEMA or 170-type controllers for loop emulation or access a wide variety of information through its serial data bus.

The RTMS is safe and easy to install, set up and maintain without disrupting traffic and it can be applied to any road type (including steel bridges, reinforced concrete, soft foundations and gravel roads) without weakening the road surface. It is self-testing before and after installation. The RTMS is an all-weather detector. Its accuracy is independent of weather or lighting conditions.

The high degree of reliability and maintainability of the RTMS results in a low life-cycle cost. Sturdy and compact, it was designed for a long life unaffected by the environment, construction work or lightning surges. And because it is software driven, it is reusable, reprogrammable and expandable.

Of superior design and construction, the RTMS is maintenance free.

Consequently, its life-cycle cost is substantially lower than any other system currently in use. While cutting costs, its built-in intelligence enables you to receive more data, more accurately and more dependably.

Fiber Optic Communications

23.1 General

23.1.1 This section will list the approved single mode fiber optic cable and associated equipment.

23.2 Fiber Optic Cable

23.2.1 Fiber optic cable shall be corning altos 8.3/125 LT duct/aerial .4/.3 DB/KM SMF28E. This is an all-dielectric, dry filled loose tube single mode fiber optic cable.

23.2.2 The installer of fiber optic cable shall be a corning warranty partner and BICSI certified.

23.2.3 Cable shall be shipped on reels of marked continuous length. Cable shall be tested prior to installation with readings no greater than 0.1 decibel per reel.

23.2.4 The installer shall provide a copy of transmission test results of cable prior to installation and after installation is complete.

23.3 Installation

23.3.1 Install equipment according to the latest version of the manufacturer's installation procedures and industry accepted installation standards, codes and practices or as directed by a Lee County Engineer.

23.3.2 Ensure conduit is clean and free from damage prior to installing fiber optic cable.

23.3.3 Provide and store fiber optic cable at each pull box and splice box to allow for future splices, additions and repairs to the fiber network. Store the fiber optic cable without twisting or bending less than the minimum bend radius. Store a minimum of 50 feet of spare cable in all pull boxes. Store a total of 100 feet of cable on each side of the splice point, in all splice boxes, with the exception the splice point in all splices boxes with the exception of termination lead into the traffic signal cabinet which shall be 50 feet at splice point. Each fiber cable shall be labeled at each pull box and splice box designating number of strands and direction to and from.

23.3.4 All optical fiber splices shall be fusion spliced according to the latest version of the manufacture's installation procedures and industry accepted installation standards, codes and practices, or as directed by a Lee County Engineer.

23.3.5 Where any cable is to be accessed for lateral insertion, open only the buffer tube containing the fiber to be accessed and cut only the actual fiber to be accessed.

23.3.6 All fibers shall be tested from both cable end points with an optical time domain reflectometer (OTDR) at wavelengths of 1310 and 1550NM. Splice loss shall not exceed maximum bidirectional average of 0.1 Decibel per splice. Connector attenuation at each termination panel and its associated splice shall not exceed 0.5 Decibel. Splices and connectors exceeding allowable attenuation shall be replaced at no cost to Lee County.

23.4 Distribution Center

23.4.1 Patch panels shall be corning part number SPH-01P or Lee County approved equivalent. Both interconnect centers utilize CCH panels. Contractor shall use the appropriate panel for each application.

23.4.2 Fiber termination shall be pre-terminated connector assemblies (pigtailed) and consist of fiber optic cables with factory installed SC type connectors on one end and un-terminated optic fiber on the other. These connector assemblies shall be installed with fusion splices.

23.4.3 Splice closures shall be corning part number: SCF-6C22-01 for cables containing up to 72 fibers using corning splice tray number: SCF-SCT-099. Corning splice closure part number SCF-6C28-01 shall be used for cables containing up to 144 fibers using splice tray number SCF-SCT-112.

23.5 Ethernet

23.5.1 Ethernet switch shall be listed on FDOT APL and Lee County approved.

23.5.2 Optics for above switch shall be ITS Express 1000LX10 SFP CLASS 1 or Lee County approved equivalent.

23.5.3 Ethernet to serial conversion shall be done using a DIGI Port Server (Part Number 70002043) or Lee County approved equivalent.

23.6 - Pan/Tilt/Zoom Cameras (PTZ)

23.6.1 PTZ cameras shall be Bosch Autodome 500i Series intelligent PTZ camera system. (Refer to manufactures website for technical data)

23.6.2 Pan/Tilt/Zoom Cameras (PTZ) Mounting and Wire.

Mounting height for Bosch Autodome 500i Series camera on a concrete strain pole shall be at a height of 40 to 50 feet using the Bosch white mounting bracket.

The preferred location for mounting Bosch Autodome 500i Series camera on a mast arm is on the arm above curb, using a Candy Cane Bracket.



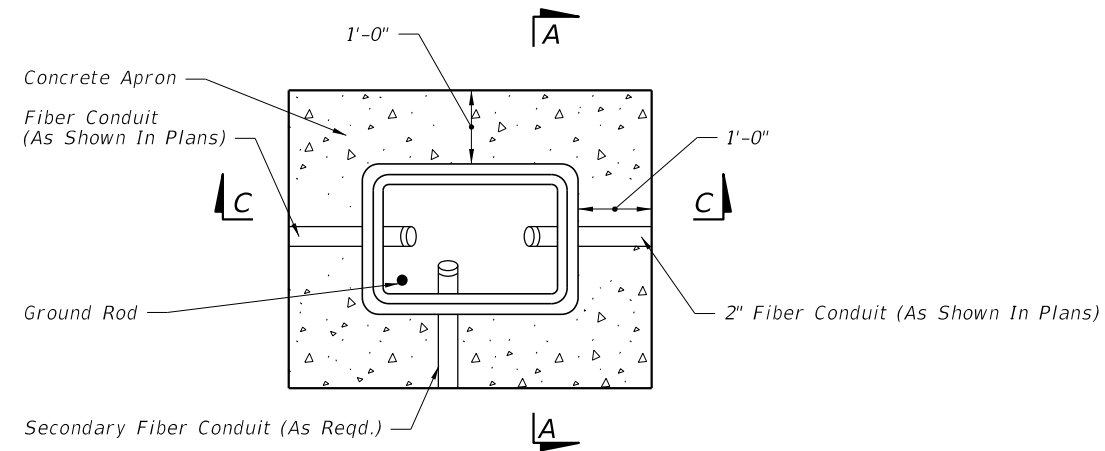
23.6.3 Pan/Tilt/Zoom PTZ power wiring shall be 14 gauge 2 wire/shielded (loop homerun wire) PTZ communication wire shall be Cat 5e outdoor/underground rated for a distance no longer than manufacture's recommendation of 350'. The transformer will be plugged into approved cabinet surge protection. Any modifications or adjustments must be approved by Lee County Traffic Engineer. Cameras (PTZ) Wire.



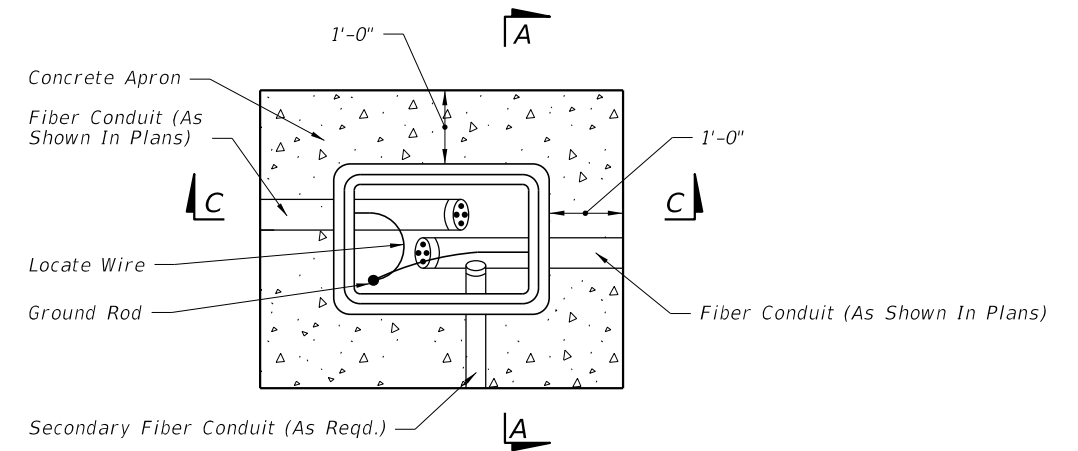
24.1 Radios

24.1.1 Wireless bridging/access point communication between traffic signal cabinets shall be on the FDOT APL and approved by Lee County.

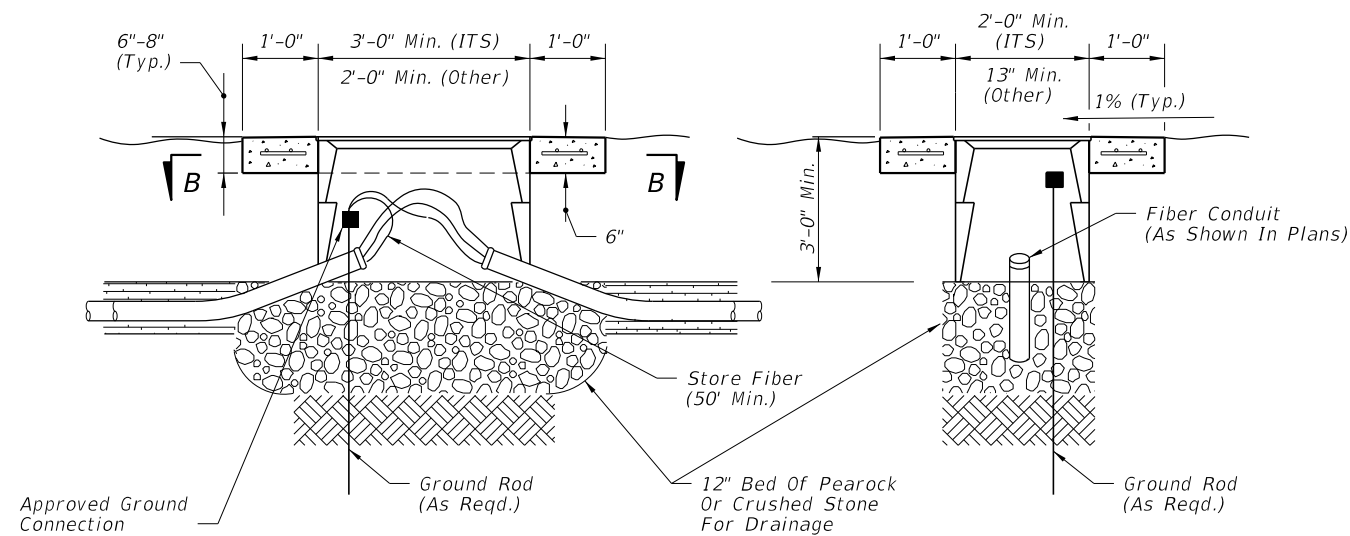
C:\projects\standards\18204-01.dgn
 r1960/h
 11:50:08 AM
 12/30/2011



SECTION BB



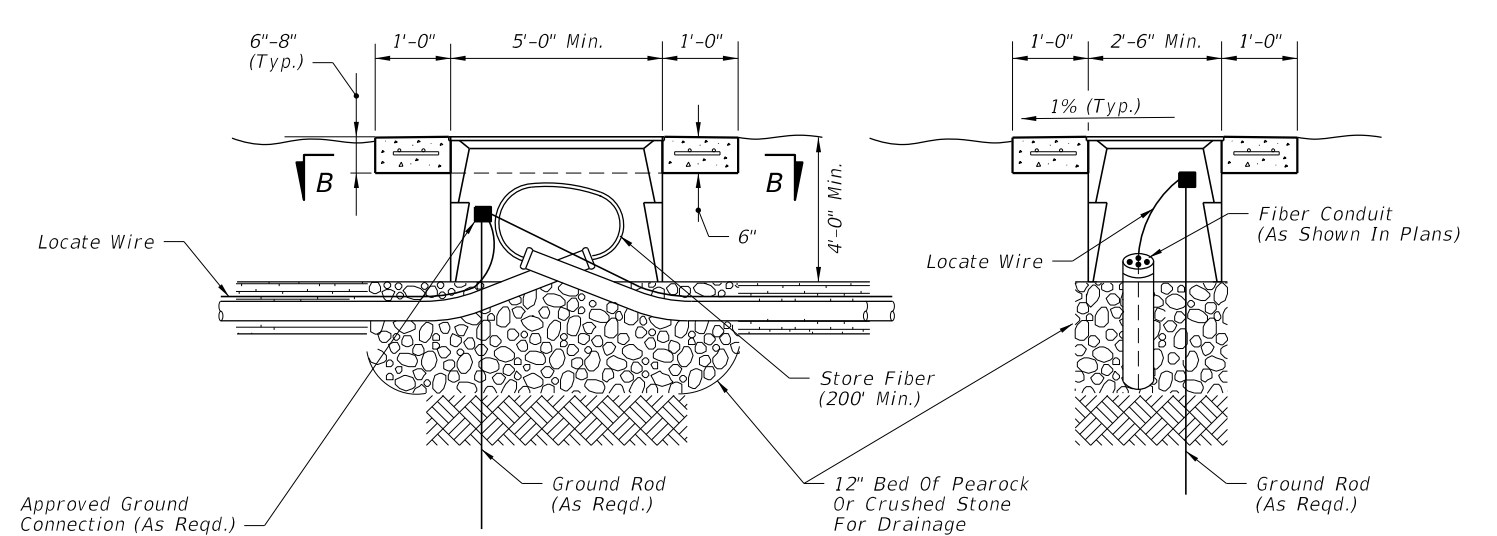
SECTION BB



SECTION CC

SECTION AA

PULL BOX




SECTION CC

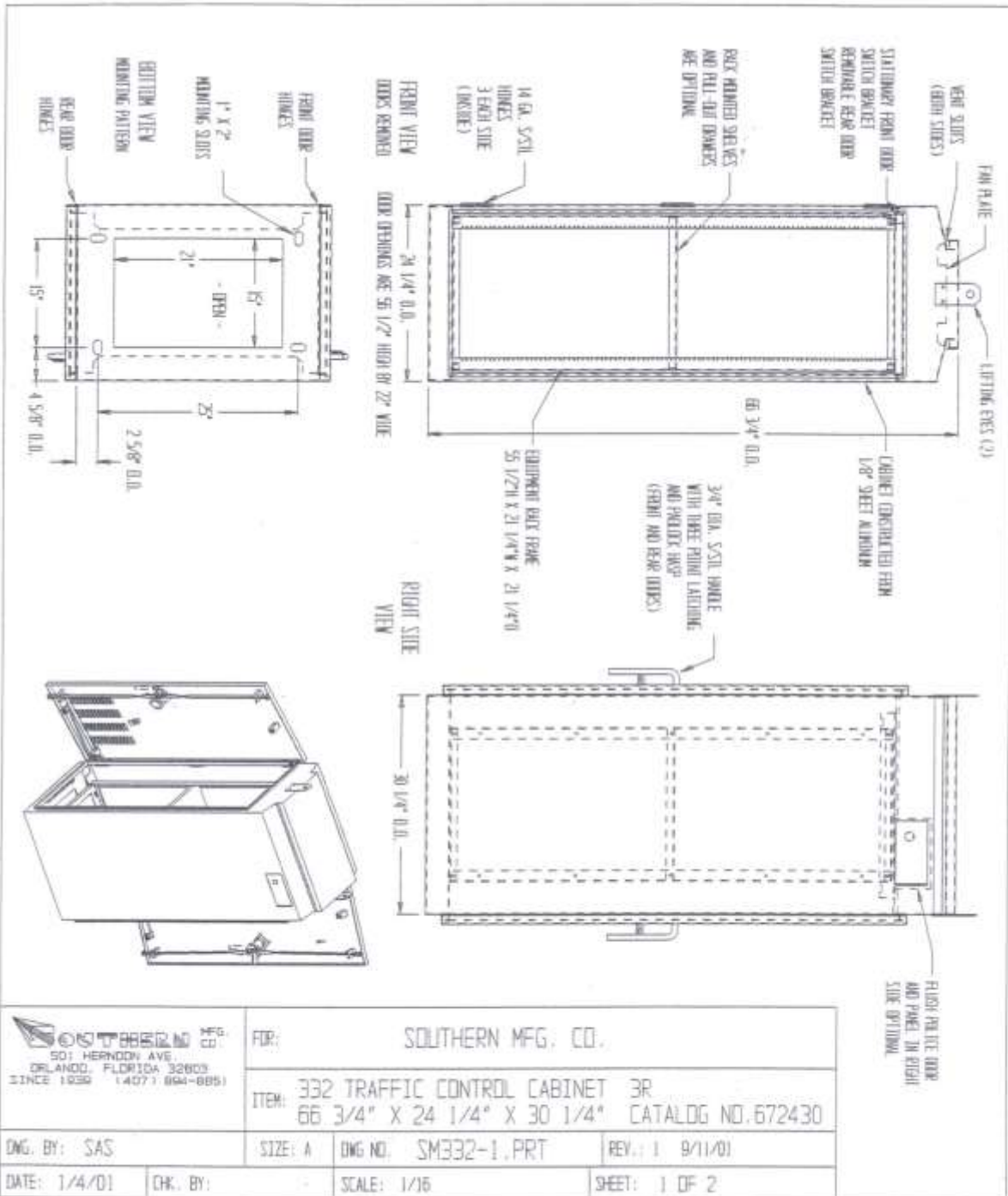
SECTION AA


SPLICE BOX

GENERAL NOTES:

1. Fiber optic boxes shall not be installed in roadways or driveways.
2. The fiber optic box shall be one of the products included on the Approved Product List. The legend "FDOT Fiber Optic Cable" shall be stamped on all covers.
3. Fiber optic boxes shall be installed flush with the finished grade surface.
4. Fiber optic box length (long side) shall be parallel to the roadway.
5. A pull wire shall be installed in the empty conduits for future use.
6. All splice boxes shall be provided with cable hanger racks designed to support cables and splice enclosures. Cost of racks to be included in cost of splice box.
7. Refer to Section 783 of the Standard Specifications for splice requirements.
8. Conduit center line shall be aligned to top edge of box to facilitate cable pulling.
9. Conduit center line shall be aligned to top edge of box to facilitate cable pulling.
10. All fiber optic boxes shall have 1'-0" wide (min.) x 6" deep concrete aprons sloped away from box. Apron is to be included in the cost of each box.
11. Fiber optic boxes shall meet FM 5-539 test procedure.
12. Refer to Section 783 of the Standard Specifications for box requirements.
13. All splices shall be properly weatherproofed.
14. The size and type of fiber optic communications conduit shall be shown on plans.
15. The use of ground rods shall be shown in the plans.

LAST REVISION	REVISION	DESCRIPTION:	 FDOT DESIGN STANDARDS FY 2012/2013	FIBER OPTIC SPLICE BOX AND PULL BOX	INDEX NO.	SHEET NO.
01/01/12					18204	1



		FOR: SOUTHERN MFG. CO.	
501 HERNDON AVE. ORLANDO, FLORIDA 32803 SINCE 1939 (407) 894-8851		ITEM: 332 TRAFFIC CONTROL CABINET 3R 66 3/4" X 24 1/4" X 30 1/4" CATALOG NO. 672430	
ENG. BY: SAS	SIZE: A	DWG NO. SM332-1.PRT	REV.: 1 9/11/01
DATE: 1/4/01	CHK. BY:	SCALE: 1/16	SHEET: 1 OF 2

SPECIFICATIONS

MATERIAL - SHEET ALUMINUM 1/8" THICKNESS, ALLOY 5052. SURFACE SHALL HAVE A SMOOTH, NATURAL ALUMINUM MILL FINISH.

DOORS AND LOCKS - THE DOORS ARE OF NBMA TYPE 3R CONSTRUCTION WITH CELLULAR NEOPRENE GASKET, WHICH IS RAIN TIGHT. HINGES (THREE PER DOOR) ARE 14 GAUGE STAINLESS STEEL AND SECURED WITH 10-24 STAINLESS STEEL CARRIAGE BOLTS. MAIN DOORS HAVE A THREE POINT LOCKING SYSTEM, WHICH SECURES THE DOORS AT THE TOP, BOTTOM, AND CENTER. TWO CORBIN LOCKS WITH FOUR KEYS ARE ALSO FURNISHED. THE DOORS ARE ALSO EQUIPPED WITH TWO POSITION DOOR STOPS, ONE AT 90°, AND ONE AT 180°. DOOR LOCKING RODS ARE 1/4" X 3/4" ALUMINUM TURNED EDGEWAYS WITH 1" NYLON ROLLERS. MAIN DOOR HANDLES ARE 3/4" DIAMETER STAINLESS STEEL. AN OPTIONAL POLICE DOOR IS PROVIDED IN THE RIGHT SIDE. A SKELETON LOCK BY CORBIN IS FURNISHED FOR THE POLICE DOOR UNLESS OTHERWISE SPECIFIED.

VENTILATION - VENT SLOTS ARE PROVIDED ON THE UNDERSIDE OF THE COVER OVERHANG AND LOUVER SLOTS ARE FORMED IN THE LOWER PORTION OF THE FRONT DOOR. THIS CREATES A NATURAL MOVEMENT OF AIR AND HAS A COOLING EFFECT ON THE ELECTRICAL EQUIPMENT. IF SPECIFICATIONS CALL FOR FAN FORCED AIR, PROVISIONS ARE PROVIDED TO ACCOMMODATE THE FAN, EXHAUST, AND INTAKE, WHICH ARE RAIN TIGHT AND WILL NOT DRAW WATER INTO THE CABINET.

ACCESSORIES


EQUIPMENT RACK - A 19" E.I.A. RACK FRAME WITH OPTIONAL SHELVES AND PULL-OUT DRAWERS IS PROVIDED.

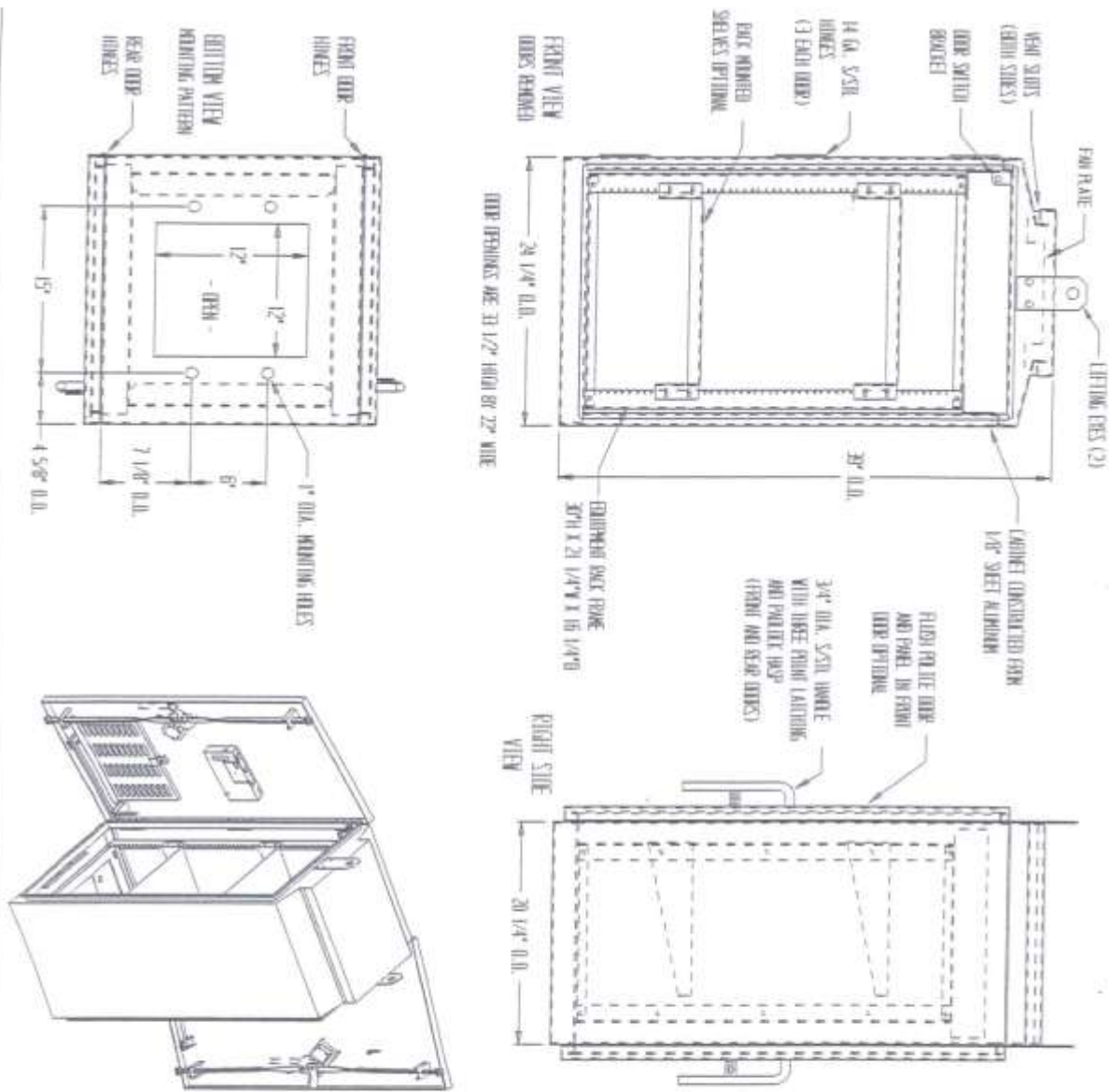
LIGHTING FIXTURE - FIXTURE MOUNTING BRACKETS WITH DOOR ACTIVATED SWITCH BRACKETS ARE OPTIONAL.

SUNSHIELDS - INSTALLED, AND FINISH TREATED PER SPECIFICATIONS, OPTIONAL.

CABINET TYPES ARE BASE MOUNTED WITH FOUR 1" X 2" MOUNTING SLOTS ON THE BOTTOM FOR ANCHORING TO A BASE. CABINET TYPES ARE ALSO AVAILABLE IN POLE MOUNT AND PEDESTAL MOUNT.

THIS SUBMITTAL IS PER SOUTHERN MANUFACTURING STANDARD SPECIFICATIONS. ANY DEVIATION FROM THIS STANDARD MAY INCUR ADDITIONAL COST.

 <p>SOUTHERN MFG. CO. 301 HERRICK AVE. ORLANDO, FLORIDA 32803 SINCE 1926 (407) 894-8851</p>	FOR: SOUTHERN MFG. CO.		
	ITEM: 332 TRAFFIC CONTROL CABINET 3R 66 3/4" X 24 1/4" X 30 1/4" CATALOG NO. 672430		
DWG. BY: SAS	SIZE: A	DWG. NO. SM332-2.PRT	REV.:
DATE: 1/4/01	CHK. BY:	SCALE: 1/16	SHEET: 2 OF 2




SOUTHERN MFG. CO.
 501 HERRON AVE.
 ORLANDO, FLORIDA 32803
 SINCE 1939 (407) 894-9991

FOR: SOUTHERN MFG. CO.
 ITEM: 336 TRAFFIC CONTROL CABINET 3R
 39" X 24 1/4" X 20 1/4" CATALOG NO. SM392420

DWG. BY: SAS	SIZE: A	DWG. NO. SM336-1.PRT	REV.:
DATE: 12/28/00	CHK. BY:	SCALE: NOT TO SCALE	SHEET: 1 OF 2

SPECIFICATIONS

MATERIAL - SHEET ALUMINUM 1/8" THICKNESS, ALLOY 5052. SURFACE SHALL HAVE A SMOOTH, NATURAL ALUMINUM MILL FINISH.

DOORS AND LOCKS - THE DOORS ARE OF NEMA TYPE 3R CONSTRUCTION WITH CELLULAR NEOPRENE GASKET, WHICH IS RAIN TIGHT. HINGES (THREE PER DOOR) ARE 14 GAUGE STAINLESS STEEL AND SECURED WITH 10-24 STAINLESS STEEL CARRIAGE BOLTS. MAIN DOORS HAVE A THREE POINT LOCKING SYSTEM, WHICH SECURES THE DOORS AT THE TOP, BOTTOM, AND CENTER. TWO CORBIN LOCKS WITH FOUR KEYS ARE ALSO FURNISHED. THE DOORS ARE ALSO EQUIPPED WITH TWO POSITION DOOR STOPS, ONE AT 90°, AND ONE AT 180°. DOOR LOCKING RODS ARE 1/4" X 3/4" ALUMINUM TURNED EDGEWAYS WITH 1" NYLON ROLLERS. MAIN DOOR HANDLES ARE 3/4" DIAMETER STAINLESS STEEL. AN OPTIONAL POLICE DOOR IS PROVIDED IN THE FRONT DOOR. A SKELETON LOCK BY CORBIN IS FURNISHED FOR THE POLICE DOOR UNLESS OTHERWISE SPECIFIED.

VENTILATION - VENT SLOTS ARE PROVIDED ON THE UNDERSIDE OF THE COVER OVERHANG AND LOUVER SLOTS ARE FORMED IN THE LOWER PORTION OF THE FRONT DOOR, THIS CREATES A NATURAL MOVEMENT OF AIR AND HAS A COOLING EFFECT ON THE ELECTRICAL EQUIPMENT. IF SPECIFICATIONS CALL FOR FAN FORCED AIR, PROVISIONS ARE PROVIDED TO ACCOMMODATE THE FAN, EXHAUST, AND INTAKE, WHICH ARE RAIN TIGHT AND WILL NOT DRAW WATER INTO THE CABINET.

ACCESSORIES


EQUIPMENT RACK - A 19" E.I.A. RACK FRAME WITH OPTIONAL SHELVES AND PULL-OUT DRAWERS IS PROVIDED.

LIGHTING FIXTURE - FIXTURE MOUNTING BRACKETS WITH DOOR ACTIVATED SWITCH BRACKETS ARE OPTIONAL.

SUNSHIELDS - INSTALLED, AND FINISH TREATED PER SPECIFICATIONS, OPTIONAL.

CABINET TYPES ARE BASE MOUNTED WITH FOUR 1" DIAMETER MOUNTING HOLES ON THE BOTTOM FOR ANCHORING TO A BASE. CABINET TYPES ARE ALSO AVAILABLE IN POLE MOUNT AND PEDESTAL MOUNT.

THIS SUBMITTAL IS PER SOUTHERN MANUFACTURING STANDARD SPECIFICATIONS. ANY DEVIATION FROM THIS STANDARD MAY INCUR ADDITIONAL COST.

 <p style="font-size: small;">SOUTHERN MFG. CO. 501 HERNDON AVE. ORLANDO, FLORIDA 32803 SINCE 1959 (407) 894-8851</p>	FOR: SOUTHERN MFG. CO.		
	ITEM: 336 TRAFFIC CONTROL CABINET 3R 39" X 24 1/4" X 20 1/4" CATALOG NO. SM392420		
DWG. BY: SAS	SIZE: A	DWG NO. SM336-2.PRT	REV.:
DATE: 12/28/00	CHK. BY:	SCALE: NOT TO SCALE	SHEET: 2 OF 2