

LIGHTING CALCULATIONS

FOR

PROPOSED RESIDENTIAL CONDOMINIUM DEVELOPMENT

55 EAGLE STREET

NEWMARKET, ONTARIO



February 22, 2011



Project: 3618

DeCaria Engineering Limited
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Richmond Hill, Ontario.,
L4B 3A9
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EXECUTIVE SUMMARY

1.0 The proposed lighting plan for the proposed development would have zero [0] impact on adjacent properties which means that the area covered by the proposed lighting would not cover any part of the adjacent properties. This meets the requirements of the Town of Newmarket.

1.0 INTRODUCTION

1.1 SCOPE

1.1 This report includes the simulated computational analysis using industry standard programs to predict the anticipated light levels. For the purpose of this report the following are the assumption and restrictions relating to the calculations.

- LIGHTING LEVELS ARE IN FOOT-CANDLES.
- CALCULATION POINTS ARE 10 FEET APART.
- LUMINAIRE LIGHT LOSS FACTOR FOR ALL LUMINAIRES ARE 75%.
- CALCULATED LIGHTING LEVELS DO NOT INCLUDE ANY LIGHT SOURCES OUTSIDE OF THE PROPERTY SUCH AS EXISTING STREET LIGHTS.
- TOWNHOUSE HEIGHT ESTIMATED AT 7.62M
- FIXTURE IN PARKING AREA AT 4.57M
- FIXTURE IN DRIVE AREA AT 6.1M
- BOLLARDS AT 1.07M

DISCLAIMER: THIS ANALYSIS IS A MATHEMATICAL MODEL BASED ON THE DESIGN DATA. ACTUAL VALUES MAY VARY FROM THE DESIGN DUE TO SITE CONDITIONS.

2.0 DESIGN STANDARDS

2.1 The calculations were performed using the following standards:

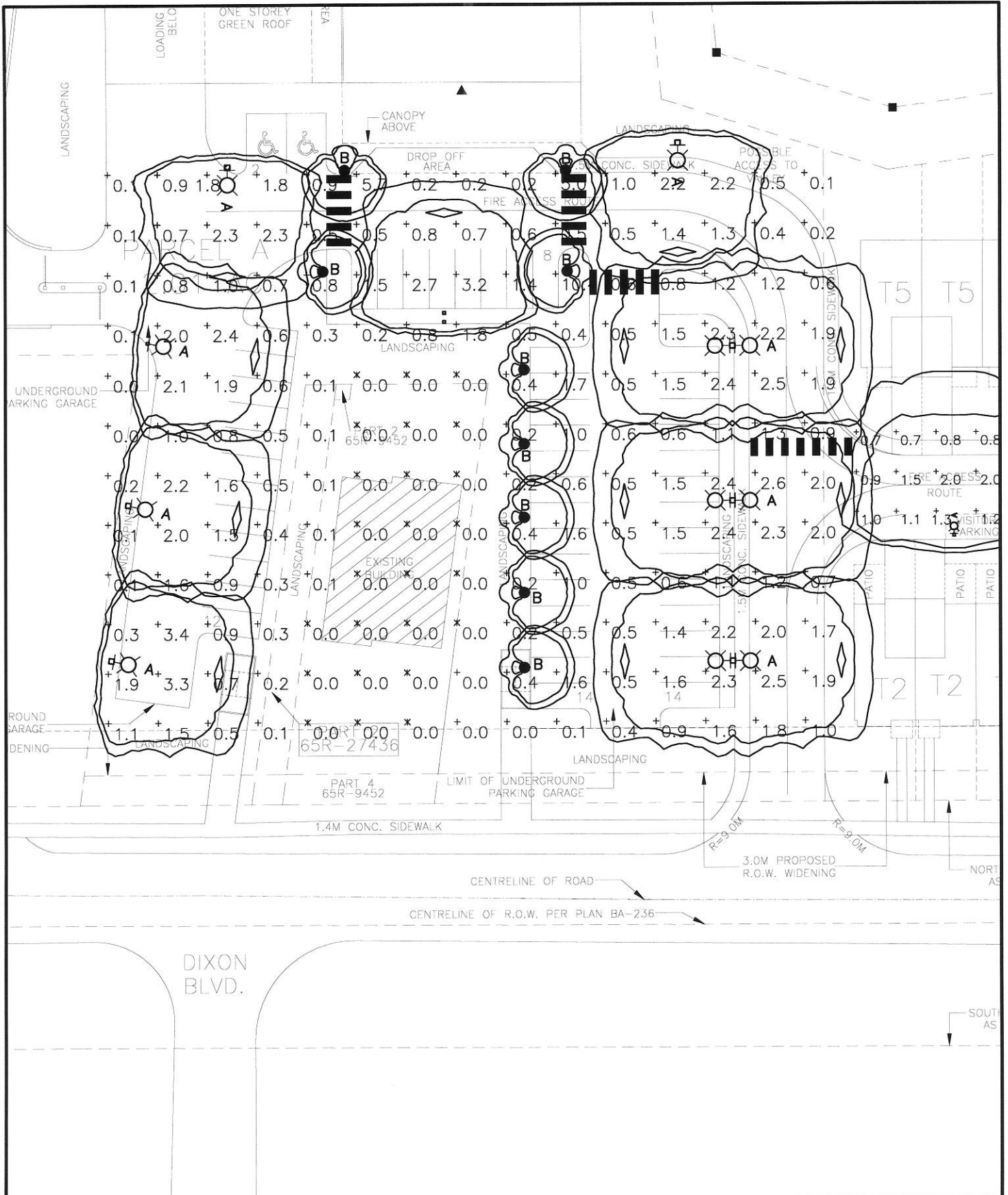
- IESNA American National Standard Practice for Roadway Lighting (ANSI/IES RP-8)
- IESNA RP-20-98 Lighting for Parking Facilities
- IESNA RP-33-99 Lighting for Exterior Environments

2.0 COMPUTATIONAL ANALYSIS.

2.1 As can be seen from detail drawings ESI-1 “Part Site Plan – Site Lighting to ESI-3 Part Site Plan – Site Lighting”, the light level on the adjacent properties is zero (0). This meets the requirements of The Town of Newmarket.

2.2 Detail drawings ESI-4 “Part Site Plan – Site Lighting and ESI-5 Part Site Plan – Site Lighting”, show the mounting detail for the luminaries.

2.3 Detail drawings ESI-6 “Part Site Plan – Site Lighting” shows the luminaries that were used in the calculations. The manufacturers specification sheets have also been include at the end of this report.



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**PROJECT:
PROJECT
PROPOSED CONDOMINIUM DEVELOPMENT
NEWMARKET, ONTARIO**

**TITLE:
PART SITE PLAN
SITE LITHING**

**DRAWN:
FAD**

**PROJ. No.
3618**

REV. NO.:
-

**CHECKED:
GAD**

**TYPE
-**

**SCALE:
2:1**

**DATE:
FEB.22/11**

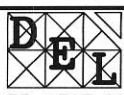
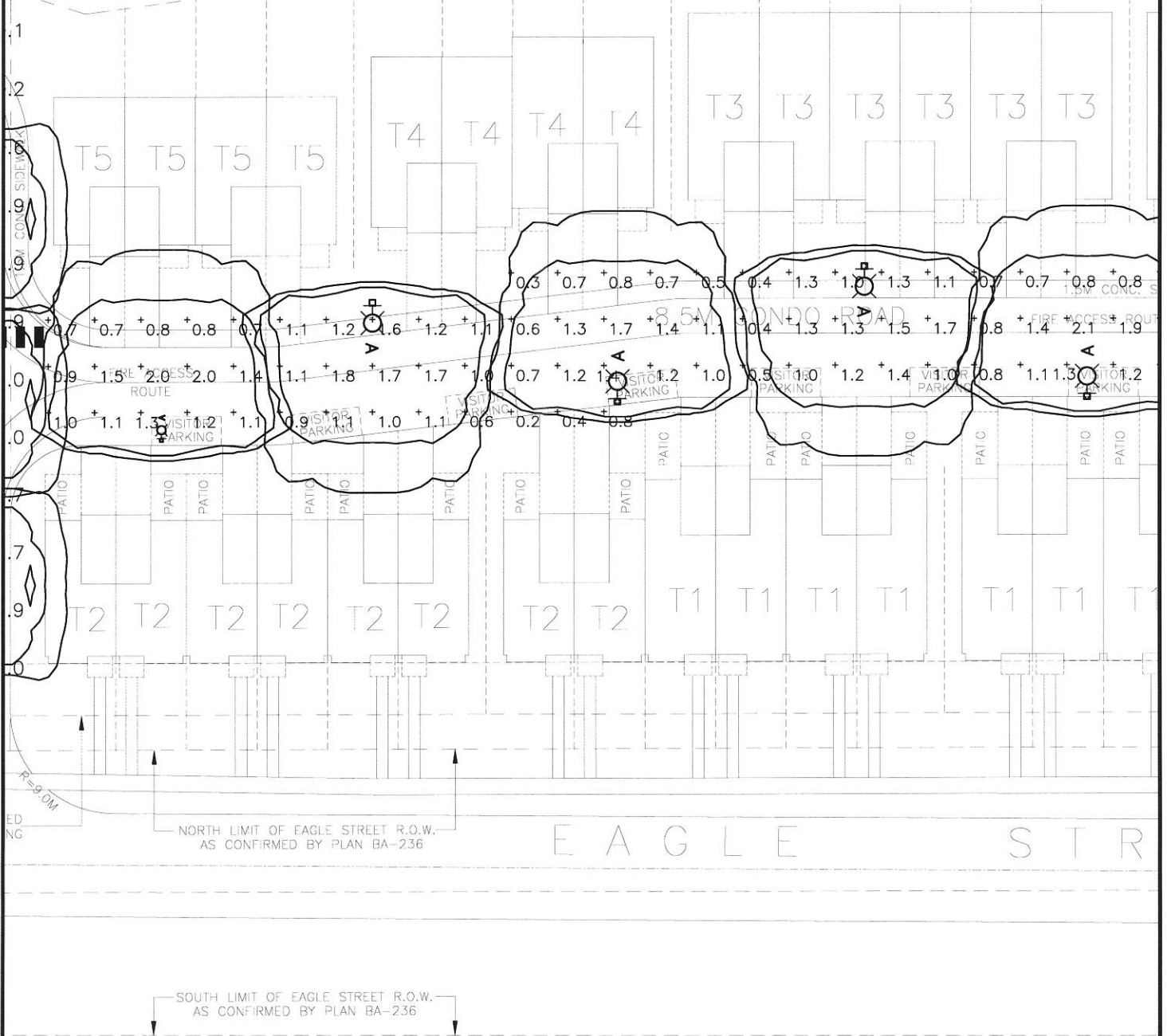
**REF. DWG.
ESI**

**DETAIL NO.
ESI-1**

LAKE SIMCOE CONSERVATION
APR. 15 2009

BUFFER ZONE

BUFFER LINE



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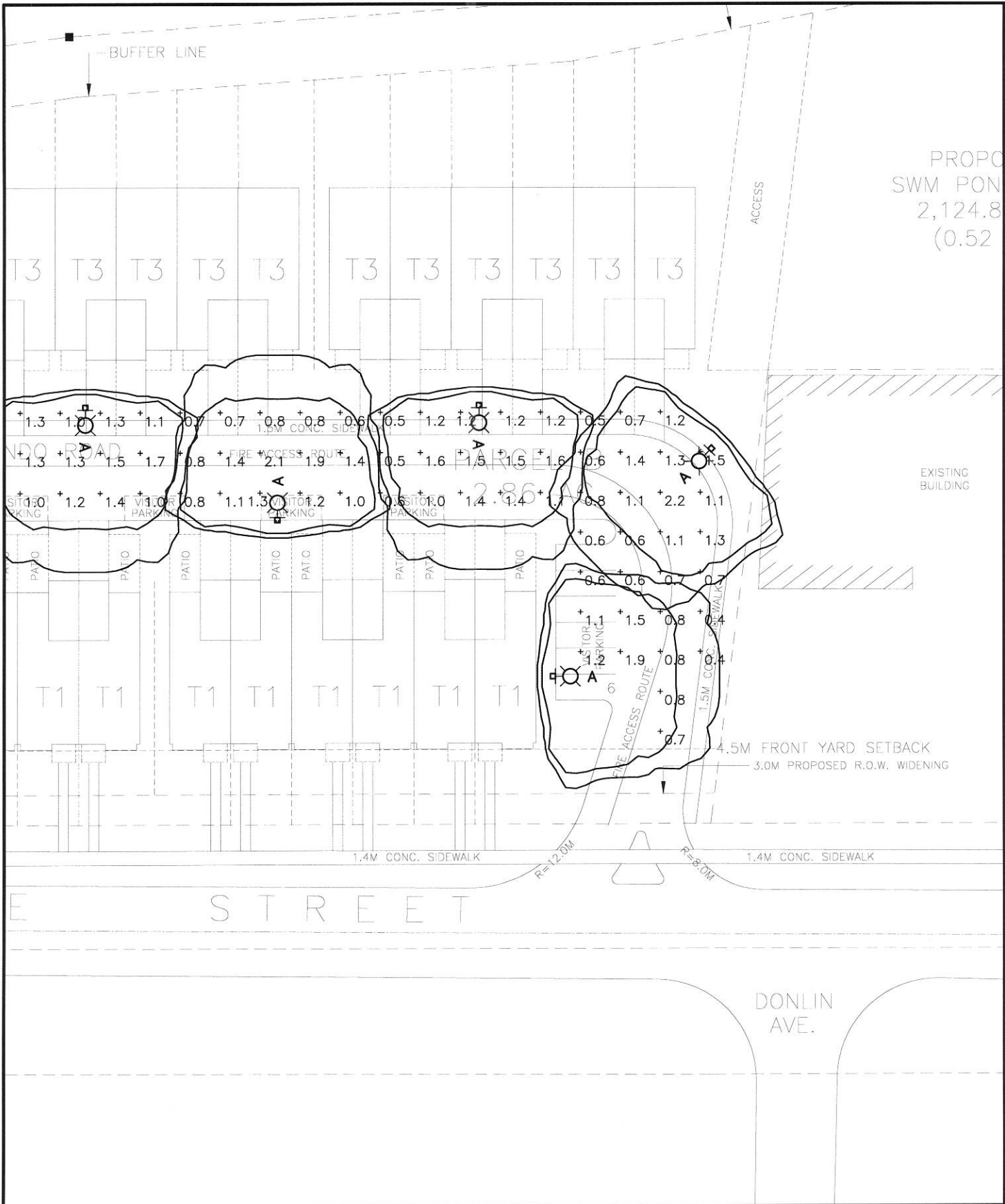
TYPE
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SCALE:
2:1

DATE:
FEB.22/11

REF. DWG.
ESI

DETAIL NO.
ESI-2



PROPOSED
SWM POND
2,124.8
(0.52)

EXISTING BUILDING



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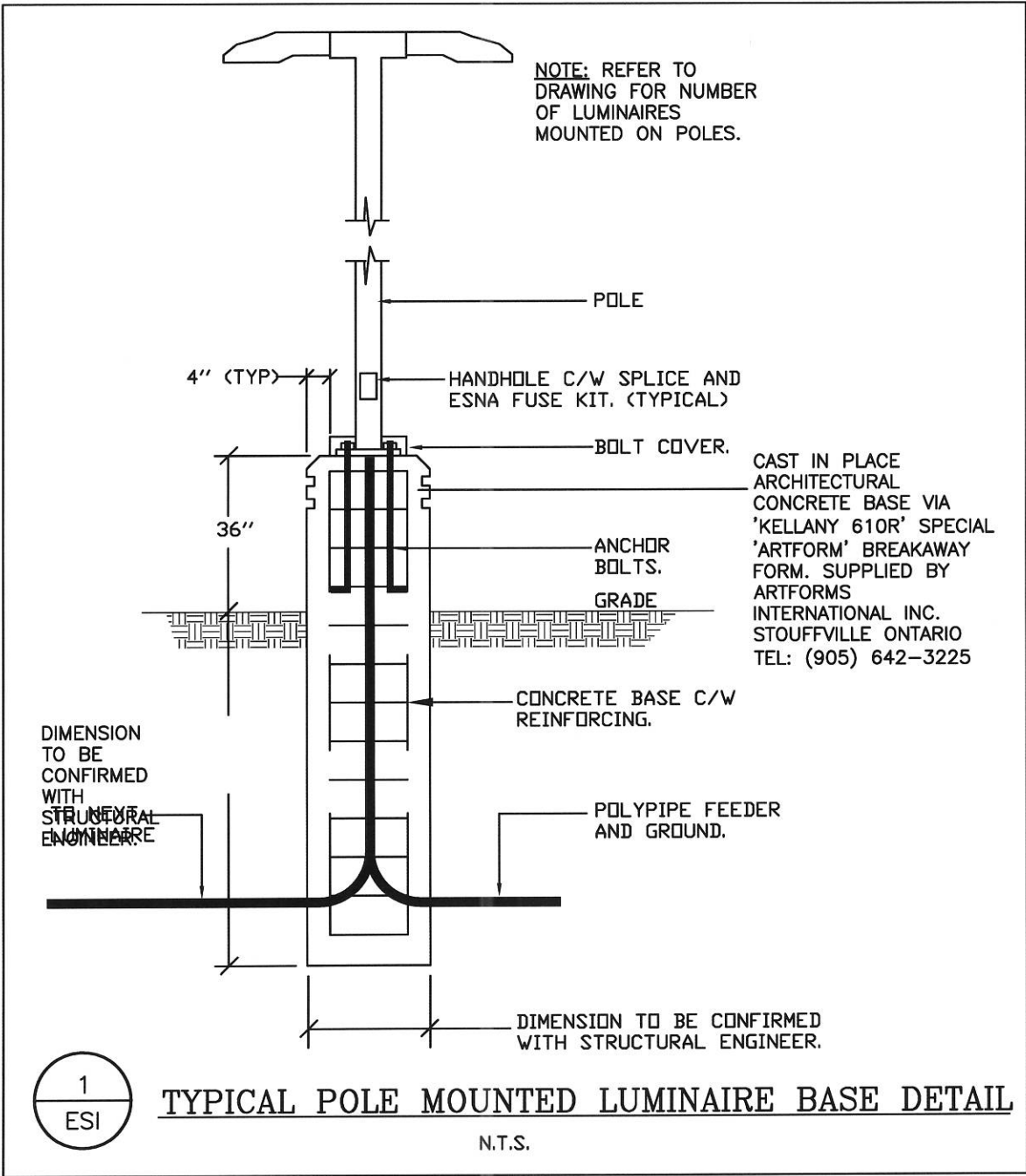
TYPE
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SCALE:
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DATE:
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ESI

DETAIL NO.
ESI-3



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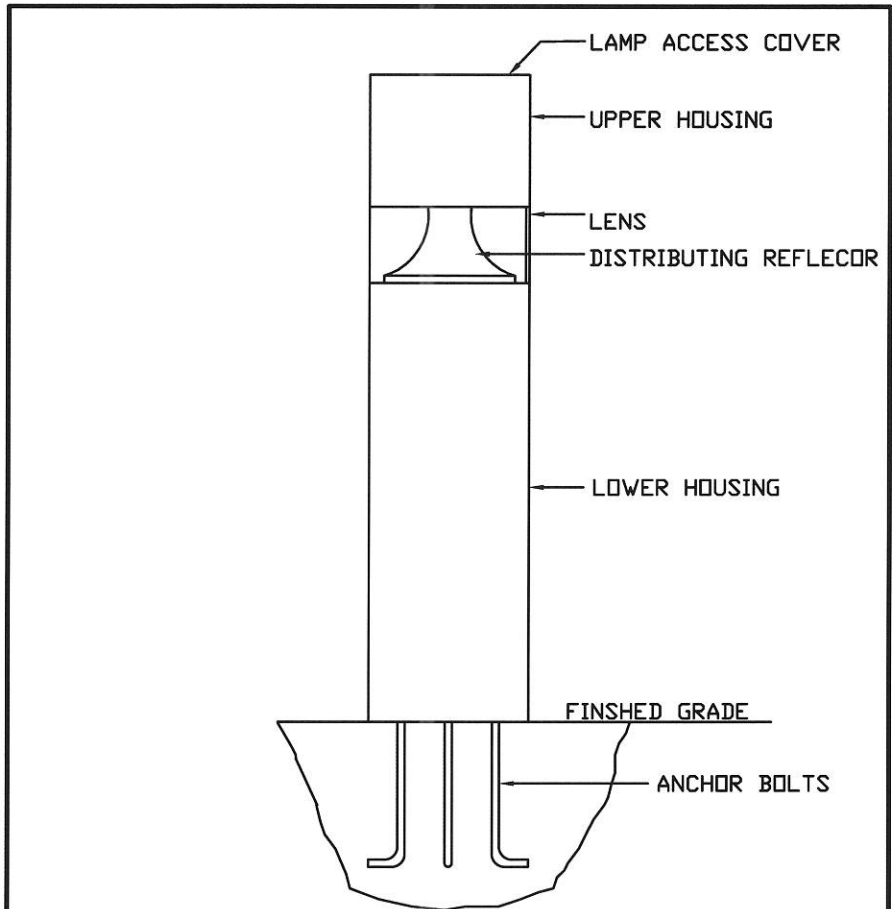
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SCALE:
2:1

DATE:
FEB.22/11

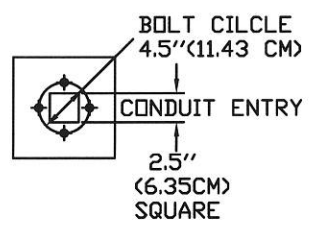
REF. DWG.
ESI

DETAIL NO.
ESI-4



BASE AND ANCHORAGE DETAILS.
 FOUR (4) 0.5" (1.27 CM) DIAMETER BY 12"
 (30.48 CM) LONG WITH 2" (5.08 CM) HOOK
 HOT DIPPED GALVANIZED ANCHOR BOLTS,
 COMPLETE WITH NUTS & WASHERS.

NOTE 1: ANCHOR BOLTS TO PROJECT 1"
 (2.54 CM) TO 1.5" (3.81 CM)
 ABOVE FOUNDATION.



TYPICAL LANDSCAPE BOLLARD LIGHTING
CONCRETE BASE TYPE 'B'
 N.T.S

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
TITLE:
 PART SITE PLAN
 SITE LITHING

| | | |
|-------------------|-----------------|---------------------|
| DRAWN: FAD | CHECKED: GAD | DATE: FEB.22/11 |
| PROJ. No. 3618 | TYPE - | REF. DWG. ESI |
| REV. NO.: | SCALE: 2:1 | DETAIL NO. ESI-5 |

SITE LUMINAIRE SCHEDULE

 **A** POLE MOUNTED HID LUMINAIRE COMPLETE WITH HORIZONTALLY MOUNTED 100 WATT PULSE START METAL HALIDE LAMP, TYPE 4 DISTRIBUTION OPTICS, DIE CAST ALUMINUM ENCLOSURE AND 20 FOOT TALL, 5"x5" SQUARE ALUMINUM POLE. BRONZE COLOURED POWDERCOAT FINISH. VOLTAGE : 347V
 LITHONIA 'AERIS' CAT#AS1-100M-SR4SC

 **B** 3110 LOUVER BOLLARD, FORWARD THROW DISTRIBUTION WITH COATED 100W MH ED-17 BRONZE COLOURED POWDERCOAT FINISH. VOLTAGE : 347V
 LITHONIA '3110/3120-100MFT

 **C** POLE MOUNTED HID LUMINAIRE COMPLETE WITH HORIZONTALLY MOUNTED 175 WATT PULSE START METAL HALIDE LAMP, TYPE 4 DISTRIBUTION OPTICS, DIE CAST ALUMINUM ENCLOSURE AND 20 FOOT TALL, 5"x5" SQUARE ALUMINUM POLE. BRONZE COLOURED POWDERCOAT FINISH. VOLTAGE : 347V
 LITHONIA 'AERIS' CAT#AS1-100M-SR4SC

STATISTICS

| DESCRIPTION | SYMBOL | AVG | MAX | MIN | MAX/MIN | AVG/MIN |
|-------------------|--------|-----|-----|-----|---------|---------|
| ENTIRE SITE | + | 1.4 | 3.2 | 0.0 | N/A | N/A |
| MAIN PARKING AREA | X | 1.9 | 3.2 | 0.5 | 6.4 | 3.7:1 |

NOTES:

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6. FIXTURE IN PARKING AREA AT 4.57M
7. FIXTURE IN DRIVE AREA AT 6.1M
8. BOLLARDS AT 1.07M

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TYPE
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REF. DWG.
 ESI

DETAIL NO.
 ESI-6



FEATURES & SPECIFICATIONS

INTENDED USE — Streets, walkways, parking lots and surrounding areas.

CONSTRUCTION — Rugged, die-cast, single-piece aluminum housing with nominal wall thickness of 1/8". Die-cast door frame has impact-resistant, tempered, glass lens (3/16" thick). Door frame is fully gasketed with one-piece tubular silicone. **US. Patent No. D447,590. Canada Patent No. 94324.**

FINISH — Standard finish is dark bronze polyester powder finish. Additional architectural are available; see www.lithonia.com/archcolors.

OPTICAL SYSTEM — Anodized segmented reflectors for superior uniformity and control. Reflectors attach with tool-less fasteners and are rotatable and interchangeable. Four full cutoff distributions available: Type II (roadway), Type III (asymmetric), Type IV (forward throw) and Type V (symmetric square).

ELECTRICAL SYSTEM — Ballast: High reactance, high power factor for 50-150W. Constant wattage autotransformer for 175W. Metal halide 150W and below are standard with pulse-start ignitor technology. Ballasts are copper-wound and 100% factory-tested. All ballasts are mounted on a removable power tray with tool-less latch and have positive locking disconnect plugs. CSA, NOM or INTL required for probe start shipments outside of the US for 175M. Not available with 175M SCWA. Ceramic metal halide lamps are recommended for use in applications where superior color rendition, lumen maintenance and longer lamp life are desired.

Socket: Porcelain, horizontally-mounted medium base socket with copper alloy, nickel-plated screw shell and center contact.

INSTALLATION — Integral arm for pole or wall mounting. Optional mountings available.

LISTING — UL Listed (standard). CSA Certified (see Options). UL listed for 25°C ambient and wet locations. IP65 Rated.

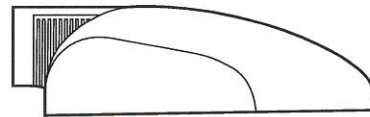
NOTE: Specifications subject to change without notice.

| | |
|----------------|------|
| Catalog Number | |
| Notes | Type |

AERIS™

Architectural Area & Roadway Luminaires

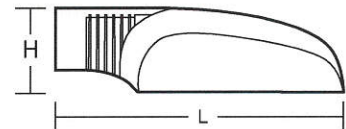
AS1



METAL HALIDE: 50W-150W
HIGH PRESSURE SODIUM: 35W-150W
 10' to 20' Mounting

Specifications

EPA: 0.7 ft²
 Length: 22.2 (56.4)
 Width: 13.0 (33.0)
 Depth: 6.3 (15.9)
 *Weight: 25.9 lbs (11.8 kg)
 *Weight as configured in example below.



All dimensions are inches (centimeters) unless otherwise specified.

ORDERING INFORMATION

For shortest lead times, configure product using **standard options (shown in bold)**.

Example: AS1 100M SR3 TB SPA LPI

| Series | Wattage | Voltage | Mounting | Ballast | Options | Finish ¹² | Lamp ¹³ |
|------------|---|----------------------|--|--|--|-----------------------------|--------------------------|
| AS1 | Metal halide | 120 | SPA Square pole mounting | (blank) Magnetic ballast | Shipped installed in fixture | (blank) Dark bronze | LPI Lamp included |
| | 50M ¹ | 208 ⁴ | | | SF Single fuse 120, 277, 347 ⁹ | | |
| | 70M ¹ | 240 ⁴ | RPA Round pole mounting | CWI Constant wattage isolated | DF Double fuse 208, 240, 480V ⁹ | DBL Black | L/LP Less lamp |
| | 100M | 277 | WBA Wall bracket (up or down) ⁷ | Pulse Start | EC Emergency circuit ^{9,10} | DGC Charcoal gray | |
| | 150M | 347 | ASKMA1 Mast arm adapter ⁸ | SCWA Super CWA pulse start ballast¹⁴ | PER NEMA twist-lock receptacle only (no photocontrol) | DMB Medium bronze | |
| | 175M ² | 480 ⁴ | DCAS1 Decorative curved arm, square pole only ⁸ | | QRS Quartz restrike system ^{9,10} | DNA Natural aluminum | |
| | High pressure sodium⁴ | 23050HZ ⁶ | DCAS1R Decorative curved arm, round pole only ⁸ | | HS Houseside shield (SR2, SR3) | DWH White | |
| | 35S ³ | | | | CSA Listed and labeled to comply with Canadian standards | CR Corrosion resistance | |
| | 50S | | | | NOM NOM Certified ⁶ | | |
| | 70S | | | | INTL International shipment for 175M | | |
| | 100S | | | | Shipped separately¹¹ | | |
| | 150S | | | | PE1 NEMA twist-lock PE (120, 208, 240V) | | |
| | Ceramic metal halide | | | | PE3 NEMA twist-lock PE (347V) | | |
| | 50MHC | | | | PE4 NEMA twist-lock PE (480V) | | |
| | 70MHC | | | | PE7 NEMA twist-lock PE (277V) | | |
| | 100MHC | | | | VG Vandal guard | | |
| | 150MHC | | | | SC Shorting cap | | |
| | | | Distribution | | | | |
| | | | SR2 Segmented type II roadway | | | | |
| | | | SR3 Segmented type III asymmetric | | | | |
| | | | SR4SC Segmented type IV forward throw, sharp cutoff | | | | |
| | | | SR5S Segmented type V square | | | | |

NOTES:

- Not available with 480V.
- Not available with SCWA.
- 120V only.
- Must specify CWI for use in Canada. Not available with 150S.
- Optional multi-tap ballast (120, 208, 240, 277V) (120, 277, 347V in Canada).
- Consult factory for available wattages.
- Mounted in lens-up orientation, fixture is damp location listed.
- Shipped separately.
- SF, DF, EC or QRS options cannot be ordered together.
- Maximum allowance wattage lamp included.
- May be ordered as an accessory.
- Additional architectural colors available; see www.lithonia.com/archcolors.
- Must be specified.
- Available with 150M or 150MHC only.

Note: Aeris™ has a unique drilling template that requires an Aeris drilling pattern to be specified when ordering poles. See example below.
 Example: SSA 20 4C **DM19AS** DDB

Aeris Drilling Pattern

| | |
|---------------|-------------------------------------|
| DM19AS | 1 at 90 degrees |
| DM28AS | 2 at 180 degrees |
| DM29AS | 2 at 90 degrees |
| DM39AS | 3 at 90 degrees |
| DM49AS | 4 at 90 degrees |
| DM32AS | 3 at 120 degrees (round poles only) |



Consistent with LEED® goals & Green Globes™ criteria for light pollution reduction

Accessories: Tenon Mounting Slipfitter

Order as separate catalog number. Must be used with round pole mounting (RPA).

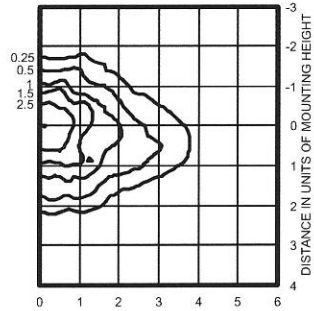
| Tenon O.D. | Number of fixtures | | | | | |
|------------|--------------------|-----------|-----------|------------|-----------|-----------|
| | One | Two@180° | Two@90° | Three@120° | Three@90° | Four@90° |
| 2-3/8" | AST20-190 | AST20-280 | AST20-290 | AST20-320 | AST20-390 | AST20-490 |
| 2-7/8" | AST25-190 | AST25-280 | AST25-290 | AST25-320 | AST25-390 | AST25-490 |
| 4" | AST35-190 | AST35-280 | AST35-290 | AST35-320 | AST35-390 | AST35-490 |
| AS1VG | Vandal guard | | | | | |

AS1 Metal Halide, High Pressure Sodium Area Lighting

Coefficient of Utilization Initial Footcandles

AS1 150M SR2 TEST NO. LTL 10086P

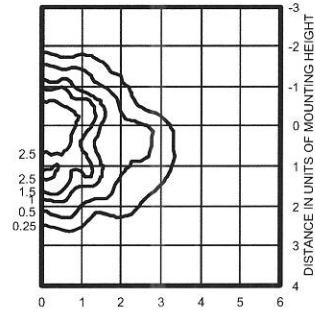
ISOILLUMINANCE PLOT (Footcandle)



150W pulse start metal halide lamp, rated 14000 lumens. Footcandle values based on 20' mounting height.
Classification: Type II, Medium, Full Cutoff

AS1 150M SR3 TEST NO. LTL 10087P

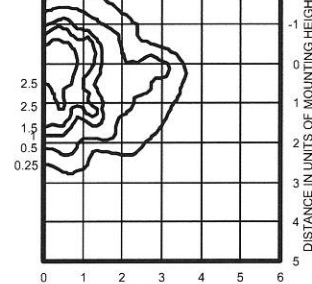
ISOILLUMINANCE PLOT (Footcandle)



150W pulse start metal halide lamp, rated 14000 lumens. Footcandle values based on 20' mounting height.
Classification: Type III, Medium, Full Cutoff

AS1 150S SR3 TEST NO: LTL10091

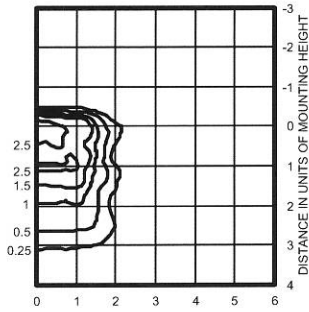
ISOILLUMINANCE PLOT (Footcandle)



150W lamp, rated 15800 lumens. Footcandle values based on 20' mounting height.
Classification: Type III, Medium, Full Cutoff

AS1 150M SR4SC TEST NO. LTL 10088P

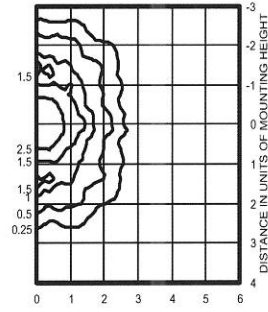
ISOILLUMINANCE PLOT (Footcandle)



W pulse start metal halide lamp, rated 14000 lumens. Footcandle values based on 20' mounting height.
Classification: Type IV, Short, Full Cutoff

AS1 150M SR5S TEST NO. LTL 10089P

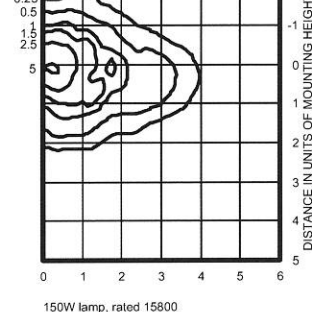
ISOILLUMINANCE PLOT (Footcandle)



150W pulse start metal halide lamp, rated 14000 lumens. Footcandle values based on 20' mounting height.
Classification: Unclassified (Type III, Very Short), Full Cutoff

AS1 150S SR2 TEST NO: LTL10090

ISOILLUMINANCE PLOT (Footcandle)



150W lamp, rated 15800 lumens. Footcandle values based on 20' mounting height.
Classification: Type II, Medium, Full Cutoff

NOTES:

- 1 Photometric data for other distributions can be accessed from the Lithonia Lighting web site (www.lithonia.com).
- 2 For electrical characteristics consult technical data tab.
- 3 Tested to current IESNA and NEMA standards under stabilized laboratory conditions. Various operating factors can cause differences between laboratory and actual field measurements. Dimensions and specifications are based on the most current data and are subject to change.

Mounting Height Correction Factor

(Multiply the fc level by the correction factor)

10 ft. = 4

15 ft. = 1.78

30 ft. = 0.44

$$\frac{\text{Existing Mounting Height}^2}{\text{New Mounting Height}^2} = \text{Correction Factor}$$



An Acuity Brands Company

HYDREL

An Acuity Brands Company

IP65   

3110 LOUVER BOLLARD ROUND DOME

DESCRIPTION

The 3110 BOLLARD is a low level area lighting luminaire that combines visual appeal with superior performance and unequalled quality. It is designed to work in building perimeter areas and public spaces completing a wide variety of architectural styles.

Superior performance extends to the detailed finish of the louvers. Matte black finish of top surface provides IES cut off performance while gloss white on bottom extends reflective light to economize on spacing of fixtures. Custom finish available on top louver surface.

The 3110 BOLLARD offers a patented impact resistant mounting and leveling design ensuring life long performance. Four levelling pads within the base mounting plate are easily accessible through the access panel. The levelling pads provide **full** contact with the concrete pad, providing a high degree of stability. The base mounting plate is fully welded to the bollard post, providing complete structural support from all directions, giving the bollard superior vandal resistance.

FEATURES & SPECIFICATIONS

MATERIAL: Copper-free Aluminum, A360.

LAMP: Fluorescent: 42 Watt Max. Triple Tube.
HID: 70 Watt Max. T6, 100 Watt Max. Coated E17/Elliptical (recommended)

VOLTAGE: See ordering guide.

DISTRIBUTION: SYM Symmetric, FT Forward Throw.

LENS: Clear Borosilicate for coated lamps. Frosted Borosilicate for clear lamps.

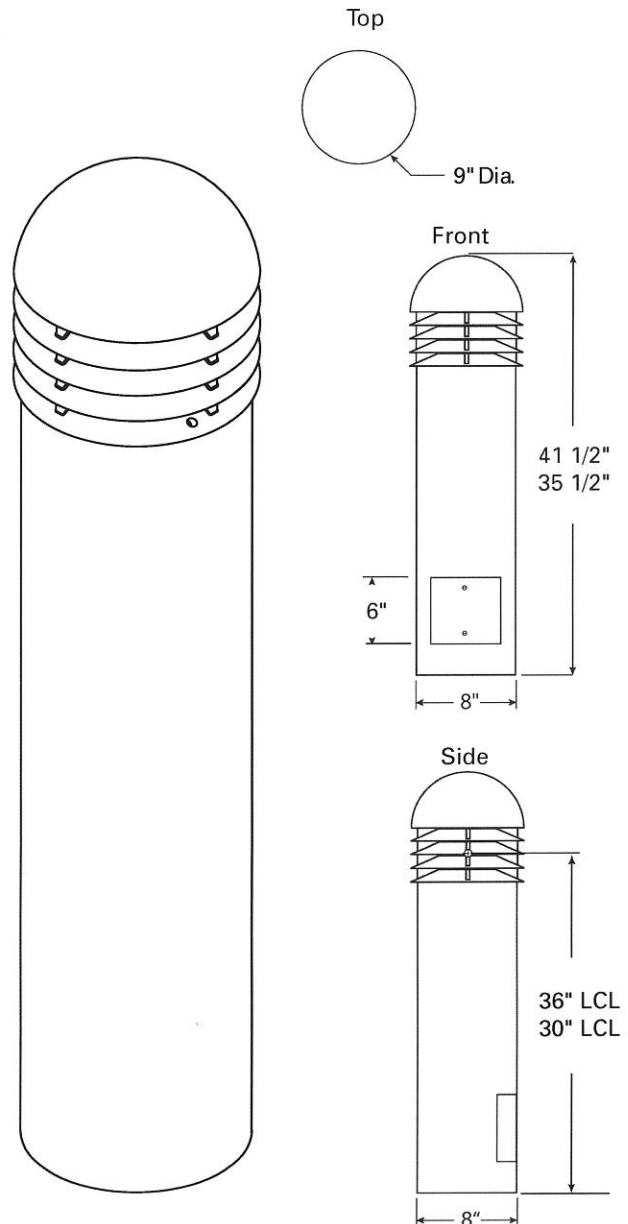
BALLAST: Integrally mounted magnetic or electronic ballast with low starting temperature.

FASTENERS: Stainless Steel.

FINISH: See ordering guide

LISTINGS: U.L., C.U.L.

| | | | | | | | | |
|-------------|--------|-----------|---------|--------------|---------|------|--------|------|
| TYPE | | JOB NAME | | | | | | |
| PART NUMBER | | | | | | | | |
| Product | Height | Lamp Type | Voltage | Distribution | Options | Lamp | Finish | List |



NOTE: HYDREL RESERVES THE RIGHT TO MODIFY SPECIFICATION WITHOUT NOTICE. Any dimension on this sheet is to be assumed as a reference dimension: "Used for information purposes only. It does not govern manufacturing or inspection requirements." (ANSI Y14.5-1973)

APPROVALS

3110 BOLLARD ORDERING INFORMATION

60 Hz Application

Choose the boldface catalog nomenclature that best suits your needs.

PART NO.

EXAMPLE:

| | | | | | | |
|--------------------------------------|---|------------|--|---|--|--|
| 3110 | 36 | 70M | 120 | FT | LPIC | BL/PL |
| Product | Height¹ | | Voltage | Distribution | Lamp | Finish |
| <input type="checkbox"/> 3110 | <input type="checkbox"/> 36 <input type="checkbox"/> 42 | | <input type="checkbox"/> 120 <input type="checkbox"/> 208 <input type="checkbox"/> 220 <input type="checkbox"/> 240 <input type="checkbox"/> 277 <input type="checkbox"/> 347 <input type="checkbox"/> 120/277 <input type="checkbox"/> TB <input type="checkbox"/> MVOLT ³ | Internal <input type="checkbox"/> SYM Symmetrical, 360° <input type="checkbox"/> FT Forward Throw, 180° | <input type="checkbox"/> LPI Lamp Included <input type="checkbox"/> LPIC Lamp Included, Coated <input type="checkbox"/> L/LP Less Lamp | <input type="checkbox"/> BL Black <input type="checkbox"/> BZ Bronze <input type="checkbox"/> DDB Dark Bronze <input type="checkbox"/> DNA Natural Aluminum <input type="checkbox"/> GN Green <input type="checkbox"/> GR Gray <input type="checkbox"/> SND Sand <input type="checkbox"/> STG Steel Gray <input type="checkbox"/> TVG Terra Verde Green <input type="checkbox"/> WH White <input type="checkbox"/> CF Custom Finish Optional Louvers Painted⁷ <input type="checkbox"/> ___/PL Louvers painted to match fixture (top only) |
| | Lamp Type | | | Options | | |
| | Fluorescent <input type="checkbox"/> 26DTT GX24Q-3 <input type="checkbox"/> 32TRT GX24Q-4 <input type="checkbox"/> 42TRT GX24Q-4 MH <input type="checkbox"/> 50M ¹ ED17 Med. <input type="checkbox"/> 50CM ¹ ED17 Med. <input type="checkbox"/> 70M ¹ ED17 Med. <input type="checkbox"/> 70CM ¹ ED17 Med. <input type="checkbox"/> 100M¹ ED17 Med. <input type="checkbox"/> 100CM ¹ ED17 Med. <input type="checkbox"/> 35CMT6 ² T6 G12 <input type="checkbox"/> 70CMT6 ² T6 G12 <input type="checkbox"/> 20CMT4 ² T4 G8.5 <input type="checkbox"/> 35CMT4 ² T4 G8.5 <input type="checkbox"/> 70CMT4 ² T4 G8.5 HPS <input type="checkbox"/> 50S ¹ E17 Med. <input type="checkbox"/> 70S ¹ E17 Med. <input type="checkbox"/> 100S ¹ E17 Med. | | Fusing <input type="checkbox"/> SF ⁴ Single Fuse <input type="checkbox"/> DF ⁵ Double Fuse Ballast <input type="checkbox"/> GEB ⁶ Generic Electronic Ballast <input type="checkbox"/> CW20 ⁹ Cold Weather Ballast (-20°C start) Receptacle <input type="checkbox"/> GFCI Receptacle <input type="checkbox"/> DR Duplex Receptacle Emergency <input type="checkbox"/> ELN ⁸ Emergency Battery Backup (fluorescent only 1300 lumen output) <input type="checkbox"/> EC 12 Volt Emergency Circuit | | | |

Notes:

- ¹ Will be provided with coated lamps unless LPI is chosen.
- ² T4 and T6 Lamps will be provided with a frosted lens.
- ³ MVOLT (120-277) available with GEB option or with Fluorescent lamps.
- ⁴ SF is only available with 120, 277 or 347 volts on HID only.
- ⁵ DF is only available with 208, 220 or 240 volts on HID only.
- ⁶ GEB is available with MH lamps only.
- ⁷ Louvers will be black unless otherwise specified (top only).
- ⁸ ELN only valid with fluorescent and only valid with 120 or 277 volts.
- ⁹ CW20 only available with fluorescent lamps and 120 or 277 volt.

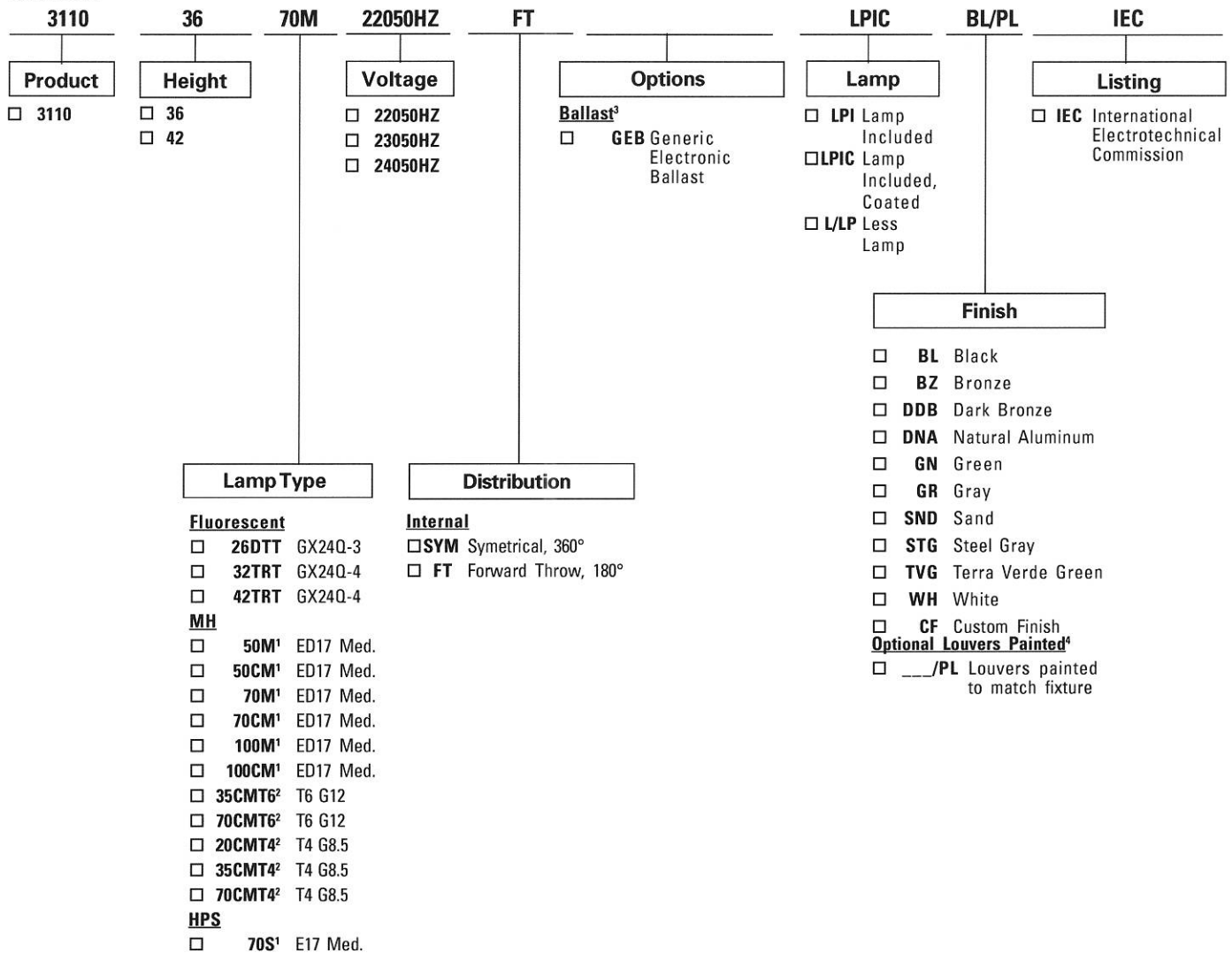
3110 BOLLARD ORDERING INFORMATION

50 Hz Application

Choose the boldface catalog nomenclature that best suits your needs.

PART NO.

EXAMPLE:



Notes:

- ¹ Will be provided with coated lamps unless LPI is chosen.
- ² T4 and T6 Lamps will be provided with a frosted lens.
- ³ GEB is available with MH lamps only.
- ⁴ Louvers will be black unless otherwise specified (top only).