AGi32 lighting software

Presented By: Keith Calais & Terry Thayer

Introduction

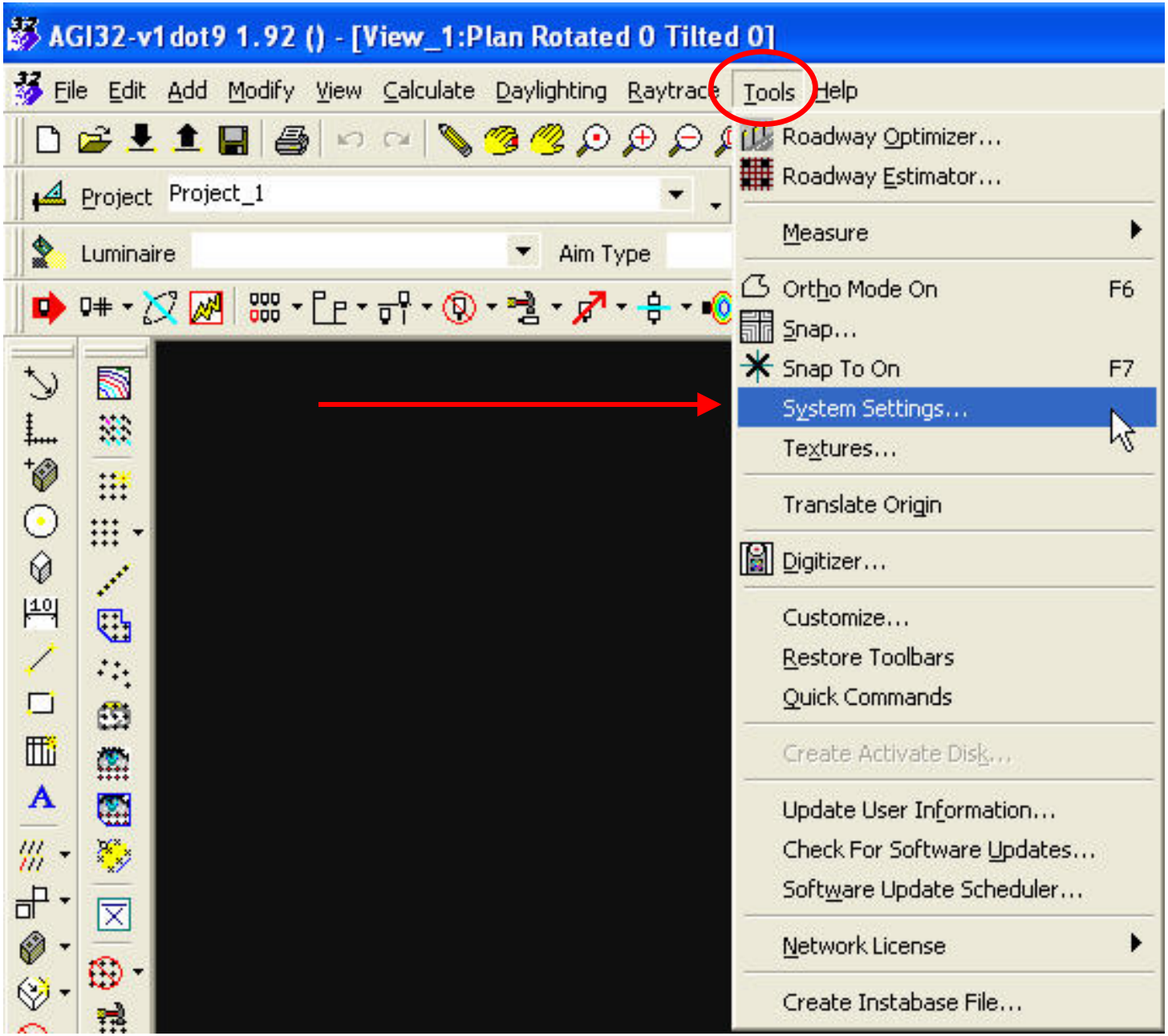
All the files that you will need for the class are located under:

"C:\AGI32_Training"

General Outline of Topics for the Class:

1.) Title Page and Index (pages 1-2)
2.) AGI32 System Settings (pages 3-11)
3.) Importing DXF files into AGI32 (pages 12-15)
4.) Exporting to DXF from AGI32 (pages 16-17)
5.) MISC Tools, View Commands & View Manager (pages 18-21)
6.) Defining Luminaires (pages 22-35)
6.) Luminaire Tools (pages 36-37)
6.) Luminaire Templates (pages 38-41)
7.) Calculation Point Tools / Calculation Point Grid Placement / Calc. Point Status Manager (pages 42-44)
7.) Luminance, Veiling Luminance, Spacing, MH, & Wattage Relationships (pages 45-47)
7.) Roadway Luminance and Veiling Luminance Grids (pages 48-50)
8.) Isolines and Highlighted Values (pages 51-52)
8.) Statistical Areas / Statistical Summary (pages 53-54)
8.) Project Manager (page 55)
9.) Printing / Documentation (pages 56-62)
10.) Network License Manager/Check-out/Check-in program/Customizing & Creating Tools (pages 63-66)
10.) Tech Support and Contacts (page 67)
11.) 3 Examples (#1 is pages 68-75) 12.) (#2 is: pages 76-83) 13.) (#3 is pages 84-111)
18.) TEST (page 112) TEST HANDOUT (pages 112 – 126)

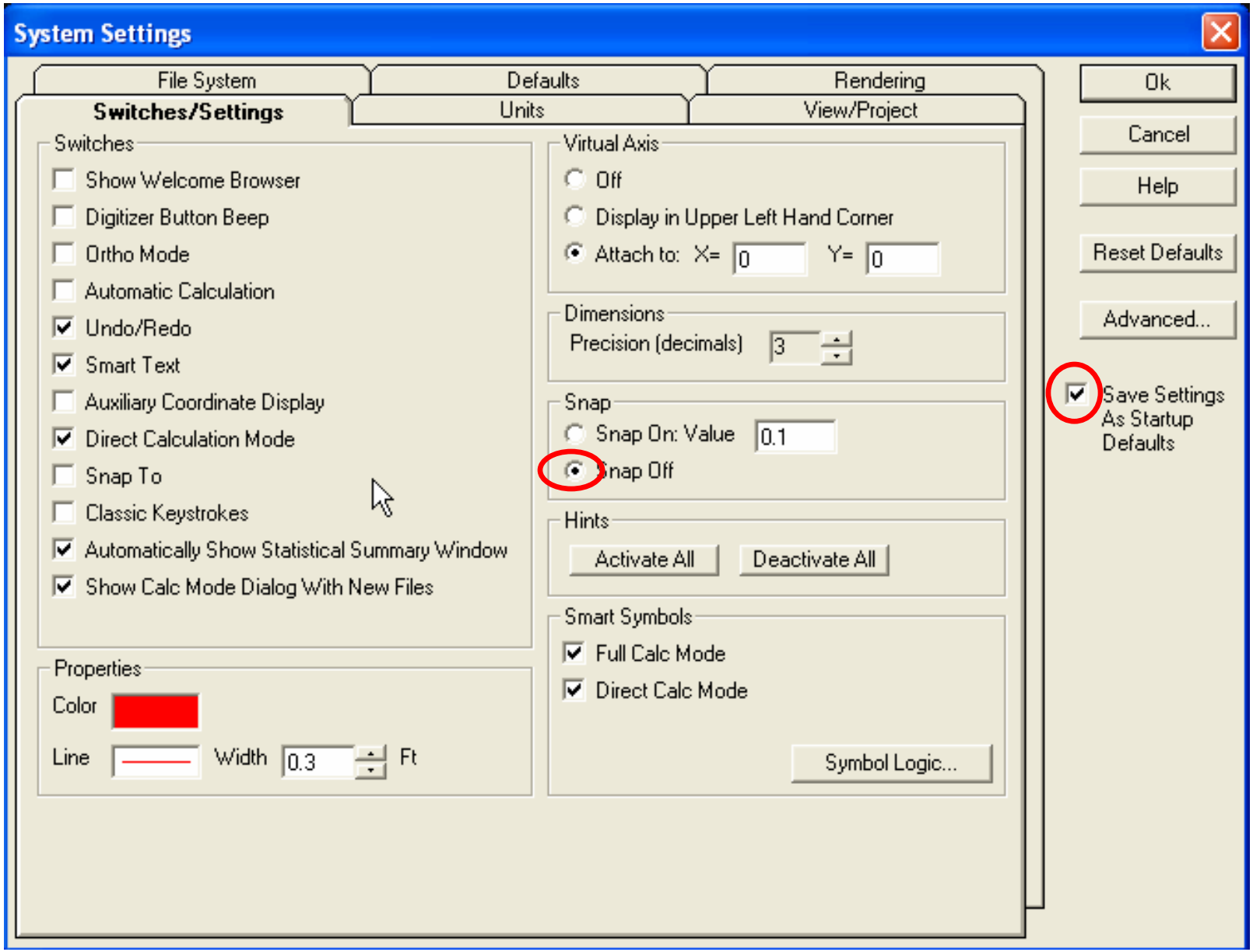
System Settings – Tools (main menu)



Or use this tool icon to bring Up system Settings menu

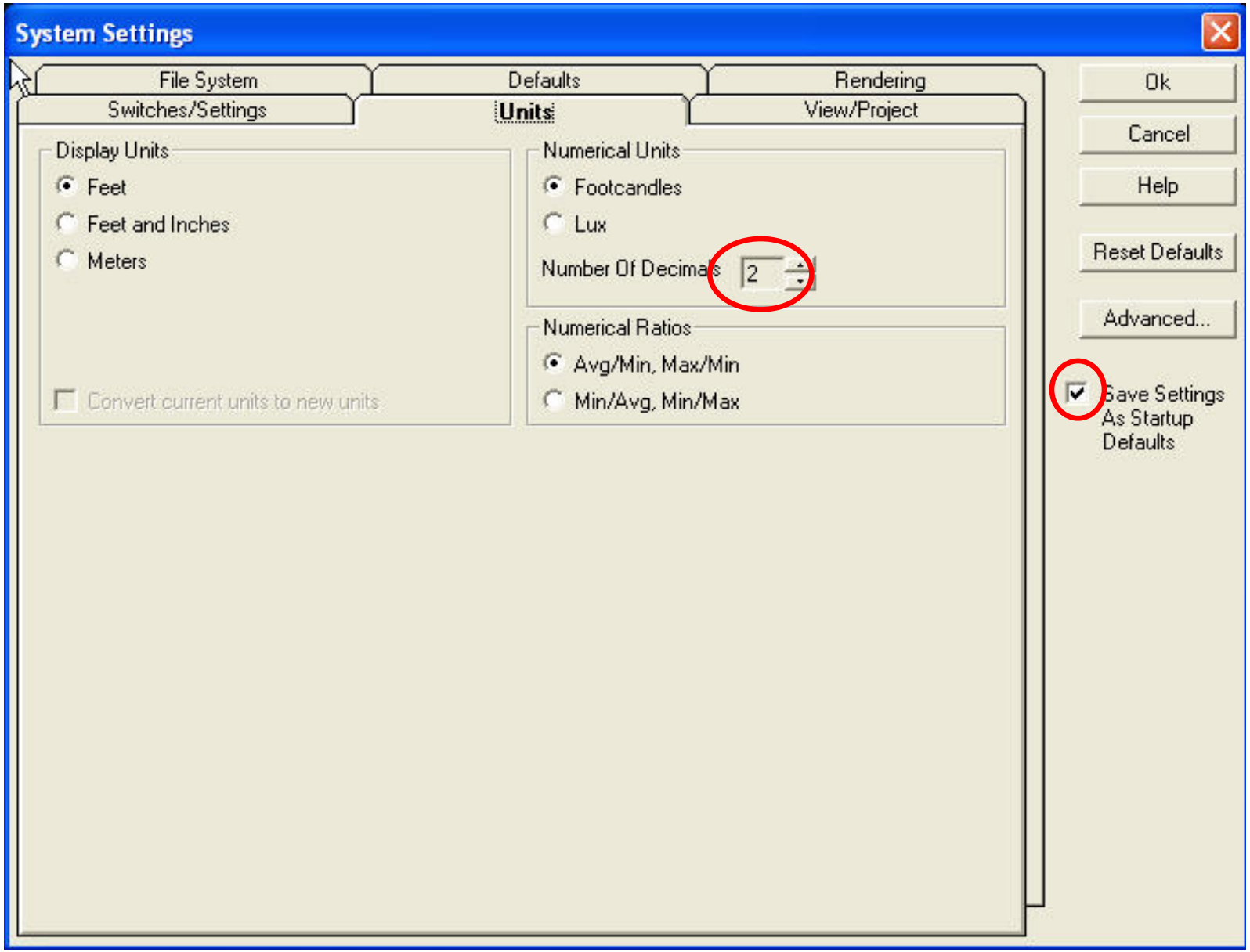
System Settings - Switches/Settings

Match the settings as shown below.



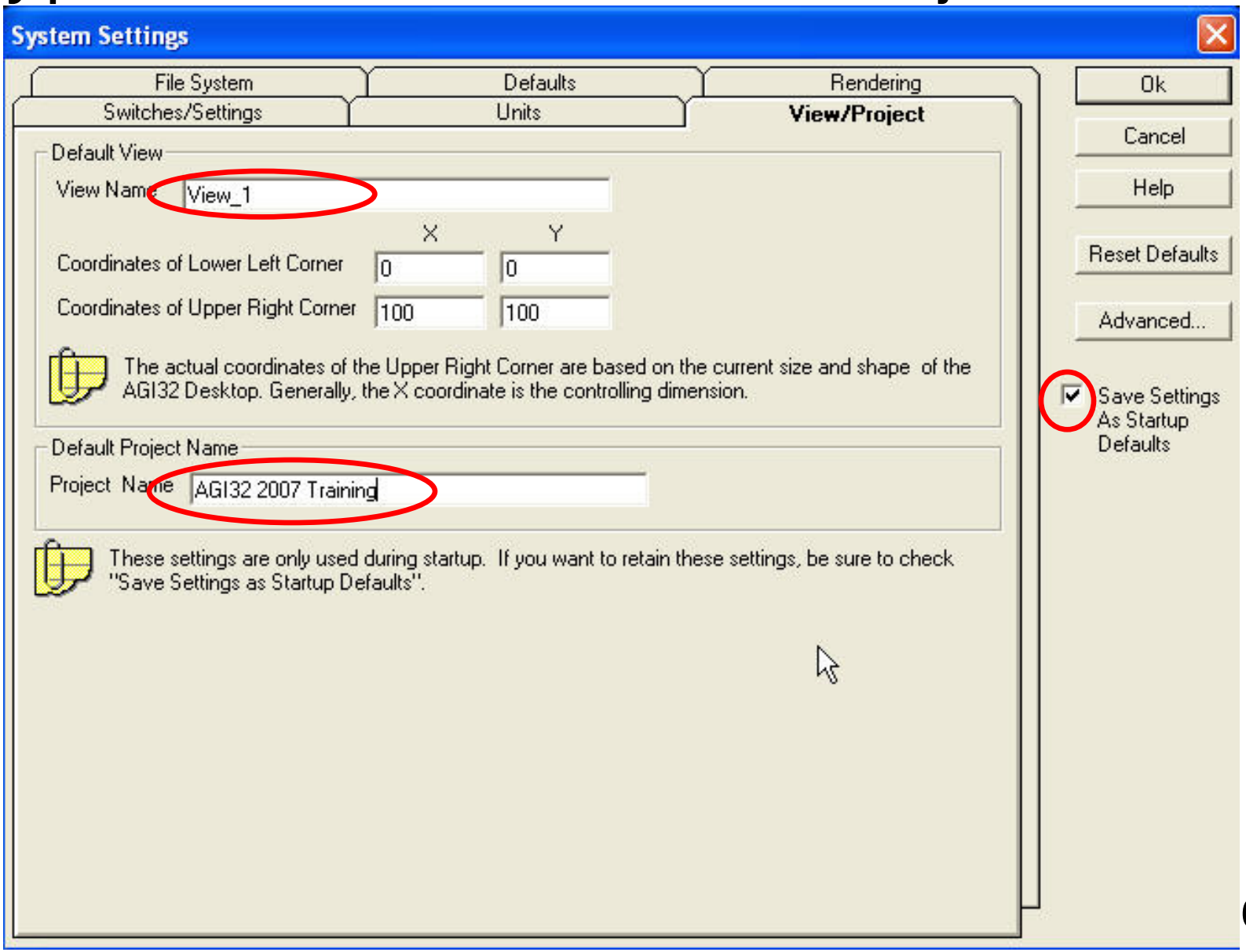
System Settings - Units

Match the settings as shown below.



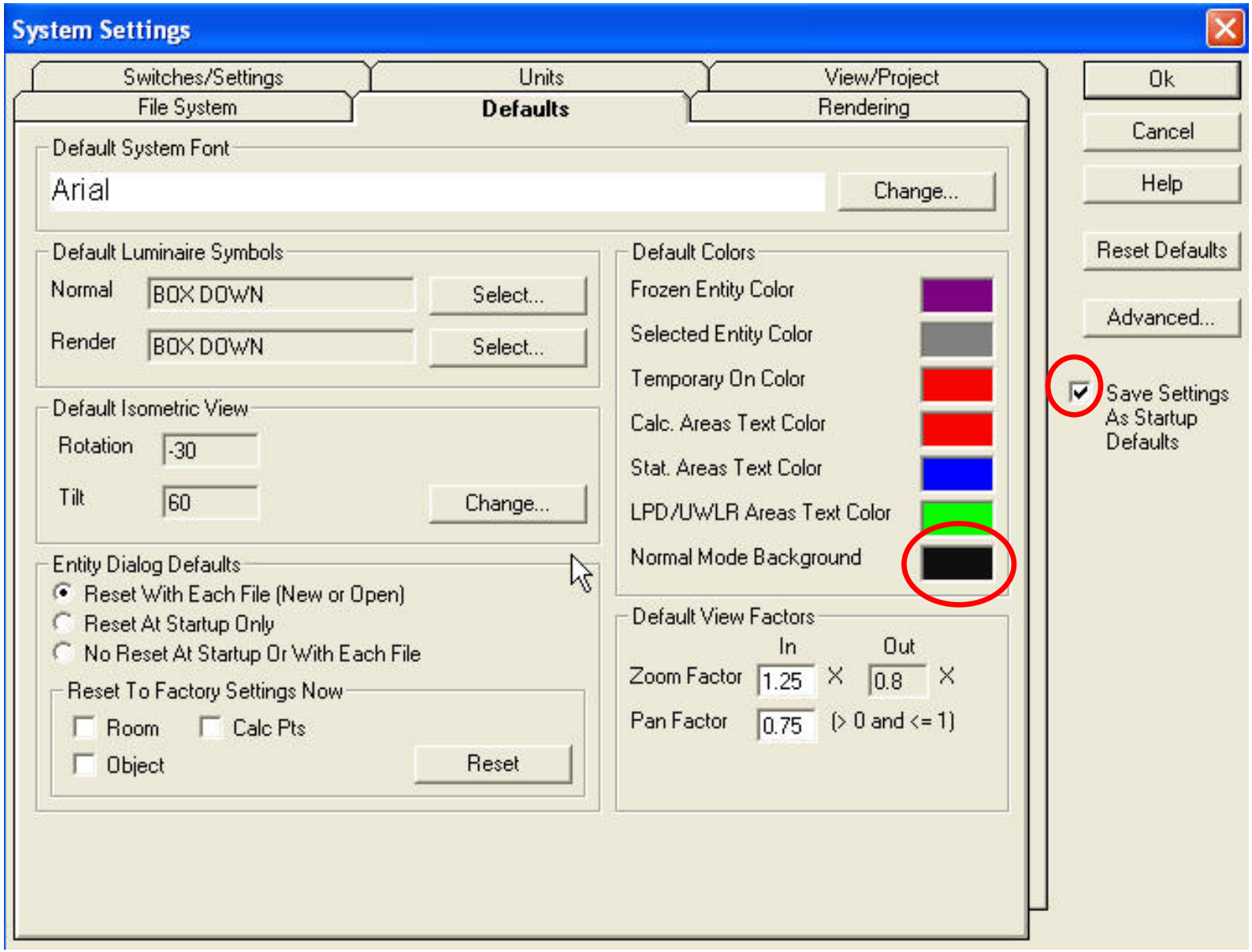
System Settings – View/Project

Type in a View Name and Project Name.



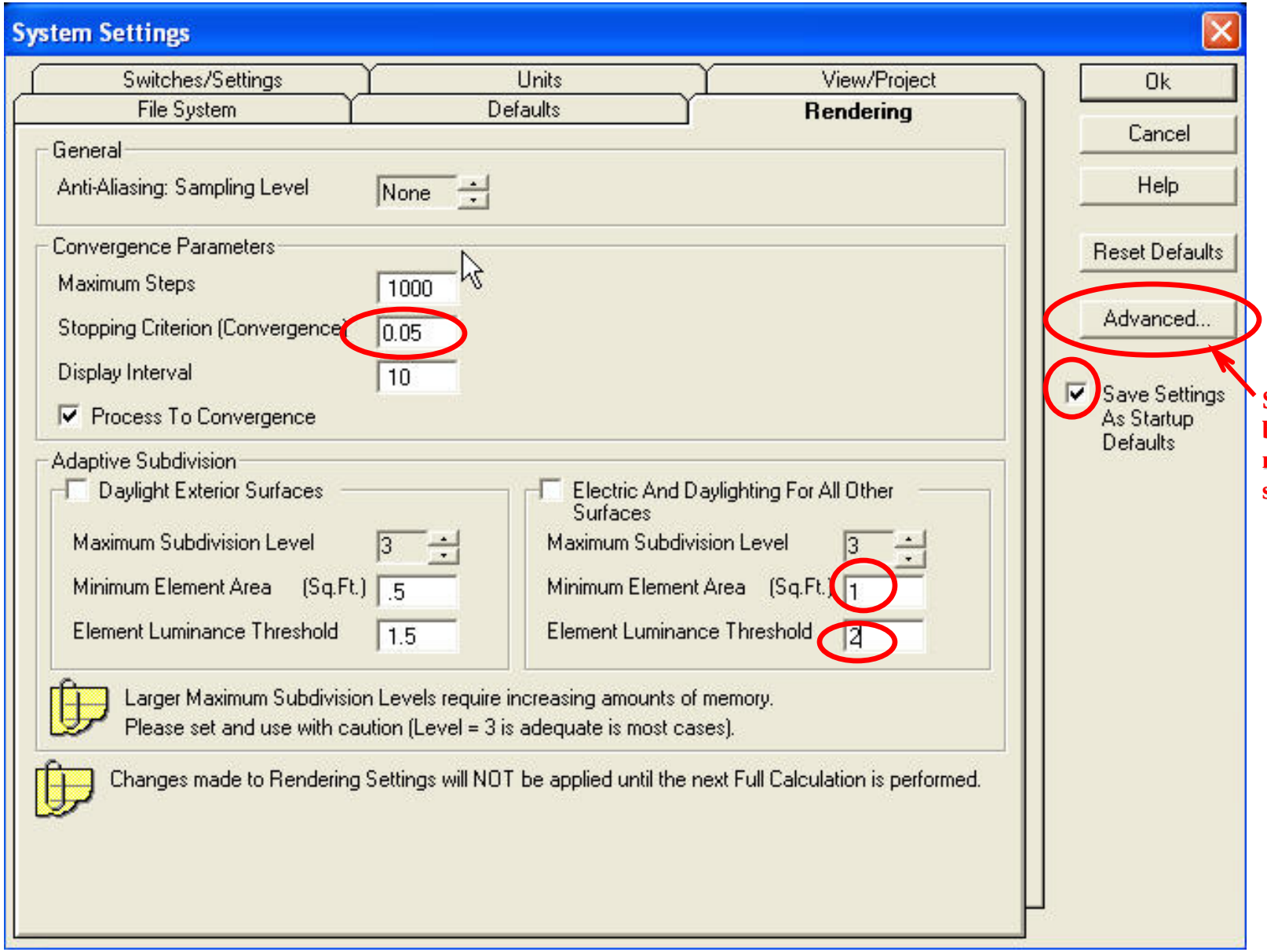
System Settings - Defaults

Match the settings as shown below.



System Settings - Rendering

Match the settings as shown below.



Select this button for menu on next slide

System Settings – Advanced Settings

Match the settings as shown below.

Advanced Settings

General | Render

General

Ghost Image - Repaint Cutoff Increment	250	Import Text - Size Factor	2
Ghost Image - Number of Entities Cutoff	1000	Import Text - Offset Factor	1.5
Ghost 2D Image - Number of Entities Cutoff	500	Flip Color Tolerance	128
Ghost 2D Image - Segment Step	3	Snap To Initial Tolerance	2
Initial Curve Increment (Degrees)	1	Snap To Final Tolerance	0.05
Font - Line Segments Per Line	8	Snap To Mouse Detect (Pixels)	3
Direct Calc Mode Limiting Value (fc)	0.0025	Max. Imported Surfaces Per Layer	5000
Surface View Mode - Tolerance	0.2	3D Entity Check Range	0.25

Ok
Cancel
Help
Reset Defaults
☑ Save Settings as Startup Defaults

Please use caution when changing these settings.

Advanced Settings

General | Render

Meshing

Initial Meshing - General Surfaces

		Length Of Side (Ft.)	Patch Size (Ft.)
Setting 1:	<=	8	2
Setting 2:	<=	32	4
Setting 3:	<=	128	8
Setting 4:	<=	384	12
Setting 5:	>	Setting 4	16

Element Size Factor = 0.5 (x Patch Size)

☑ Smart Meshing

Initial Meshing - Glass/Transition Surfaces

		Length Of Side (Ft.)	Patch Size (Ft.)
Setting 1:	<=	8	2
Setting 2:	<=	16	2
Setting 3:	>	Setting 2	4

Initial Meshing - Miscellaneous

	Patch Level	Element Level
Pole/ Pendant	0	1
Luminaire Symbols	0	1

Luminaire Subdivision

Min. Luminaire Segment (Ft.) 1

☐ Force Luminaire Subdivision

Secondary Sources

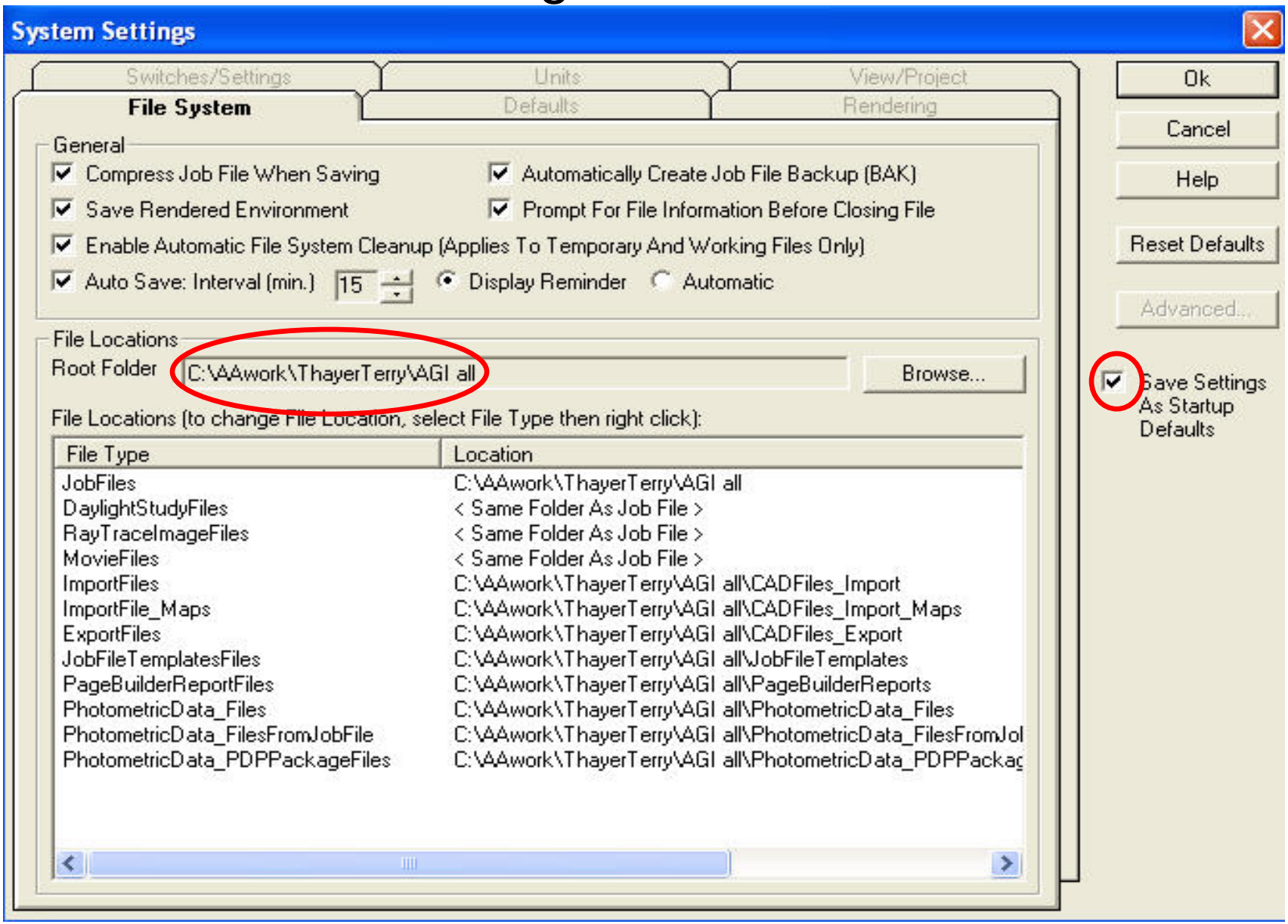
☐ Secondary Sources: Threshold 0.01

Ok
Cancel
Help
Reset Defaults
☑ Save Settings as Startup Defaults

Please use caution when changing these settings.

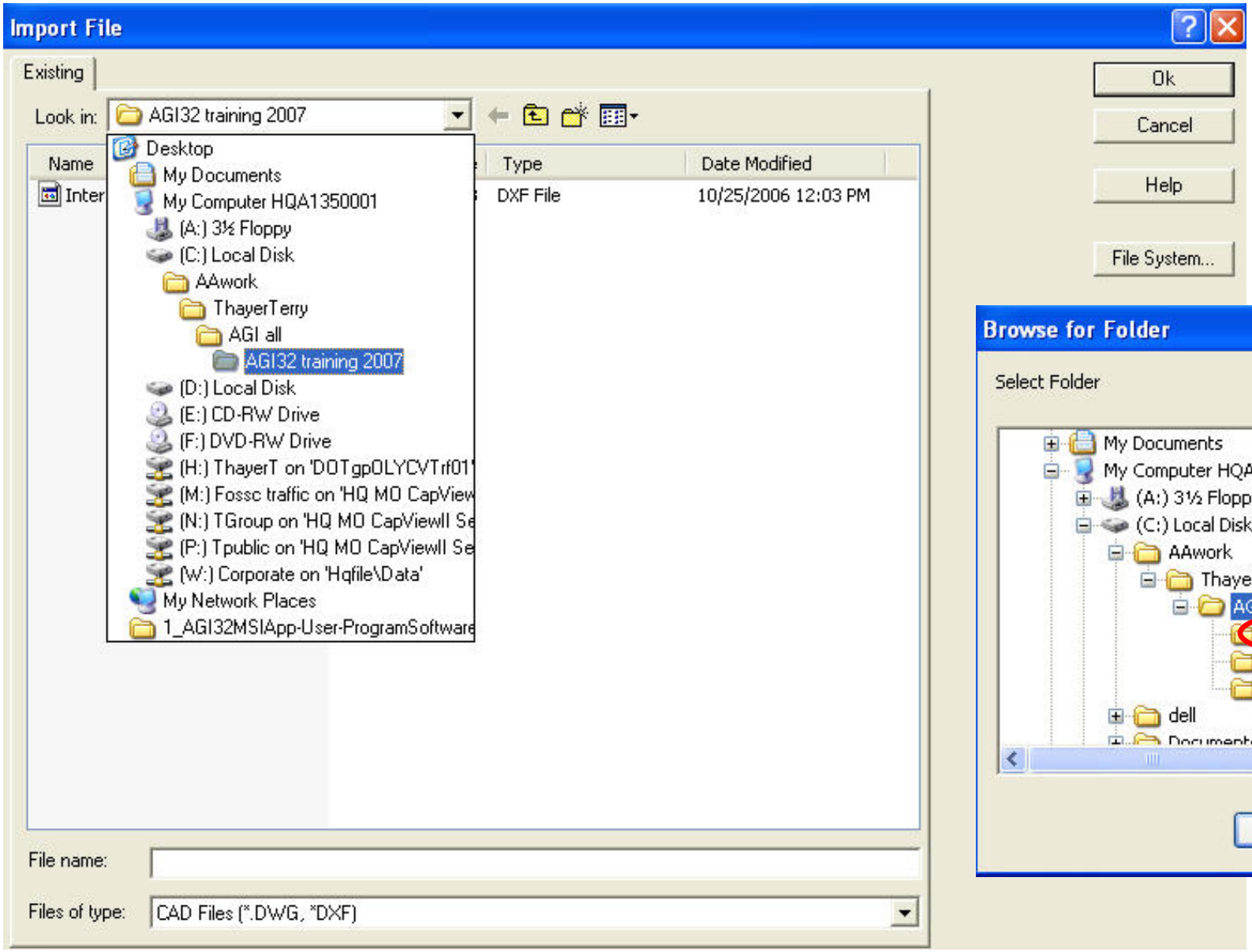
System Settings – File System

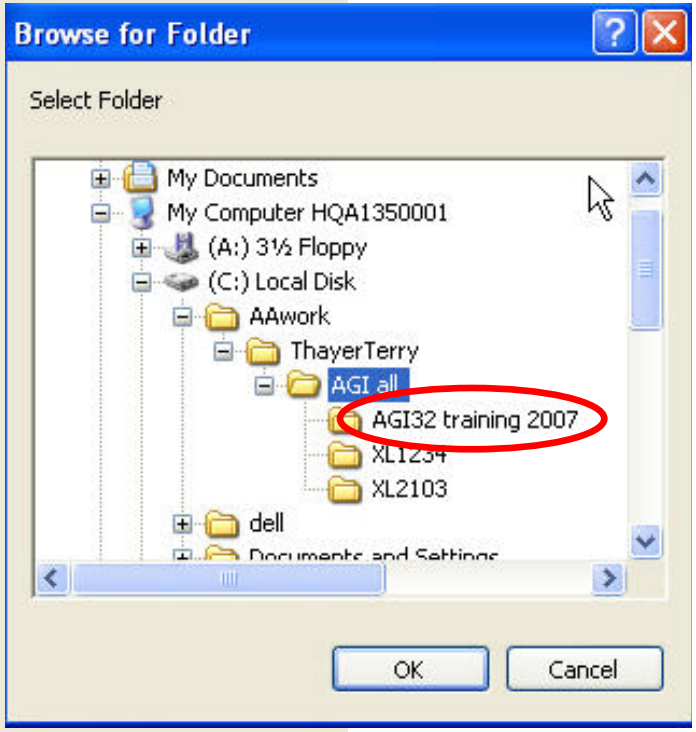
Match the settings as shown below. (use your name)



System Settings – File System

Match the settings as shown below. (use your name)





Importing a DXF File into AGI32

Open a new file in AGI and go to File\Import.

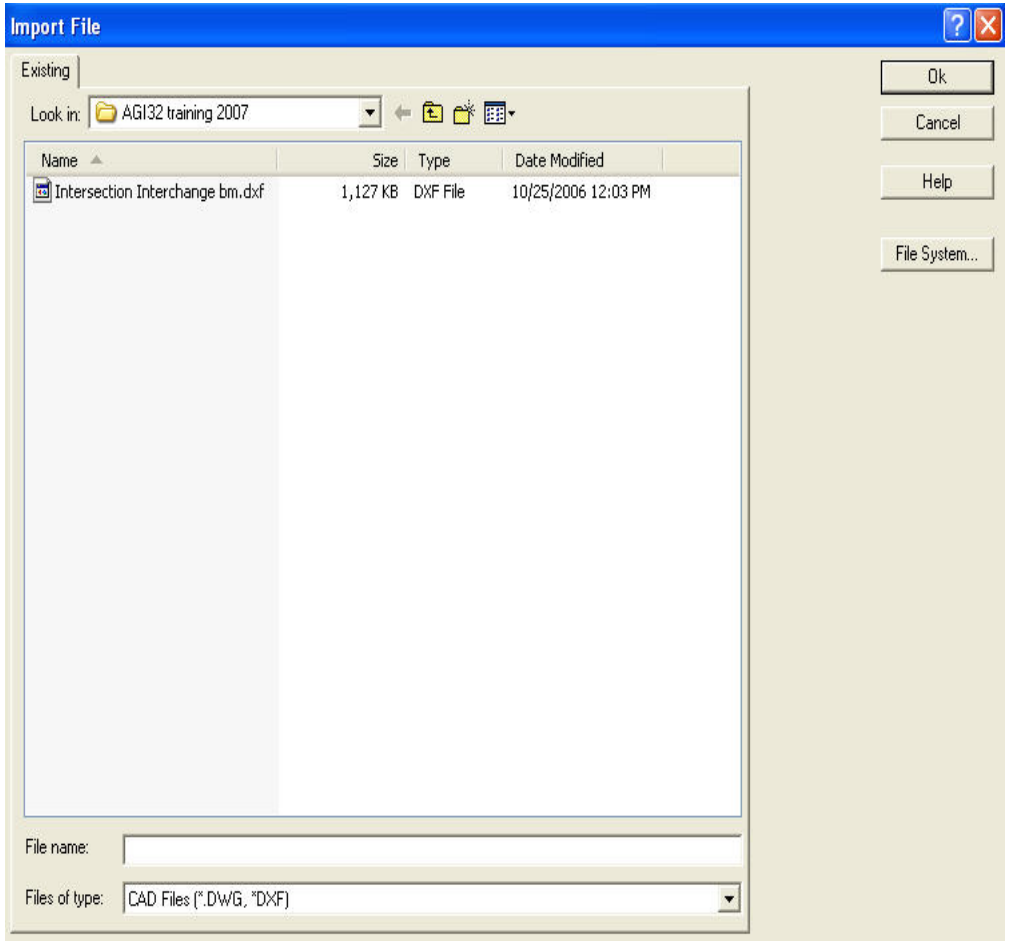
Notes:

Set up the AGI System Settings before Importing DXF file. (**Decide on the units** that you are going to use.)

When creating the DXF File, delete any non useful elements from the basemap before exporting.

Recommend you draw lines around each design area for use in AGI32.

Don't move or reorient the basemap after Importing.



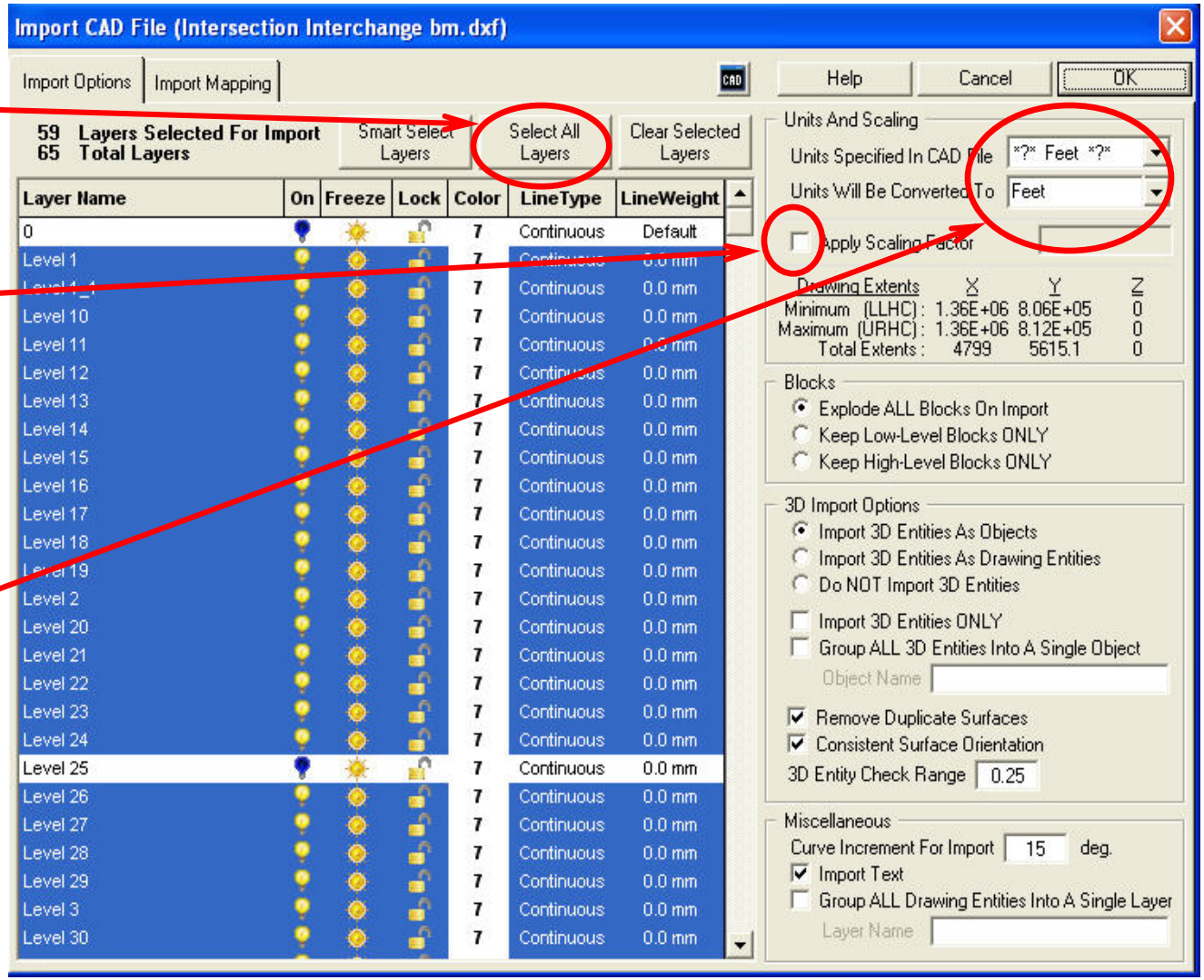
Select the file you wish to import.

Importing a DXF File into AGI 32 Cont…

Select All Layers

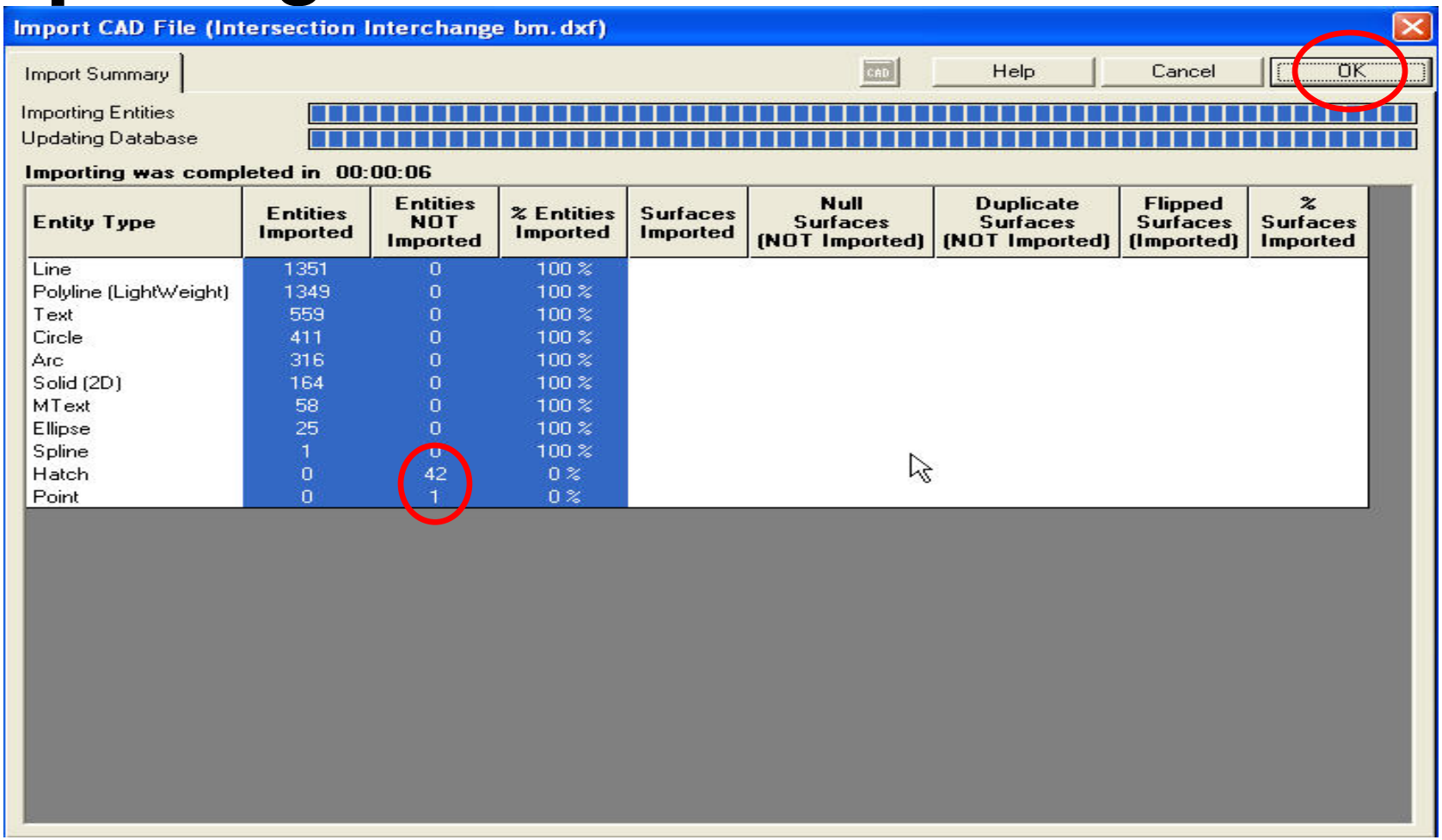
Do not change the scale factor

Verify unit are feet



<u>Note:</u> If you want to Export Luminaire locations back to MicroStation, don't move or rotate the basemap once it has been imported.

Importing a DXF File into AGI 32 Cont...

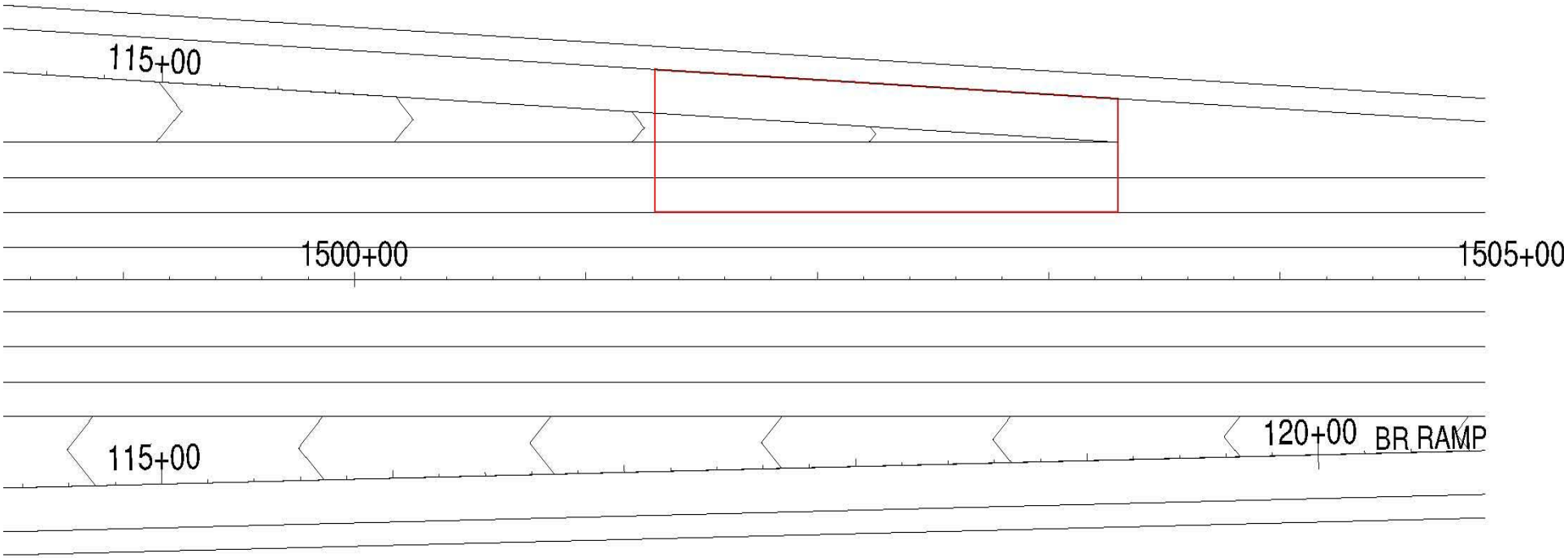


Entity Type	Entities Imported	Entities NOT Imported	% Entities Imported	Surfaces Imported	Null Surfaces (NOT Imported)	Duplicate Surfaces (NOT Imported)	Flipped Surfaces (Imported)	% Surfaces Imported
Line	1351	0	100 %					
Polyline (LightWeight)	1349	0	100 %					
Text	559	0	100 %					
Circle	411	0	100 %					
Arc	316	0	100 %					
Solid (2D)	164	0	100 %					
MText	58	0	100 %					
Ellipse	25	0	100 %					
Spline	1	0	100 %					
Hatch	0	42	0 %					
Point	0	1	0 %					

After the Import has completed this Report window will appear. Some drawing entities were not imported. Just select "OK" and proceed on.

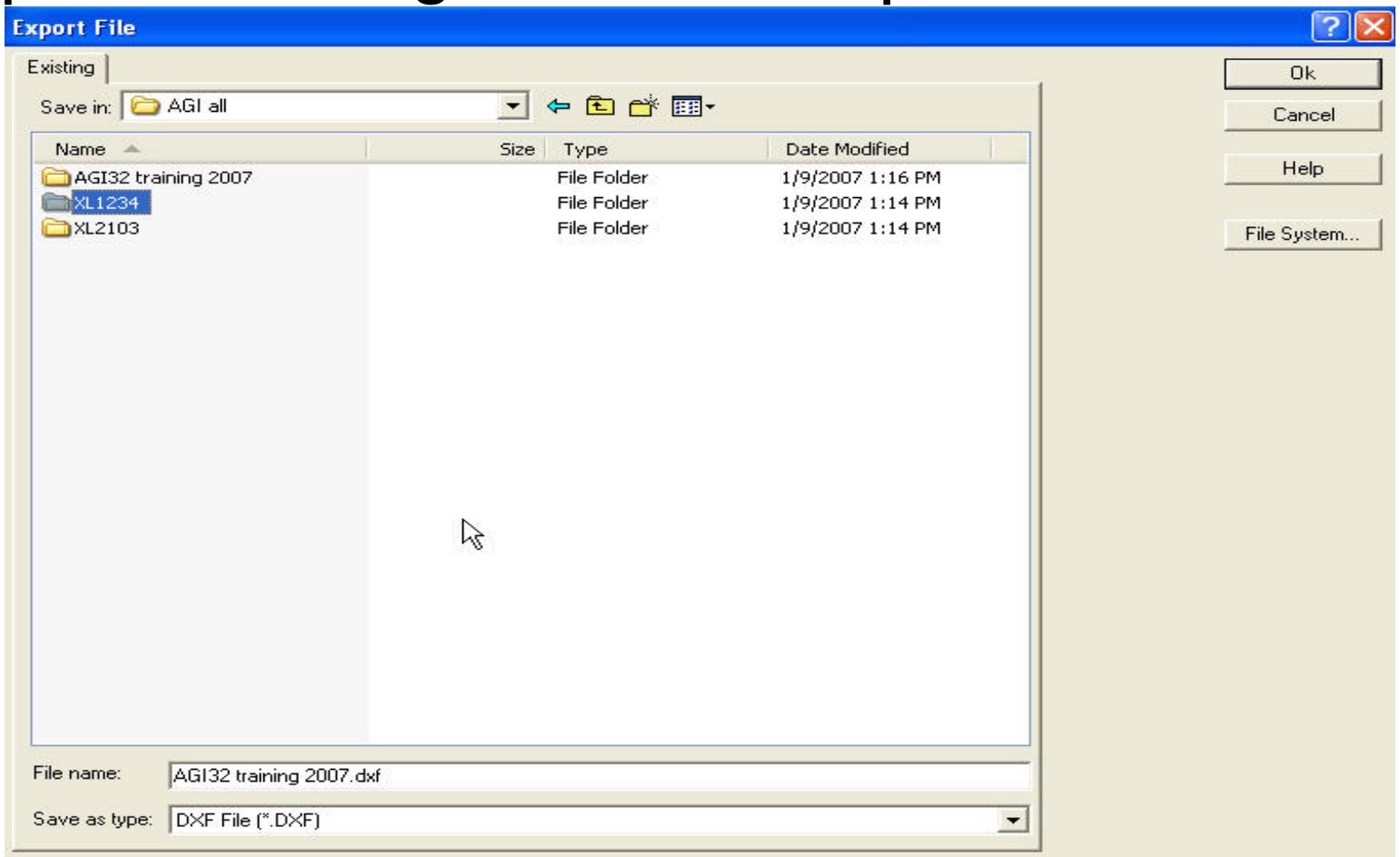
Example 1

File Imported



Exporting from AGI32 to DXF

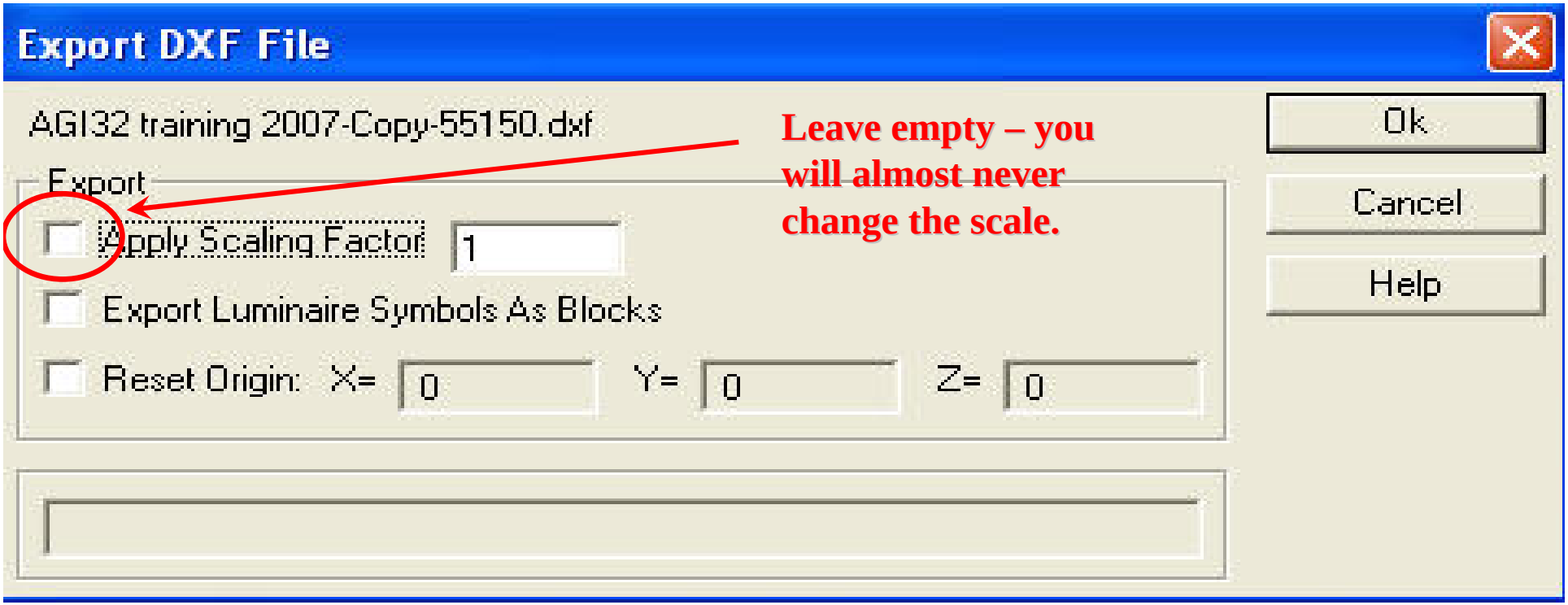
Open the file in AGI32 that you want to Export. Next go to File\Export.



Select a name and location for the exported file.

Exporting from AGI32 to DXF Cont…

Leave all settings at the default and select OK.



Note: Before exporting, you should copy the AGI32 file and then delete everything except for the Luminaire locations. This way you will only be importing the luminaire locations into your CADD basemap.

MISC Tools

1.) **Units** (The imported basemap is in feet, light levels and values are in Ftc.)

2.) **Snap** (**OFF** is best. The cursor moves by the displayed increment on the design grid.)

3.) **OrthoMode** (**OFF is best.** Allows you to move in any direction instead of by right angles.)

4.) **Snap To** (Used to Snap To the end points of all entities, including drawing entities, rooms and objects)

5.) **Auto Calc** (within Direct Mode, when "on", will recalculate when a luminaire is modified or moved or a calculation modified is applied)

6.) **Calc Mode Switch** (Switches between **Direct** and **Full Calc** Modes. Use Direct Calculation Mode unless you wish to render the design file. In order to render you need to place objects with reflectance properties. See Manual for more information on Objects and Rendering.

7.) **Calculate Switch** (Calculates the design file.)

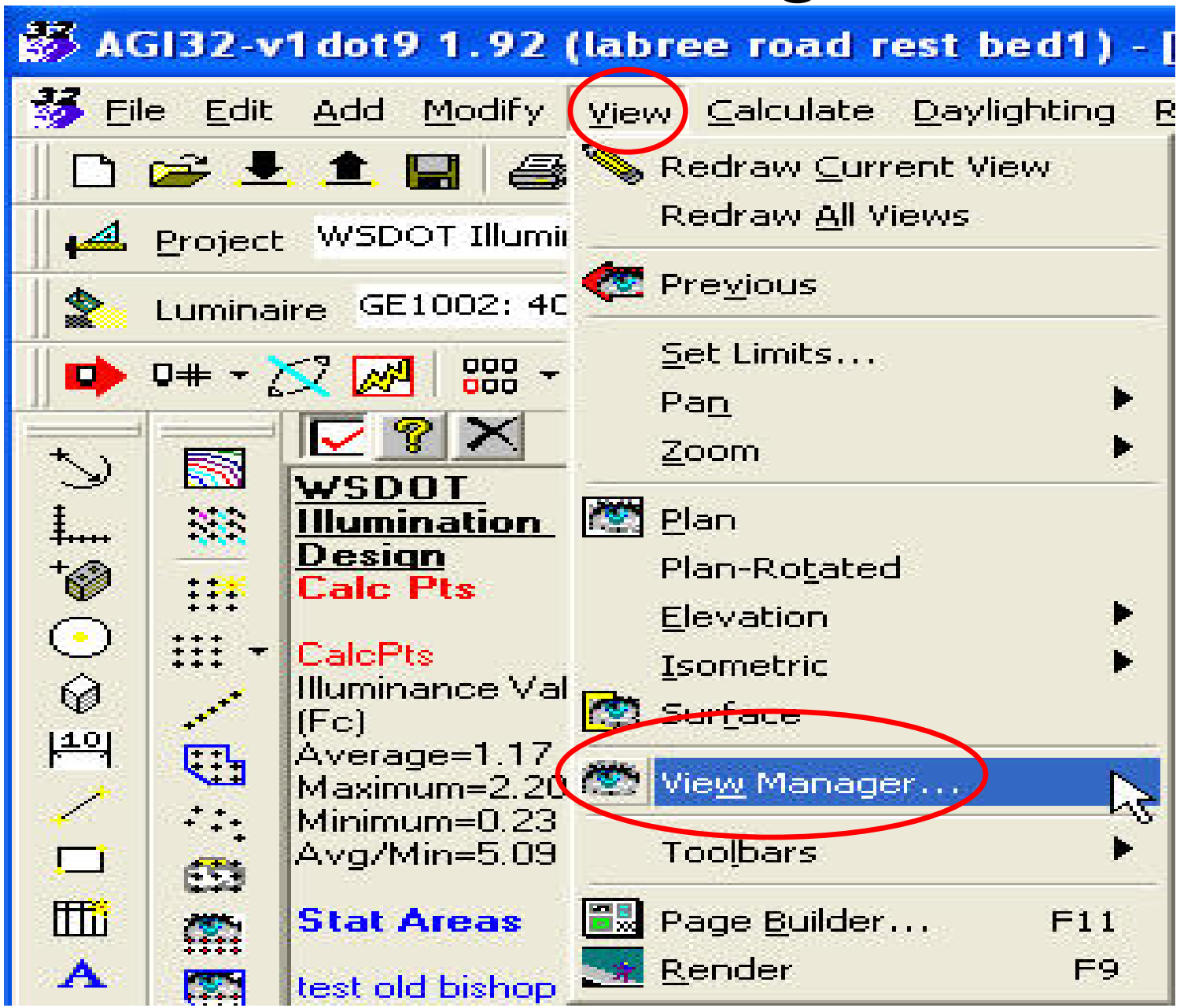
8.) **Update Status** (Displays a **red** ball until program is done calculating and updating the database.)

9.) **More Tools** (Add or Remove tools from toolbar.)

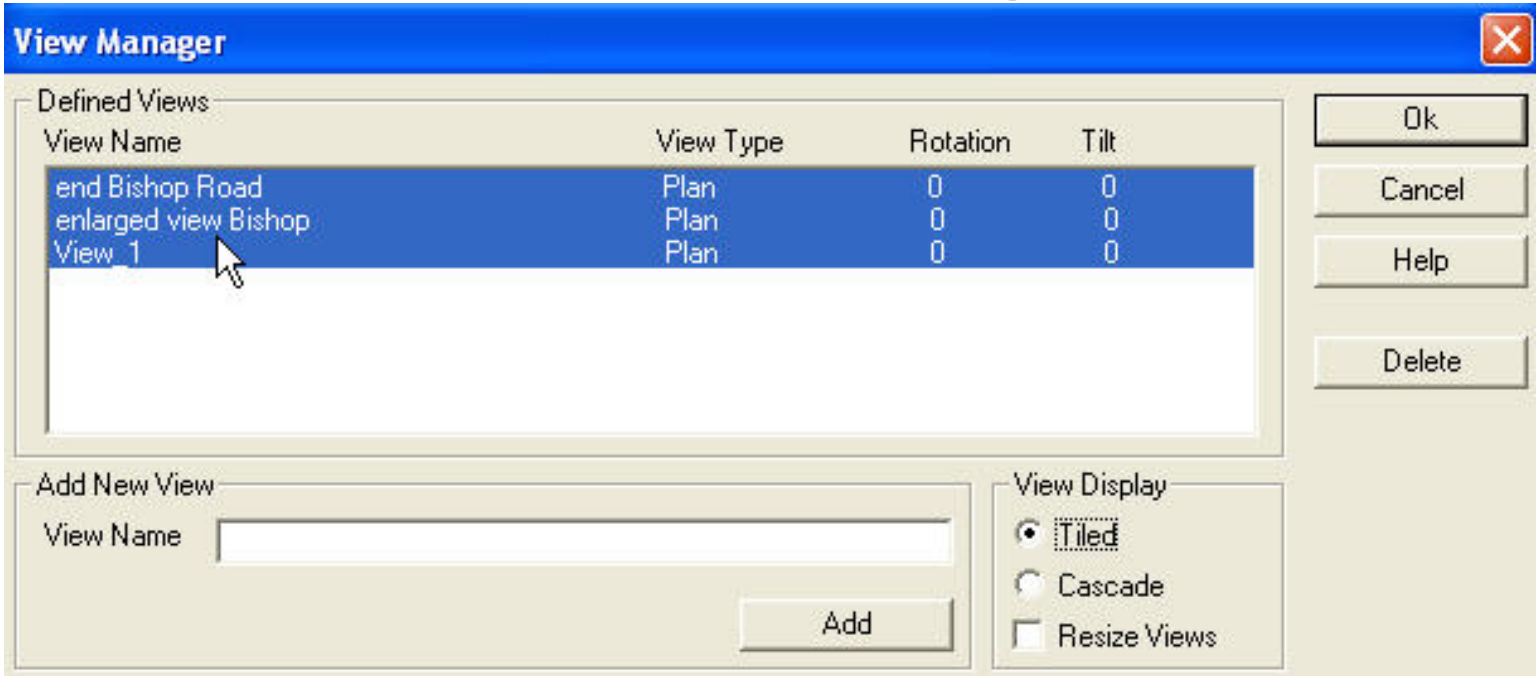
View Commands

1.) **Redraw Current View** (Refresh View)
2.) **Pan Center** (Use to move any point to the center of the view)
3.) **Pan Point** (Use to move the view in any direction.)
4.) **Zoom Center** (Moves the selected point to the center of the screen and zooms in the amount set in the system settings. The default setting is 2x.)
5.) **Zoom In (home)**
6.) **Zoom Out (end)**
7.) **Zoom Window** (Place a fence around the area that you wish to view closer.)
8.) **Zoom Extents** (Fits everything in the file to your specified view.)
9.) **Limits** (Brings the view to the X=0, Y=0 Grid Location)
10.) **View Previous** (Allows you to see previous view)
11.) **Plan-view** (Rotates the view to any orientation that you wish)
12.) **Elevation View** (Select 2 pts from left to right in the direction of the cross section that you wish to view.)
13-16.) **Elevation View** (View North, South, East & West Elevation Views)
17.) **View Room Wall or Object Side Surface**
18.) **Isometric View** (Shows a skewed 3D view according to System Settings)
19-22.) **Preset Isometric View** (View Northeast, Northwest, Southeast, Southwest Isometric Views)
23.) **View Manager** (Allows you to add / create / name / manipulate (Turn ON/OFF) different views)

View Manager



View Manager



The View Manager allows you to create different views of the file.

1.) **Type the name of the new view under "add new view"**
2.) **You can select multiple views by holding in the shift key and selecting the views you want.**
3.) **When multiple views are present you can change the perspective of each view individually by selecting the view window and then applying the appropriate command.**

Cobra Head Fixture – State Standard

For 200W, 250W, 310W, or 400W HPS, Type III, Medium Cutoff with Flat Glass use the **GE1002.ies** photometrics file.

(The yellow 40 label stands for 400W HPS)

(blue = mercury & red = metal halide per Std. Spec. 9-29.10)

200W = 22,000 Lumens(248W), 250W = 28,000 Lumens(314W)
310W = 37,000 Lumens(387W), 400W = 51,000 Lumens(479W)

Cobra Head Fixture - Specification

M-400A POWR/DOOR® LUMINAIRE WITH CUTOFF OPTICS

APPLICATIONS
- For street, highway and parking lot lighting

SPECIFICATION FEATURES
- Powr/Module ballast assembly
- Filtered optics
- Universal two or four-bolt slipfitter
- Standardized reflector
- "Dead back" tunnel type, FRP terminal board
- 2 in. pipe mounting only with MDCA
- Die-cast aluminum housing with electrocoat gray paint finish
- Adjustable mogul base socket (house side) – E39 standard
- ALGLAS® finish on reflector
- No-tool PE receptacle
- Plug-in ignitor available
- External paddle type stainless steel bail latch
- ®/® listed unit available—See Options
- True 90° cutoff—no light above 90° (meets RP8-2000 for full cutoff) with flat glass

ORDERING NUMBER LOGIC

MDCA	40	S	1	A	2	1	F	MC3	1	F
PRODUCT IDENT	WATTAGE	LIGHT SOURCE	VOLTAGE	BALLAST TYPE	PE FUNCTION	IGNITOR MOUNTING	LENS TYPE	IES DISTRIBUTION TYPE	FILTER	OPTIONS
XXXX	XX	X	X	X	X	X	X	XX	X	XX
MDCA = M-400A with Cutoff Optics 4-Bolt Slipfitter MDCL = M-400A with Cutoff Optics 2-Bolt Slipfitter	10 = 100 15 = 150 (55V) 17 = 175 20 = 200 24 = 250/400 25 = 250 31 = 310 40 = 400 NOTE: Dual wattage connected for lower wattage only	S = HPS M = MH C = Merc Standard Lamp not included.	60Hz: 0 = 120/208/240/277 Multivolt 1 = 120 2 = 208 3 = 240 4 = 277 5 = 480 7 = 120/240 8 = 240V Ballast 120VPE Receptacle not recon-nectable D = 347 F = 120/347 T = 230 W = 230 50Hz: 6 = 220 R = 230 Y = 240 NOTE: Dual voltage connected for lower voltage	See Ballast Selection Table A = Autoreg C = Merc-Reg H = HPF Reactor or Lag M = Mag-Reg N = NPF Reactor or Lag P = OVI With Grounded Socket Shell	1 = None 2 = PE Receptacle NOTE: Receptacle connected same voltage as unit except as noted. Order PE Control separately.	1 = Non Plug-in/None 2 = Plug-in base and Ignitor	A = Acrylic Clear Globe (250 watt Maximum) F = Flat Glass G = Shallow Glass Globe L = Polycarbonate Clear Globe (250 watt) HPS only	See Photometric Selection Table S = Short M = Medium C = Cutoff 1 = Type I 2 = Type II 3 = Type III	1 = Fiber gasket 2 = Charcoal with elas-tomer gasket	F = Fusing (Not available with multivolt or dual voltage) J = Line Surge Protector, Expulsion Type N = Meets ANSI C136.31 requirments for Bridge and Underpass Vibration U = UL Listed Glass Lens and 60Hz

M-400 ROADWAY LIGHTING

PHOTOMETRIC SELECTION TABLE

CLEAR REFRACTORS All light sources are clear.

Wattage	Light Source	IES Distribution Type Photometric Curve Number 35–45xxxx: Flat Glass "F" MC2	Flat Glass "F" MC3	SAG Glass Globe "G" MC1	SC2	SC3	MC2	MC3	Polycarbonate
150 (55V)	HPS	0386	0387	N/A	N/A	N/A	0547	0546	C/F
200-400	HPS	1001	1002	N/A	0101	0102	1003	1004	1045** (MC3)
175 & 250	MH	0343	0342	N/A	N/A	N/A	0544	0545	C/F
400	MH	452880*	452882*	0281	N/A	N/A	0280	N/A	N/A
400	Merc	N/A	N/A	N/A	N/A	N/A	0375	0376	N/A
400 (Coated)	Merc	N/A	N/A	N/A	0282	C/F	N/A	N/A	N/A

NOTE N/A = Not Available C/F = Contact Factory
*Requires the use of ED-28 Lamp
**250 watts maximum

GE Lighting Systems, Inc.
www.gelightingsystems.com

R-16/2005

PHOTOMETRIC SELECTION TABLE

CLEAR REFRACTORS All light sources are clear.

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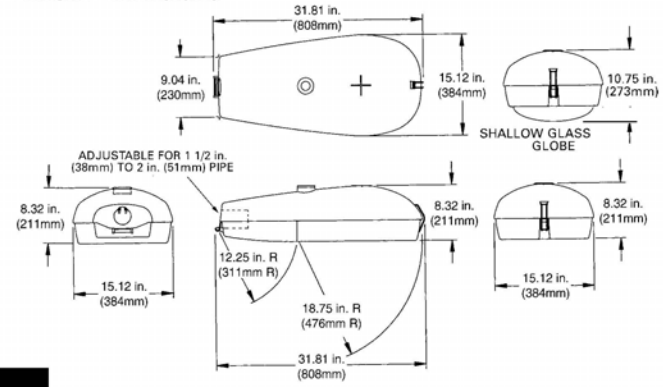
150 (55V)	HPS	0386	0387	N/A	N/A	N/A	0547	0546	C/F
200-400	HPS	1001	1002	N/A	0101	0102	1003	1004	1045** (MC3)
175 & 250	MH	0343	0342	N/A	N/A	N/A	0544	0545	C/F
400	MH	452880*	452882*	0281	N/A	N/A	0280	N/A	N/A
400	Merc	N/A	N/A	N/A	N/A	N/A	0375	0376	N/A
400 (Coated)	Merc	N/A	N/A	N/A	0282	C/F	N/A	N/A	N/A

NOTE N/A = Not Available C/F = Contact Factory
*Requires the use of ED-28 Lamp
**250 watts maximum

Cobra Head Fixture - Specification

M-400A POWR/DOOR® LUMINAIRE
WITH CUTOFF OPTICS & 4 BOLT SLIPFITTER

FIXTURE DIMENSIONS



DATA

Approximate Net Weight	33-39 lbs	15-19 kgs
Effective Projected Area	1.1 sq. ft. max	.01 sq. M max
Suggested Mounting Height	30-50 ft.	9-15 M

REFERENCES

See Page R-48 for start of Accessories.
See Page R-52 for Explanation of Options and Other Terms Used.
See Pole and Bracket Section Page P-2 for pole selection.

BALLAST SELECTION TABLE

			Ballast Type/Voltage												
			60Hz										50Hz		
Wattage	Light Source	Multi-volt	120	208	240	277	480	120X 240	347, 120X347	240/120 PE R	220	230	220	230	240
150 (55V)	HPS	H,N	G,H,M,N	G,M	G,M	G,M	G,M	G,H,M,N	G*,H,M*,N	G,M	N/A	N/A	N/A	N/A	N/A
200	HPS	A,M,P	A,G,H,M,N,P	A,G,H,M,N,P	A,G,H,M,N,P	A,G,M,P	A,G,M	A,G,M,P	N/A	A,G,H,M,N	N/A	H	N/A	N/A	N/A
250	HPS	A,M,P	A,G,H,M,N,P	A,G,H,M,N,P	A,G,H,M,N,P	A,G,M,P	A,G,M,P	A,G,M,P	A,M,P	A,G,H,M,N	A,H	H	A,H,M,N	H	M
250/400	HPS	A	A	A	A	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
310	HPS	A,M	A,G,M	A,G,H,M,N	A,G,H,M,N	A,G,M	A,G,M	A,G,M	N/A	A,G,H,M,N	N/A	H	N/A	N/A	N/A
400	HPS	A,M	A,G,M	A,G,H,M,N	A,G,H,M,N	A,G,M	A,G,M	A,G,M	A,G,M	A,G,H,M,N	H,A,N	H	A,H,M,N	N/A	A,H,M
175	MH	A	A	A	A	A	A	A	A	A	N/A	N/A	N/A	N/A	N/A
250	MH	A	A	A	A	A	A	A	A	A	A	N/A	N/A	N/A	N/A
400	MH	A	A,P	A,P	A,P	A,P	A,P	A,P	A,P	A	A	N/A	N/A	N/A	A
400	Merc	C	C,N	C/F	C,H,N	C,H,N	C	C	N/A	A,C,H,N	N/A	N/A	C/F	N/A	H

NOTE: N/A = Not Available
*Not available in 120X347 volt
C/F = Contact factory

MDCA — SUGGESTED CATALOG ORDERING NUMBERS

Catalog Number	Wattage	Light Source	Voltage (60Hz)	Ballast Type	Refractor Type	Photometric Distribution
MDCA25S0A22FMC21	250	HPS	Multivolt	Auto-Regulator	Glass	MC2
MDCA40S0A22FMC31	400	HPS	Multivolt	Auto-Regulator	Glass	MC3

All GE suggested catalog ordering numbers come with PE receptacle. PE control must be ordered separately. Order and install SCCL-PECTL if no PE is desired.

Multivolt ballasts can be for either 120, 208, 240, or 277 volt incoming power supply.

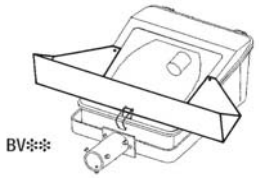
M-400 ROADWAY LIGHTING

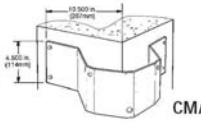
R

Cobra Head Fixture – Accessories

ACCESSORIES

REFER TO ACCESSORY INDEX TO MATCH ACCESSORY WITH PRODUCT.
ILLUSTRATIONS SHOWN ARE TYPICAL REPRESENTATIONS.





BOTTOM VISOR

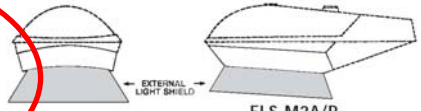
- **BVAL-V2FS** Aluminum
- **BVDB-V2FS** Dark Bronze

CORNER MOUNTING ADAPTER

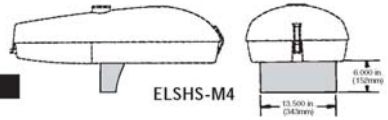
- **CMA-PB**

EXTERNAL LIGHT SHIELD

- **ELS-M2A**
  For M-250A2 (360° shield)
- **ELS-M2R**
  For M-250R2 (360° shield)
- **ELSHS-M4R**
  House side light shield for M400 and M400A non-cutoff, house or street side light shield for MSRL/MSCL/MDRA/MDCA



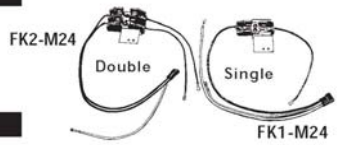
Street side shield



House side shield

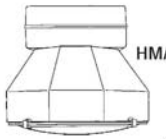
FUSE KITS (LESS FUSE[S])

- **FK1-M24** Single
- **FK2-M24** Double



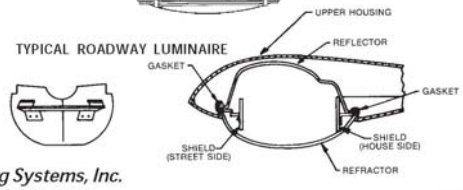
HAIL SHIELD

- **HMAA-HS**
  Hail shield for high mast luminaire



INTERNAL LIGHT SHIELD

- **ILS-M2**
  House or street side light shield for M-250A and M-250R non-Cutoff
- **ILS-M4**
  House or street side light shield for M-400A and M-400 non-cutoff or refractor type units
- **ILS-M4RL**
  House or street side light shield for MSRL/MDRL non-cutoff or refractor type units



ROADWAY LIGHTING ACCESSORIES

GE Lighting Systems, Inc.
www.gelightingsystems.com

Cobra Head Fixture – Ballast Spec.

[ ] = Ballast Type in Ordering Number Logic table. See individual product pages.

HPS—MULTIVOLT, 60Hz

ANSI Lamp Type	Rated Lamp Watts	Input Volts	Maximum Input Amps	Input Watts
[M] HPS BALLAST–REGULATOR (LAG TYPE) – MAGNETIC REGULATOR ALLOWABLE LINE VOLTAGE VARIATION: ±10%				
S-51	400	120	4.0	481
		208	2.3	479
		240	2.0	477
		277	1.7	478
S-67	310	120	3.3	388
		208	1.9	388
		240	1.6	385
		277	1.4	386
S-50	250	120	2.6	316
		208	1.5	314
		240	1.3	312
		277	1.1	312
S-66	200	120	2.[illegible]	249
		208	1.2	248
		240	1.1	248
		277	0.9	24[illegible]
[P] HPS BALLAST – REGULATOR (LEAD TYPE) – CWI ALLOWABLE LINE VOLTAGE VARIATION: ±10%				
S-50	250	120	2.6	300
		208	1.5	300
		240	1.3	300
		277	1.1	293
S-66	200	120	2.1	24[illegible]
		208	1.2	24[illegible]
		240	1.0	244
		277	0.9	244
[A] HPS BALLAST – AUTO-REGULATOR (LEAD TYPE) – CWA ALLOWABLE LINE VOLTAGE VARIATION: ±10%				
S-52	1000	120	9.7	1105
		208	5.5	1103
		240	4.9	1105
		277	4.2	1104
S-51	400	120	4.0	473
		208	2.3	476
		240	2.0	475
		277	1.8	475
S-50	250	120	2.6	306
		208	1.5	304
		240	1.3	308
		277	1.1	308
S-66	200	120	2.0	239
		208	1.2	239
		240	1.0	239
		277	0.9	239
S-55	150	120	1.6	186
		208	0.9	185
		240	0.8	183
		277	0.7	184
S-54	100	120	1.0	121
		208	0.6	120
		240	0.5	120
		277	0.4	119
S-62	70	120	0.8	88
		208	0.5	88
		240	0.4	87
		277	0.3	87

ANSI Lamp Type	Rated Lamp Watts	Input Volts	Maximum Input Amps**	Input Watts
[H] HPS BALLAST– REACTOR TYPE (HIGH POWER FACTOR LAG) ALLOWABLE LINE VOLTAGE VARIATION: ±5%				
S-111	750	120	13.7	840
		208	7.0	840
		240	6.9	835
		277	5.9	838
S-55	150	120	2.7	182
		208	1.6	184
		240	1.4	182
		277	1.2	184
S-54	100	120	2.0	126
		208	1.2	126
		240	1.0	125
		277	0.9	126
S-62	70	120	1.4	88
		208	0.8	91
		240	0.7	89
		277	0.6	89
S-68	50	120	1.0	63
		208	0.6	63
		240	0.5	64
		277	0.4	65
[N] HPS BALLAST – REACTOR TYPE (NORMAL POWER FACTOR LAG) ALLOWABLE LINE VOLTAGE VARIATION: ±5%				
S-55	150	120	4.7	182
		208	2.8	184
		240	2.3	182
		277	2.1	184
S-54	100	120	3.1	126
		208	1.8	126
		240	1.6	125
		277	1.4	126
S-62	70	120	2.8	88
		208	1.6	91
		240	1.4	89
		277	1.2	89
S-68	50	120	1.9	63
		208	1.1	63
		240	1.0	64
		277	0.9	65

** Note: For [H] or [N] type systems the maximum current is for the open circuit or starting condition. Normal run current will be lower.

Per Std. spec. 9-29.9 Ballast, Transformers

HPS–MULTIVOLT, 60Hz

ANSI Lamp Type	Rated Lamp Watts	Input Volts	Maximum Input Amps	Input Watts
[M] HPS BALLAST–REGULATOR (LAG TYPE) – MAGNETIC REGULATOR ALLOWABLE LINE VOLTAGE VARIATION: ±10%				

T TECHNICAL DATA

T-10/2005

GE Lighting Sy

www.gelightingsy

Cobra Head Fixture – HPS Lamp Data

ORDERING ABBREVIATION	ANSI CODE	FINISH	LIGHT CENTER LENGTH INCHES	INITIAL LUMENS	MEAN LUMENS
35-WATT–LIFE AT 10 HOURS/START = 16,000 HOURS					
LU35/Med	S76	Clear	3-7/16	2,250	2,025
LU35/D/Med	S76	Diffuse	3-7/16	2,150	1,900
50-WATT–LIFE AT 10 HOURS/START = 24,000 + HOURS					
LU50/Med	S68	Clear	3-7/16	4,000	3,600
LU50/D/Med	S68	Diffuse	3-7/16	3,800	3,420
LU50	S68	Clear	5	4,000	3,600
LU50/D	S68	Diffuse	5	3,800	3,420
70-WATT–LIFE AT 10 HOURS/START = 24,000 + HOURS					
LU70/Med	S62	Clear	3-7/16	6,400	5,450
LU70/D/Med	S62	Diffuse	3-7/16	5,950	5,050
LU70	S62	Clear	5	6,400	5,450
LU70/D	S62	Diffuse	5	5,950	5,050
100-WATT–LIFE AT 10 HOURS/START = 24,000 + HOURS					
LU100/Med	S54	Clear	3-7/16	9,500	8,550
LU100/D/Med	S54	Diffuse	3-7/16	8,800	7,920
LU100	S54	Clear	5	9,500	8,550
LU100/D	S54	Diffuse	5	8,800	7,920
150-WATT–LIFE AT 10 HOURS/START = 24,000 + HOURS					
LU150/Med	S55	Clear	3-1/2	16,000	14,400
LU150/D/Med	S55	Diffuse	3-1/2	15,000	13,500
LU150/55	S55	Clear	5	16,000	14,400
LU150/55/D	S55	Diffuse	5	15,000	13,500
LU150/100	S56	Clear	5	15,000	13,500
200-WATT–LIFE AT 10 HOURS/START = 24,000 + HOURS					
LU200	S66	Clear	5-3/4	22,000	[illegible]
250-WATT–LIFE AT 10 HOURS/START = 24,000 + HOURS					
LU250	S50	Clear	5-3/4	28,000	[illegible]
LU250/D	S50	Diffuse	5	26,000	23,400
310-WATT–LIFE AT 10 HOURS/START = 24,000 + HOURS					
LU310	S67	Clear	5-3/4	37,000	[illegible]
400-WATT–LIFE AT 10 HOURS/START = 24,000 + HOURS					
LU400	S51-	Clear	5-3/4	51,000	45,900
LU400/D	S51	Diffuse	7	47,500	42,750
750-WATT–LIFE AT 10 HOURS/START = 24,000 + HOURS					
LU750	S111	Clear	6-7/8	110,000	99,000
1000-WATT–LIFE AT 10 HOURS/START = 24,000 + HOURS					
LU1000	S52	Clear	8-3/4	140,000	126,000
ECOLUX® NC NON-CYCLING HIGH PRESSURE SODIUM LAMPS (TCLP COMPLIANT)					
LU70/ECO/NC	S62	Clear	5	6,300	5,670
LU100/ECO/NC	S54	Clear	5	10,500	9,450
LU150/ECO/NC	S55	Clear	5	16,000	14,400
LU200/ECO/NC	S66	Clear	5-3/4	22,000	19,800
LU250/ECO/NC	S50	Clear	5-3/4	29,000	26,100
LU400/ECO/NC	S54	Clear	5-3/4	54,000	48,600

NOTE: Consult lamp manufacturer for lamp lumen depreciation.

ORDERING ABBREVIATION	ANSI CODE	FINISH	LIGHT CENTER LENGTH INCHES	INITIAL LUMENS
DELUXE LAMPS				
70-WATT–RATED LIFE AT 10 HOURS/START = 10,000 HOURS				
LU70/DX/Med	S62	Clear	3-1/2	3,800
LU70/DX/D/Med	S62	Diffuse	3-1/2	3,600
150-WATT–RATED LIFE AT 10 HOURS/START = 15,000 + HOURS				
LU150/DX/Med	S55	Clear	3-1/2	10,500
LU150/DX/D/Med	S55	Diffuse	3-1/2	9,900
LU150/55/DX	S55	Clear	5	10,500
LU150/DX/D	S55	Diffuse	5	9,900
250-WATT–RATED LIFE AT 10 HOURS/START = 15,000 + HOURS				
LU250/DX	S50	Clear	5-3/4	22,500
LU250/DX/D	S50	Diffuse	5	20,000
400-WATT–RATED LIFE AT 10 HOURS/START = 15,000 + HOURS				
LU400/DX	S51	Clear	5-7/32	37,400
LU400/DX/D	S51	Diffuse	5-7/32	35,500

NOTE

Similar wattage clear, diffuse, or deluxe HPS lamps may not have the same bulb size or light center length. If lamps are interchanged, the socket position may need to be changed to obtain the desired photometric distribution.

Most GE Lighting Systems products will be furnished with mogul base sockets. Any exceptions will be noted on product pages. Medium base socket must be rated for 4KV.

AVERAGE LIFE VS. HOURS/START‡

HOURS/START	ESTIMATED AVG. LIFE
Continuous	Greater than 100%. Varies with lamp rating and ballast. Contact factory
10	100%
5*	75%
2.5	56%
1.2	42%

‡Applies to HPS, Metal Halide and Mercury lamps.
* Rating standard for 1500, 1650 and 2000 watt lamps. Contact factory for life on other burning cycles.

200W

250W

310W

400W

TECHNICAL DATA

Lamp Data based on GE Lamp Ratings, where applicable

T-30/2005

GE Lighting Systems, Inc.
www.gelightingsystems.com

High Mast Fixture

Dark Skies

For 400W Clear, HPS, Cutoff, Type V High Mast use the Holophane **43842.ies** photometrics file.

400W = 51,000 Lumens

High Mast - Specifications

DARK SKIES
HIGH MAST CUTOFF

The Dark Skies High Mast Cutoff (HMSD) luminaire provides highly efficient lighting while protecting against the ever present concerns of light pollution. The optimized light control provided by the HMSD luminaire can be utilized in a wide variety of applications especially in areas near observatories or other locations sensitive to "dark skies". The optional low-brightness reflector increases this luminaire's effectiveness by reducing direct glare even further.

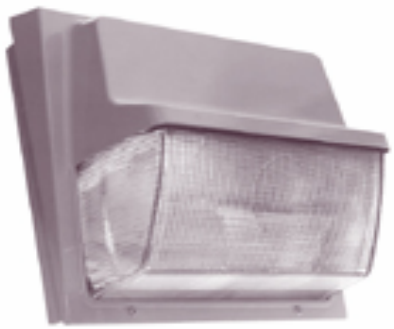
The open ventilated glass optical system provides both lower dirt depreciation and easy maintenance. When combined with a Holophane Lowering Device, the HMSD luminaire provides efficient and effective lighting with a system that reduces maintenance and relamping time.

HOLOPHANE

HL-7253-7201

Underpass Style Fixture – Wall Mount

Wallpack II and Wallpack III



For 250W or 400W Clear, HPS, Non-Cutoff, Type None Underpass Style use the Holophane **43346.ies** photometrics file.

200W = *11,000 Lumens, 250W = *14,000 Lumens

400W = *25,000 Lumens

*** Design Experience has shown that 50% of the design lumen output is more accurate.**

Wallpack – Specification

WALLPACK® SERIES

Perimeter and security lighting require excellent control and uniformity. Light trespass and glare must be minimized as should pockets of shadow. Wallpack II and Wallpack III fixtures excel at this, requiring fewer units to achieve needed light levels. This control readily transfers to lighting other areas such as uniflow garages and underpasses for the most economical solutions. Wallpack fixtures feature borosilicate glass refractors for precise illumination - and they never yellow from heat or UV. Sockets are field adjustable for maximum control of light throw.

All housings are formed of die cast aluminum for corrosion resistance. This is complemented by a seven stage polyester powder paint finish in a wide variety of colors. Vandal resistant options are available.

Wallpack – Special Provision / Cost Estimate

Underdeck and Wall Mount Luminaires

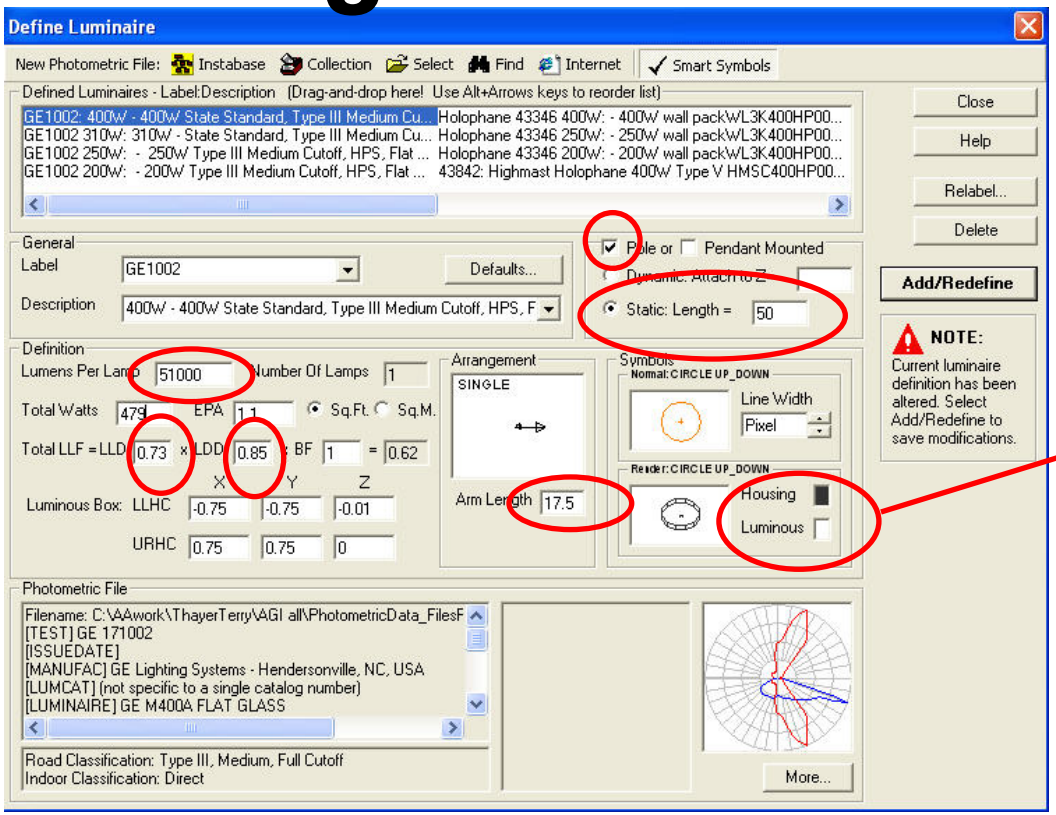
Section 9-29.10(4) is supplemented with the following:

Underdeck fixtures shall be wall mountable and shall be hose-down rated with a gasket between the doorframe and ballast housings and between the doorframe and lens. Housing shall be low copper alloy cast aluminum with gray paint finish. The luminaires down light efficiency shall be no less than 64% of lamp output, with peak candle power occurring at 65 to 70 degrees, using a heavy borosilicate prismatic glass lens with 180 degree beam spread. Lamps shall have HPF ballasts, per requirements of Section 9-29.9. Lamps shall be high-pressure sodium, with mogul base socket. Lens shall be vandal resistant. The luminaires shall have wire protective guards on the lenses. Fusing shall be provided for all conductors above ground potential.

More information on 250W Wallpack III Underdeck Fixture (mounted to wall with unistrut type material)
http://www.holophane.com/products/Family.asp?Brand=HLP&Family=Wallpack%20Series&ProductType=Outdoor&Category=Infrastructure&SubCategory=Pole,%20Wall%20and%20Canopy

Cost Estimate: Materials = $315 per fixture w/ Ballast
Installation labor = 2.0 hr per Fixture

Defining Luminaires



Don't change these colors!

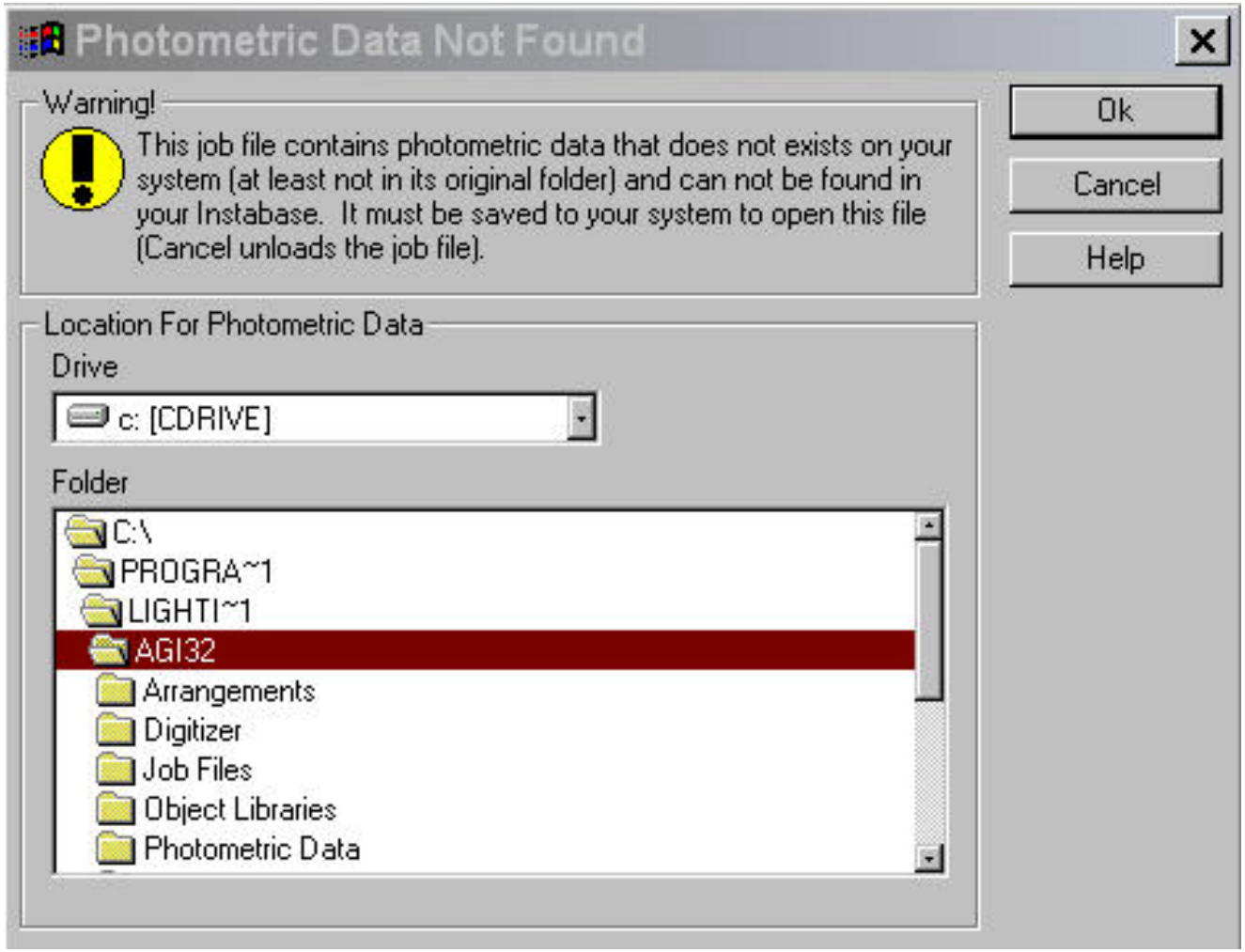
Photometric Collections (After defining a luminaire you can save it for use in another file etc.)

Find Photometric File (Searches your computer for any IES or PPF files)

Select IES Photometric File (Allows you to manually search for IES or PPF files.)

- **When you send an AGI file to another user, AGI sends along all of the IES (photometric) files that are needed for that file. When the other user opens up the file, they are asked where they would like to store that design file's IES file or files. See Next Slide.**

Defining Luminaires Cont...



This window is asking you where you wish to store the photometric files on your computer. Leave the location at the Program assigned default.

Defining Luminaires Cont…

- **Label \ Description** (Whatever you want to describe your luminaire or light standard.)

- **LLF** = 85%(Dirt Factor)(LDD) x 73%(Lamp Lumen Depreciation Factor)(LLD) x 100%(BF) = 62% or .62
  (BF=Ballast Depreciation Factor, this value is already incorporated into the other numbers.)

- **Arm Length** is always the actual arm length plus **1.5 ft** to the center of the light source. The arm length also determines the distance between the light source and the insertion point.

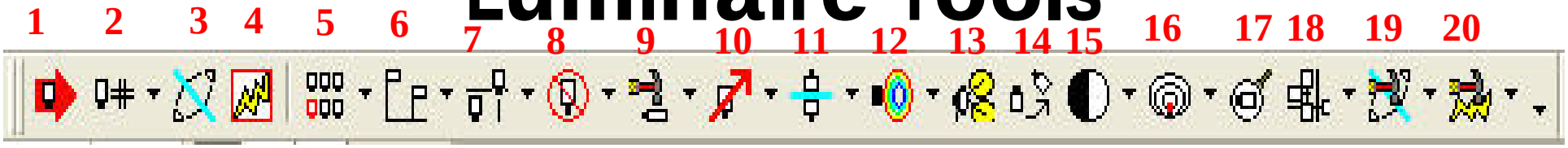
- **Pole** *Dynamic* changes the length of the pole according to the mounting height of the light source.

  Static the pole length remains constant regardless of the mounting height. (Use this for 3D designs where light standards are placed at elevations other than zero.

- **Symbol** Use the appropriate symbol to fit your application. The type of symbol does not effect the lighting calculations. **Do Not** change the Housing or Luminous Area color.

- **Arrangement** select the one that fits your situation. Usually **Single or Back-Back.**

Luminaire Tools



1.) Add Luminaire Location (Place Selected Luminaire According to what is defined.)

2.) Specify Luminaire Labels

3.) Add Parametric Mirror (Advanced class)

4.) Create LPD/UWLR Area (Advanced class)

5.) Array Luminaire (Advanced class)

6.) Luminaire – Change Height (Change Luminaire heights. Uses same aiming angles)

7.) Copy Luminaire (Copies the luminaire and all its characteristics.)

8.) Delete Luminaire

9.) Edit Luminaire (Ex: change from 250W to 400W luminaire, 25ft-MH to 40ft-MH, etc.)

10.) Move Luminaire (can be moved in any direction while maintaining aiming angle or point)

11.) Mirror Luminaire (Advanced class)

12.) Photometric web display (Advanced class)

13.) Re-Aim Luminaire (modify a single luminaire aiming point in Plan, Isometric or Elevation view.)

14.) Re-Orient Luminaire (Allows you to rotate the luminaire 360 Deg. around insertion point.)

15.) Switch Luminaire (turn luminaire on and off)

16.) Luminaire – Template (Displays a Light Output(Ftc) contour line pattern for each specific luminaire after considering tilt, mounting height, photometrics, wattage etc.)

17. Magnify Symbol (magnifies the Luminaire Symbol, Insertion point remains constant.

18.) Luminaire Group (combine luminaires into a group of luminaires that act as one luminaire (receive common edit, move, modify, etc.)

19.) Modify Parametric Mirror (Advanced class)

20.) Edit LPD/UWLR Area (Advanced class)

1

Luminaire Tools Cont...

1.) Define Luminaires (Define mast arm length, photometrics, lumens, LLF, symbol, etc..)

Luminaire → Select the Luminaire to be placed.

Aim Type → Select **Locate and Orient**

MH → Type in the desired Mounting Height for the luminaire above the roadway surface, Z=0.

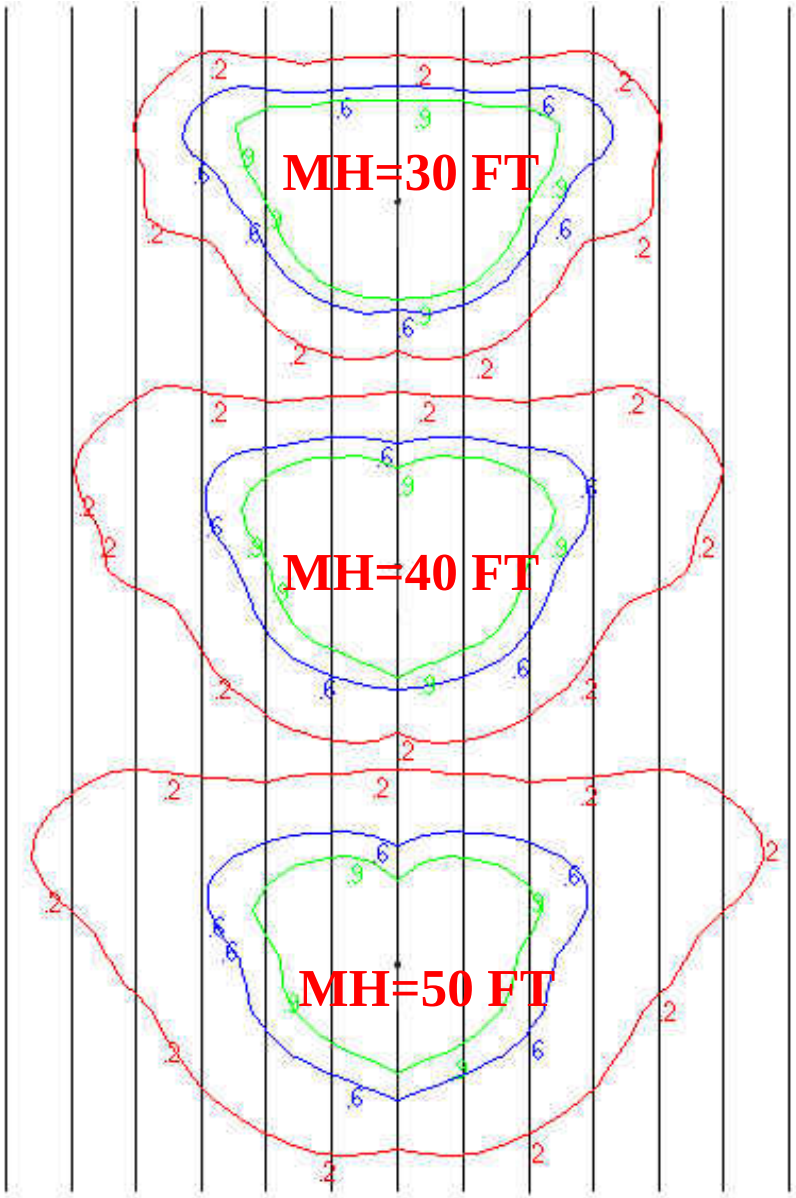
*(Remember to use a MH that is 1.5ft-2.5ft lower than the design height, see below)

Orient → Leave this set to **0 Degrees** because you can orient the light standard 360 Degrees around the insertion point once you have placed it in the file.

Press this Icon to place the luminaire that you have described above.

Try to maintain a 90 degree orientation to the roadway edge line. Place the luminaire at a mounting height(in AGI32) of (1.5 ft – 2.5 ft) lower than the mounting height you are calling out in the plans. This will make your design more conservative and flexible in the field. Make sure that you look at the roadway cross sections to determine the actual mounting height at that location. (However, don't specify odd pole lengths to maintain a consistent mounting height. (i.e. 37ft, 40ft, 42ft, 38ft, etc.→Use 40ft for all.))

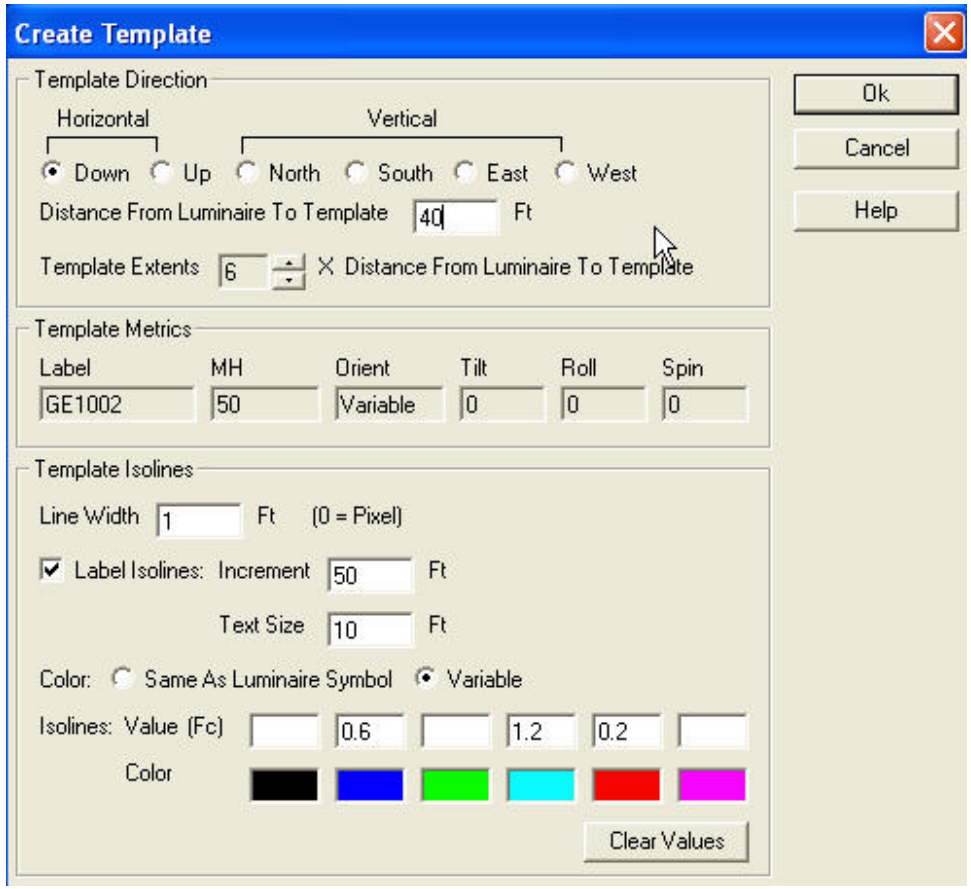
Luminaire Template



Press this Icon to create a luminaire template.

1. **<u>Example:</u> Light distribution of a 400 Watt HPS Type III Medium Cutoff, GE1002.ies**

The Vertical lines are 25FT Apart.



Luminaire Template Cont…

Choosing isoline value when creating the Luminaire Templates.

Example: **The required Average Illuminance is 1.1 Ftc with 3:1 Uniformity(Avg./Min).**

1.) Do the following: 1.1Ftc x 1.25 = 1.4 Ftc (Average Illuminance - Design) → We don't want to design for the bare minimum Average Illuminance. (Use 1.4 instead of 1.1)

2.) Next: Take 1.4 / 2.75 = 0.50 Ftc (Minimum Light Level)→ We don't want to design for a maximum Uniformity. (Use 2.75:1 instead of 3:1)

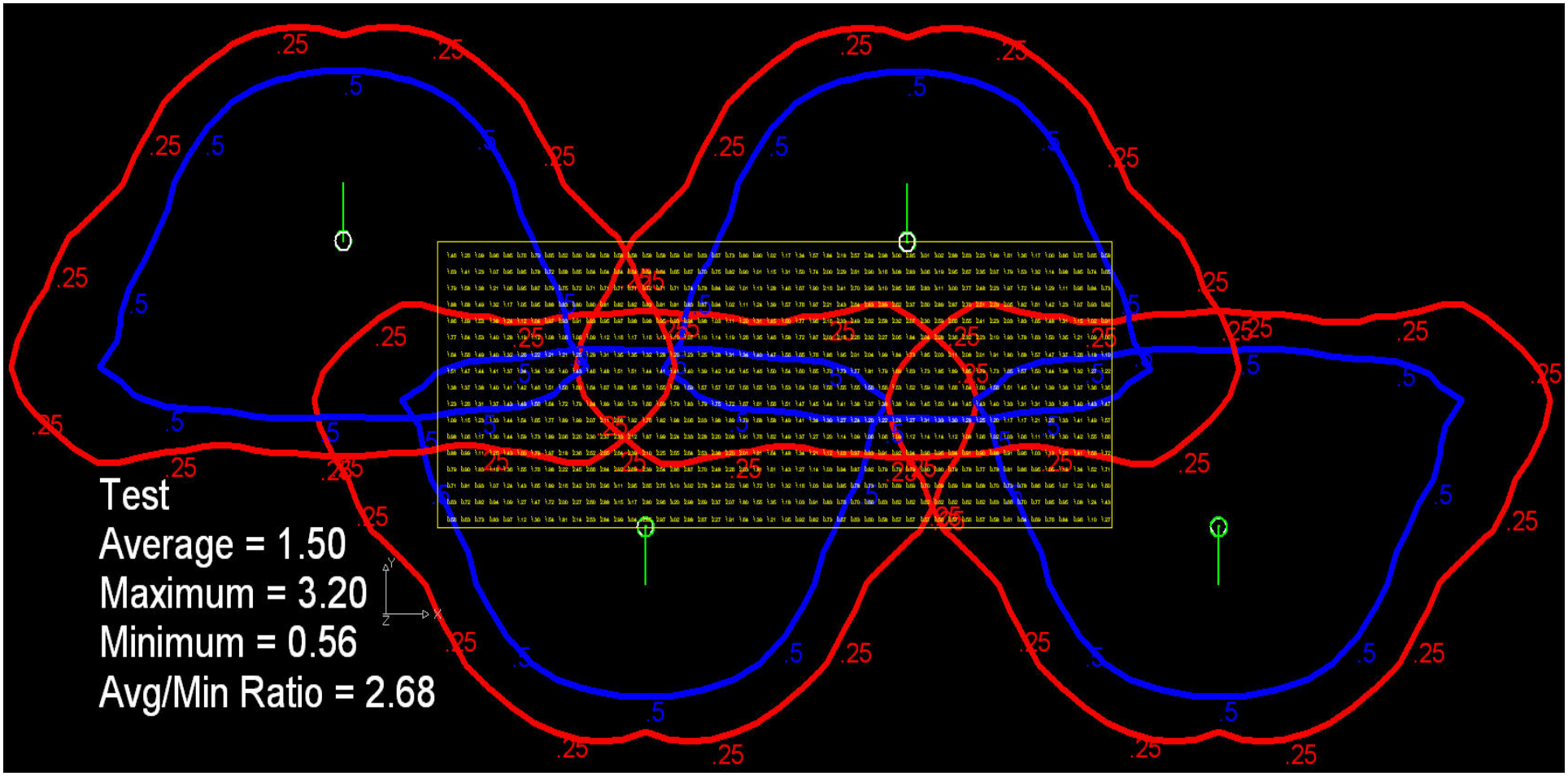
3.) Take 0.50 Ftc / 2 = 0.25 Ftc

4.) → *Place Template Isolines at 0.50 Ftc and 0.25 Ftc.*

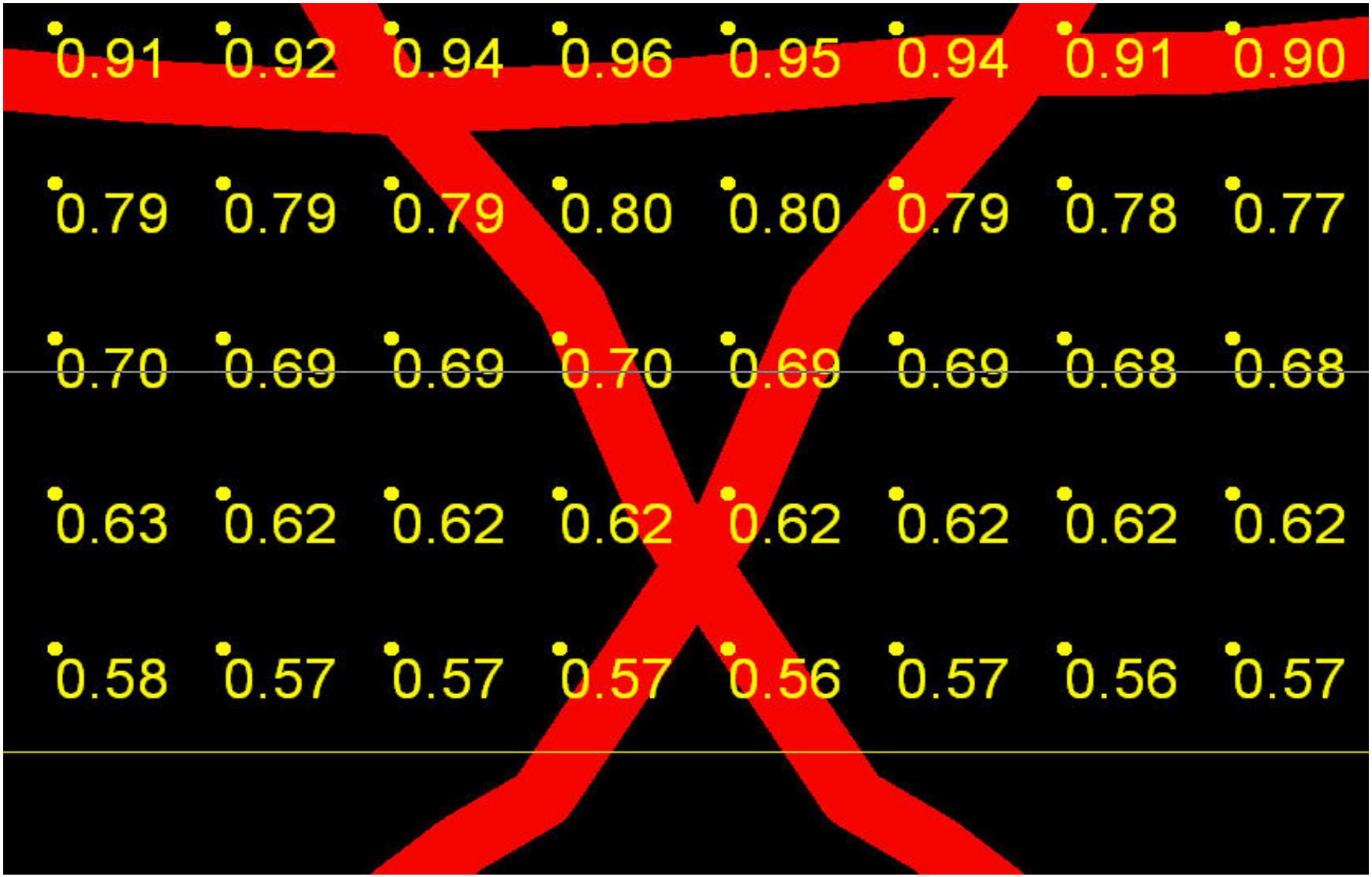
5.) After you calculate the Design File Repeat steps 2 thru 4. Substitute the actual calculated Average Illuminance for Step 2 in place of 1.4.

(Example: For my design area I calculated 1.8Ftc for my Average Illuminance. Take 1.8/2.75 = 0.66 Now place new Template Isolines at 0.66Ftc and 0.33Ftc and recalculate the design file.)

Luminaire Template Cont...



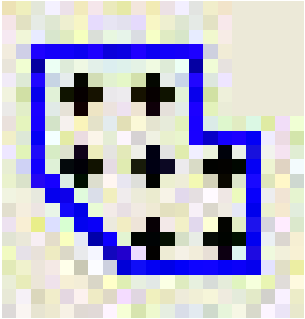
Luminaire Template Cont…

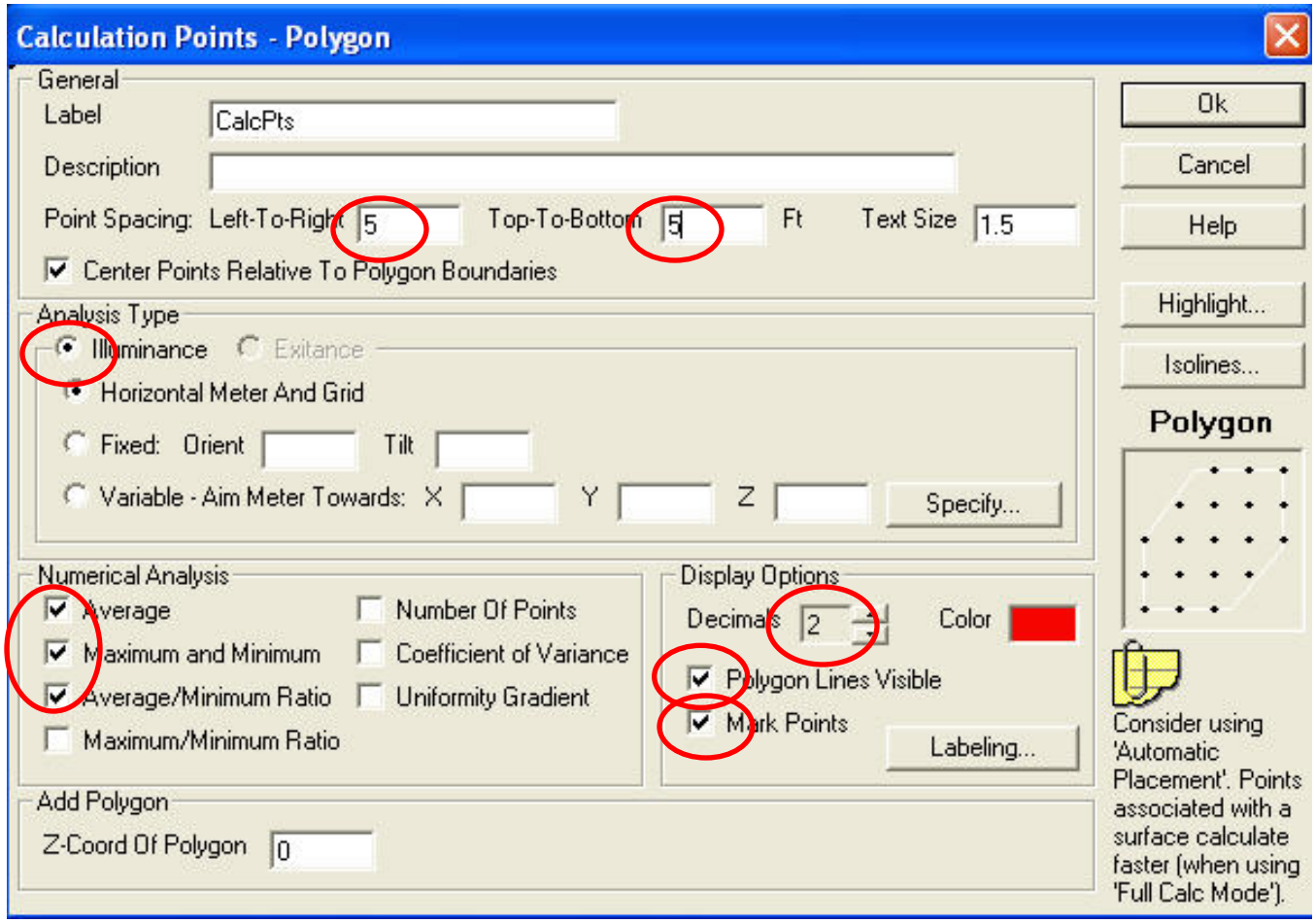


Calculation Point Tools

1.) Calc Pts – Isolines (Set "Contour" lines at a given statistical(Ftc) value. Color Code.)
2.) Calc Pts – Highlighted Values (Color code calculated statistical(Ftc) value ranges.)
3.) Calculate Points Automatic Placement (Advanced class)
4.) CalcPts – Grid (Advanced class)
5.) CalcPts-Line (Advanced class - RP-8 point placement concept)
6.) Calc Pts – Polygon (Place calc points by drawing a polygon shape on the design plane.)
7.) CalcPts-Scattered (Allows you to specify individual points for calculation of illuminance values)
8.) Calculation Points-daylight factor (Advanced class)
9.) CalcPts-Glare Rating (Advanced class)
10.) CalcPts-Unified Glare Rating (Advanced class)
11.) Calc Pts – Roadway Luminance (Place a 3 point grid for calculating Roadway Luminance and Veiling Luminance. See the new commands manual for more explanation.)
12.) Calc Pts – Statistical Area (Calculates Min, Max, Avg., Avg./Min, Etc. for values that are inside a polygon that you draw. Use this feature to calculate values for design areas that are larger or smaller than one Calculation Point Grid.
13.) Delete Calc Pts (Deletes the entire calculation point plane that you select.)
14.) Edit Calc Pts (Allows you to modify the calculation point grid characteristics.)
15.) Move Calc Pts (Allows you to move the entire calculation point grid.)
16.) Calc Pts – Labels (Allows you to delete or move calculation point labels.)
17.) Calc Pts – Remove Pts (Removes some calculation points so they are not calculated.)
18.) Calc Pts – Replace Pts (Allows you to replace removed points.)
19.) Modify Statistical Area (Delete, Change properties (what values are being calculated), and Move Labels.

Calculation Point Grid Placement

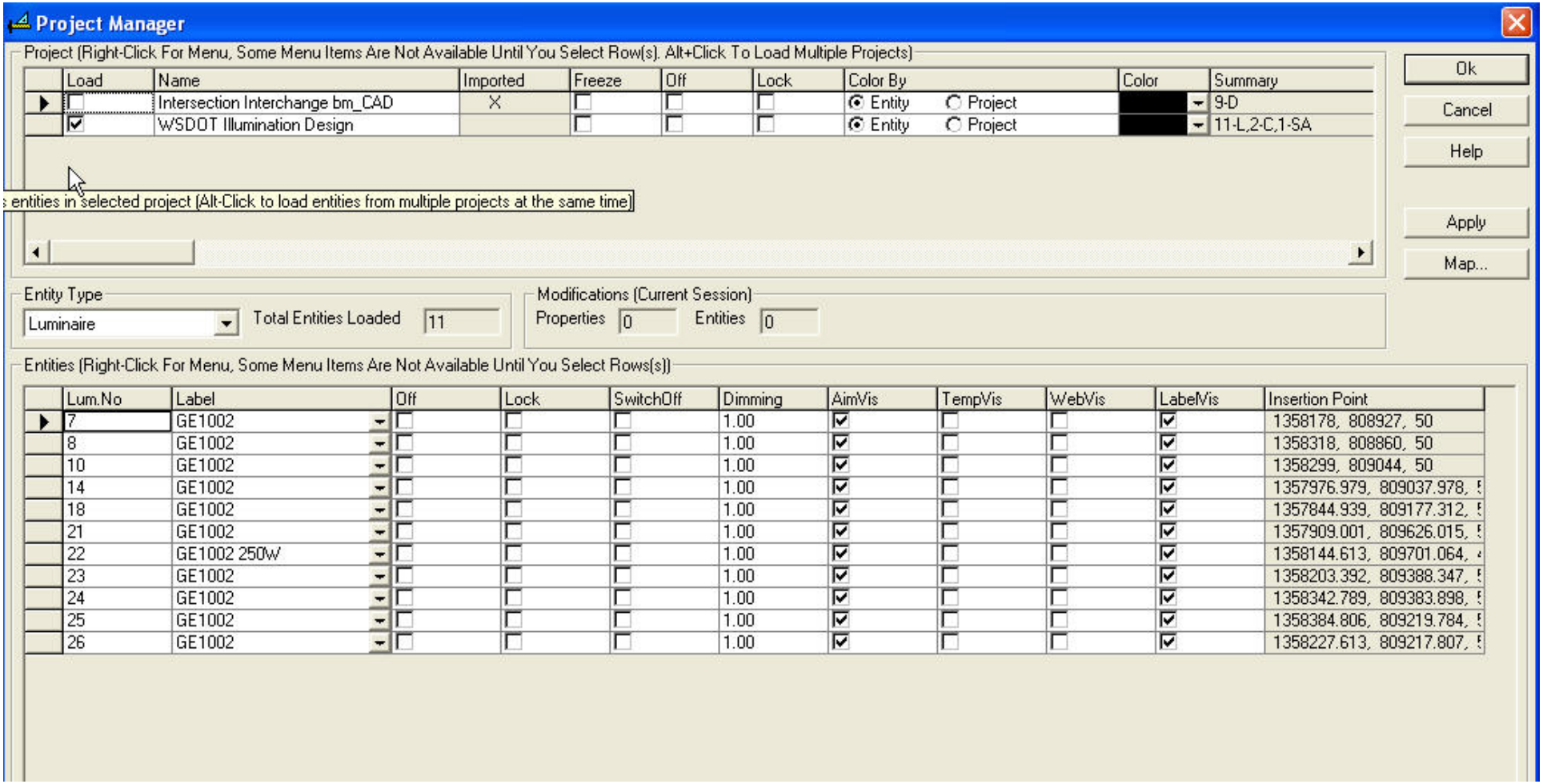




Use the values as shown above.

Make Sure that you use a <u>5 X 5 Grid Point Spacing</u> with <u>2 Decimal Points</u>.

Project Manager – Entity Type Luminaire

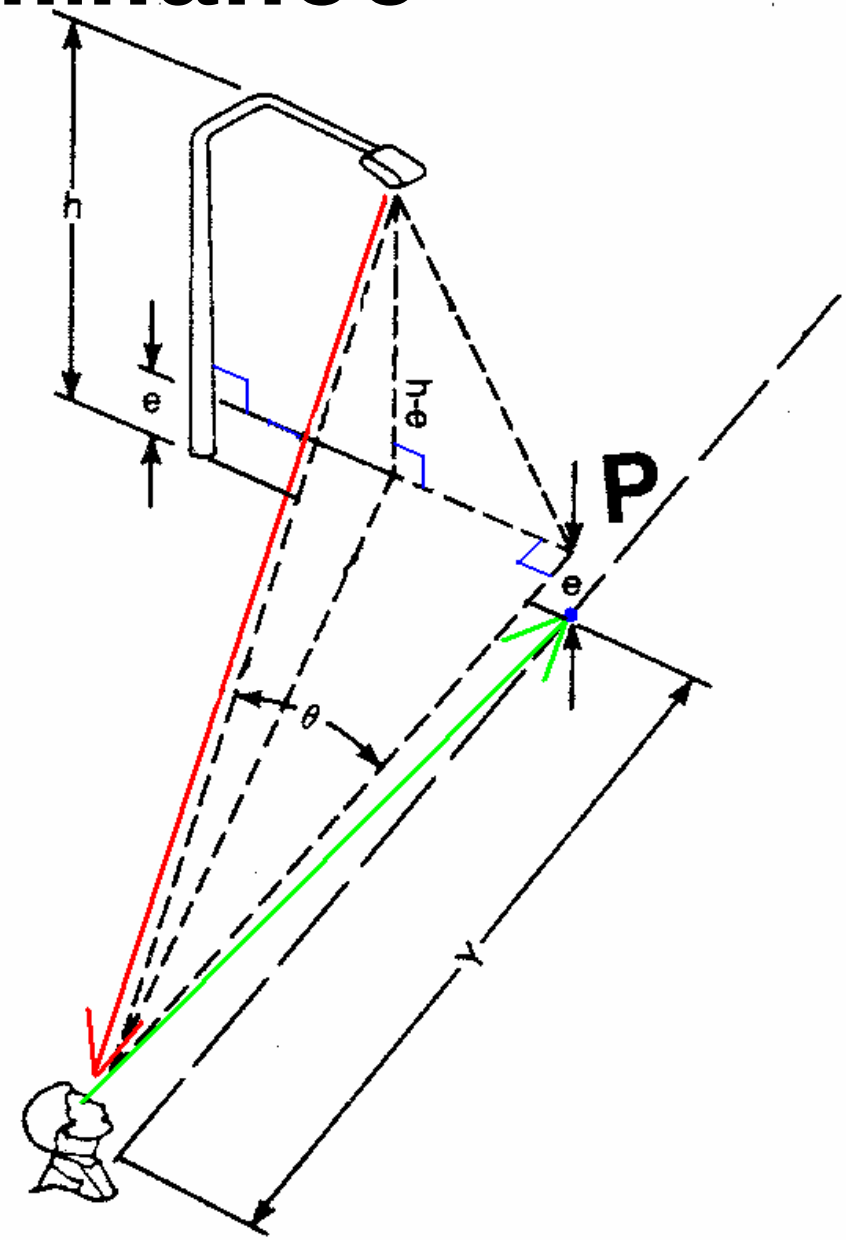


Use the Project Manager –Entity Type Luminaire, to Change Visibility(On/Off), CalcPts status(On/Off), Visibility of Values Only (On/Off), & Visibility of the Isolines(On/Off) for each individual entity type. A very powerful tool.

Veiling Luminance

Red → Path of Veiling Luminance(Disability Glare) from the luminaire to the observers eye.

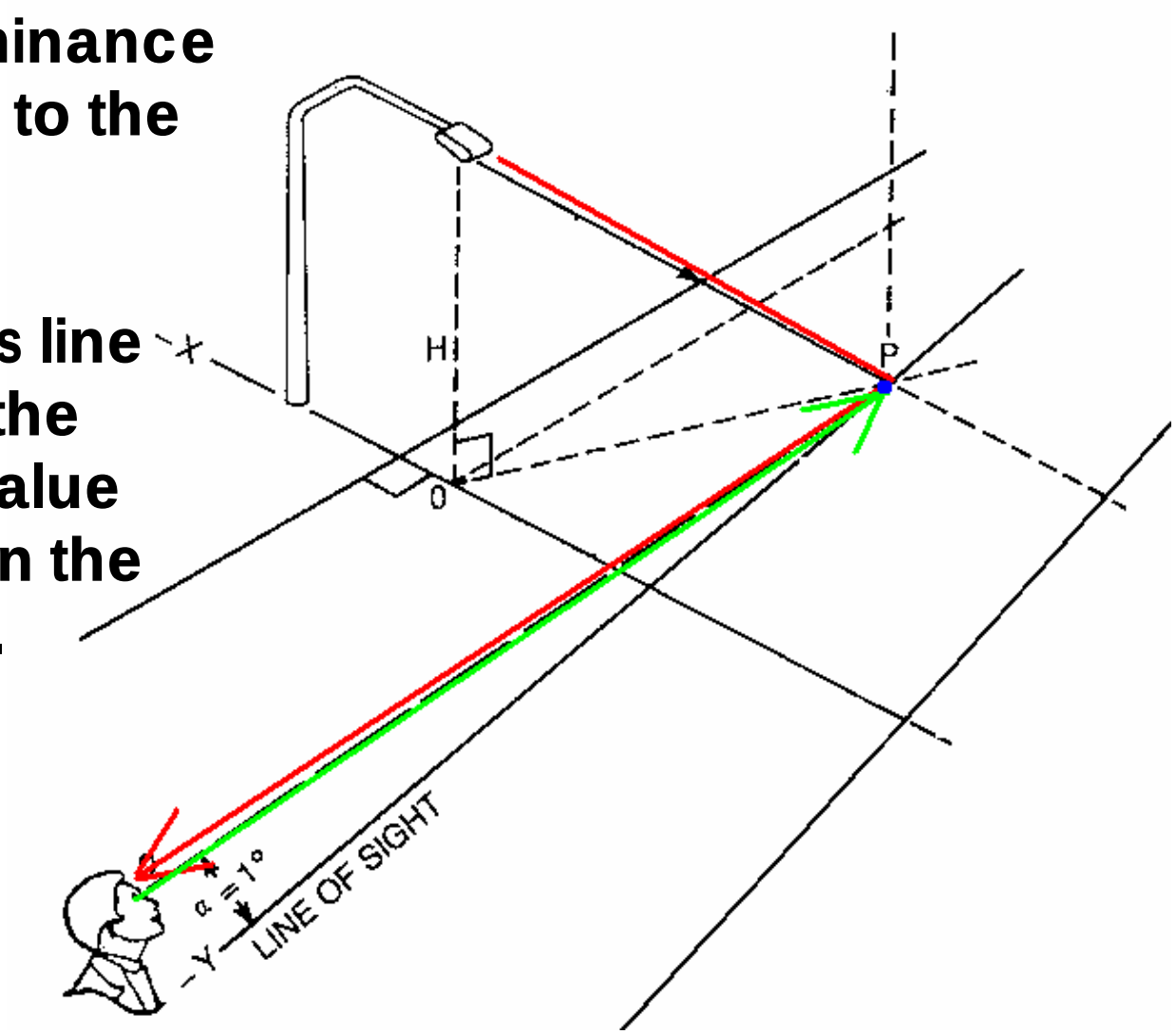
Green → Observers line of sight looking at the Veiling Luminance point value(Lv) to be calculated on the pavement surface.



Luminance

Red → Path of Luminance from the luminaire to the observers eye.

Green → Observers line of sight looking at the Luminance point value to be calculated on the pavement surface.



Illuminance / Luminance / Max Veiling Luminance Comparisons

If you <u>Increase the MH</u>:

1.) Average Illuminance Values → Decrease **BAD (I.e. 1.6Ftc to 1.3Ftc)**
2.) Uniformity Values → Decrease **GOOD (I.e. 5.0 to 2.5)**
3.) Max Veiling Luminance Ratio Values → Decrease **GOOD (I.e. 0.35 to 0.25)**

If you <u>Decrease the Spacing</u>:

1.) Average Illuminance Values → Increase **GOOD (I.e. 1.1Ftc to 1.7Ftc)**
2.) Uniformity Values → Decrease **GOOD (I.e. 5.0 to 2.5)**
3.) Max Veiling Luminance Ratio Values → Decrease **GOOD (I.e. 0.35 to 0.25)**

If you <u>Increase the Luminaire Lumens</u>:

1.) Average Illuminance Values → Increase **GOOD (I.e. 1.1Ftc to 1.7Ftc)**
2.) Uniformity Values → Remain Constant **OK**
3.) Max Veiling Luminance Ratio Values → Remain Constant **OK**

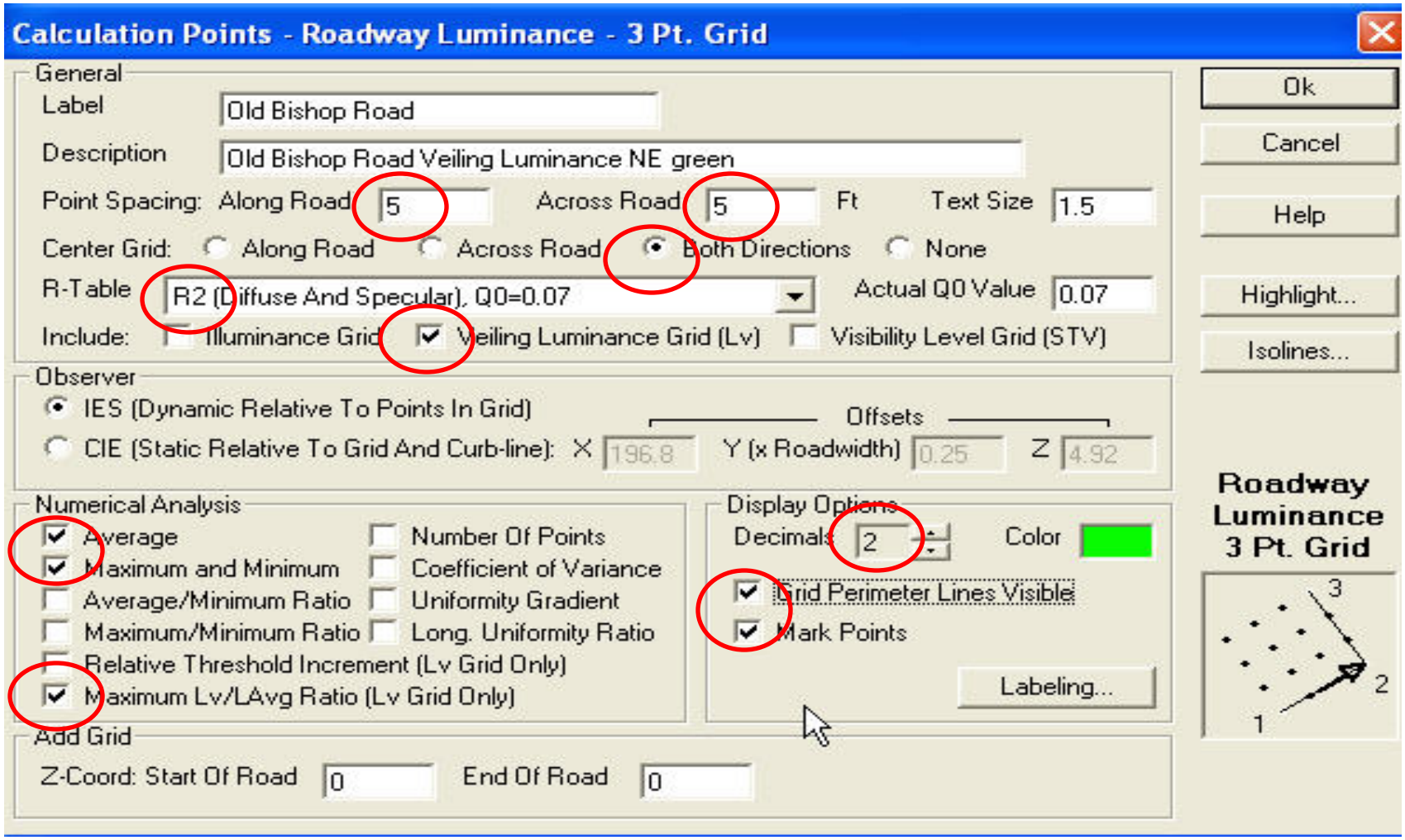
Placing Luminance and Veiling Luminance Grids

1) **Place both Luminance and Veiling Luminance Grids in the same locations using the Roadway Luminance Grid in AGI32.**
2) **Place the grid parallel to the direction of travel. Grid points 1 & 2 define the direction of travel.**
3) **Place the grid width so it includes the widest section of roadway traveling in the same direction. Include all pedestrian features in this calculation if they were included in the illuminance calculations.**
4) **Place the first grid point on the right edge line of the start of the design area. Place the second point downstream (direction of travel) on the right edge line of the end of the design area. Place the third point at the left edge of the design area (in the direction of traffic).**
5) **Evaluate the results from each set of grids independently.**
6) **Follow steps 1-5 for all directions of travel including the minor approaches.**

7) **Review the concepts shown in section 1. Veiling Luminance calculations are only valid when the 272 foot tangent area exists before the beginning of the design area.**

8) **There should be at least 200 feet of tangent design area after the 272 feet of Veiling Luminance observer approach area. Do not calculate Veiling Luminance if there is not 472 feet (or greater) of tangent length, except the minor leg approach to a "T" intersection. Calculate the minor leg of a "T" intersection if there is 272 feet of Veiling Luminance observer approach area prior to the intersection.**

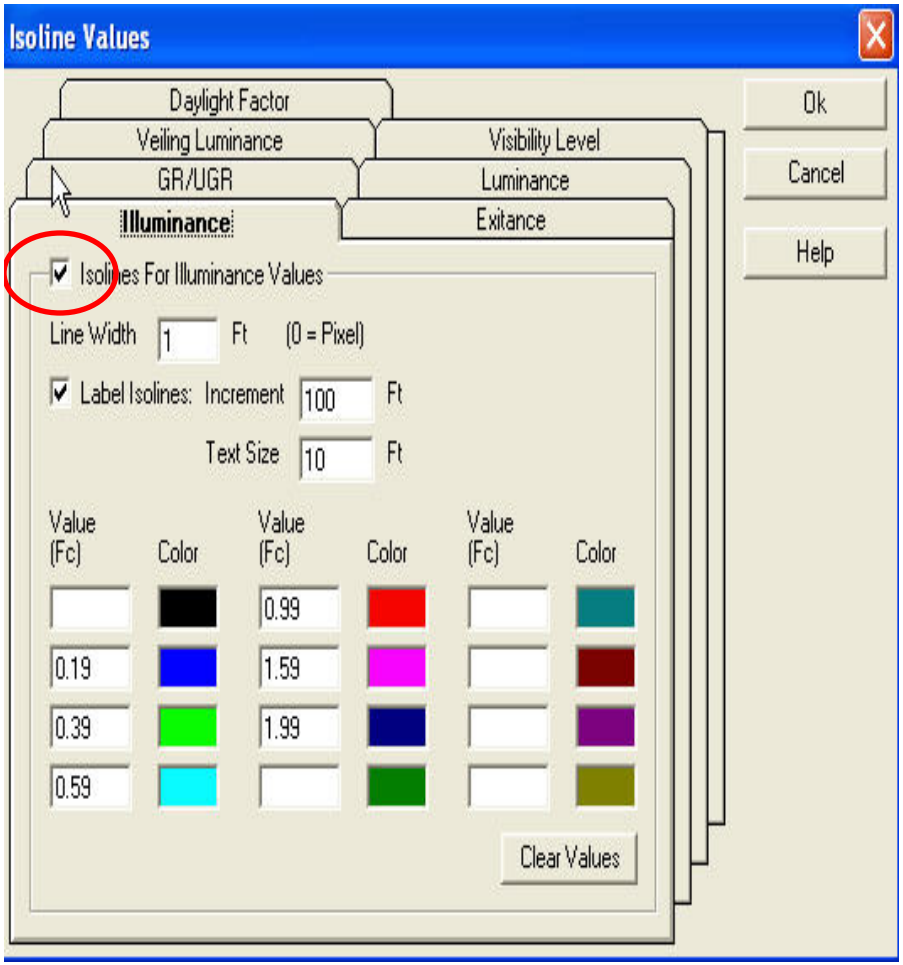
Roadway Luminance & Veiling Luminance Grids



Use the settings as shown above.

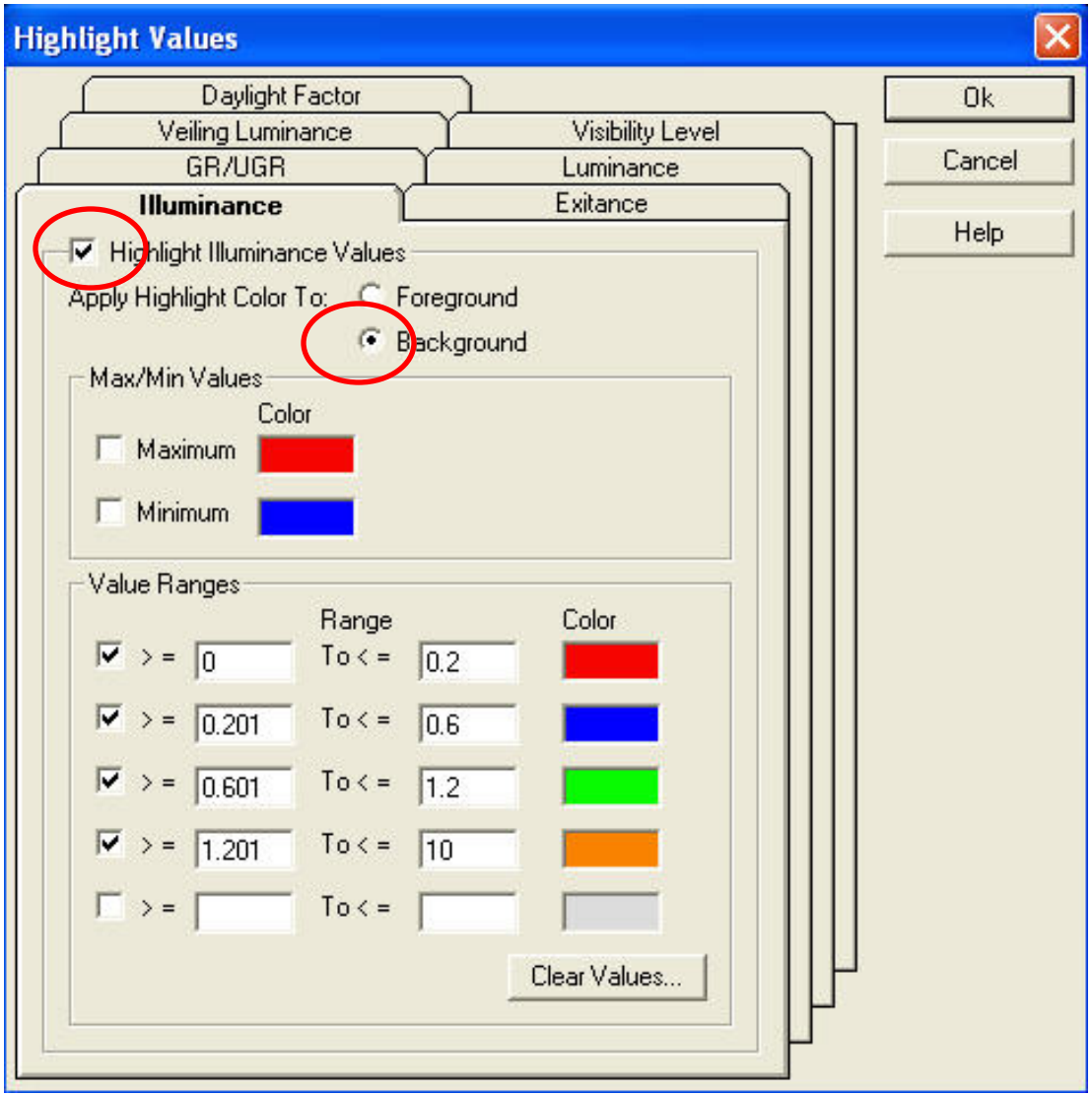
Place grid points 1 and 2 parallel to the directions of travel. Place the 3rd grid point perpendicular to the direction of travel to encompass the appropriate width.

Setting Isolines



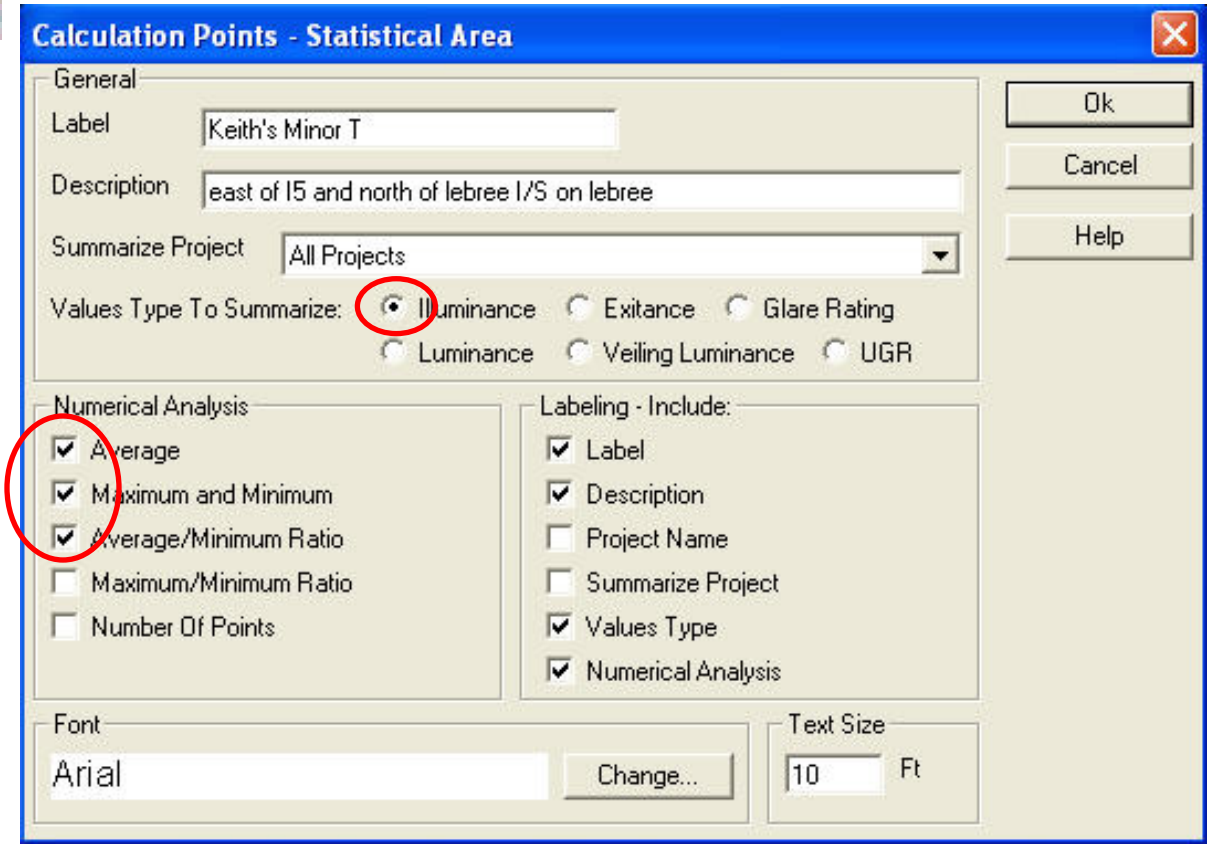
- You can set isoline values to whatever you want.
- Set separate values for Illuminance, Luminance and Veiling Luminance.
- You can modify the color of the isoline by double clicking on the colored rectangle.
- **<u>Illuminance</u>** Isolines are **great for helping to solve uniformity problems**. A low minimum light level is usually the cause of poor uniformity. (Uniformity = Avg Ftc / Minimum Ftc) Figure out what the minimum light level is and set a couple of isoline values slightly above that value. Then adjust your luminaire locations to increase the minimum value in that particular area.

Highlighted Values



- You can set Highlight Values to whatever you want.
- Set separate values for Illuminance, Luminance and Veiling Luminance.
- The colors can be changed by double clicking on the colored rectangle.
- **<u>Illuminance Highlight Values</u>** are great for colorizing trouble areas or hot spots in your design.
- Specified ranges refer to the Light Level(Ftc) values that you wish to separate by color.

Statistical Area



1.) Select Icon and draw a box around the calculated values that you wish to analyze.

2.) Enter Label

3.) Select Values to Summarize (Illuminance, Luminance or Veiling Luminance)

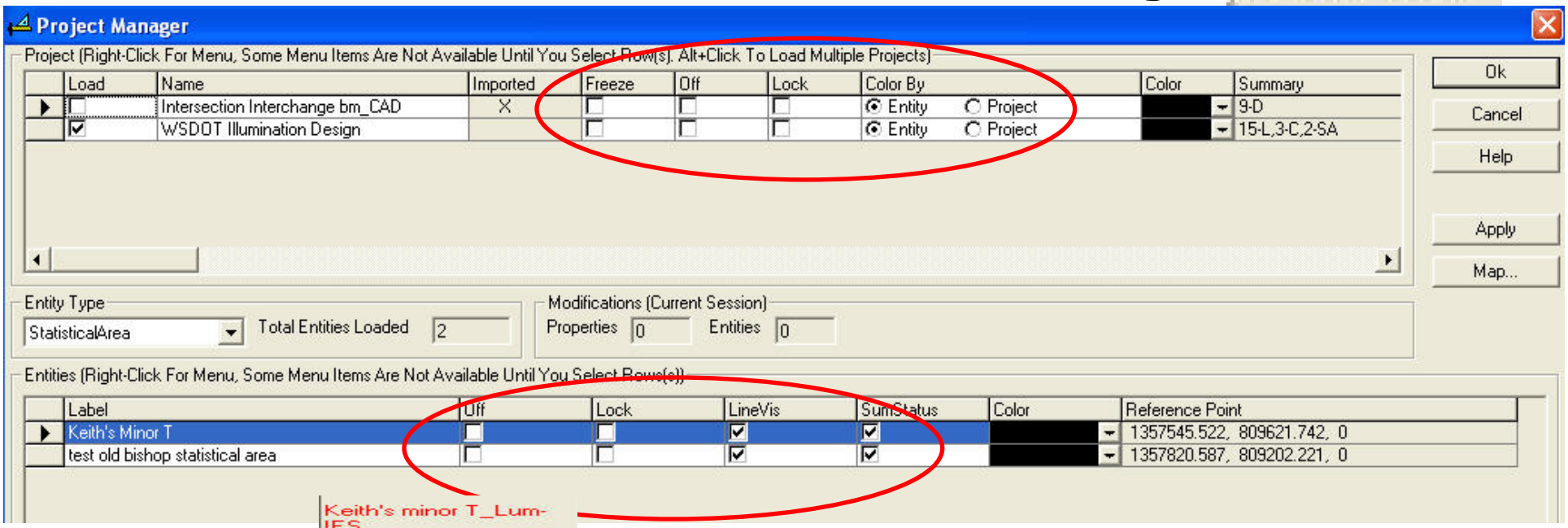
4.) For **Illuminance** → Select Average, Maximum and Minimum, Average/Minimum Ratio

For **Luminance** → Select Average

For **Veiling Luminance** → Select Maximum and Minimum

5.) If you would like the values displayed in the design file Select Options under "Labeling-Include" and change the text size to 10.

Statistical Summary



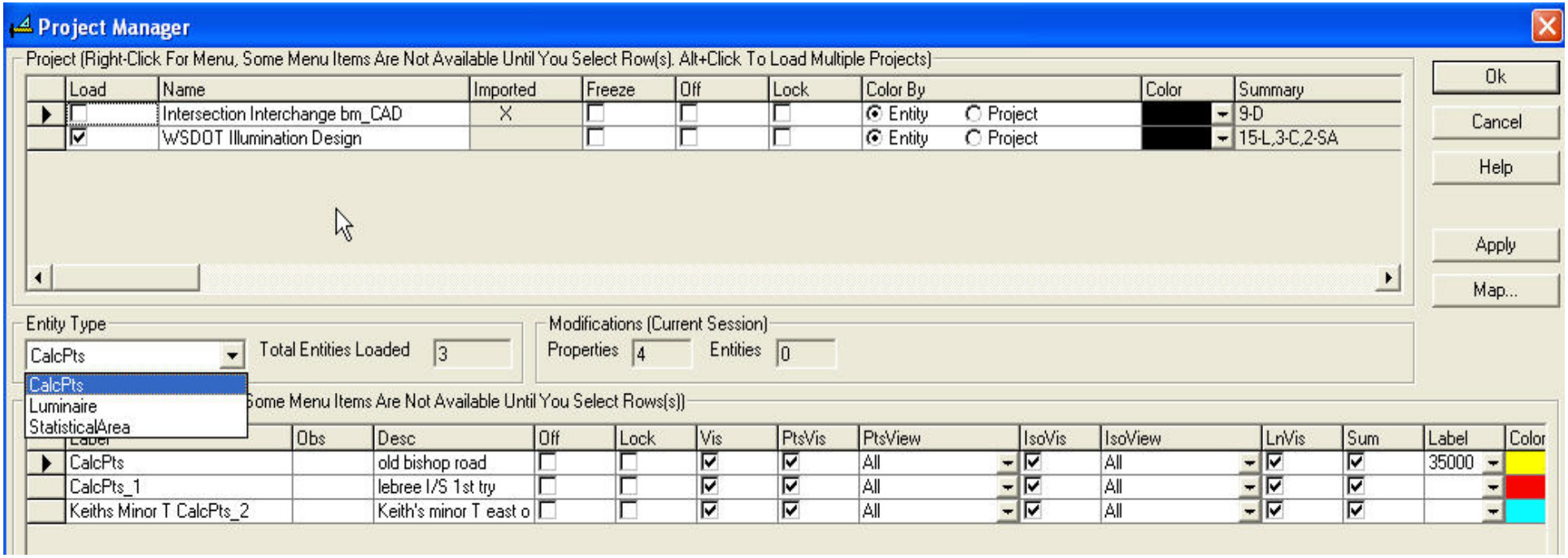
This is the statistical summary display

This term is a carry over from earlier AGI Program versions (see Pragram Manager).

Decide which **Calculation Points, Luminaire** or **Statistical Area** Values you wish to view (or to not view).

Just **left click** on the check box to make your choice.

Project Manager

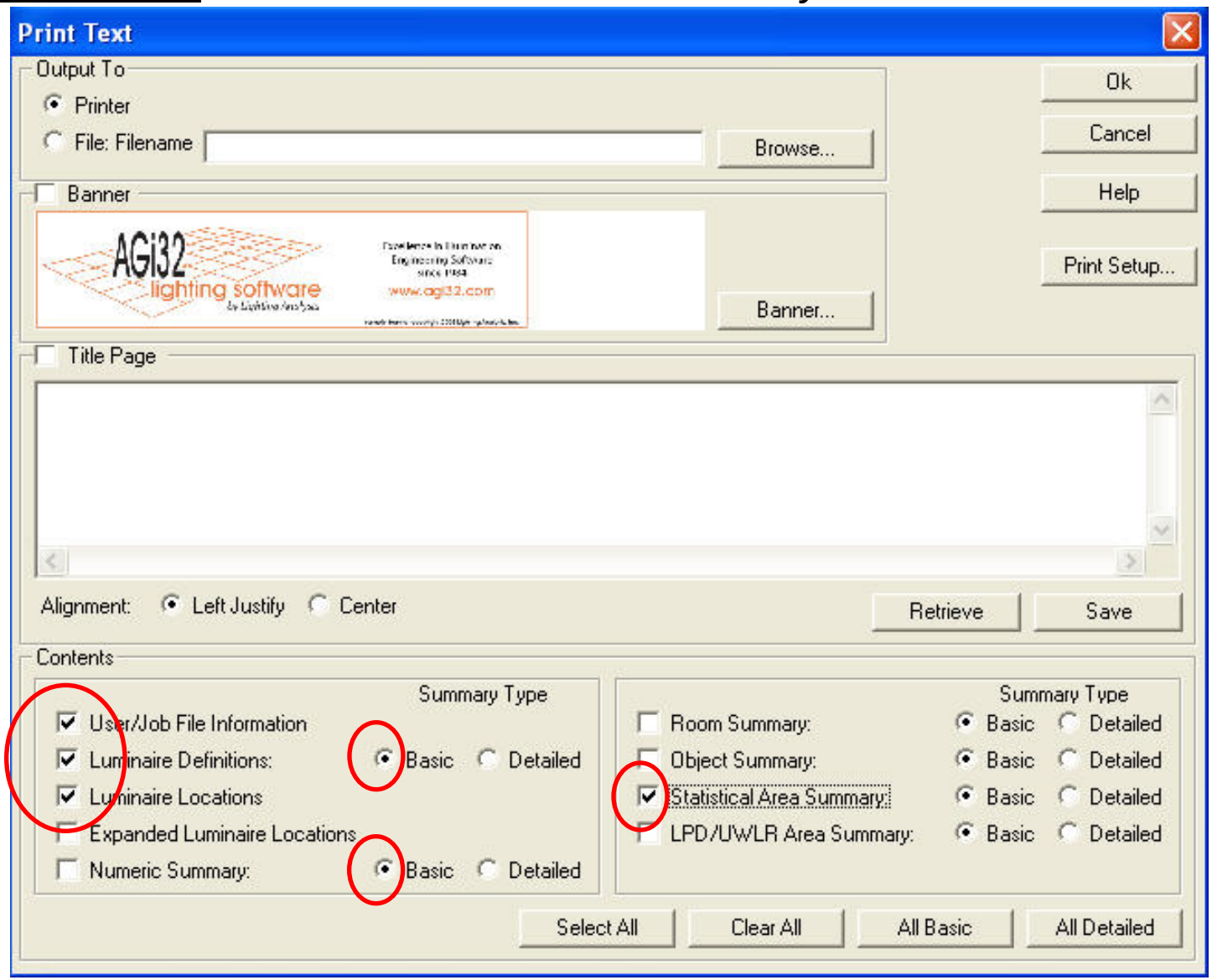


Use the project manager to turn On/Off Calc Points, Luminaires, Statistical Areas, Imported file Elements, etc.. Create multiple projects to decrease calculation time, and much more.

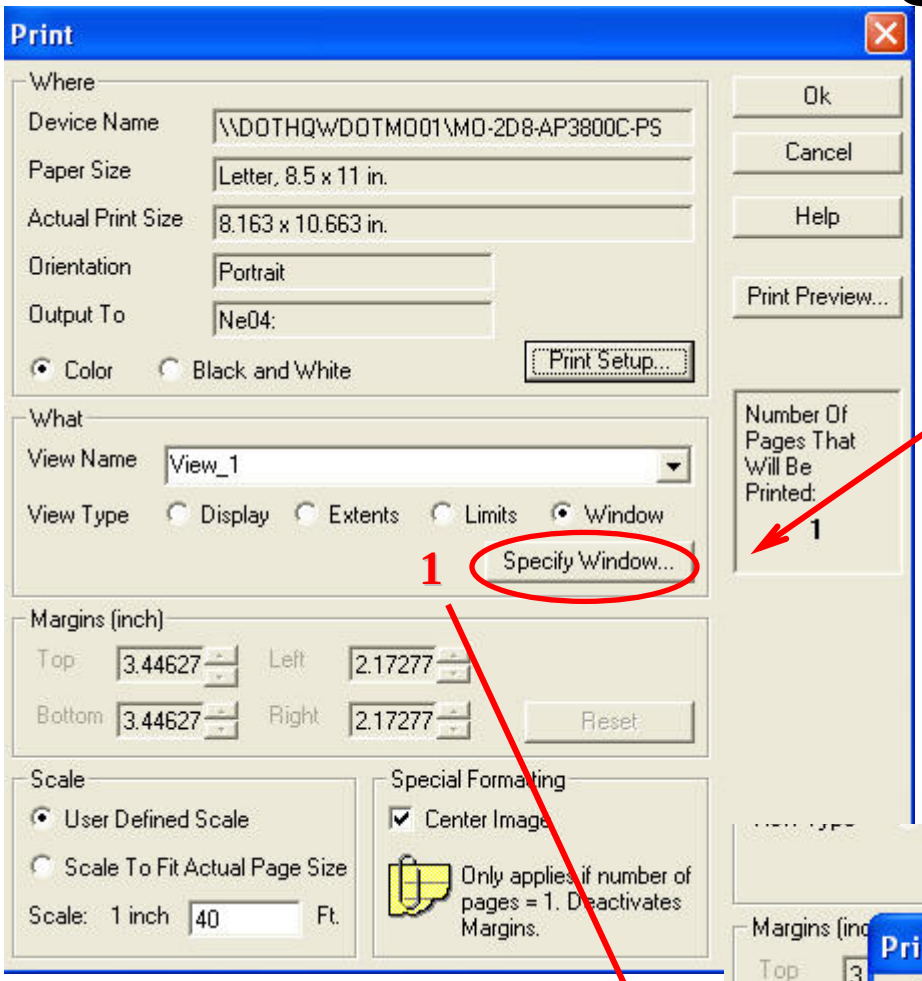
Just Left Click on any line heading to make your choice. Read the help menu for in depth discussion of all the features of Project Manager

Printing

If you would like a print out of all the technical information in the file go to **File - Print Text** and select the information you would like to see.



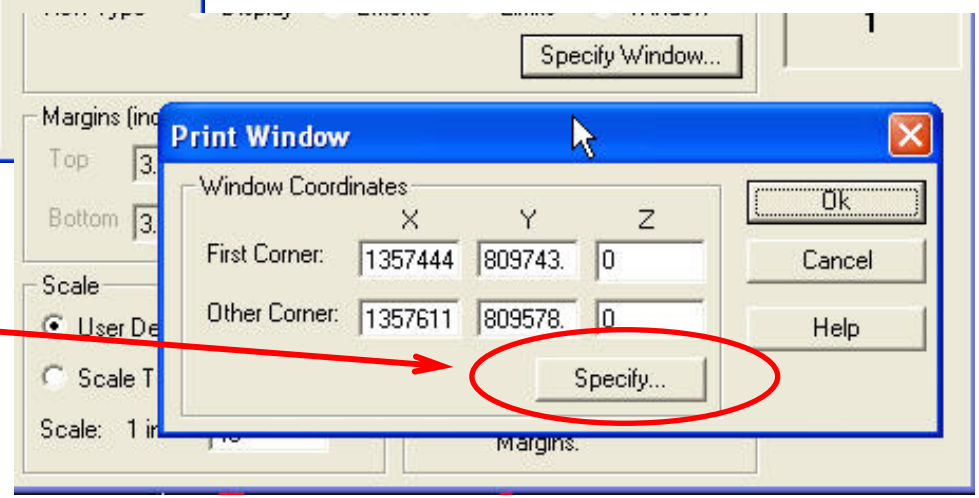
Printing Cont…



Printing in AGI works like any other windows program except for the **Window and Scale Options.**

<u>Window</u>→ After selecting the window option you need to specify a window around what part of the drawing you wish to print.

<u>Scale</u> → When using the User Defined Scale make sure to watch the number of pages to be printed.



2

Select specify button to use mouse to draw around view on screen

Documentation

See Example 1

1.) Include a Graphical Print of all design areas with calculation points. Make the print legible and scaleable.
2.) Clearly indicate all calculated values and exactly where they came from.
3.) Clearly explain any unusual design areas.
4.) Include Average Illuminance, Minimum Illuminance, Average Illuminance / Minimum Illuminance Ratio and Max Veiling Luminance Ratios for each design area and direction of travel.
5.) Clearly list all photometric files, luminaire definitions and their characteristics.

AGi32 lighting software by Lighting Analysts

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Engineering Software
since 1984
www.agi32.com

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User and Job File Information

User Information

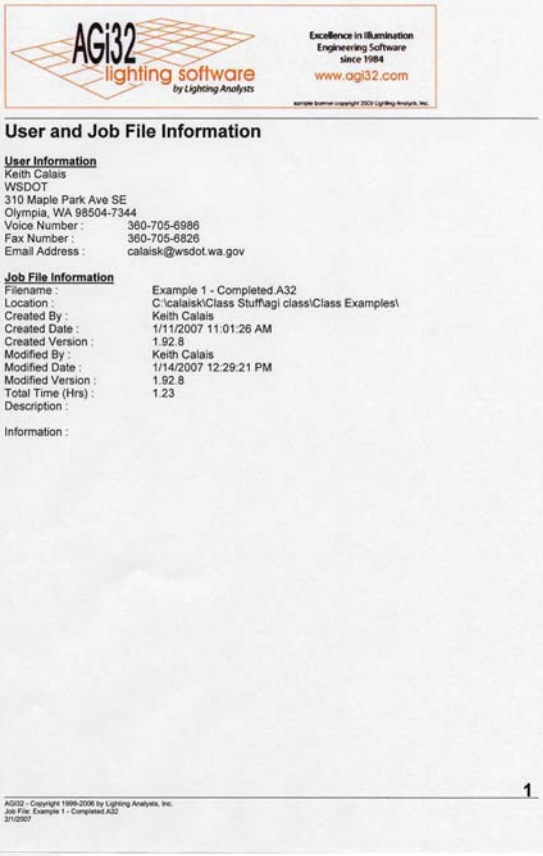
Keith Calais
WSDOT
310 Maple Park Ave SE
Olympia, WA 98504-7344

Voice Number :	360-705-6986
Fax Number :	360-705-6826
Email Address :	calaisk@wsdot.wa.gov

Job File Information

Filename :	Example 1 - Completed.A32
Location :	C:\calaisk\Class Stuff\agi class\Class Examples\
Created By :	Keith Calais
Created Date :	1/11/2007 11:01:26 AM
Created Version :	1.92.8
Modified By :	Keith Calais
Modified Date :	1/14/2007 12:29:21 PM
Modified Version :	1.92.8
Total Time (Hrs) :	1.23
Description :	

Information :



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Luminaire Definition(s)

GE451002

State Standard-Type III-Med Cut Off, HPS, Flat Glass d

Filename =	GE451002.IES
Lumens per Lamp =	51000
Number of Lamps =	1
Lamp Lumen Depreciation (LLD) =	0.62
Lamp Dirt Depreciation (LDD) =	1
Ballast Factor (BF) =	1
Total Light Loss Factor (LLDxLDDxBF) =	0.620
Luminaire Watts =	468
Total Watts =	468
Luminaire Effective Projected Area =	0 Sq.Ft.
Total Effective Projected Area =	0 Sq.Ft.
Normal Mode Symbol =	1200X300 mm DOWN
Normal Mode Symbol Scaling =	(X= .33 Y= 1.016 Z= 1.016)
Render Mode Symbol =	1200X300 mm DOWN
Render Mode Symbol Scaling =	(X= .33 Y= 1.016 Z= 1)
Housing Color =	(R= 51 G= 51 B= 51)
Luminous Color =	(R= 255 G= 255 B= 255)
Arrangement =	SINGLE
Arm Length =	17.5
Offset =	0
Pole Mounted	

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Luminaire Location(s)

Luminaire Locations
Project Name : WSDOT Illumination Design
Coordinates in Feet

Seq. No.	Label	X	Y	Z	Orient	Tilt	Roll	Spin	Aiming Point X	Aiming Point Y	Aiming Point Z	Status
2	GE451002	1356220.87	810799.49	40	270	0	0	0	1356220.87	810799.49	40	On
1	GE451002	1355979.69	810810.58	40	270	0	0	0	1355979.69	810810.58	40	On

Summary By Label
Project Name : WSDOT Illumination Design

Label	On	Off	Total
GE451002	1	0	2

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Statistical Area(s)

SB Off Ramp

Southbound Off Ramp From Mainline
Project: WSDOT Illumination Design
Illuminance Values (Fc)

Average =	1.06
Maximum =	3.07
Minimum =	0.31
Avg/Min =	3.42
Max/Min =	9.9

WAN License Manager

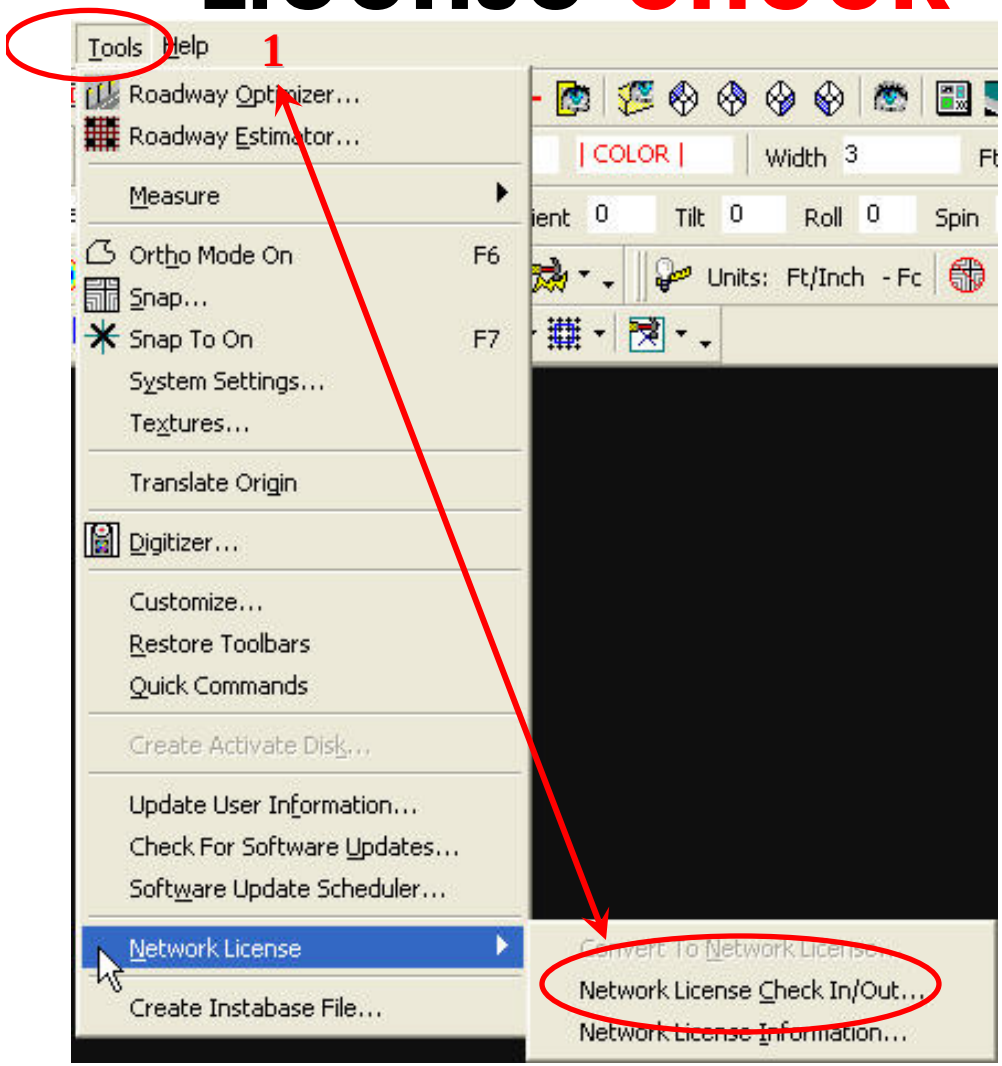
1.) There are 25 Concurrent Licenses available in a statewide license pool.

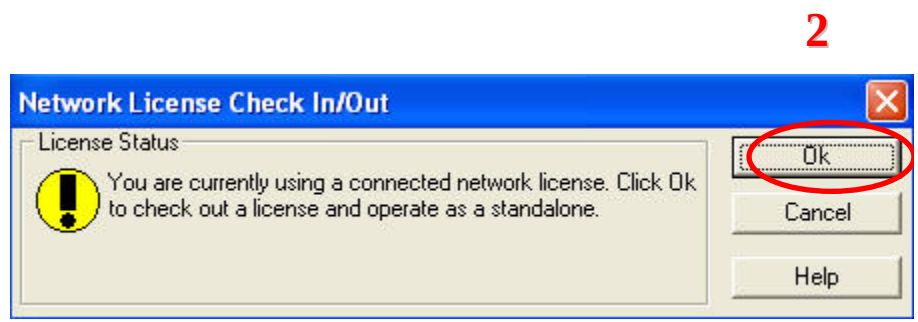
2.) There is no limit to the number of people that can have the AGI32 Software.

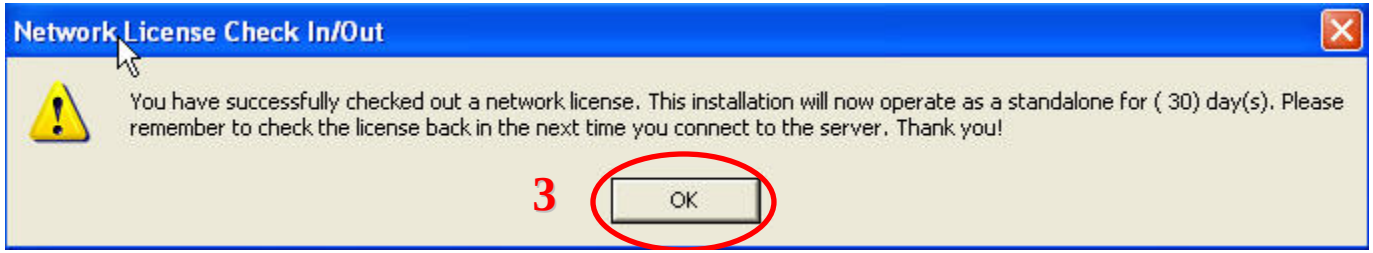
3.) There will also be 2 Individual User Licenses available for computers that do not have access to the network.

4.) If you are experiencing problems with the Network contact HQ Help Desk @ (360)705-7050.

License check-out / check-in

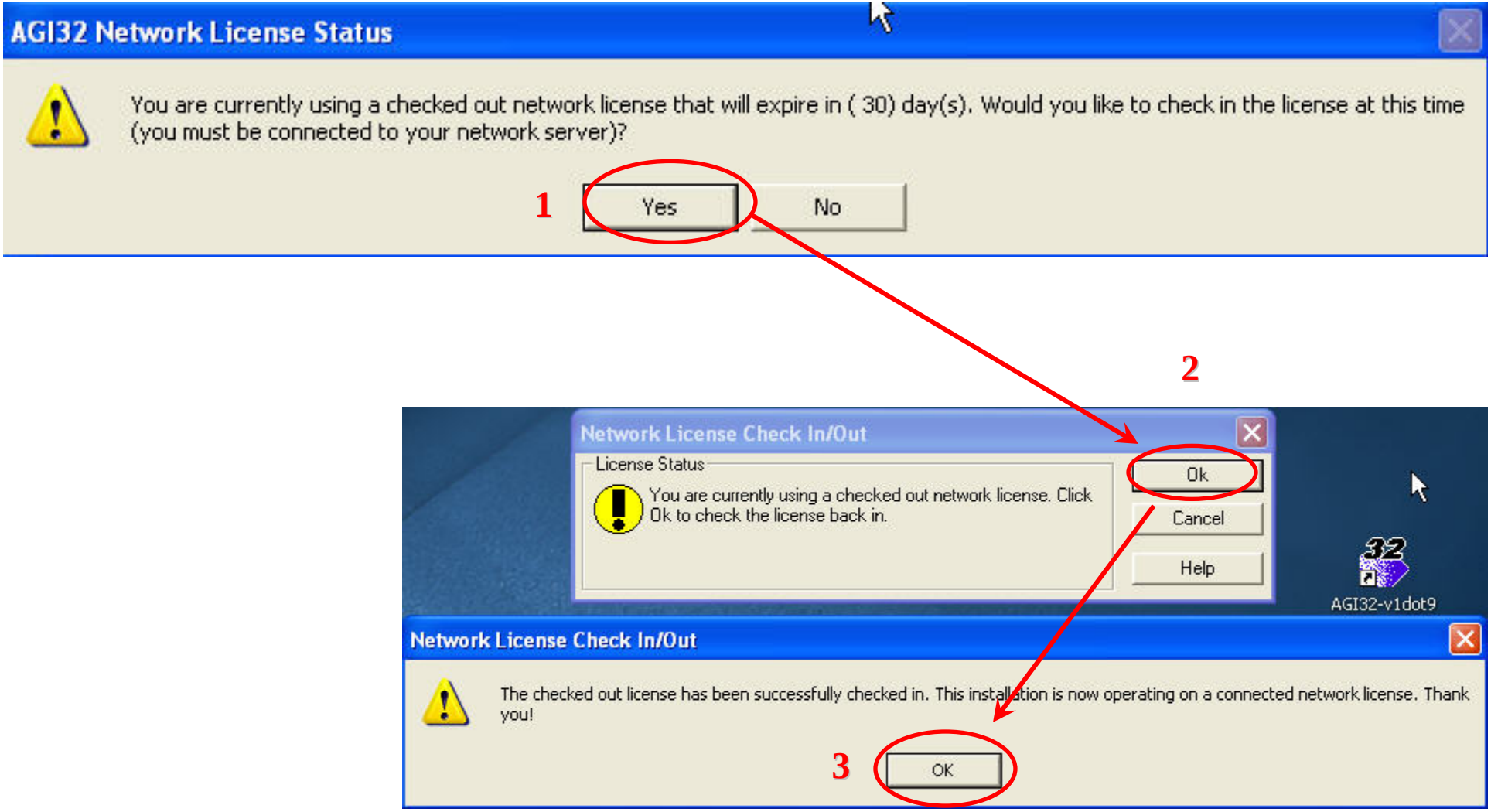




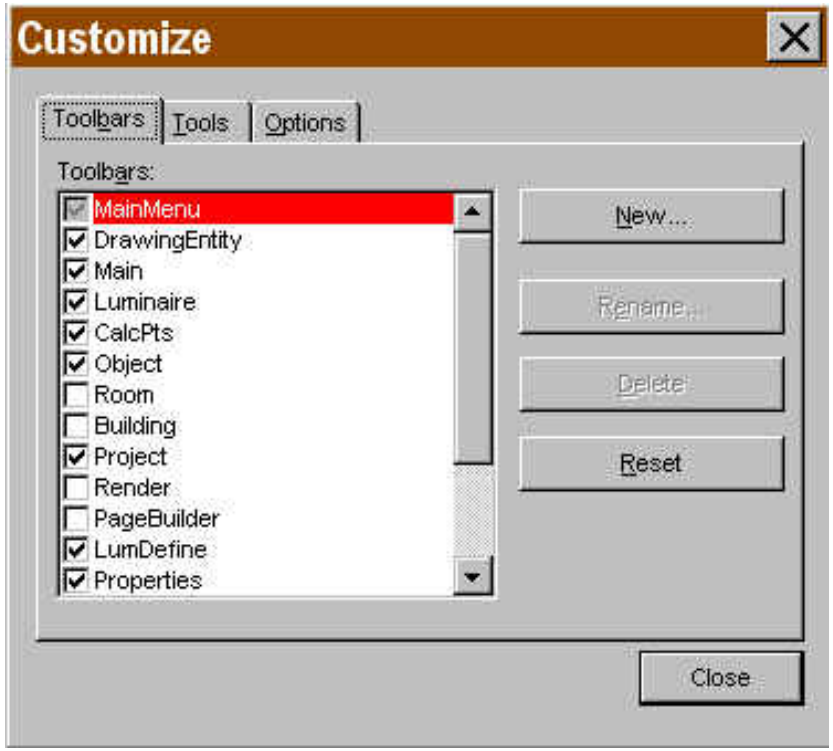


License check-out / check-in

1) You will receive this message each time you use AGI32 on your PC. When you are on network, check it back in.



Customizing and Creating Tool Bars



Modify Existing Tool Bar

1.) Right click anywhere on the Tool Bar.

2.) Go to Customizing at the bottom of the menu. The Customize window will appear.

3.) **The Customize Window must be open in order to make any changes to an existing or created tool bar.**

4.) If you want to create a new Tool Bar, select new and this window will appear.

Remove Tool →Hold the cursor over the tool icon, press the left mouse button and drag it off to the side.

Copy Tool to Another Bar →Hold down the **CTL+ALT Keys** and drag the tool to the new tool bar.

To Replace a Tool → Go to the down arrow at the end of the tool bar and select the tool you wish to replace.

Reset a Tool Bar → Use the Customize Window above. Select the Tool Bar and press reset.

AGI32 Contacts

Tech Support from Lighting Analysts in Littleton, CO

To obtain technical support for the AGi32 product

First - Please consult the AGi32 Help system.
Second - See our online forums available from the Help menu, "On the Web - Forums"
Third - Use one of the following support avenues:

North America (USA and Canada):

User's with current SupportPlus annual maintenance plan:
Telephone support (please have your user identification number ready): 303.972.8887
Fax support: 303.972.8851
Email: **help@agi32.com**
Web: **www.agi32.com**

user number:

WSDOT Internal Support

(All support questions need to be routed through the HQ Help Desk (360)705-7050)

Keith Calais
calaisk@wsdot.wa.gov Ph: (360)705-6986
Fax: (360)705-6826

Terry Thayer
thayert@wsdot.wa.gov Ph: (360)705-7290
Fax: (360)705-6826

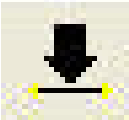
Computer Number (Shared Files)

*Keith Calais **HQA1736039**
*Terry Thayer **HQA0268001L**

Go to Start/Search/PrintersComputersPeople/Computer on the network/ (ex: **HQA1736039 to see shared files on Keith's PC**).

Example 1 – Practice Using AGI32

Open new file. Name File: Example 1.A32

Import File: example 1.dxf 

→Roadway Design Class – Highways with full access control

Pedestrian Area Classification - Low

Design for: **1.) Average Illuminance of *0.6 Ftc,**

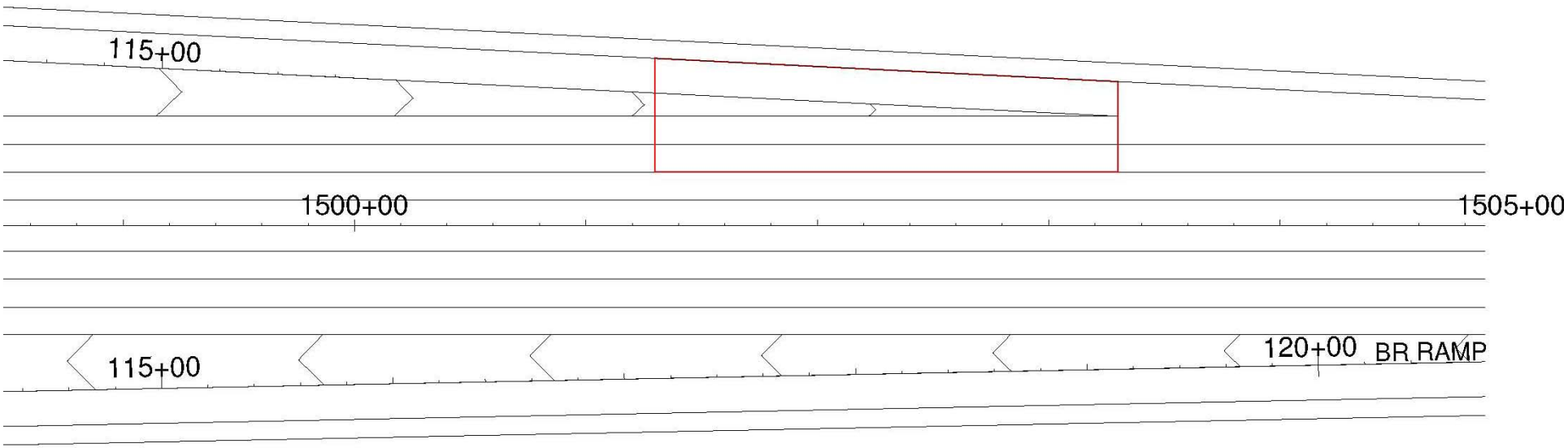
2.) Uniformity(Avg./Min Illuminance) <= *4:1

3.) Max Veiling Luminance Ratio (Max Veiling Luminance / Avg. Luminance) <=*0.3:1

Note: * Design Values are from the Light Level and Uniformity Ratio Chart, Figure 840-25, Page 840-41 of the November 2006 Design Manual, Chapter 840.

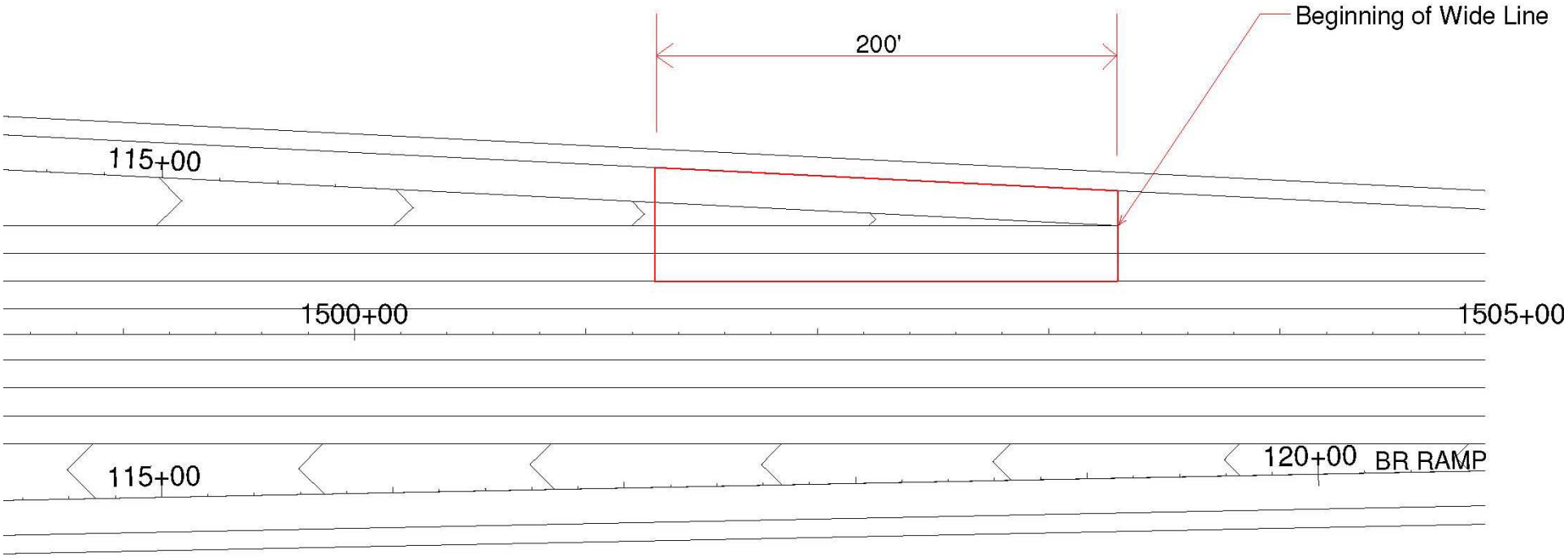
Example 1

File: Example 1 - File Imported.A32



Example 1

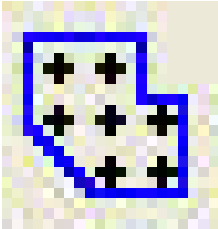
File: Example 1 – Required Design Area Layout.A32



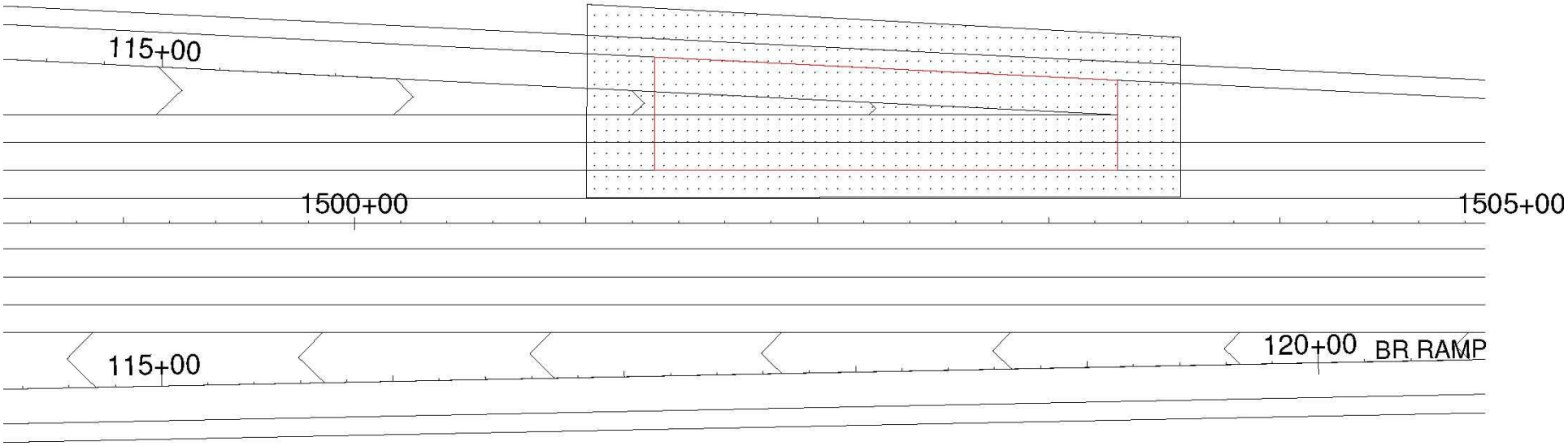
Required Levels
Highways with Full Access Control - Main Line
Minimum Average Light Level - 0.6fc
Maximum Uniformity Ratio - <=4:1
Maximum Veiling Luminance Ratio - <=0.3:1

Example 1

Calculation Points Layout



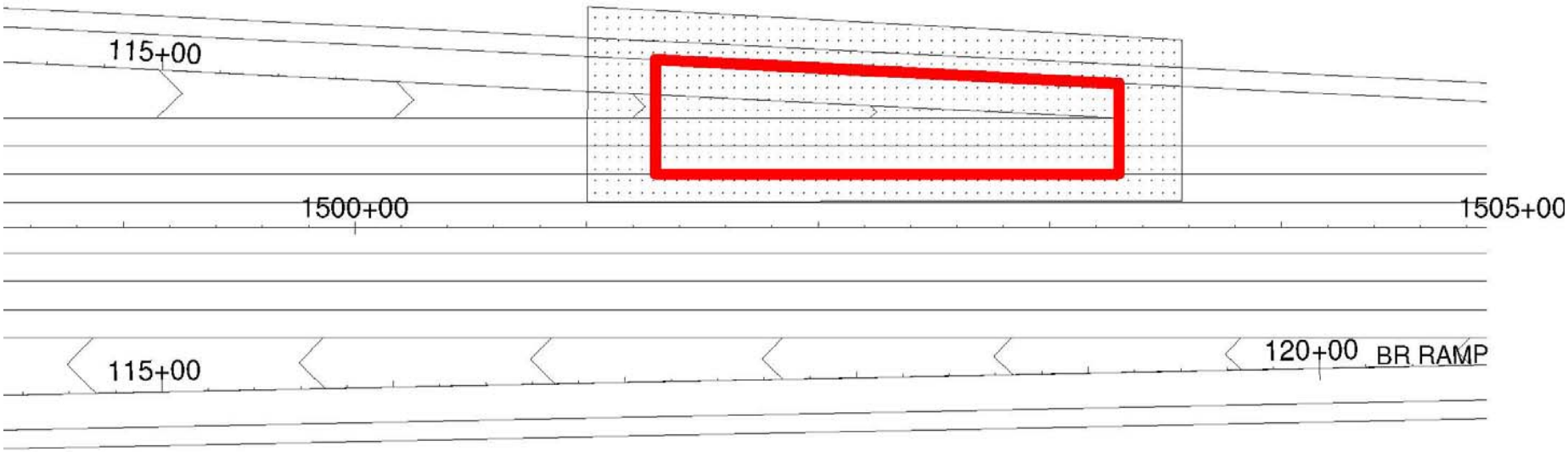
Required Levels
Highway With Full Access Control - Main Line
Minimum Average Light Level - 0.6fc
Maximum Uniformity Ratio - <=4:1
Maximum Veiling Luminance Ratio - <=0.3:1



Example 1

Statistical Area Layout

Required Levels
Highway With Full Access Control - Main Line
Minimum Average Light Level - 0.6fc
Maximum Uniformity Ratio - <=4:1
Maximum Veiling Luminance Ratio - <=0.3:1

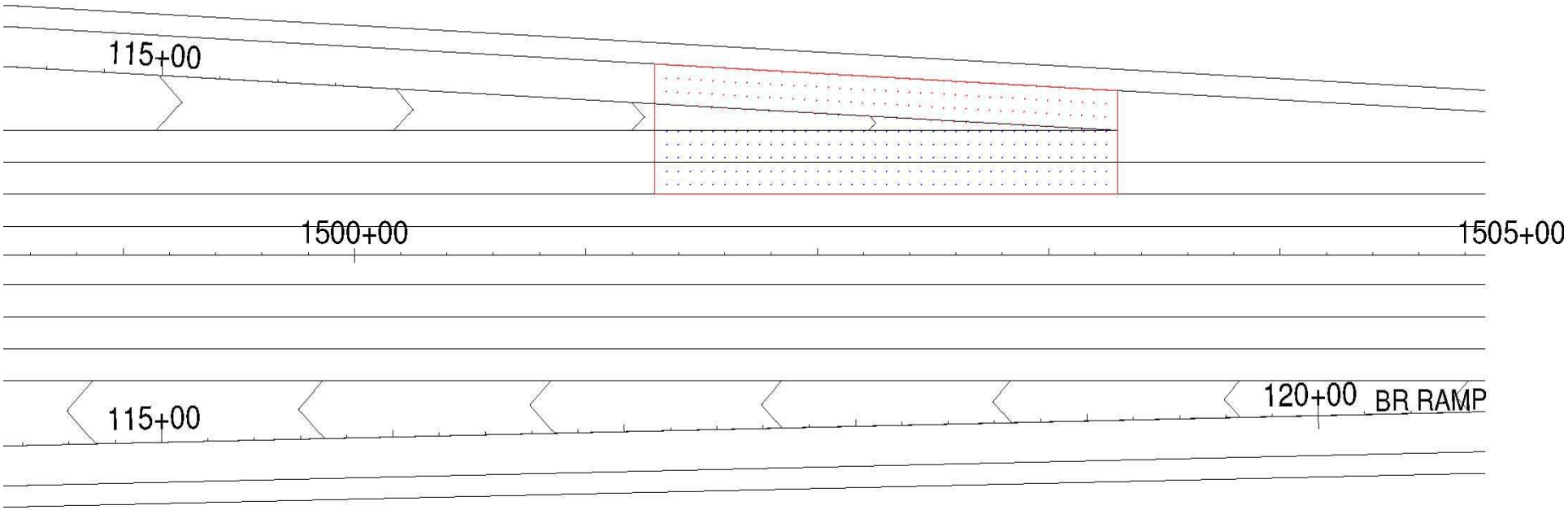


SB Off Ramp
Southbound Off Ramp From Main Line
Illuminance Values(Fc)
Average =0.00
Maximum =0.00
Minimum =0.00
Avg/Min Ratio=0.00

Example 1

Veiling Luminance Grids Layout

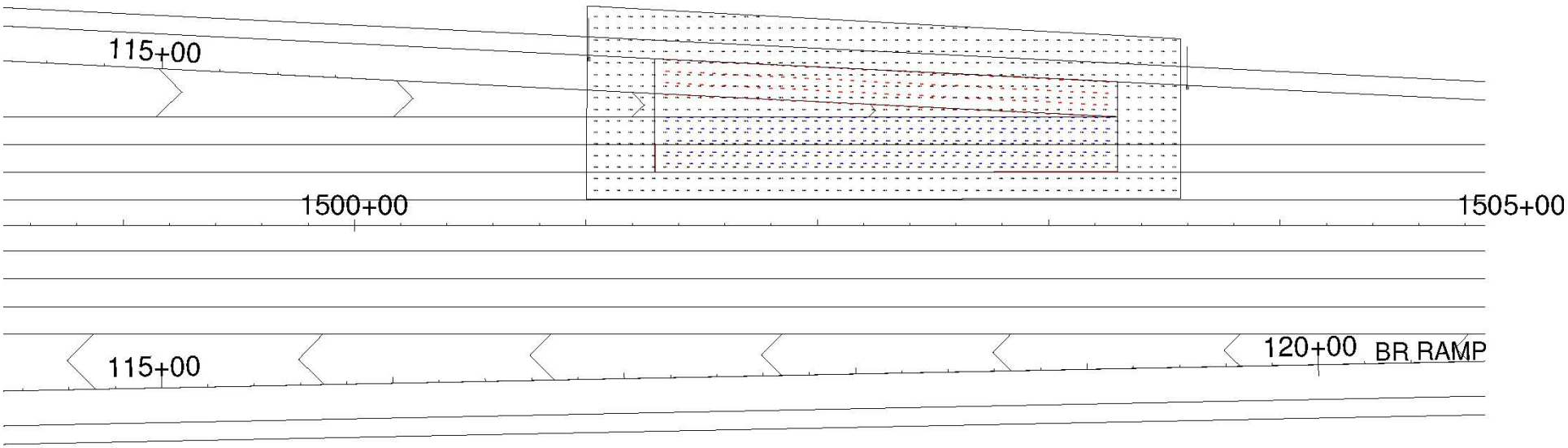
Required Levels
Highway With Full Access Control - Main Line
Minimum Average Light Level - 0.6fc
Maximum Uniformity Ratio - <=4:1
Maximum Veiling Luminance Ratio - <=0.3:1



Example 1

1st try on Luminaire Placement

Required Levels
Highway With Full Access Control - Main Line
Minimum Average Light Level - 0.6fc
Maximum Uniformity Ratio - <=4:1
Maximum Veiling Luminance Ratio - <=0.3:1



SB Off Ramp
Southbound Off Ramp From Main Line
Illuminance Values(Fc)
Average =0.67
Maximum =1.99
Minimum =0.23
Avg/Min Ratio=2.91

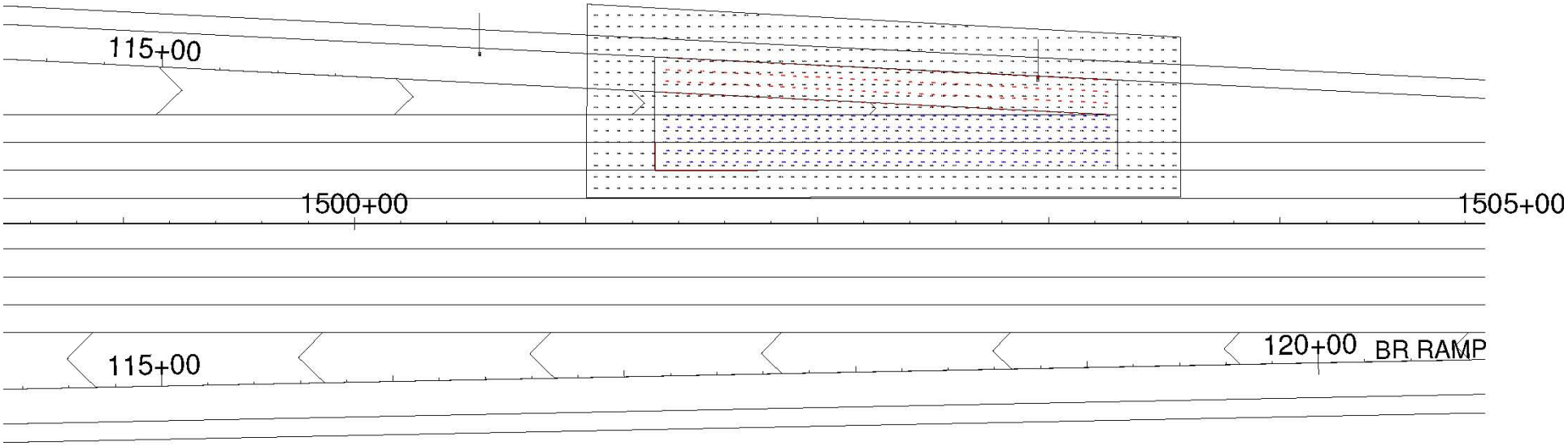
Main Line
Veiling Luminance Ratio = 0.42

Ramp
Veiling Luminance Ratio = 0.30

Example 1

Completed

Required Levels
Highway With Full Access Control - Main Line
Minimum Average Light Level - 0.6fc
Maximum Uniformity Ratio - <=4:1
Maximum Veiling Luminance Ratio - <=0.3:1



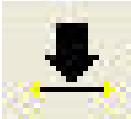
SB Off Ramp
Southbound Off Ramp From Mainline
Illuminance Values(Fc)
Average =1.06
Maximum =3.07
Minimum =0.31
Avg/Min Ratio=3.42

Main Line
Veiling Luminance Ratio = 0.25

Ramp
Veiling Luminance Ratio = 0.22

Example 2 – Practice Using AGI32

Open new file. Name file: Example 2.A32

Import file: example 2.dxf 

→Roadway Design Class – Highway with Full Access Control

Pedestrian Area Classification - Low

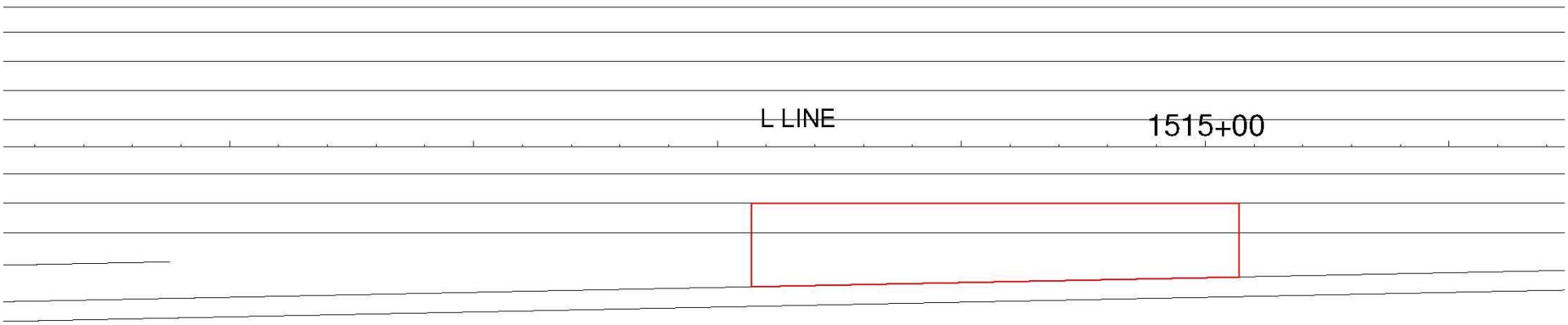
Design for:

1.) **Average Illuminance of *0.6 Ftc,**
2.) **Uniformity(Avg./Min Illuminance) <= *4.0:1**
3.) **Max Veiling Luminance Ratio (Max Veiling Luminance / Avg. Luminance) <=*0.3:1**

Note: * Design Values are from the Light Level and Uniformity Ratio Chart, Figure 840-25, Page 840-41 of the November 2006 Design Manual.

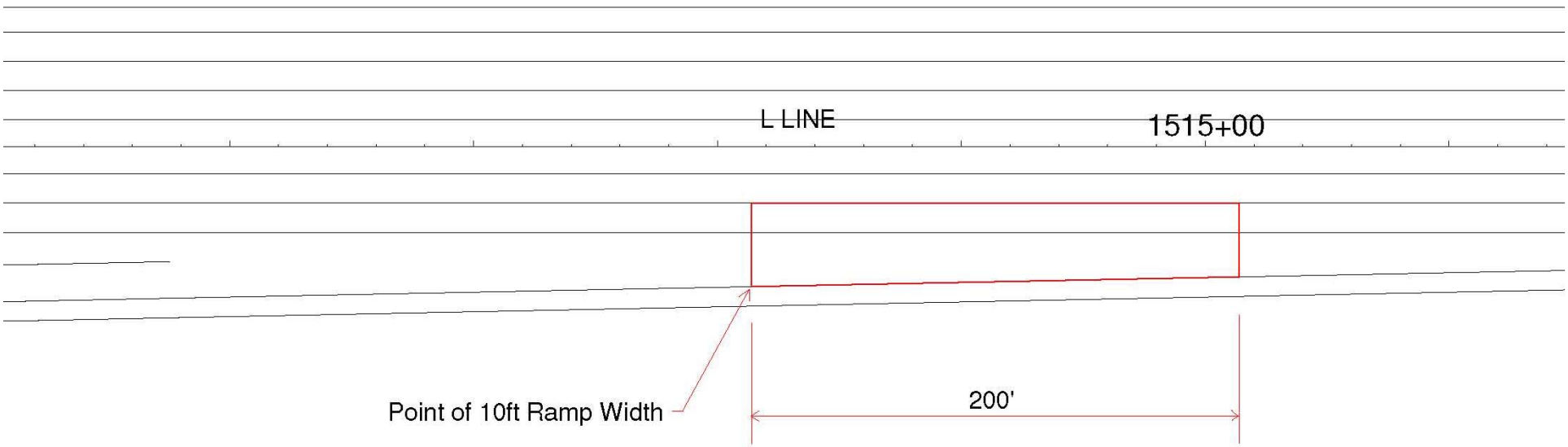
Example 2

File: Example 2 – File Imported.A32



Example 2

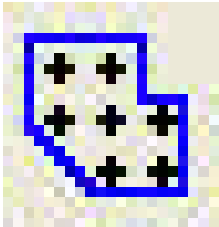
File: Example 2 – Required Design Area Layout.A32



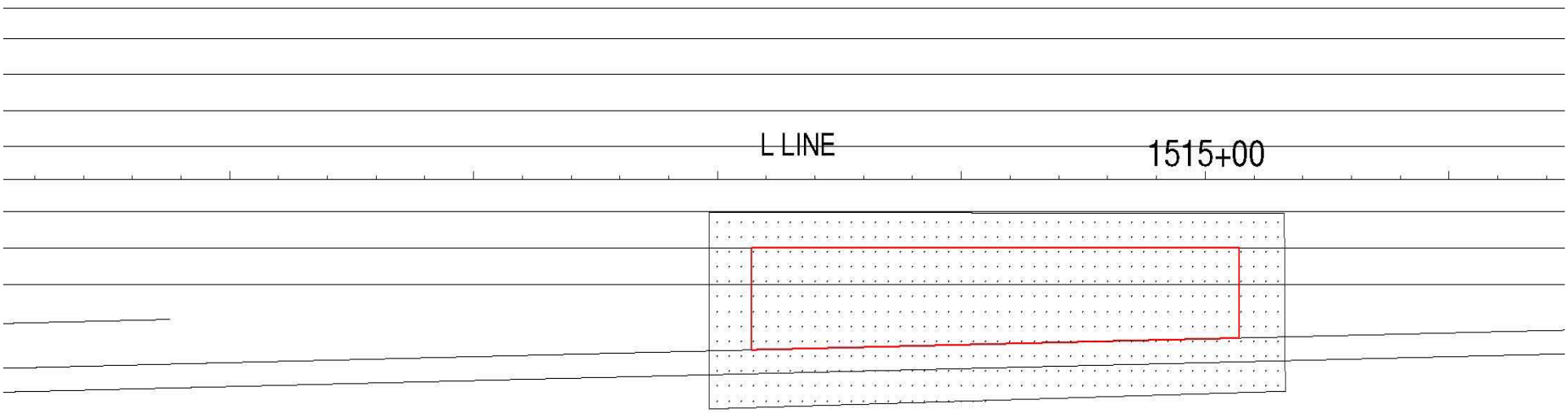
Required Levels
Highways With Full Access Control - Main Line
Minimum Average Light Level - 0.6fc
Maximum Uniformity Ratio - <=4:1
Maximum Veiling Luminance Ratio - <=0.3:1

Example 2

Calculation Points Layout

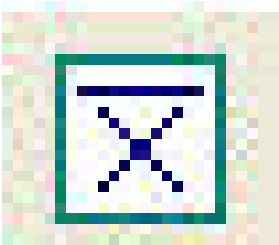


Required Levels
Highways with Full Acces Control - Main Line
Minimum Average Light Level - 0.6fc
Maximum Uniformity Ratio - <= 4:1
Maximum Veiling Luminance Ratio - <=0.3:1

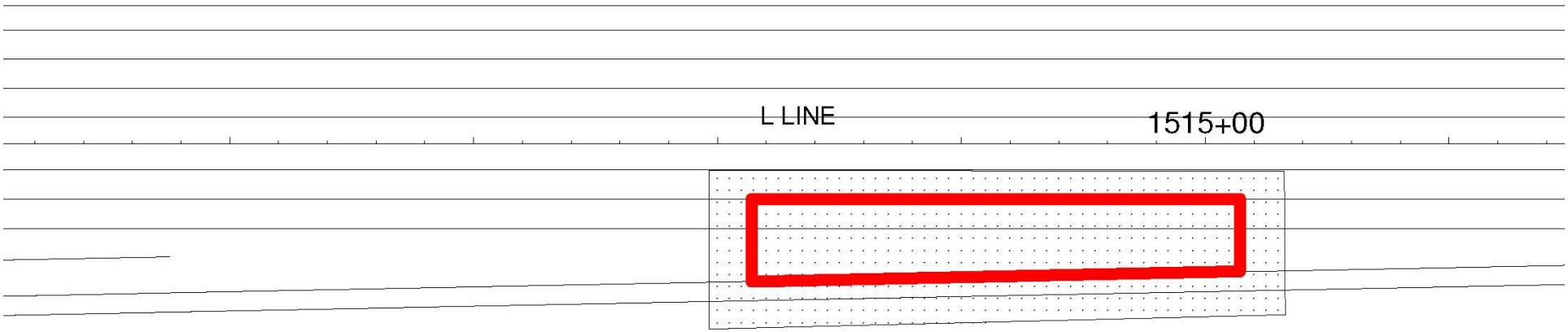


Example 2

Statistical Area Layout



Required Levels
Highways with Full Acces Control - Main Line
Minimum Average Light Level - 0.6fc
Maximum Uniformity Ratio - <= 4:1
Maximum Veiling Luminance Ratio - <=0.3:1

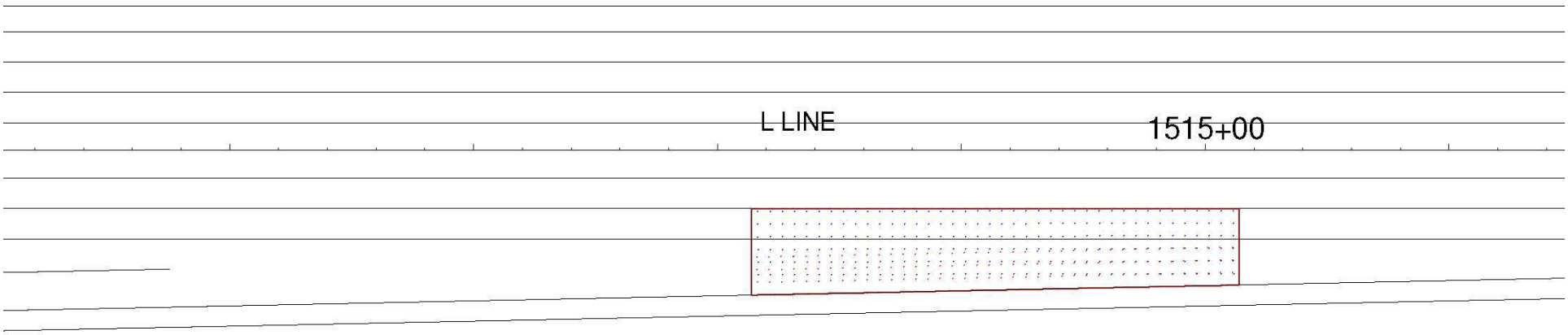


NB On Ramp
Northbound On Ramp to Main Line
Illuminance Values(Fc)
Average =0.00
Maximum =0.00
Minimum =0.00
Avg/Min Ratio=0.00

Example 2

Veiling Luminance Grids Layout

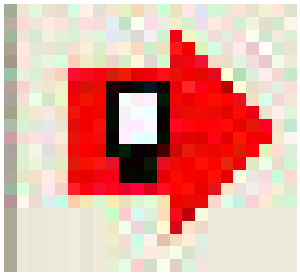
Required Levels
Highways with Full Acces Control - Main Line
Minimum Average Light Level - 0.6fc
Maximum Uniformity Ratio - <= 4:1
Maximum Veiling Luminance Ratio - <=0.3:1



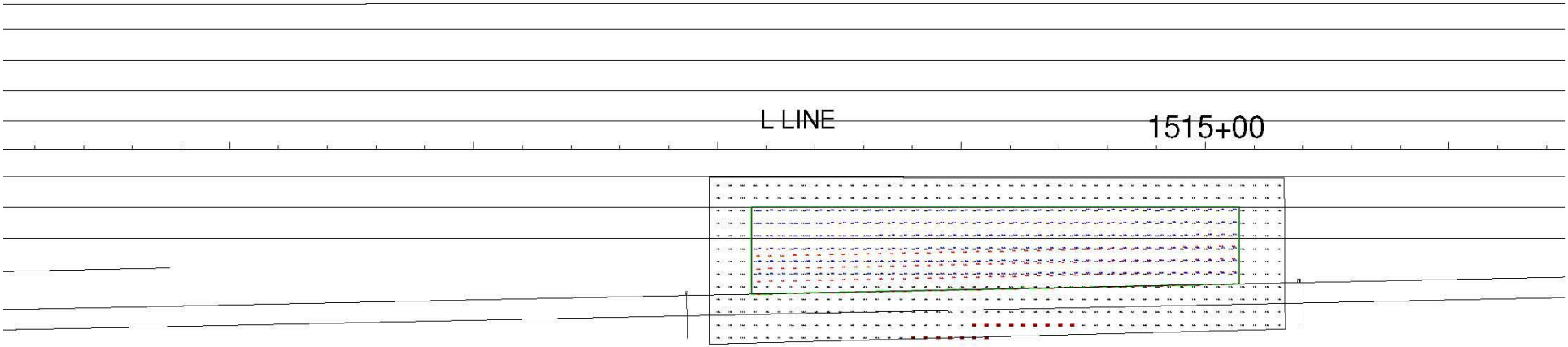
NB On Ramp
Northbound On Ramp to Main Line
Illuminance Values(Fc)
Average =0.00
Maximum =0.00
Minimum =0.00
Avg/Min Ratio=0.00

Example 2

1st try on Luminaire Placement



Required Levels
Highways with Full Acces Control - Main Line
Minimum Average Light Level - 0.6fc
Maximum Uniformity Ratio - <= 4:1
Maximum Veiling Luminance Ratio - <=0.3:1



NB On Ramp
Northbound On Ramp to Main Line
Illuminance Values(Fc)
Average =0.74
Maximum =2.17
Minimum =0.26
Avg/Min Ratio=2.85

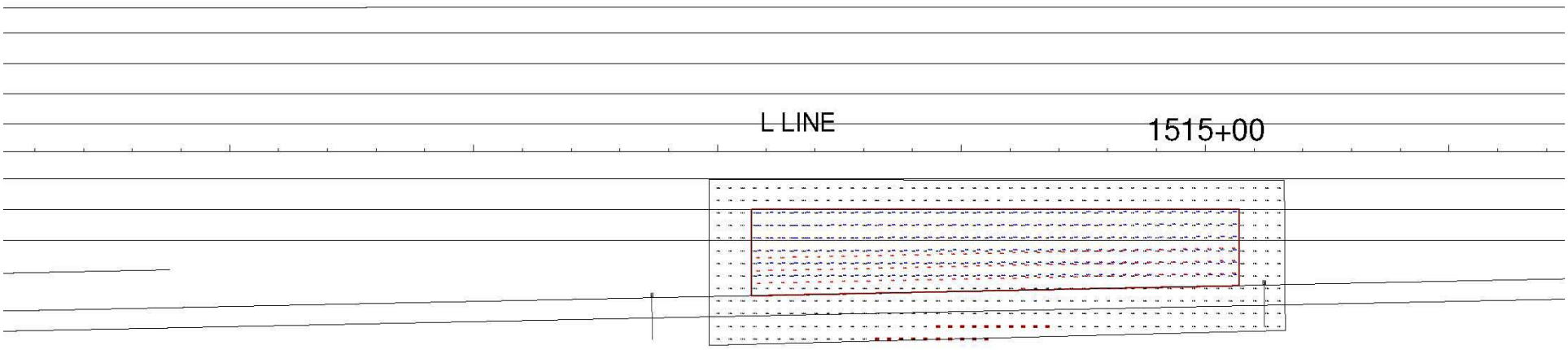
Main Line
Veiling Luminance Ratio = 0.29

Ramp
Veiling Luminance Ratio = 0.22

Example 2

Completed

Required Levels
Highways with Full Acces Control - Main Line
Minimum Average Light Level - 0.6fc
Maximum Uniformity Ratio - <= 4:1
Maximum Veiling Luminance Ratio - <=0.3:1



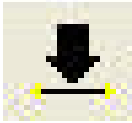
NB On Ramp
Northbound On Ramp to Main Line
Illuminance Values(Fc)
Average =0.77
Maximum =2.81
Minimum =0.26
Avg/Min Ratio=2.96

Main Line
Veiling Luminance Ratio = 0.27

Ramp
Veiling Luminance Ratio = 0.21

Example 3 – Practice Using AGI32

Open new file. Name File: Example 3.A32

Import file: example 3.dxf 

→Roadway Design Class – Principal Arterial

Pedestrian Area Classification - Low

Design for: **1.) Average Illuminance of *0.6 Ftc mainline**
***0.9 ftc intersection**

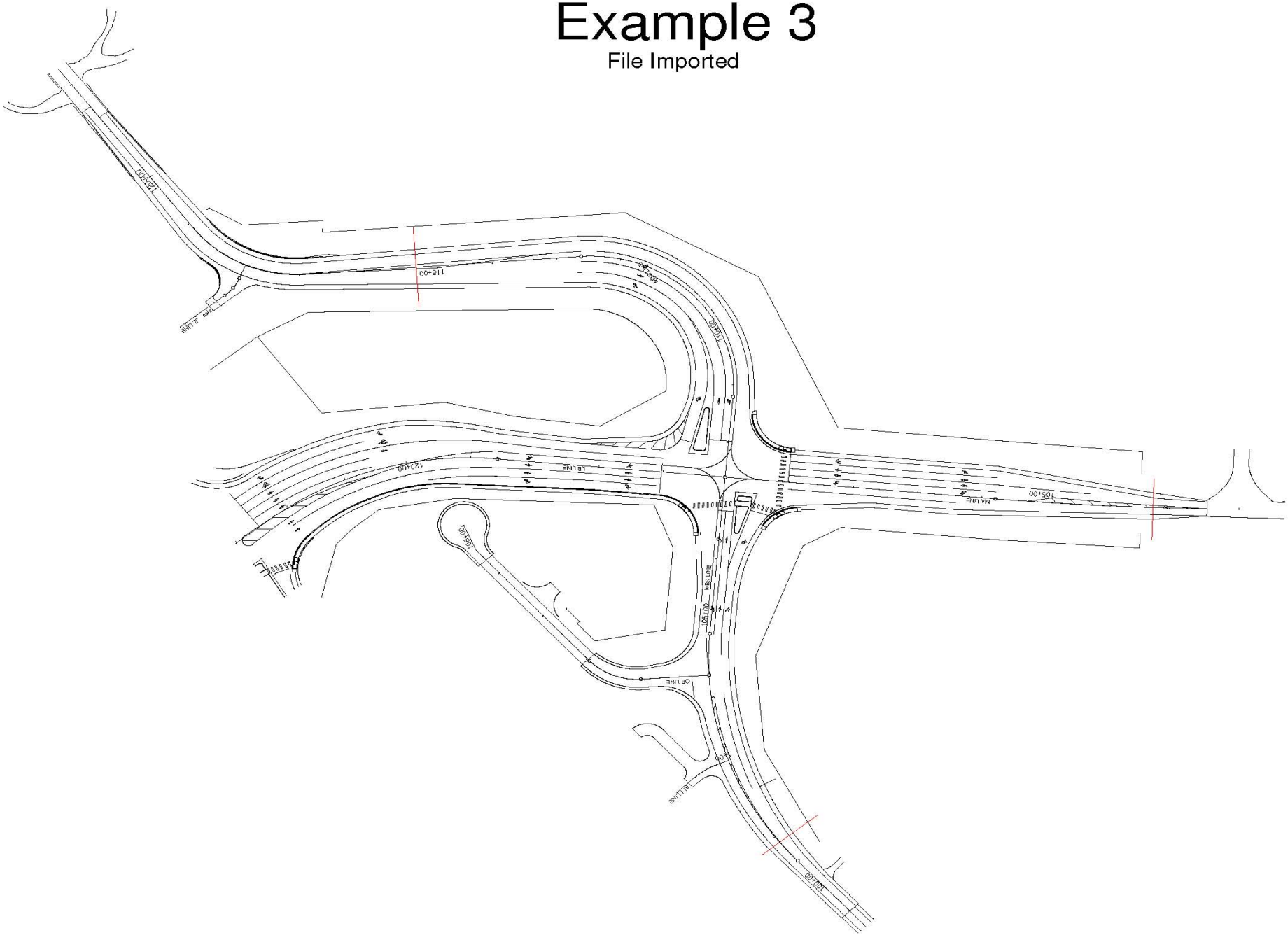
2.) Uniformity(Avg./Min Illuminance) <= *3.0:1

3.) Max Veiling Luminance Ratio (Max Veiling Luminance / Avg. Luminance) <=*0.3:1

Note: * Design Values are from the Light Level and Uniformity Ratio Chart, Figure 840-25, Page 840-41 of the November 2006 Design Manual.

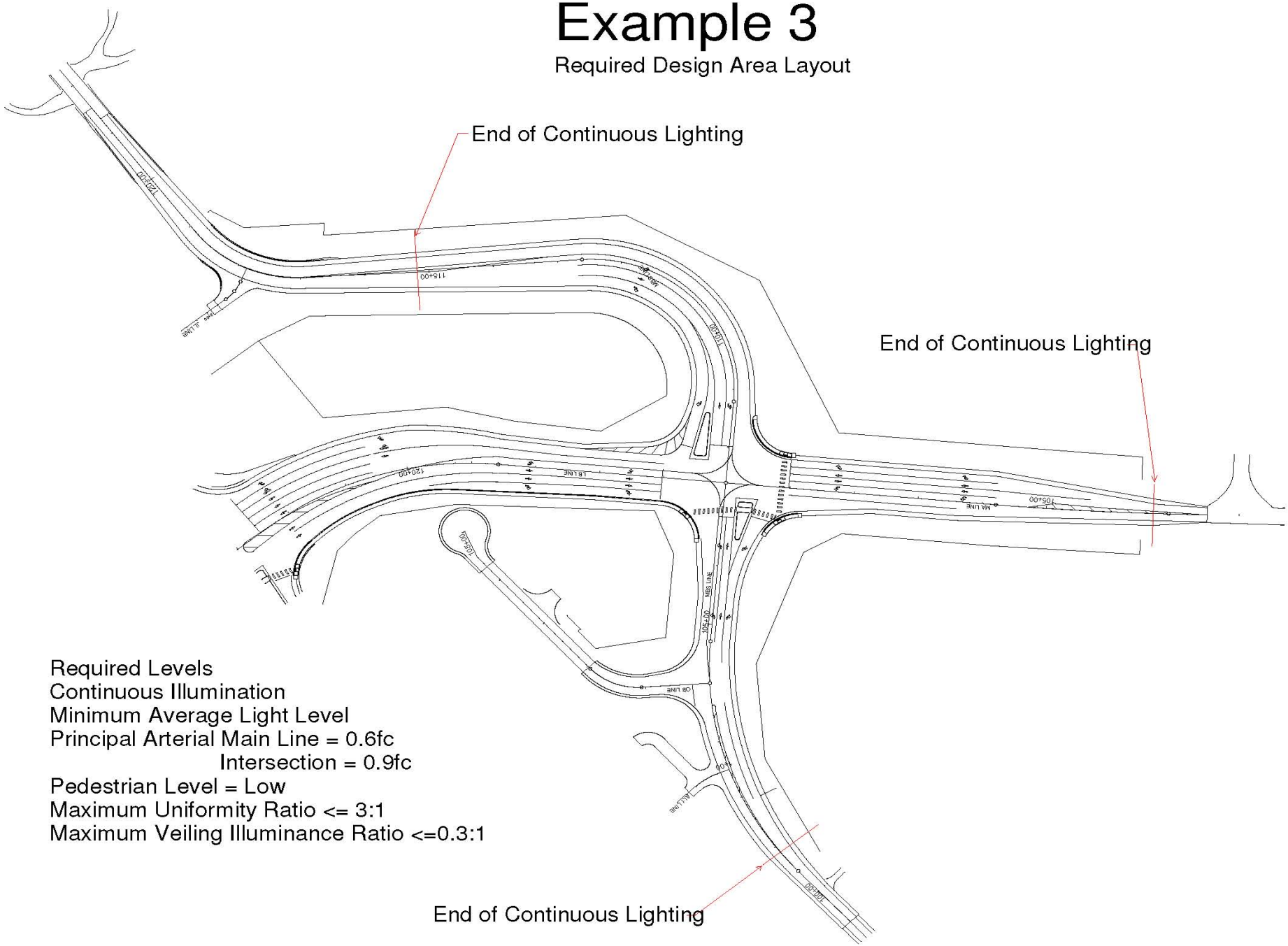
Example 3

File Imported



Example 3

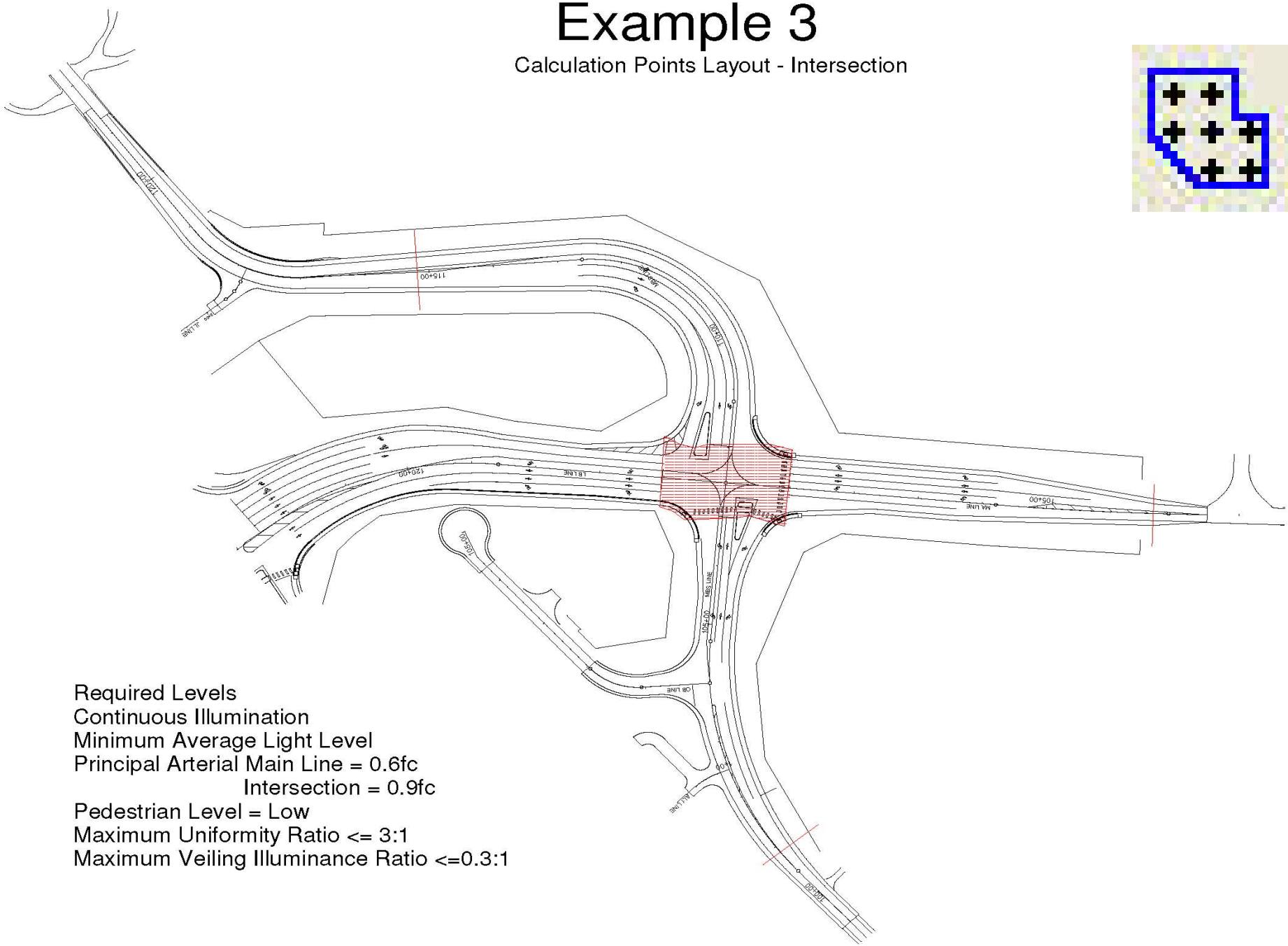
Required Design Area Layout



Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

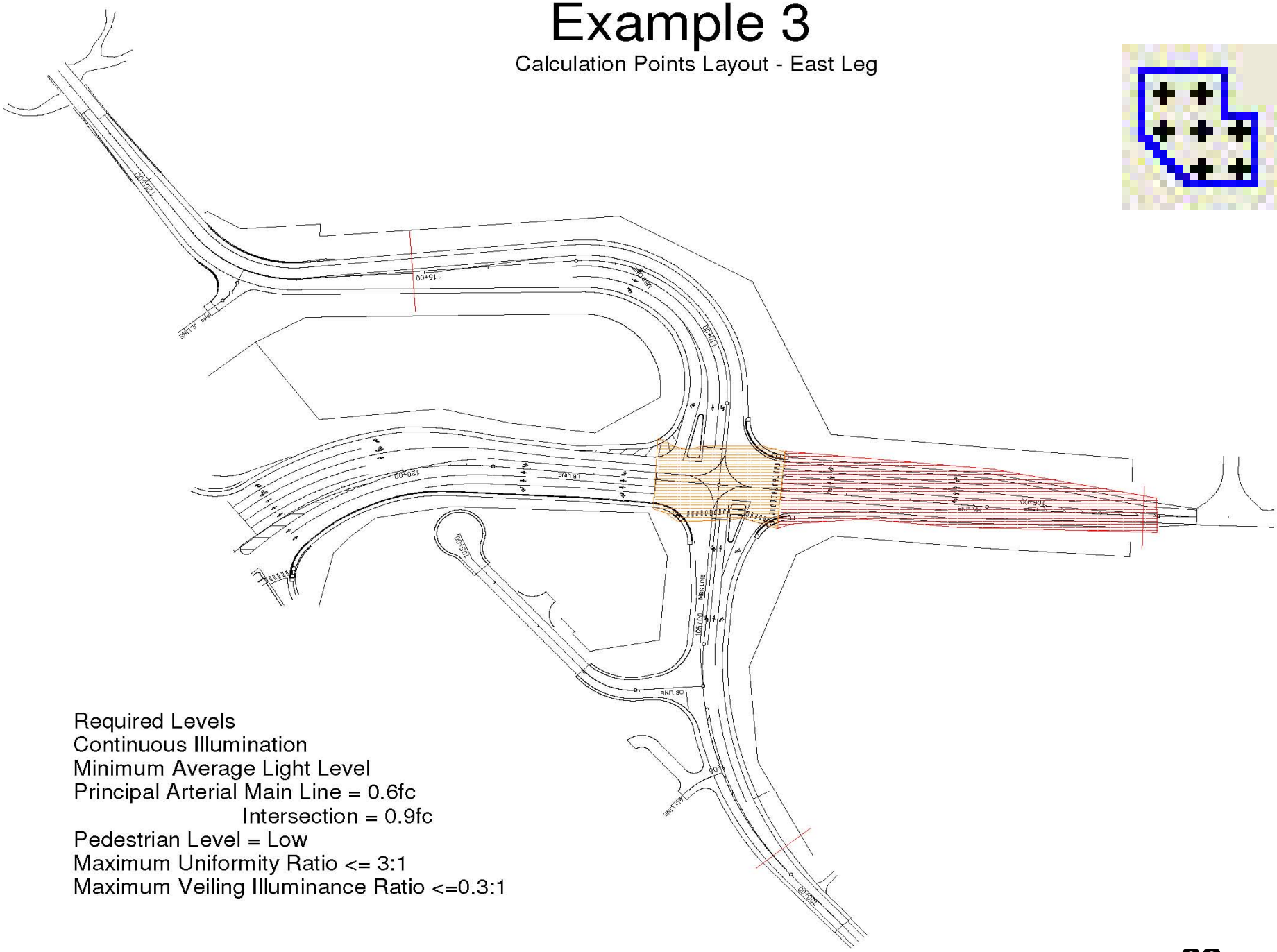
Calculation Points Layout - Intersection



Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

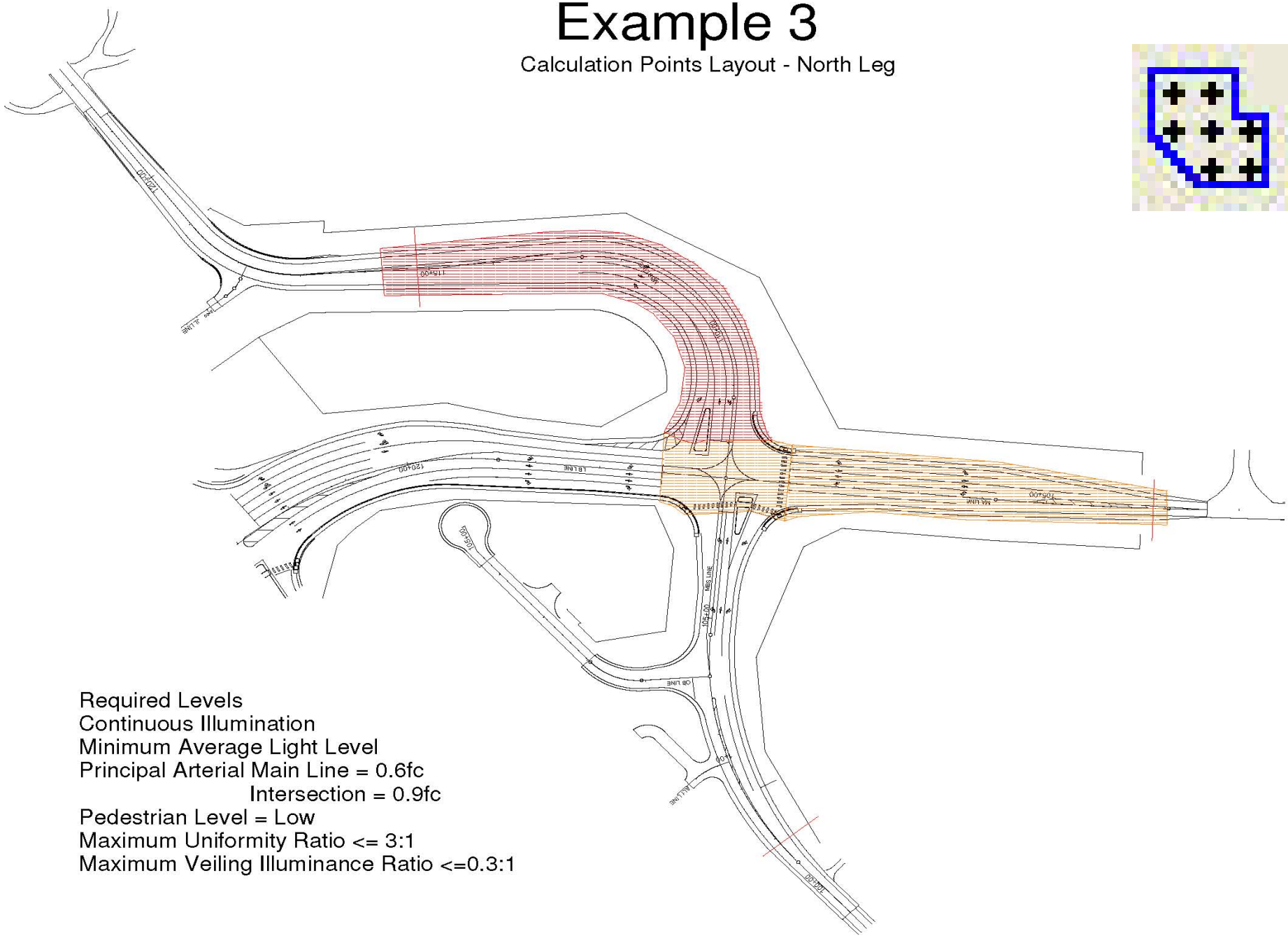
Calculation Points Layout - East Leg



Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

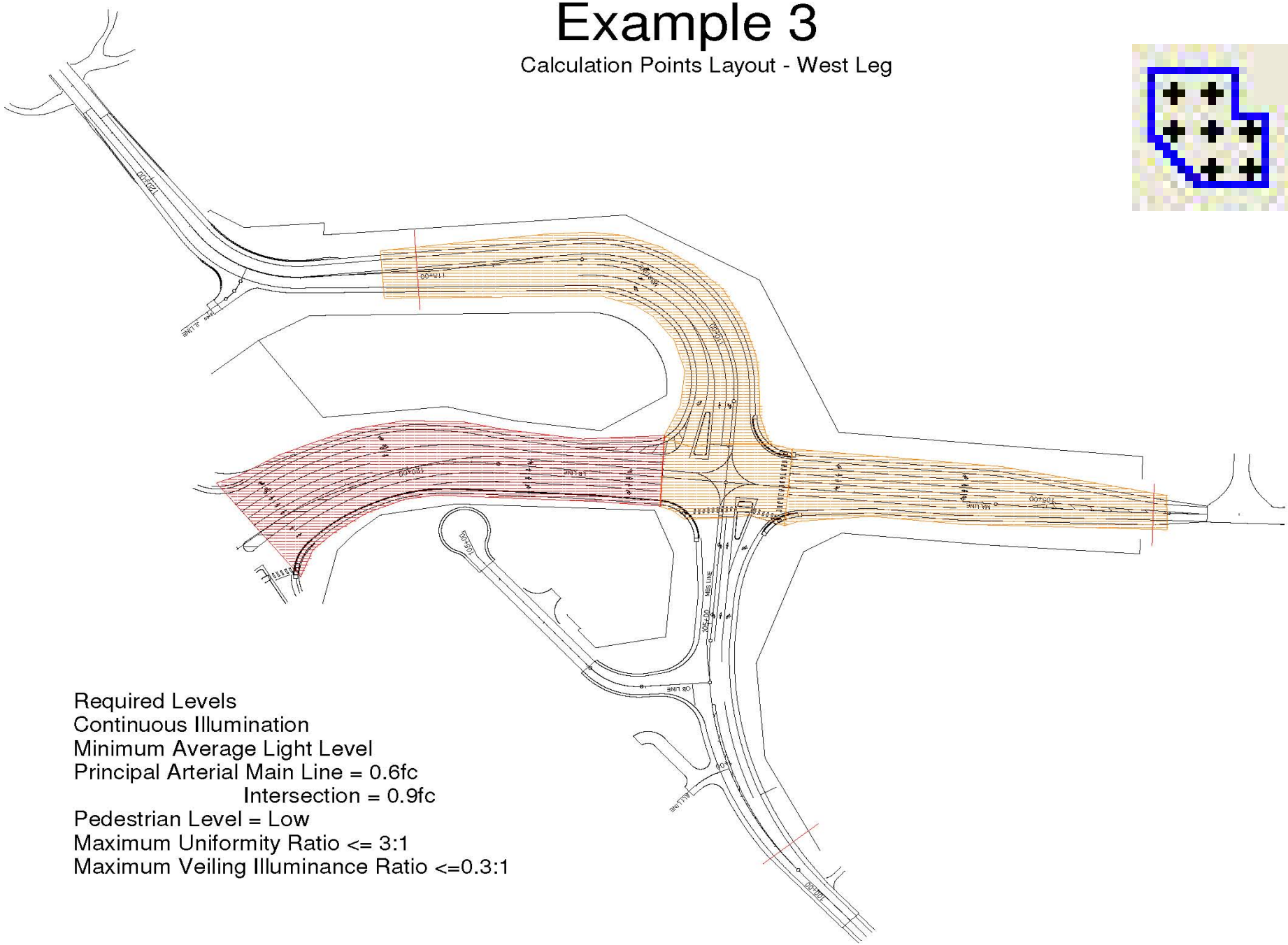
Calculation Points Layout - North Leg



Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

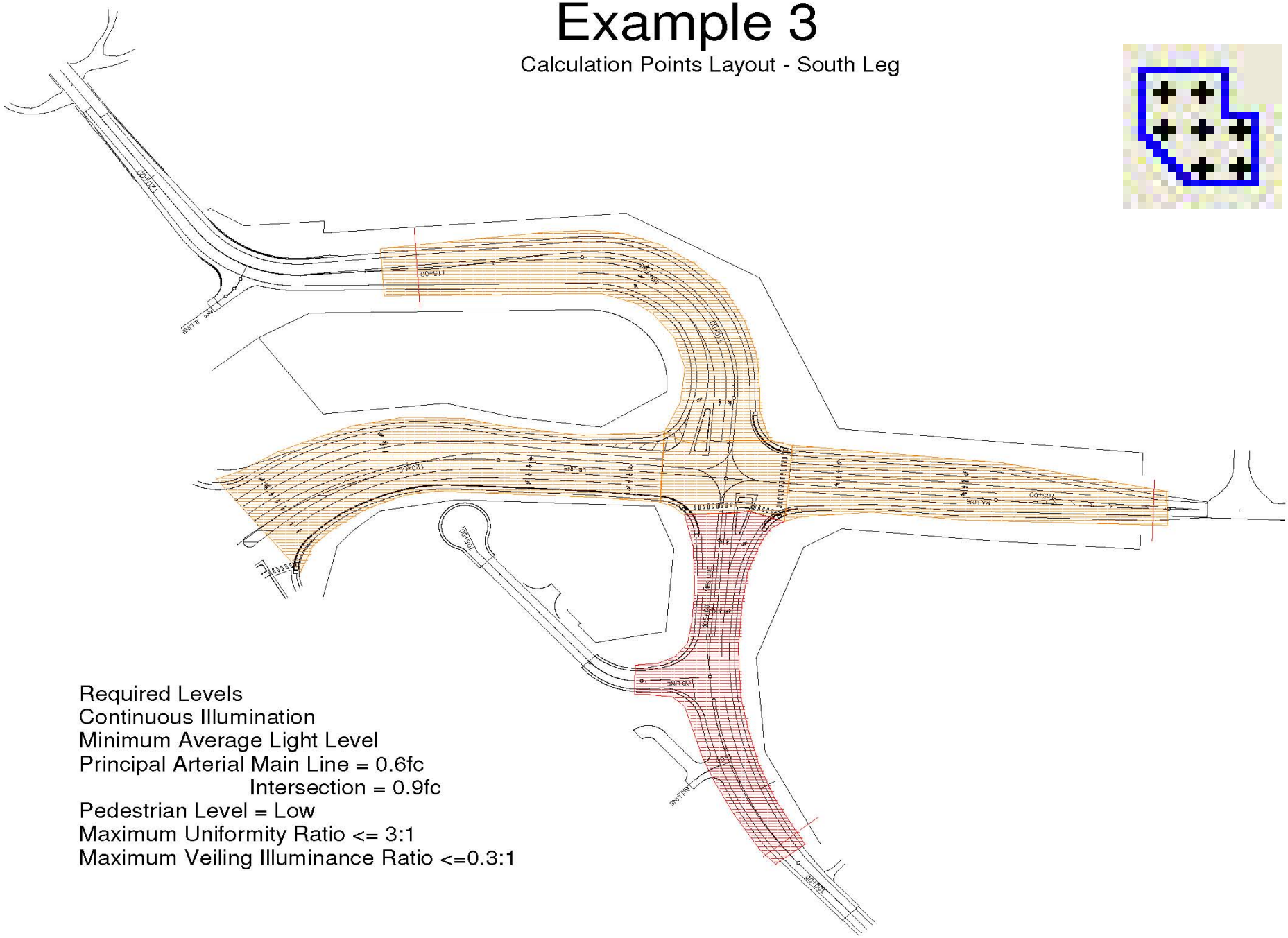
Calculation Points Layout - West Leg



Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

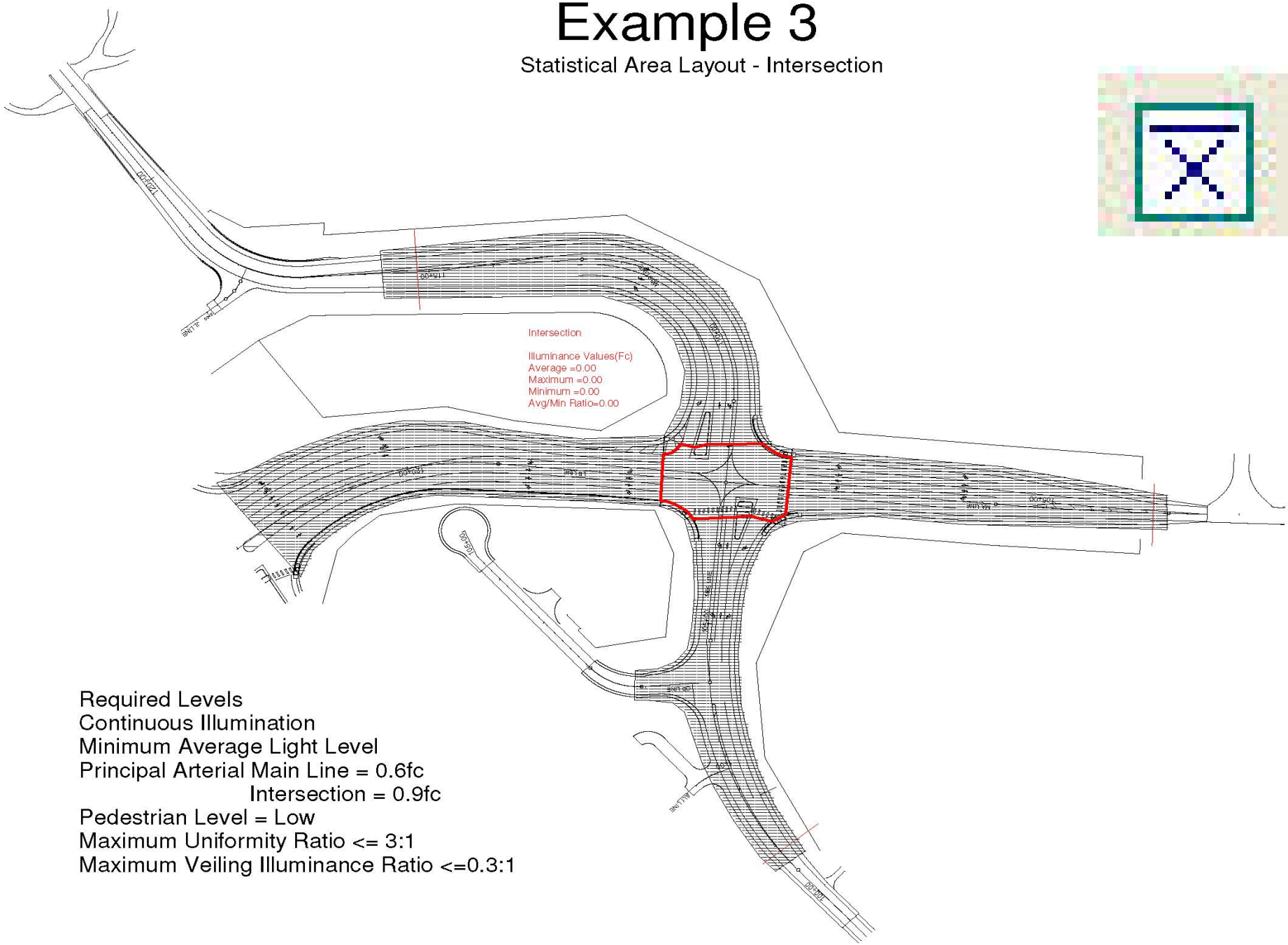
Calculation Points Layout - South Leg



Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

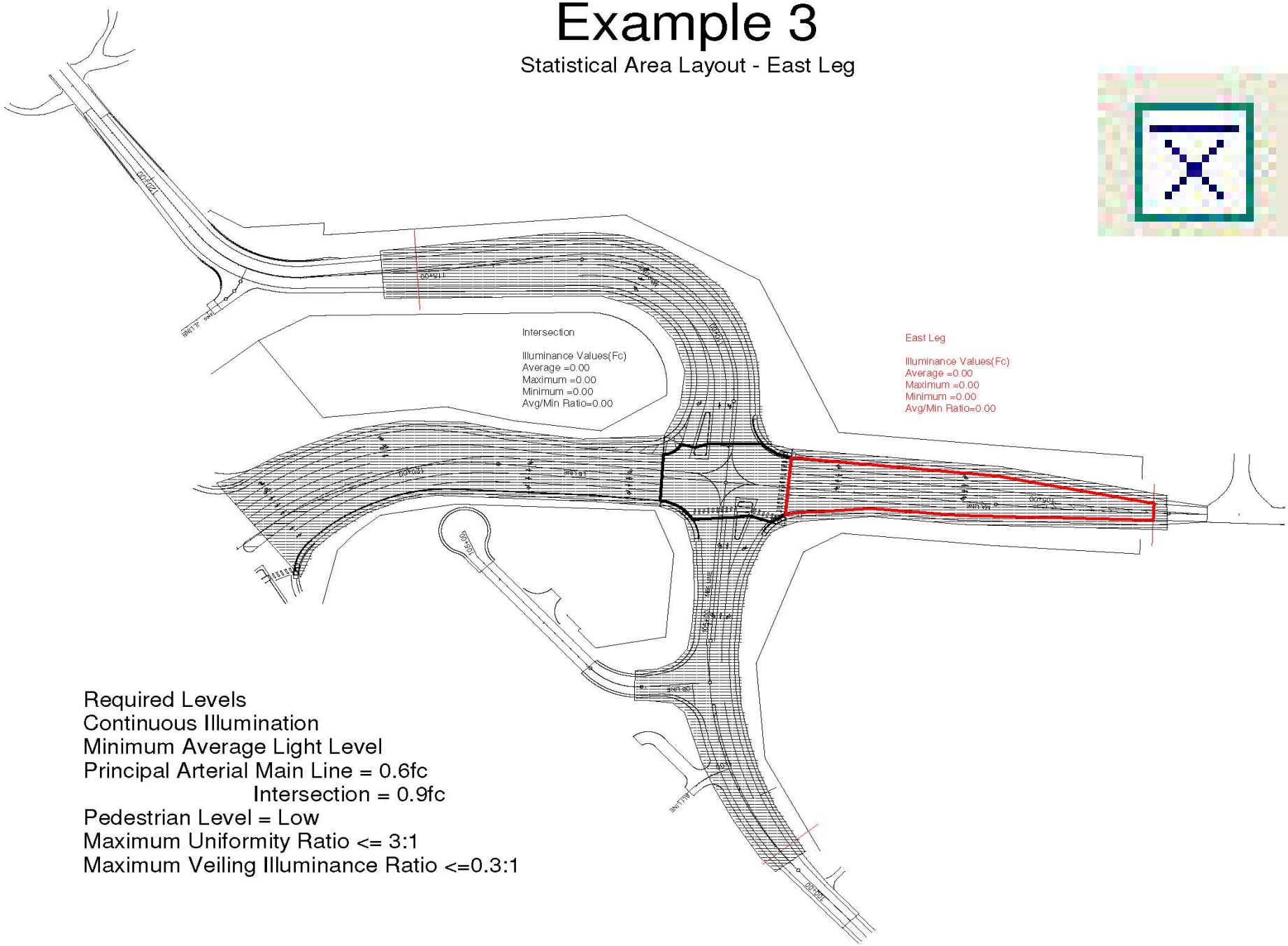
Statistical Area Layout - Intersection



Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

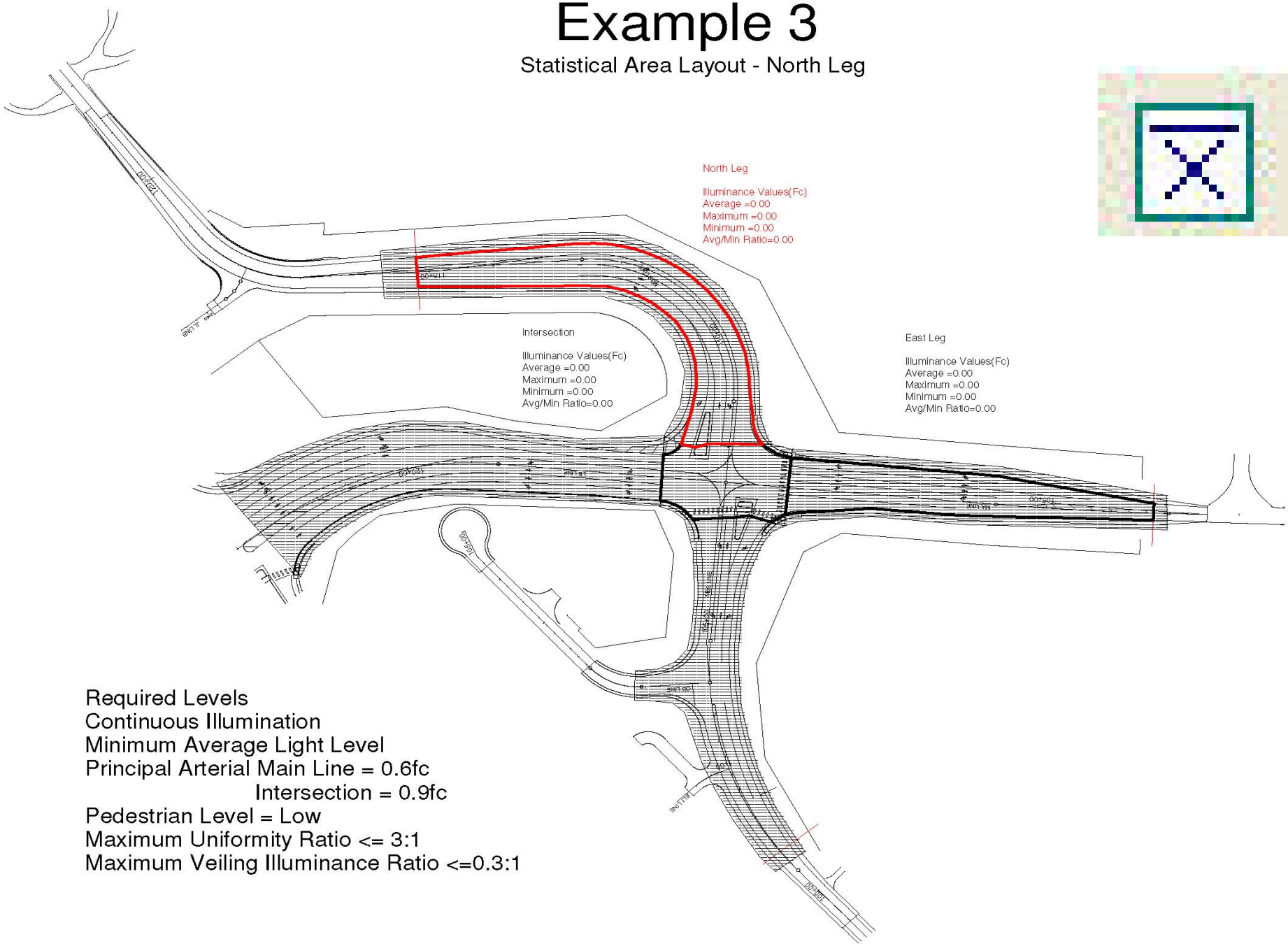
Statistical Area Layout - East Leg



Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

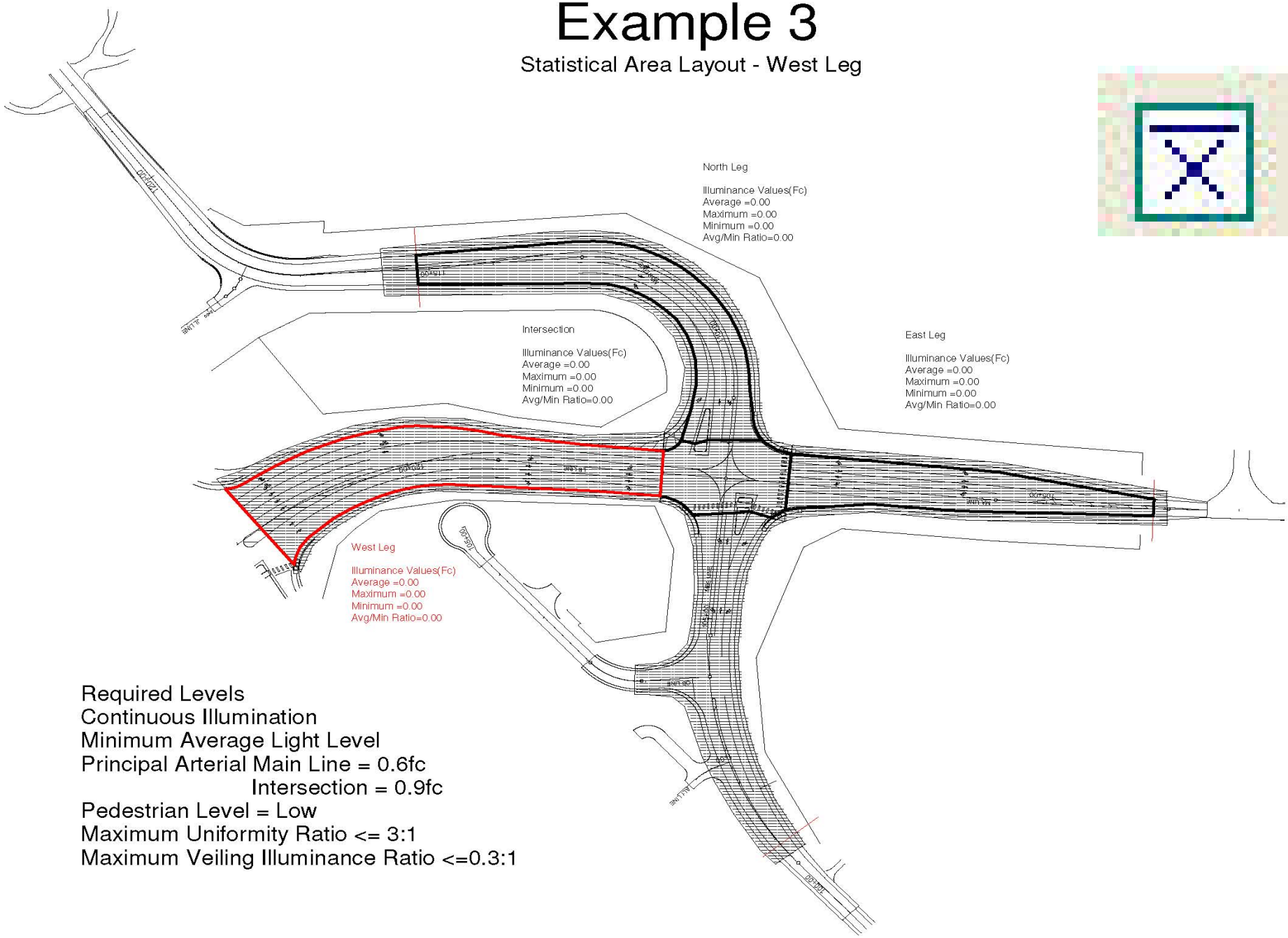
Statistical Area Layout - North Leg



Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

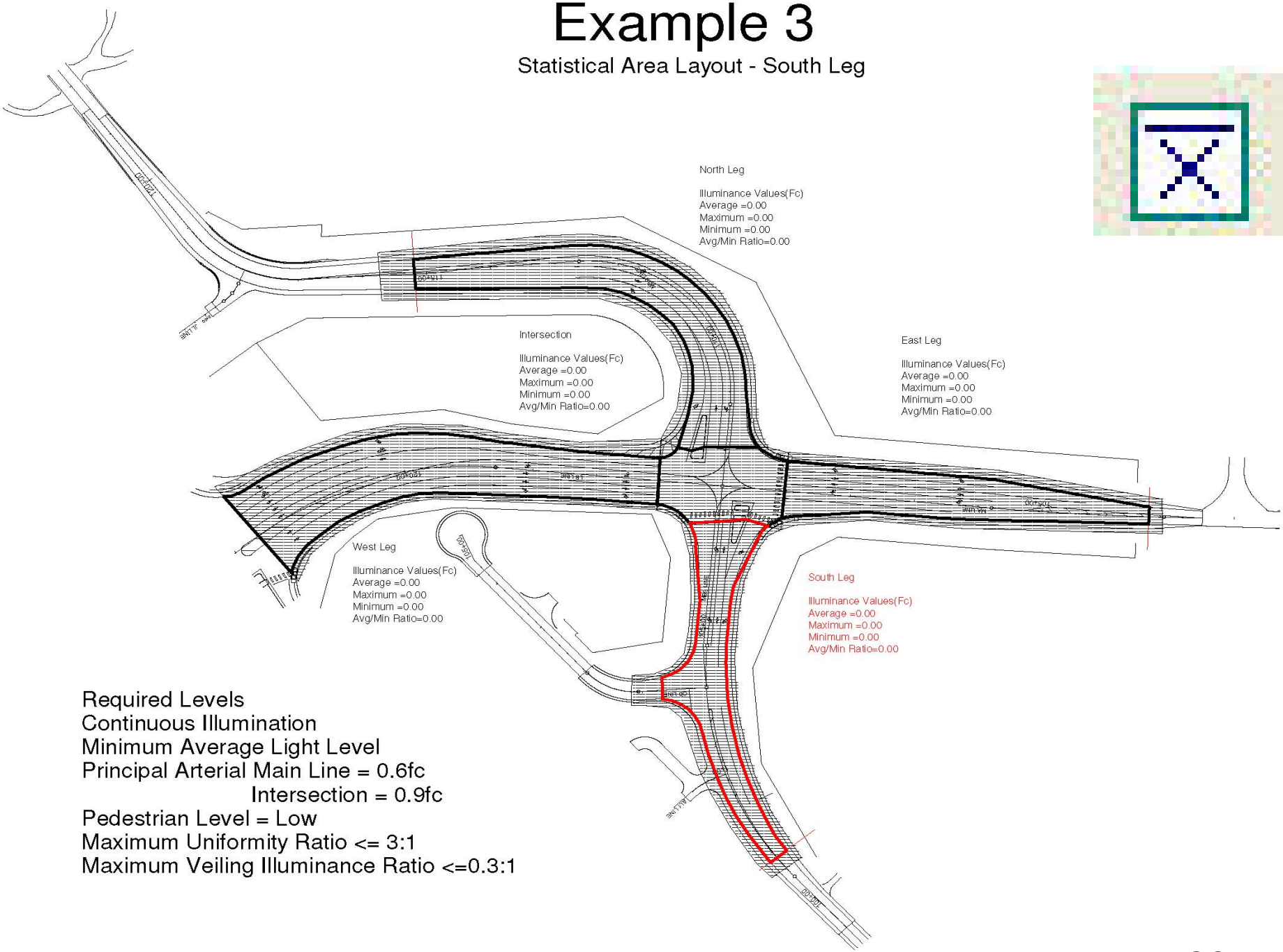
Statistical Area Layout - West Leg



Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

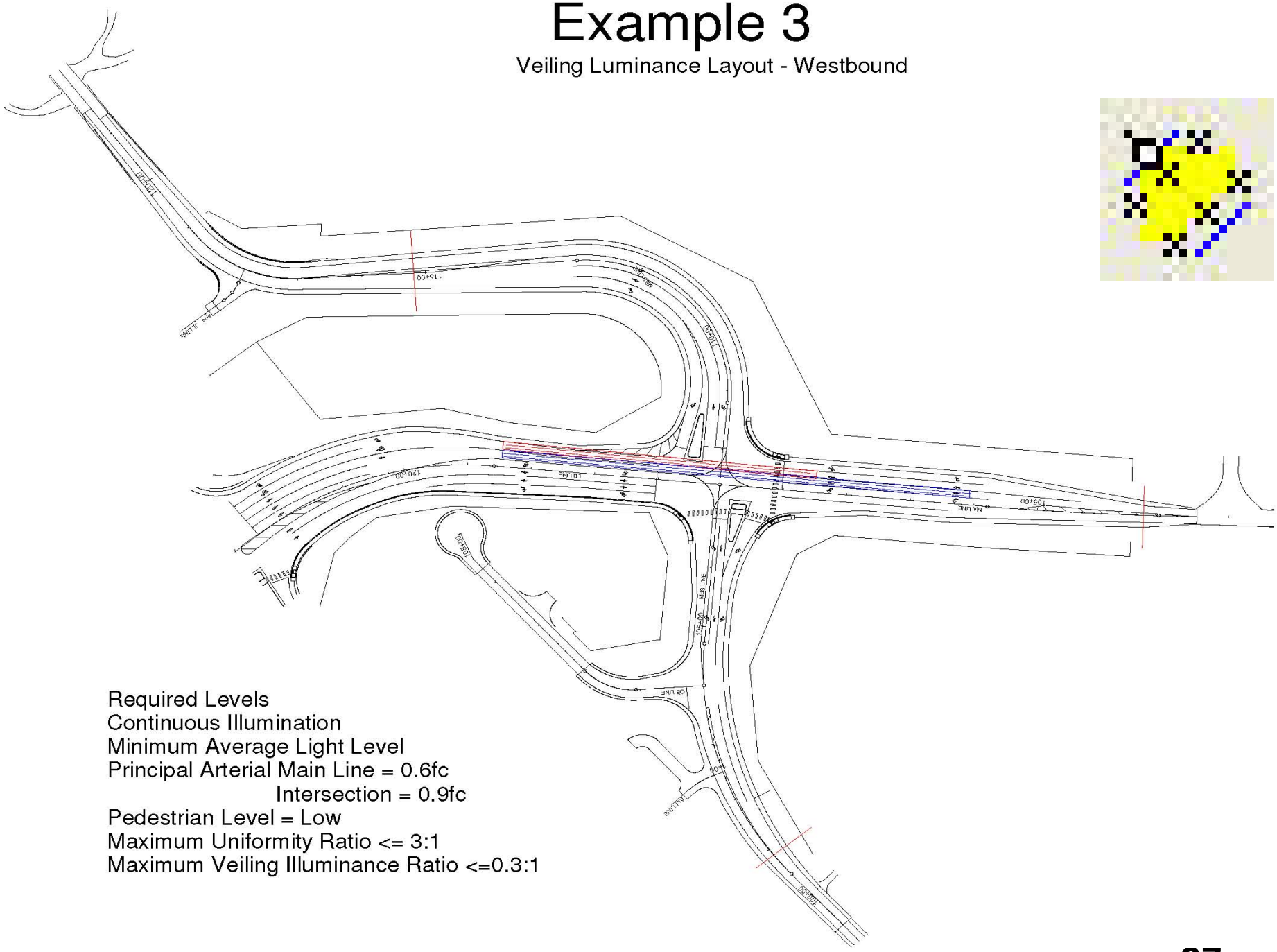
Statistical Area Layout - South Leg



Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

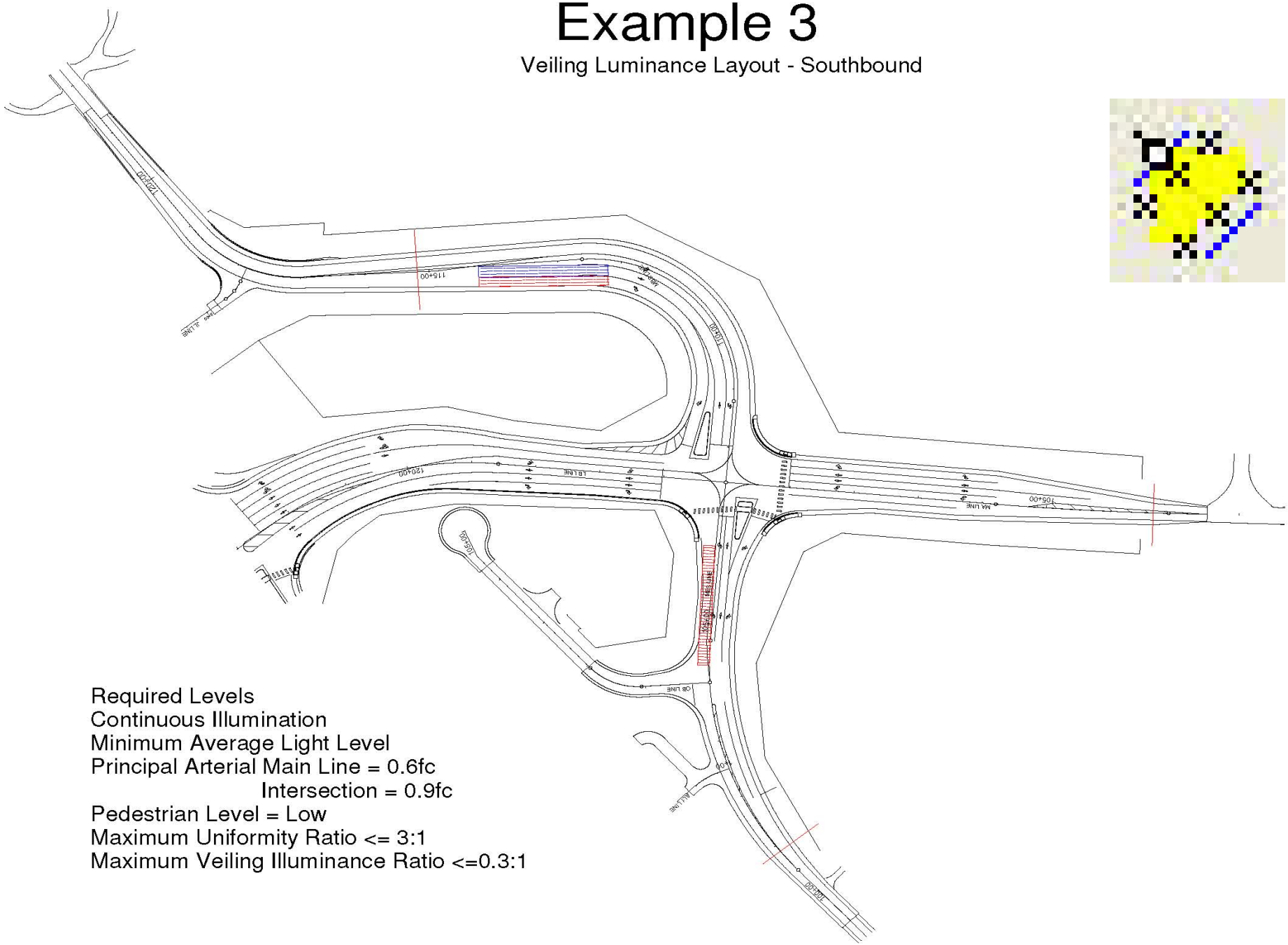
Veiling Luminance Layout - Westbound



Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

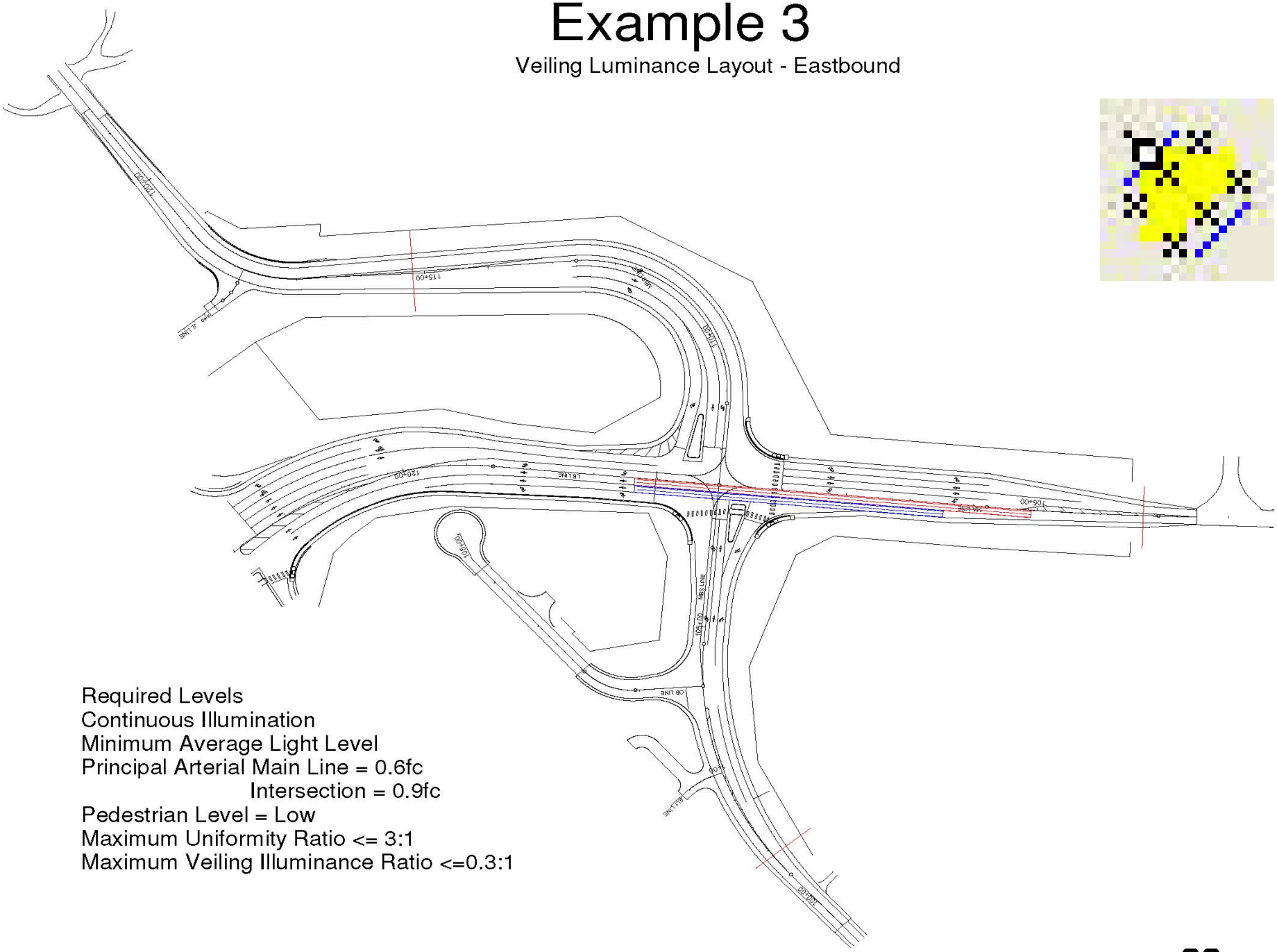
Veiling Luminance Layout - Southbound



Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

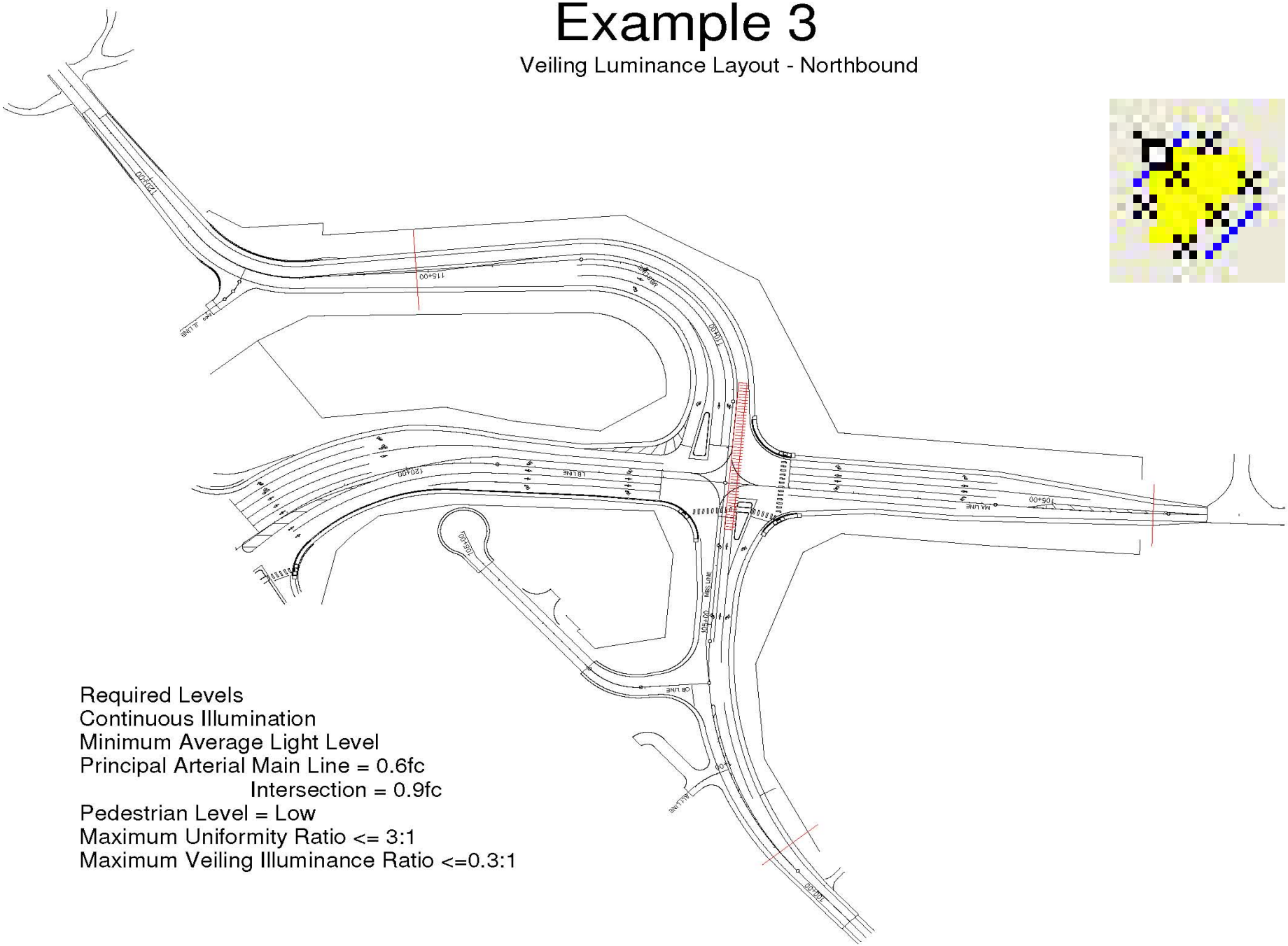
Veiling Luminance Layout - Eastbound



Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

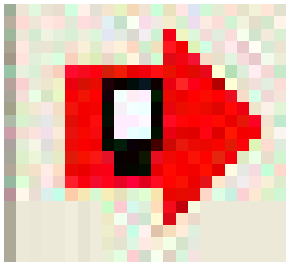
Veiling Luminance Layout - Northbound

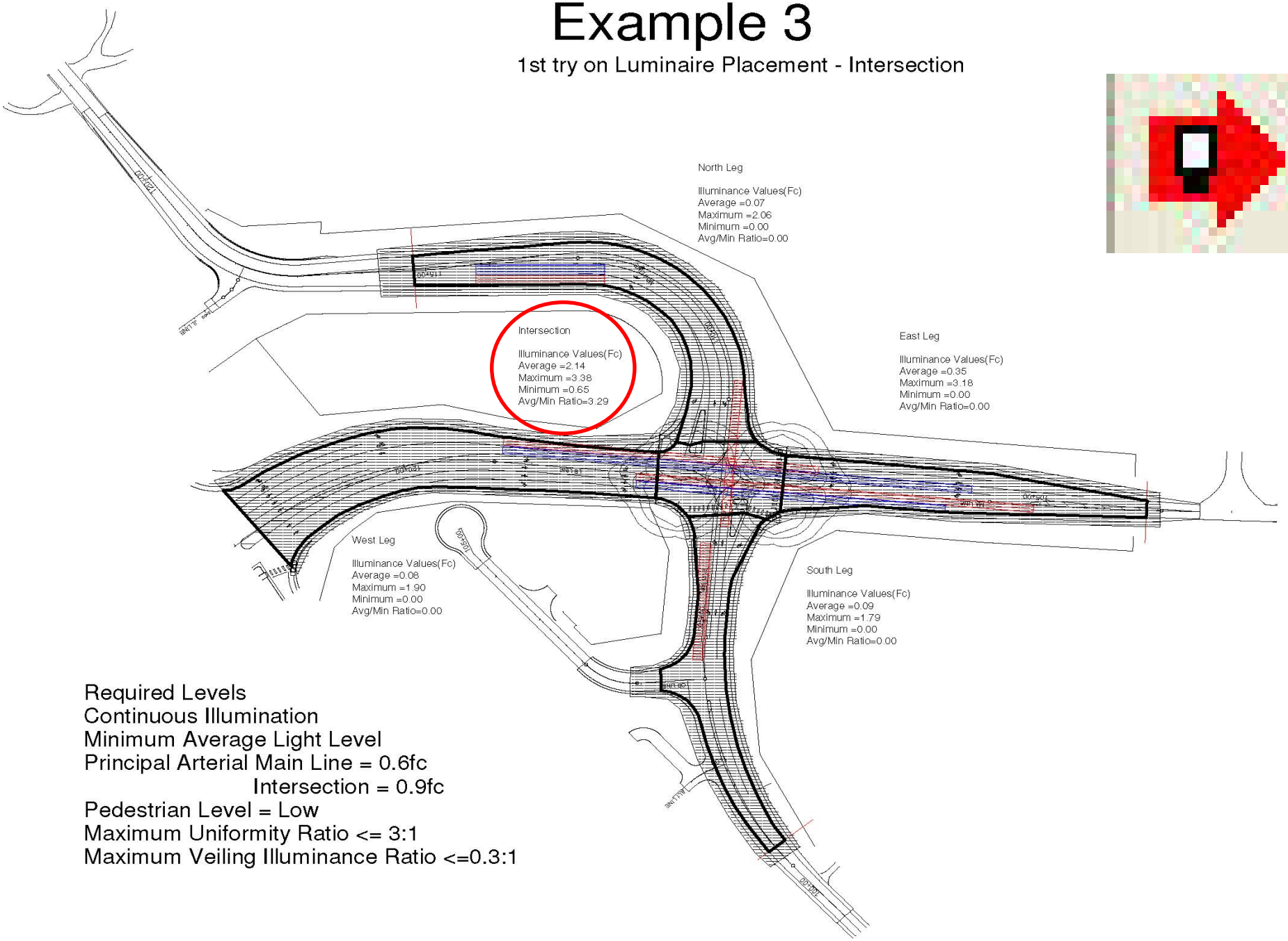


Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

1st try on Luminaire Placement - Intersection

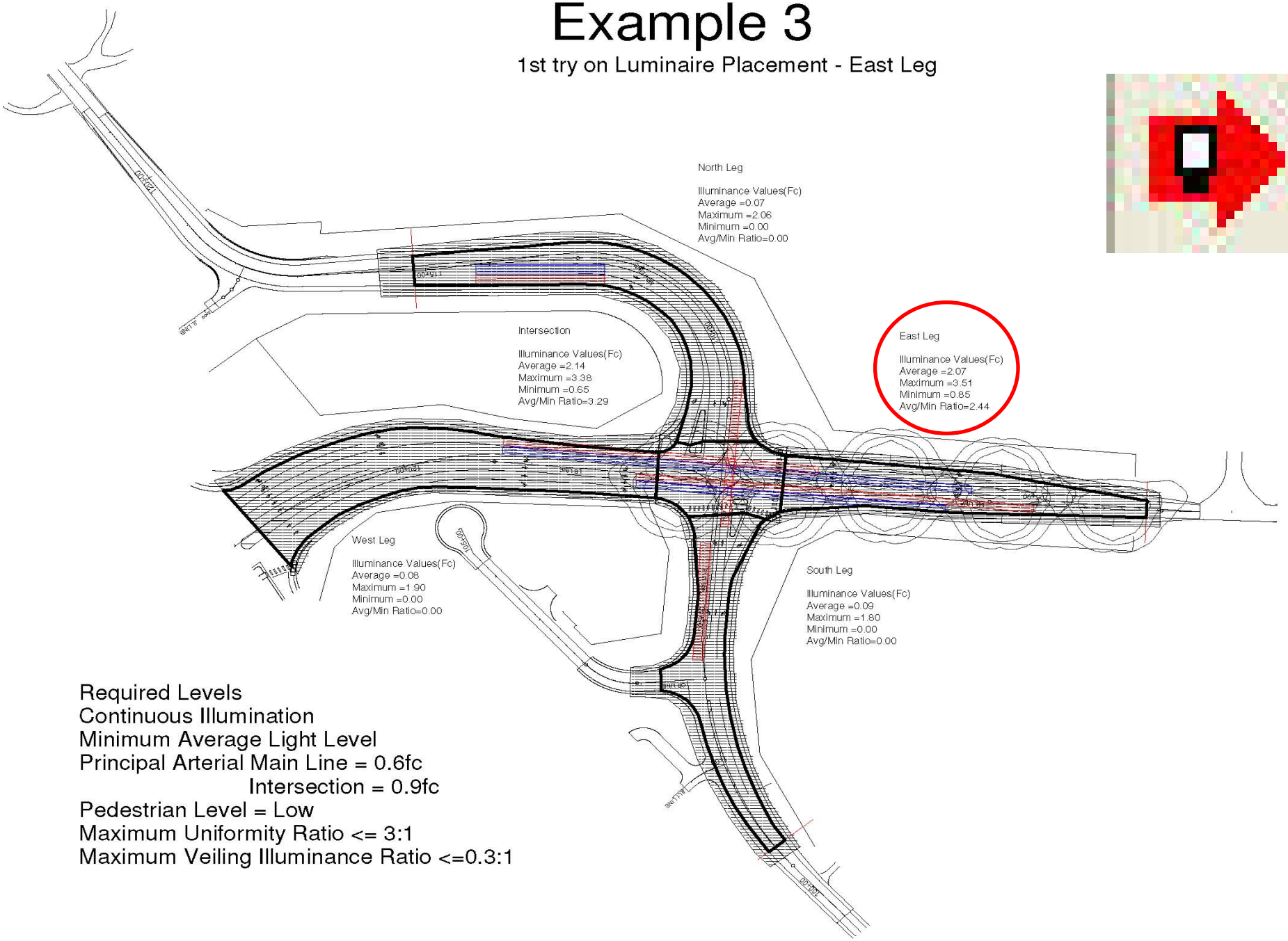




Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

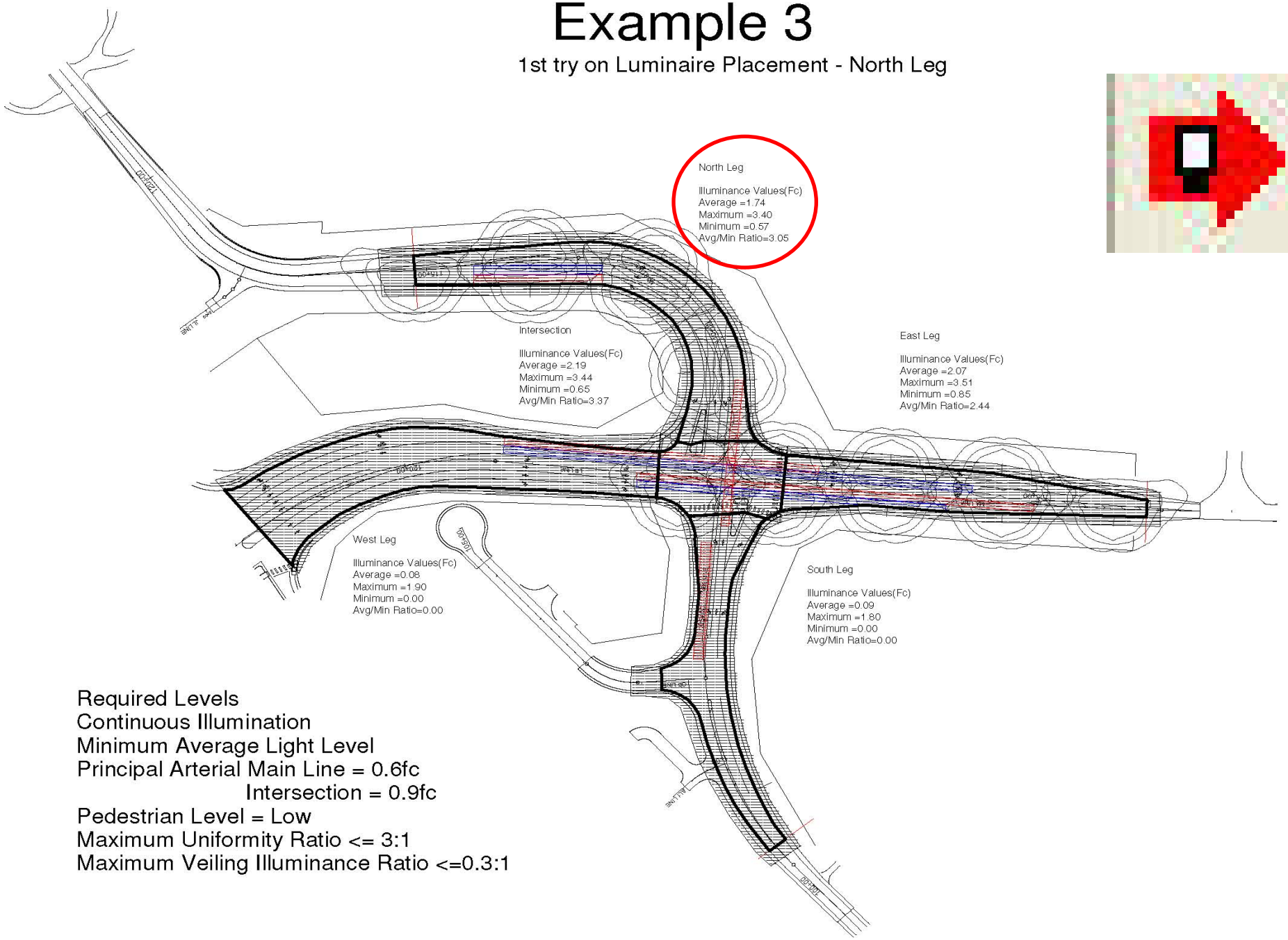
1st try on Luminaire Placement - East Leg

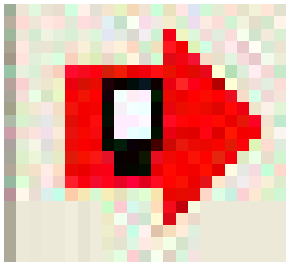


Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

1st try on Luminaire Placement - North Leg

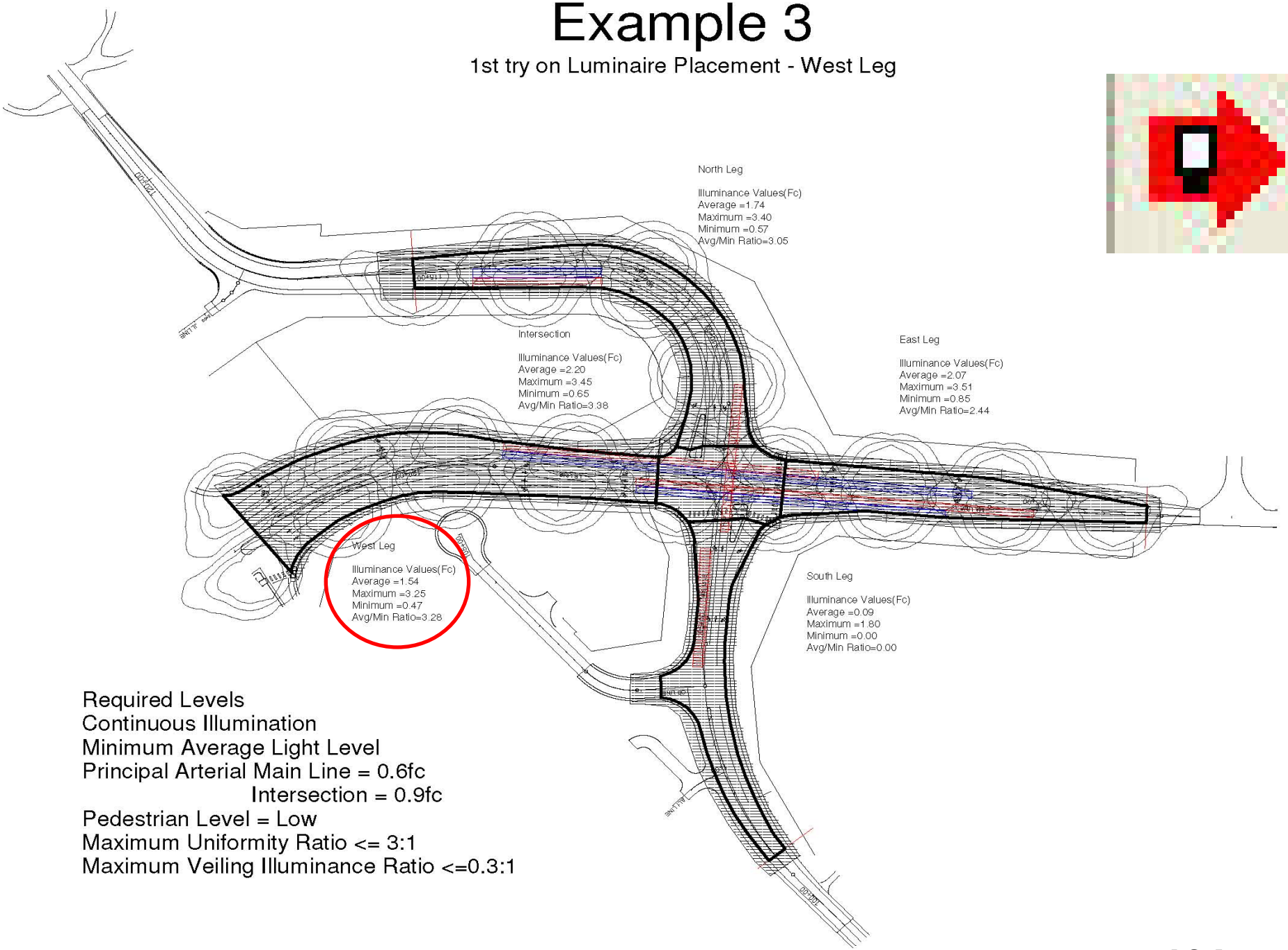




Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

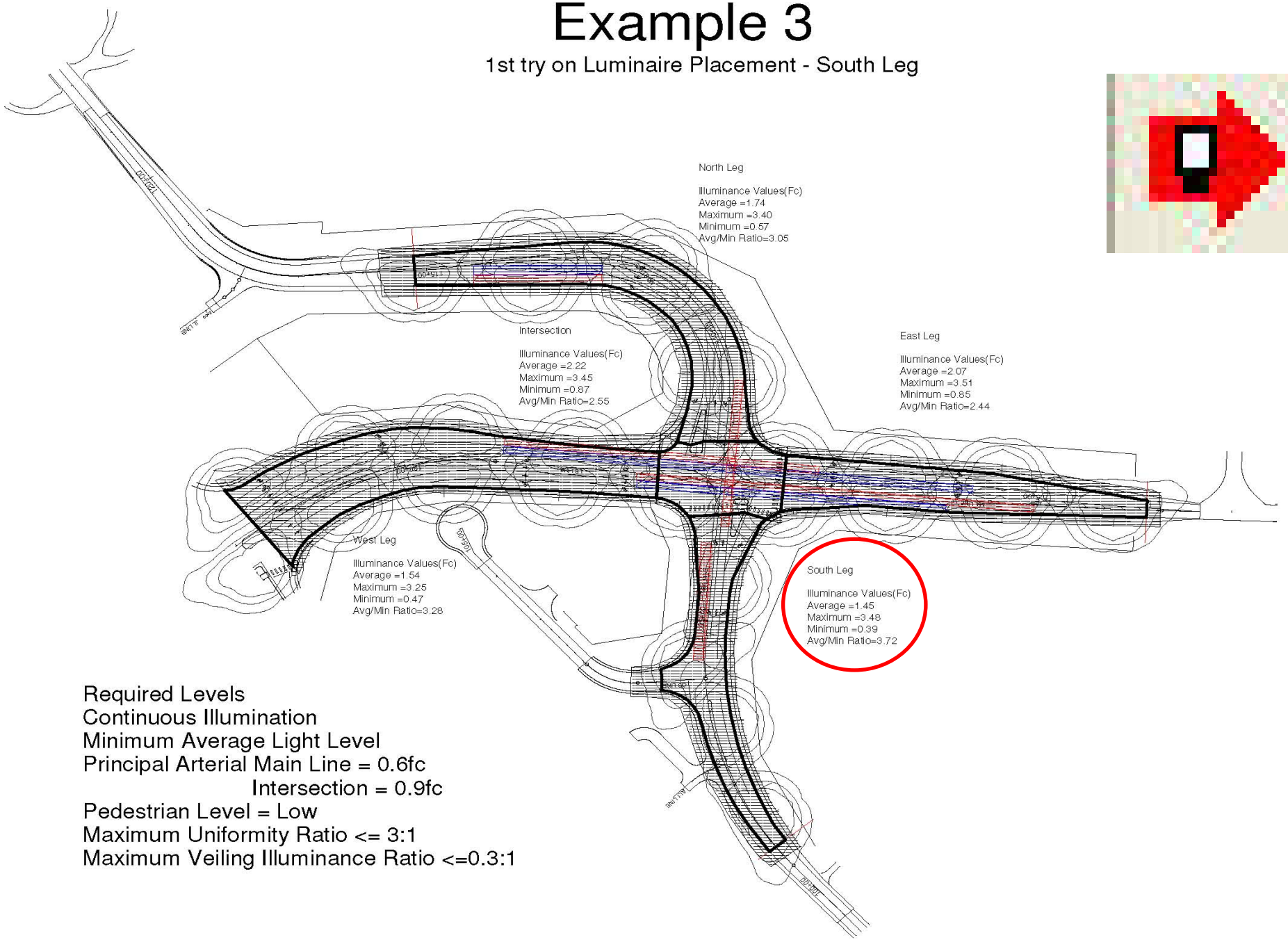
1st try on Luminaire Placement - West Leg



Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

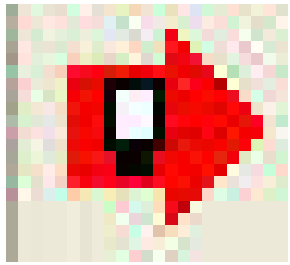
1st try on Luminaire Placement - South Leg

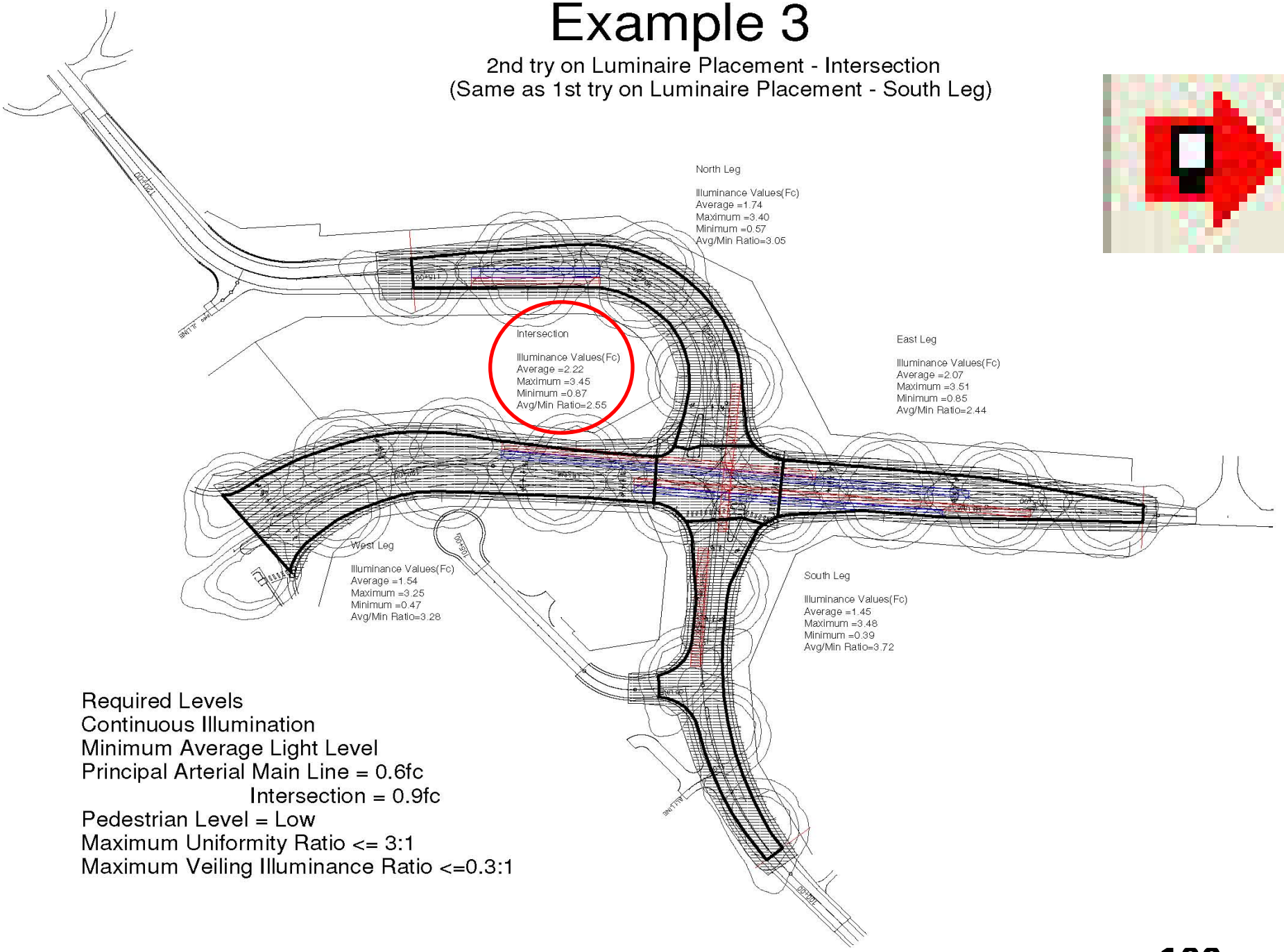


Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

2nd try on Luminaire Placement - Intersection
(Same as 1st try on Luminaire Placement - South Leg)

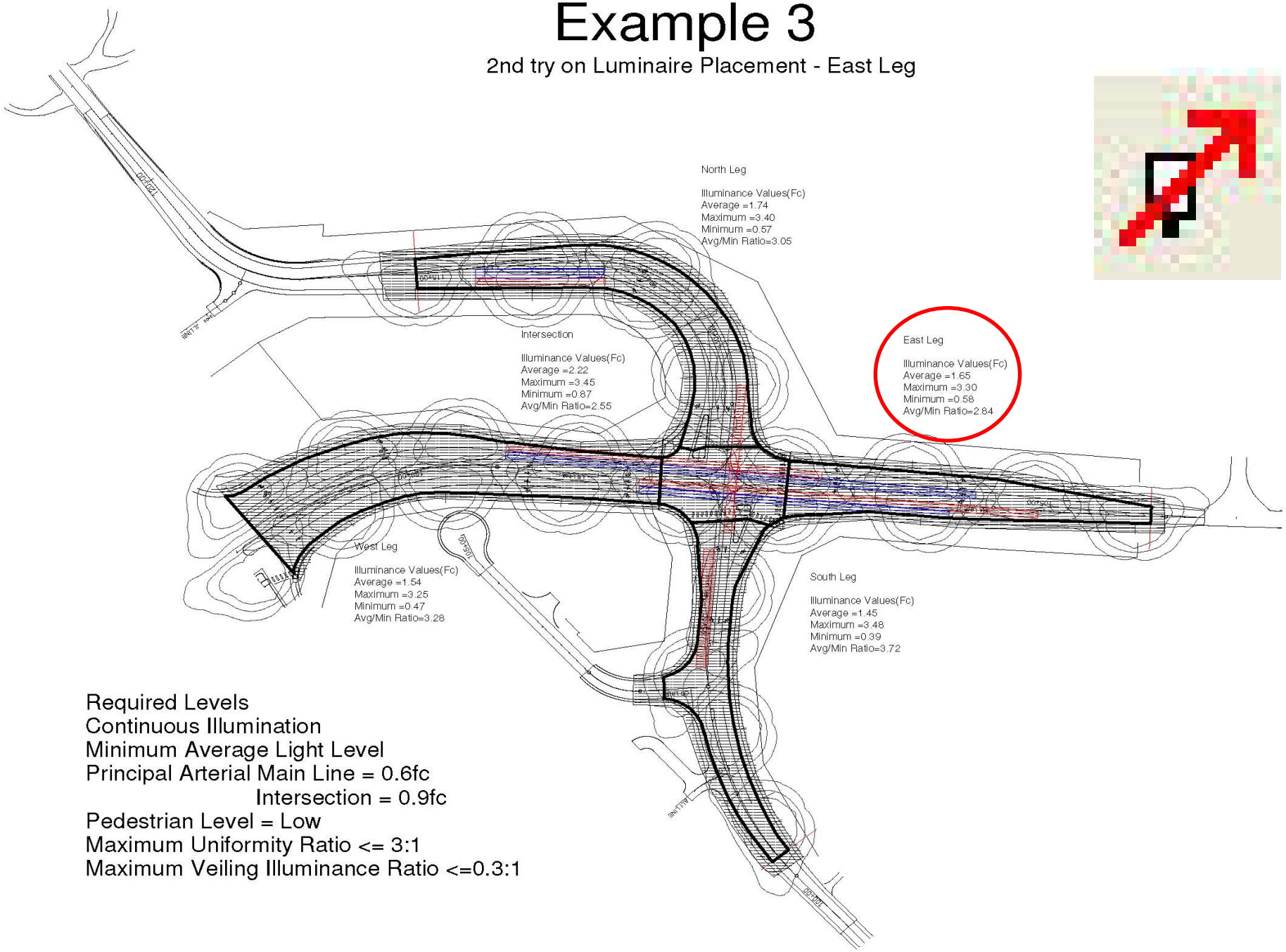




Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

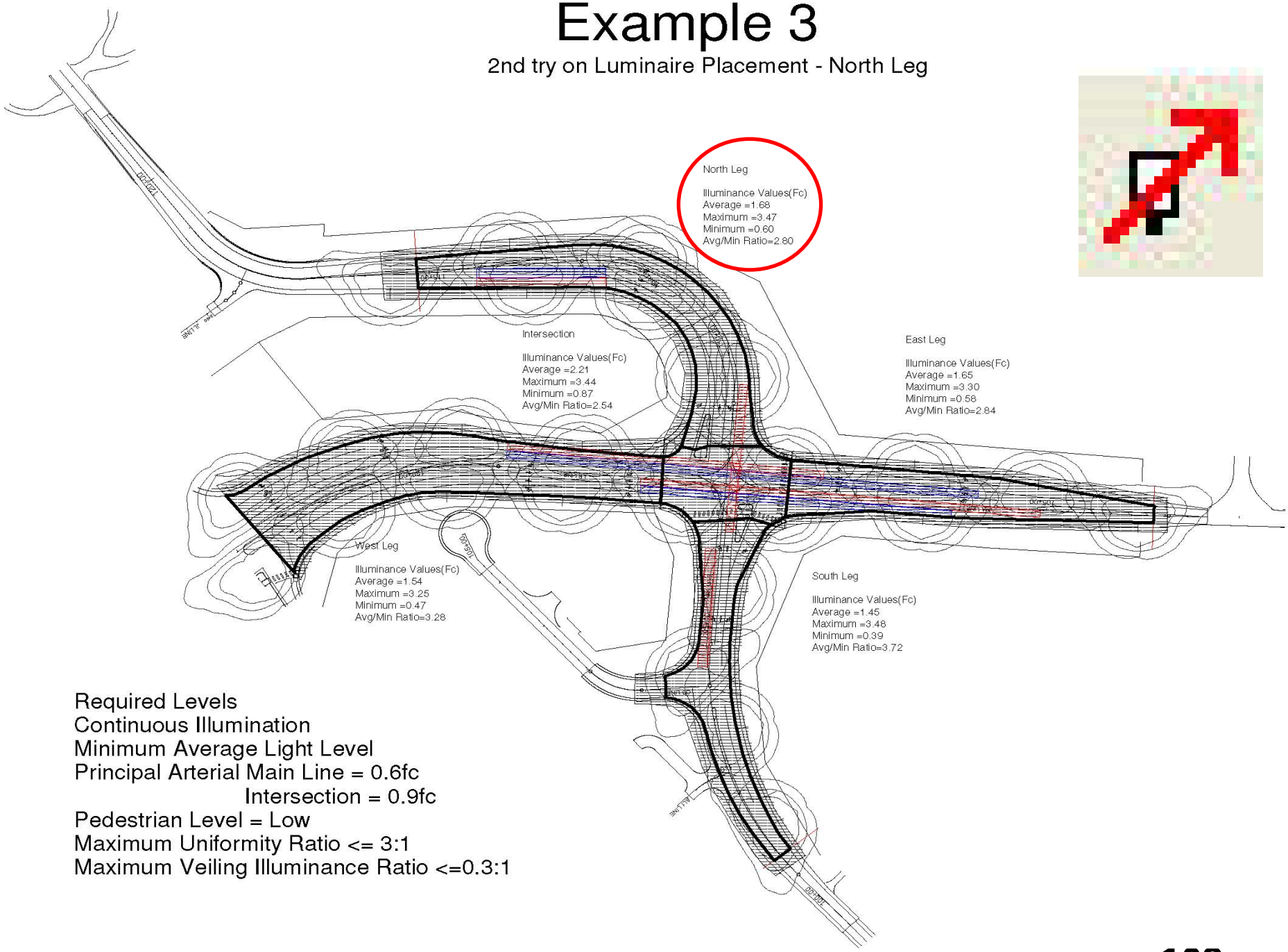
2nd try on Luminaire Placement - East Leg



Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

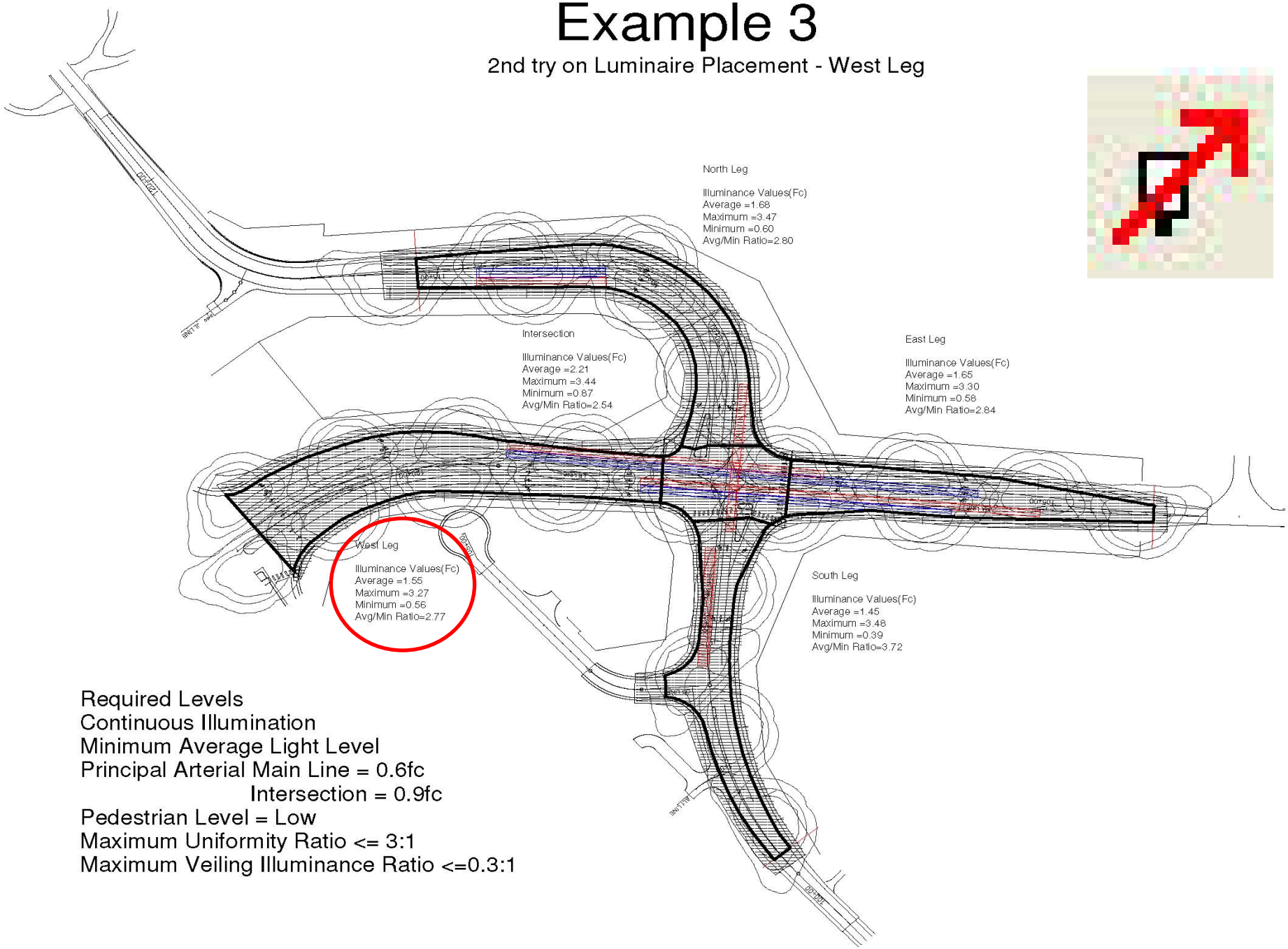
2nd try on Luminaire Placement - North Leg



Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

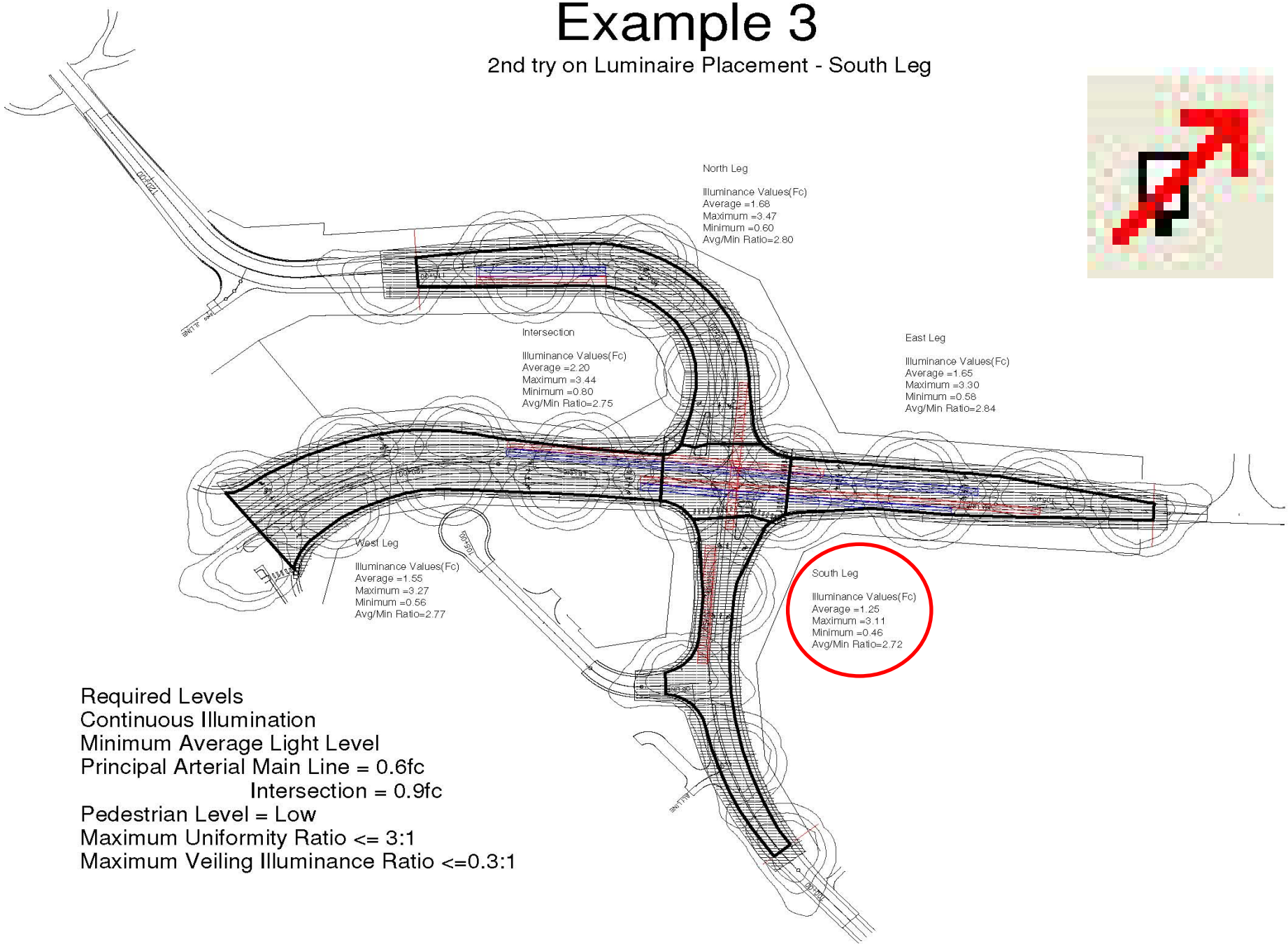
2nd try on Luminaire Placement - West Leg



Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

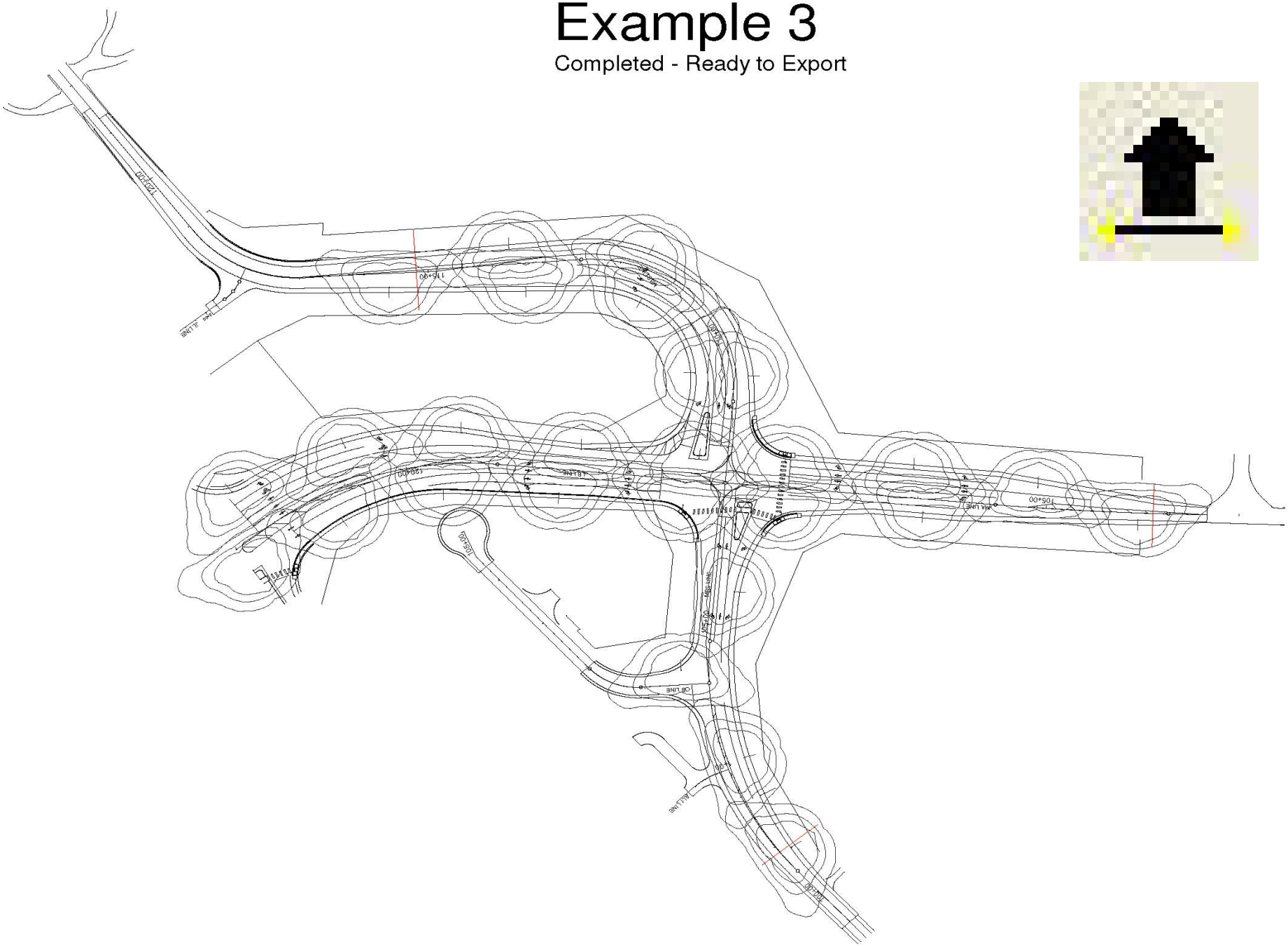
2nd try on Luminaire Placement - South Leg



Required Levels
Continuous Illumination
Minimum Average Light Level
Principal Arterial Main Line = 0.6fc
Intersection = 0.9fc
Pedestrian Level = Low
Maximum Uniformity Ratio <= 3:1
Maximum Veiling Illuminance Ratio <=0.3:1

Example 3

Completed - Ready to Export



TEST

1.) Import the DXF files that are located in the Class folder.

2.) Determine Required Illumination areas in EACH file.

3.) Determine required Design Requirements for all locations.

4.) Use 40 foot Mounting Height.

6.) Use ONLY the state Standard Luminaire.

7.) Use 16 foot Mast arm Length.

8.) Show that you have met all the State Lighting Standards

9.) Export Only the light standards back to DXF.

10.) Save the file as “Test-name”. (I.e. Test-Your Name)