AGI32

32-bit analysis for lighting

Presented By: Ted Bailey

Introduction

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

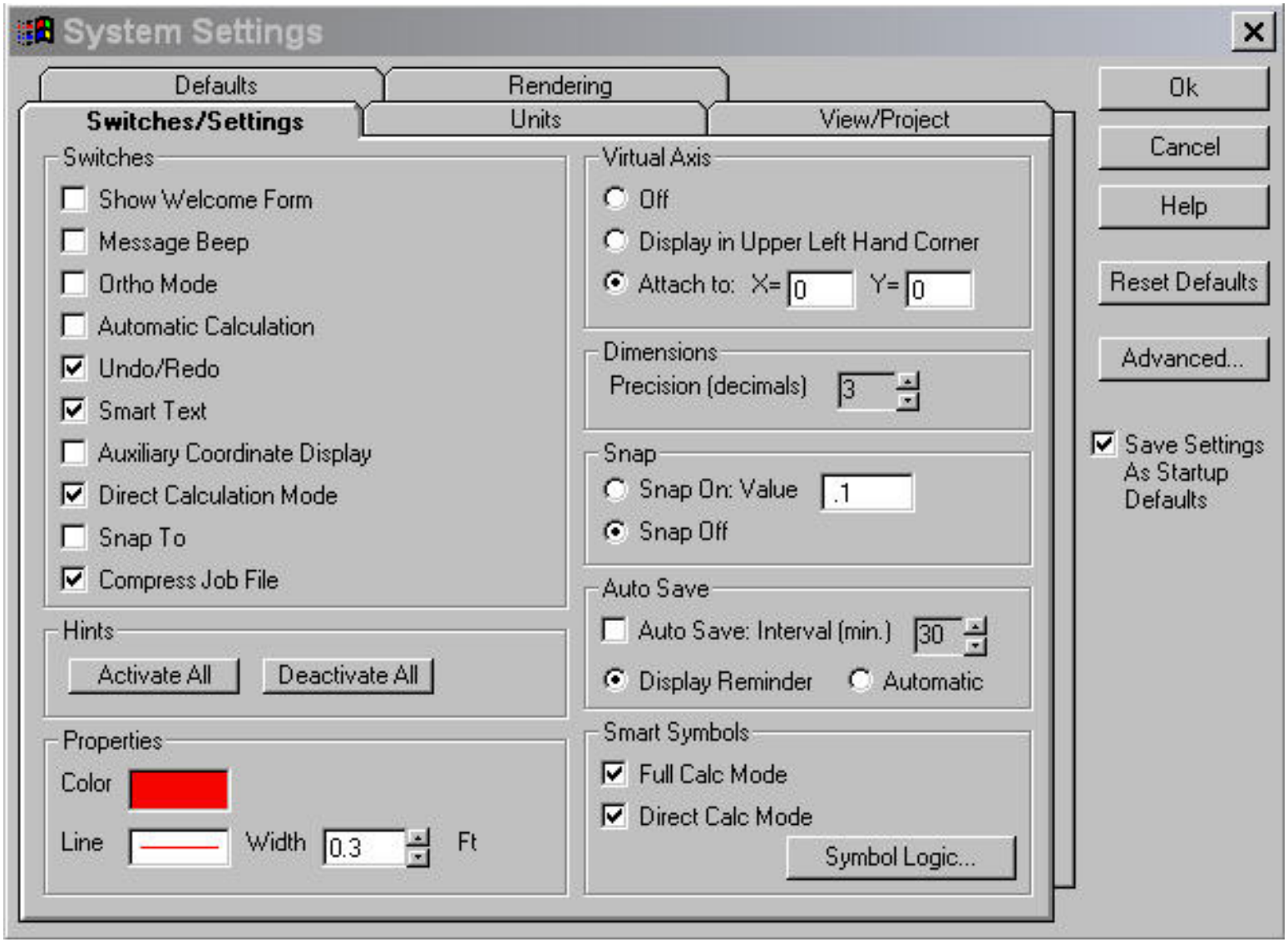
"C:\AGI32_Training"

General Outline of Topics for the Class:

1.) AGI32 System Settings
2.) Importing DXF files into AGI32
3.) Exporting to DXF from AGI32
4.) MISC Tools, View Commands & View Manager
5.) Defining Luminaires
6.) Luminaire Tools
7.) Luminaire Templates
8.) Calculation Point Tools / Calculation Point Grid Placement / Calc. Point Status Manager
9.) Luminance, Veiling Luminance, Spacing, MH, & Wattage Relationships
10.) Roadway Luminance and Veiling Luminance Grids
11.) Isolines and Highlighted Values
12.) Statistical Areas / Statistical Summary
13.) Project Manager
14.) Printing / Documentation
15.) New Network License Manager / Activation Disk / Customizing & Creating Tools
16.) Tech Support and Contacts
17.) 5 Examples
18.) TEST
19.) 3D in AGI32 - Basics

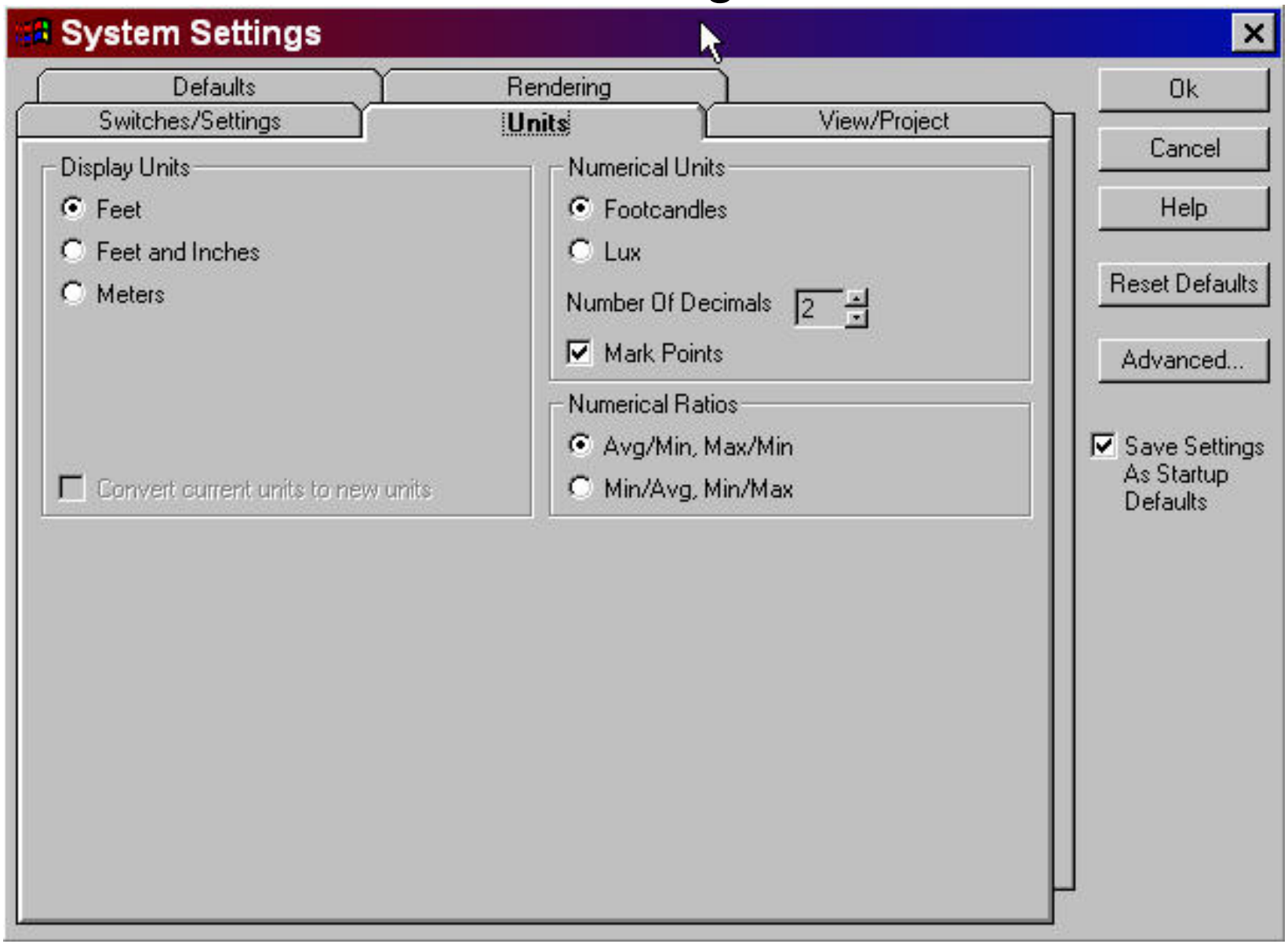
System Settings - Switches/Settings

Match the settings as shown below.



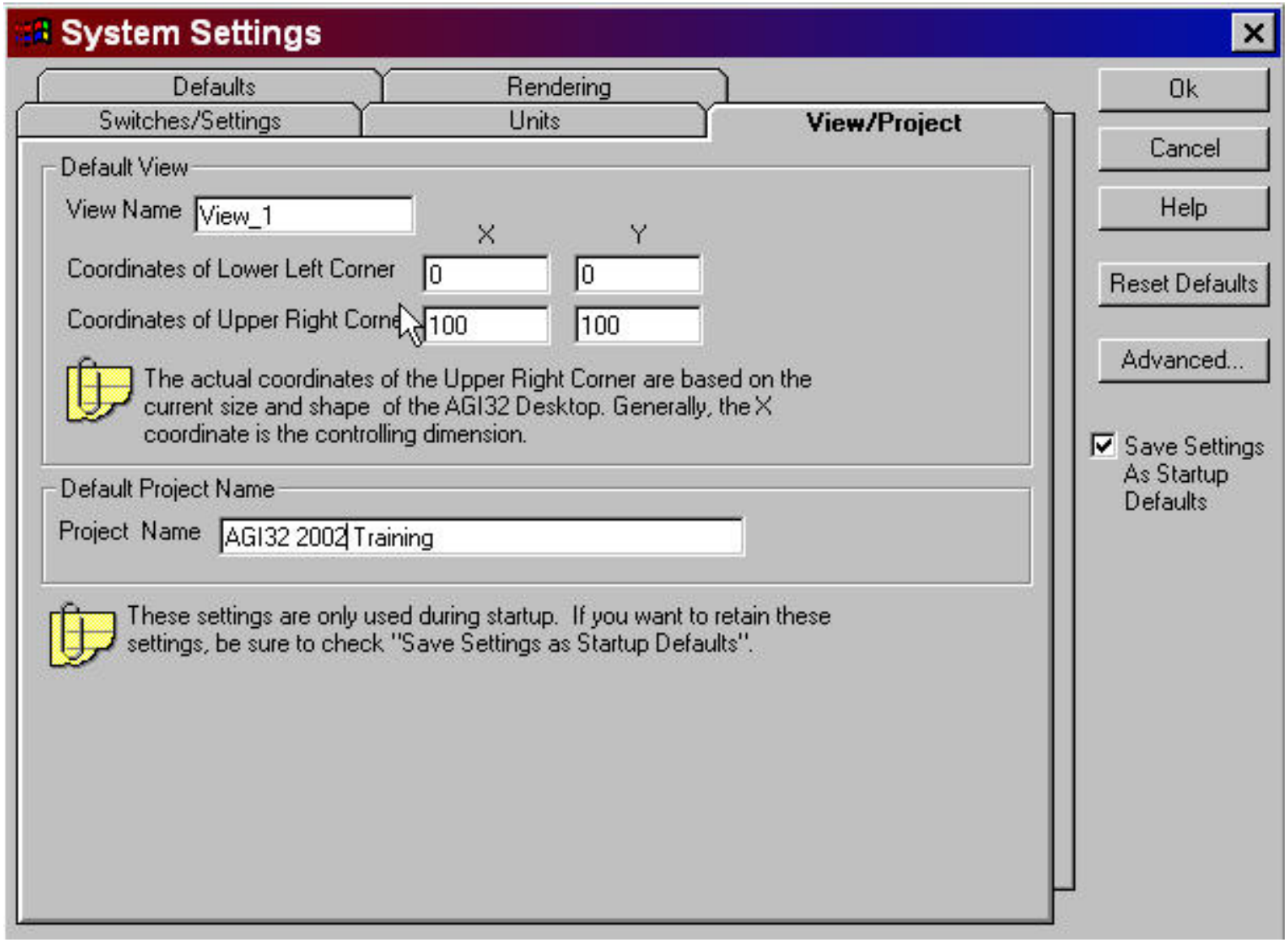
System Settings - Units

Match the settings as shown below.



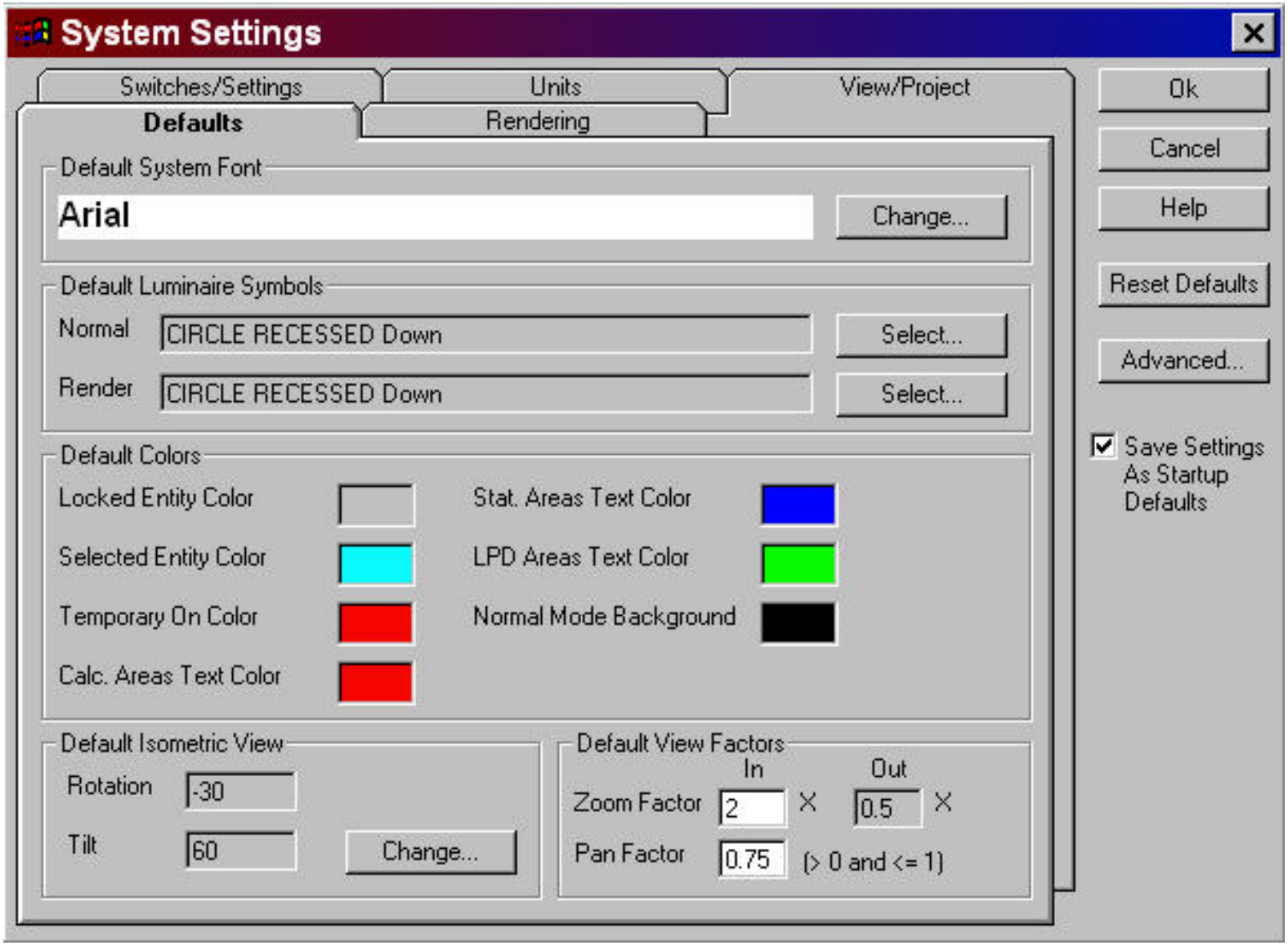
System Settings – View/Project

Type in a View Name and Project Name.



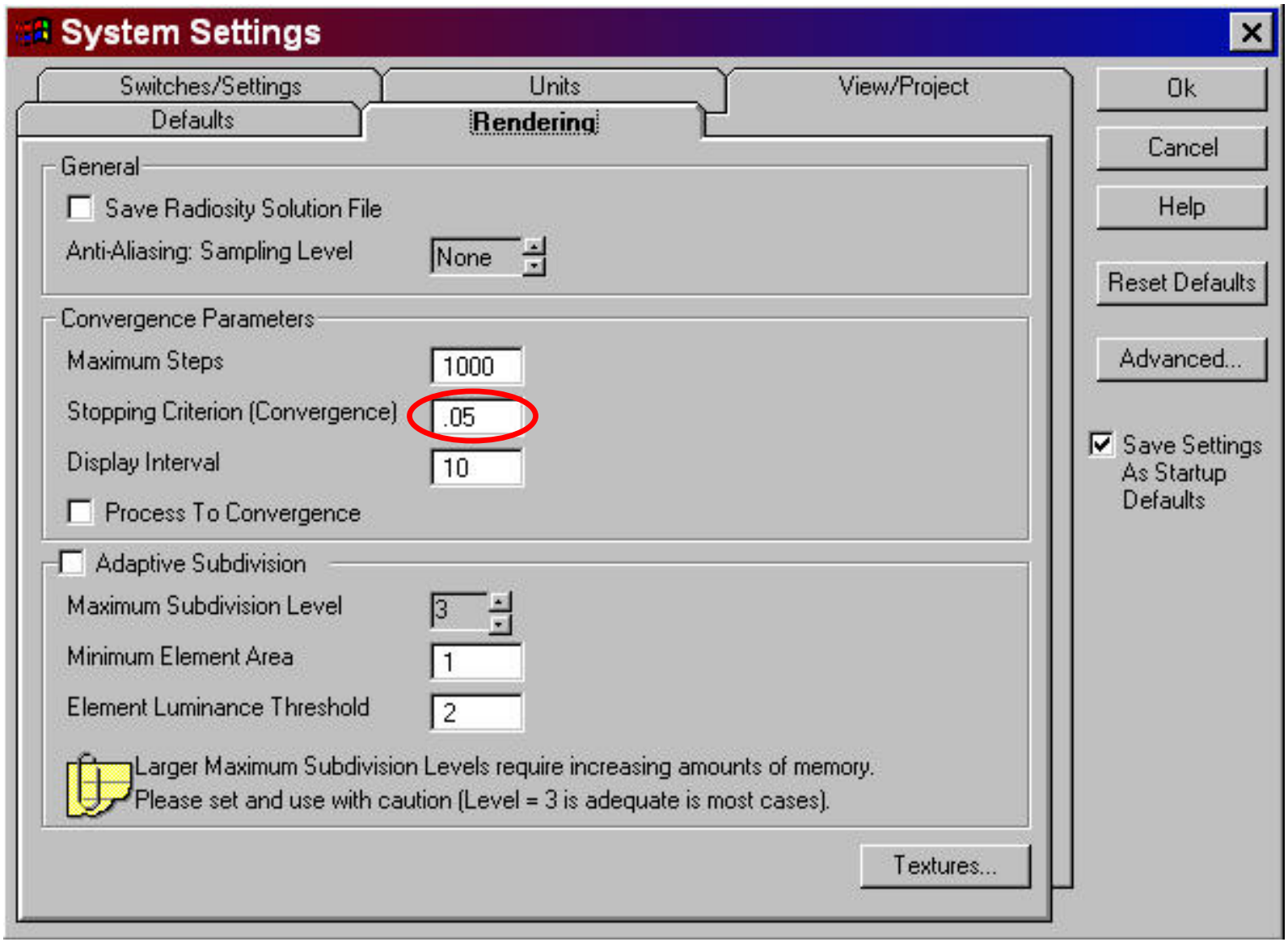
System Settings - Defaults

Match the settings as shown below.



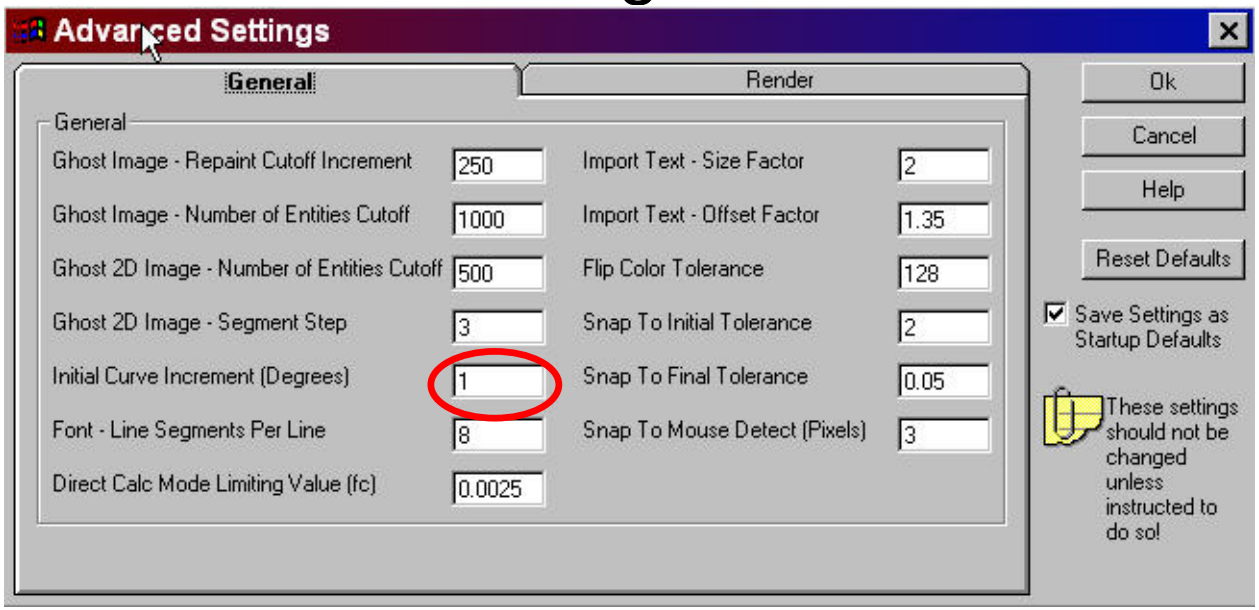
System Settings - Rendering

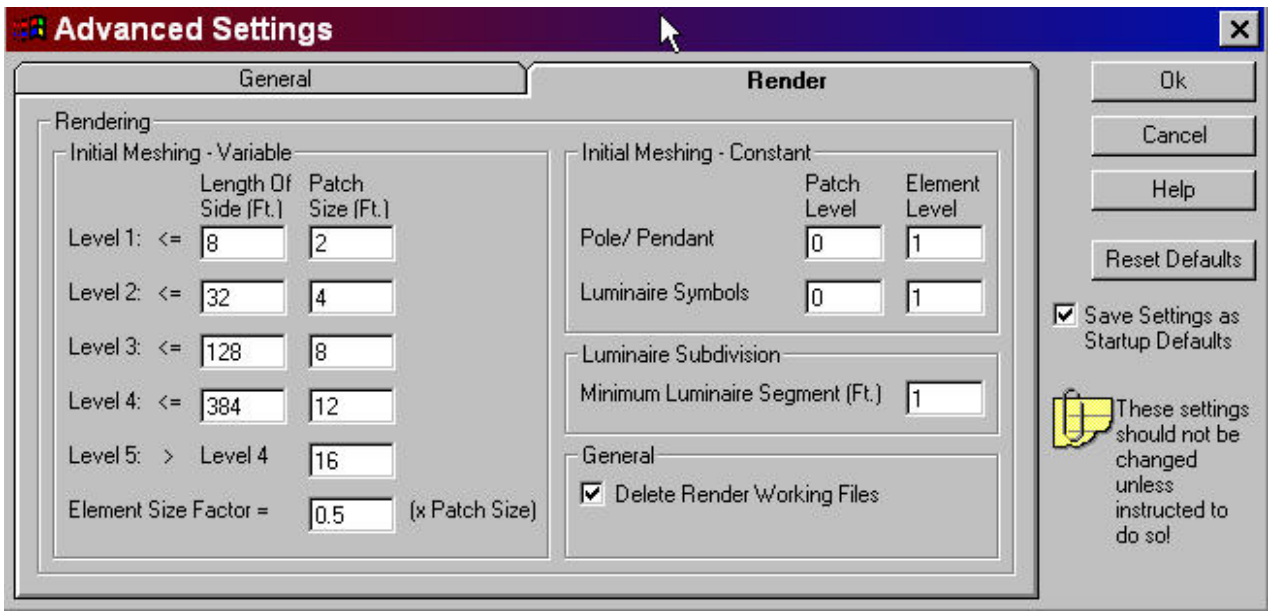
Match the settings as shown below.



System Settings – Advanced Settings

Match the settings as shown below.





Importing a DXF File into AGI32

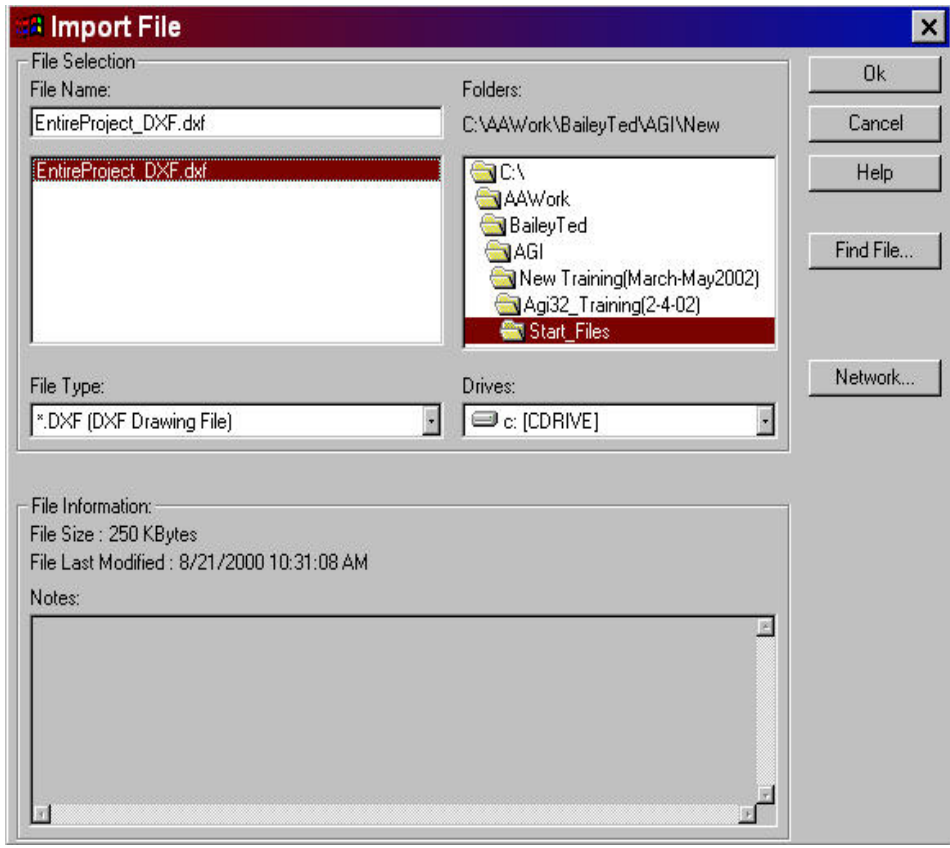
Open a new file in AGI and go to File\Import.

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.

Don't move or reorient the basemap after Importing.



Select the file you wish to import.

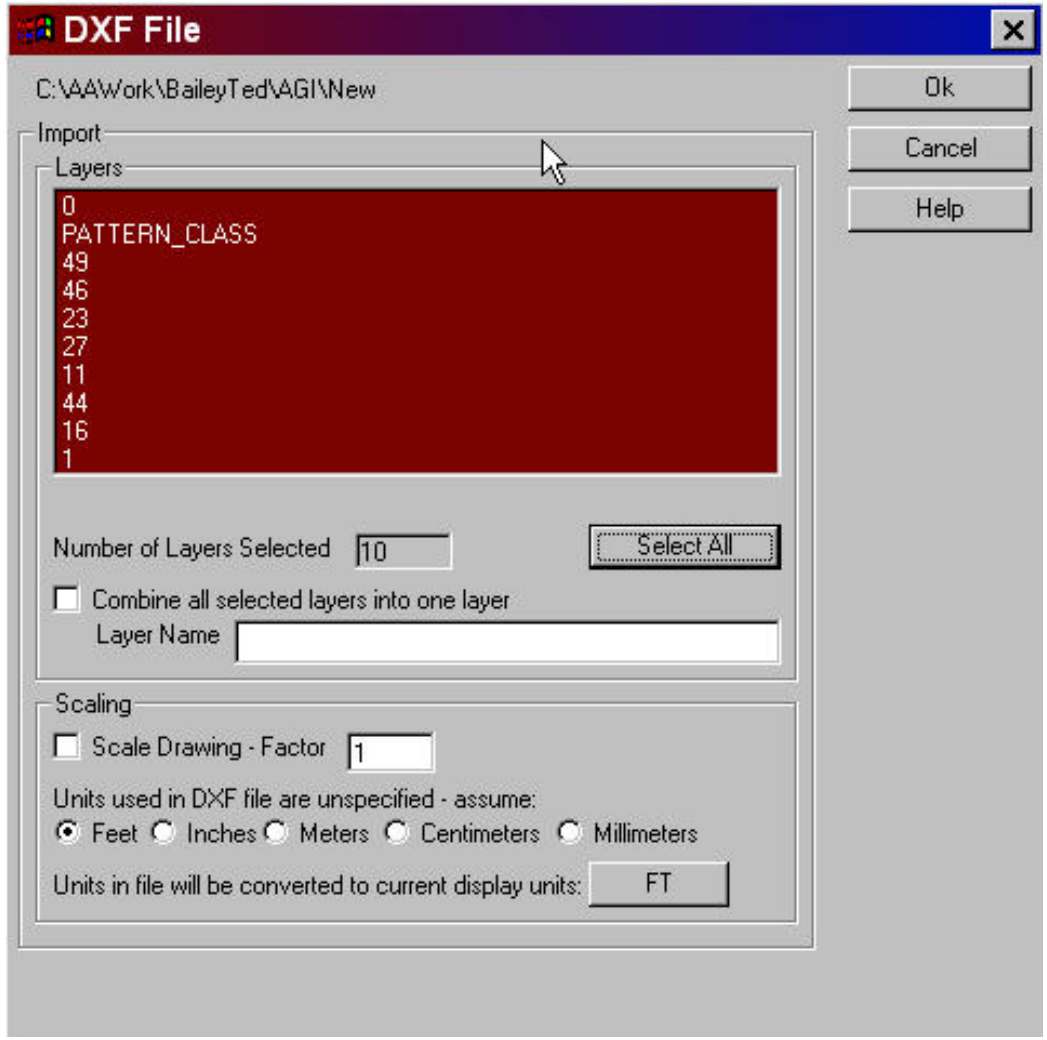
Importing a DXF File into AGI 32 Cont…

Select All Layers

Set the scale factor to 1.

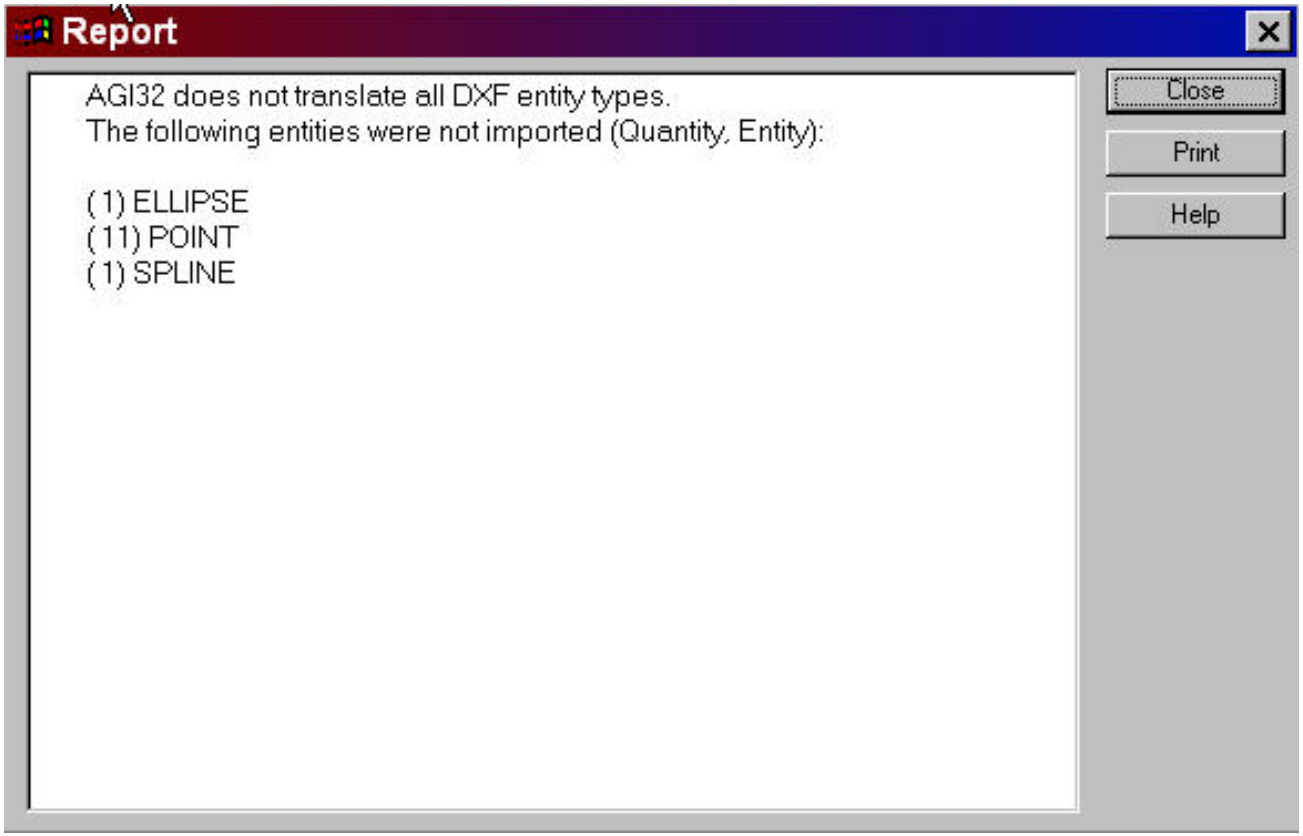
Specify the units to match the DXF file.

Select your desired working units in AGI.



<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.

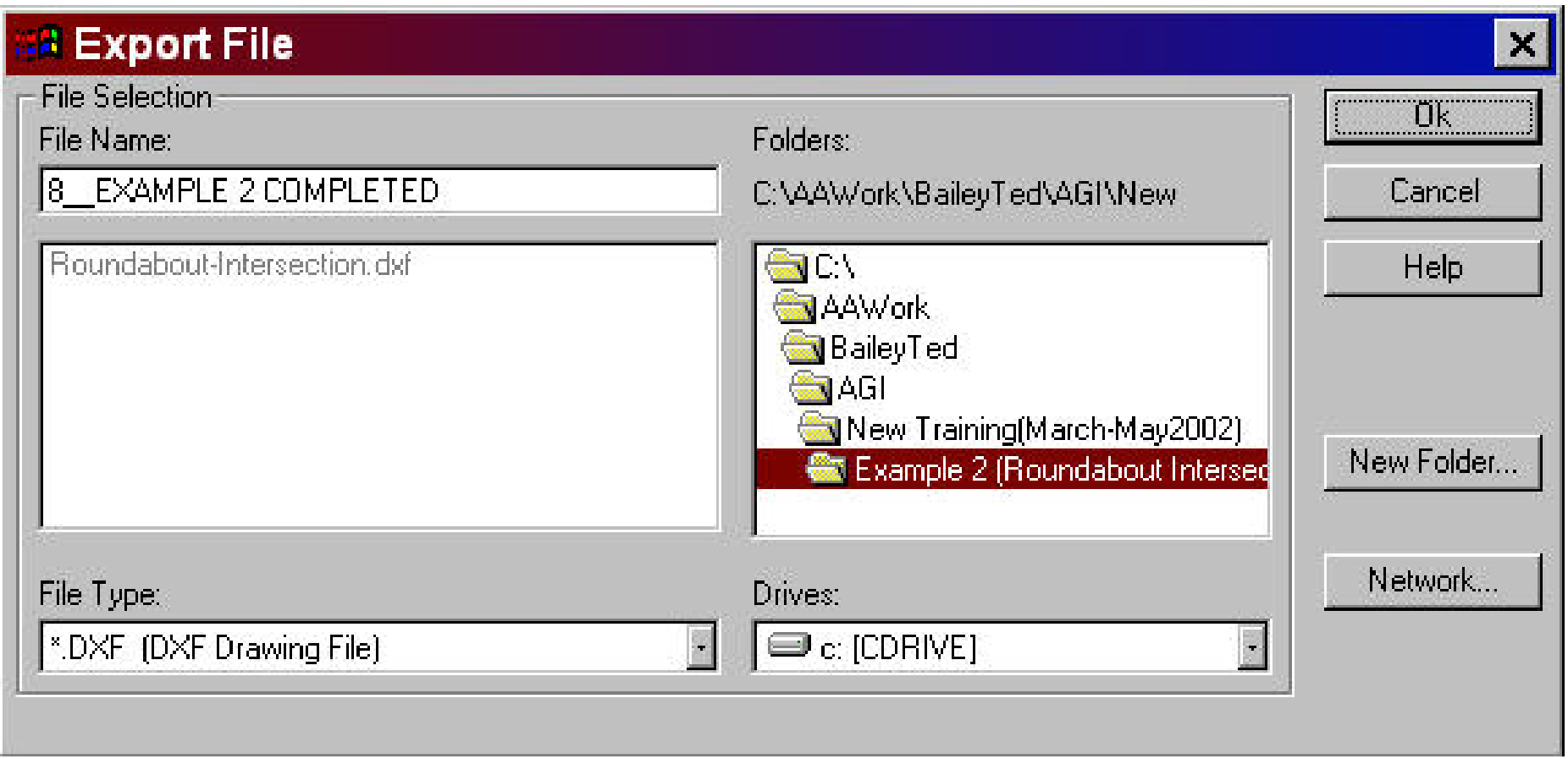
Importing a DXF File into AGI 32 Cont…



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

Exporting from AGI32 to DXF

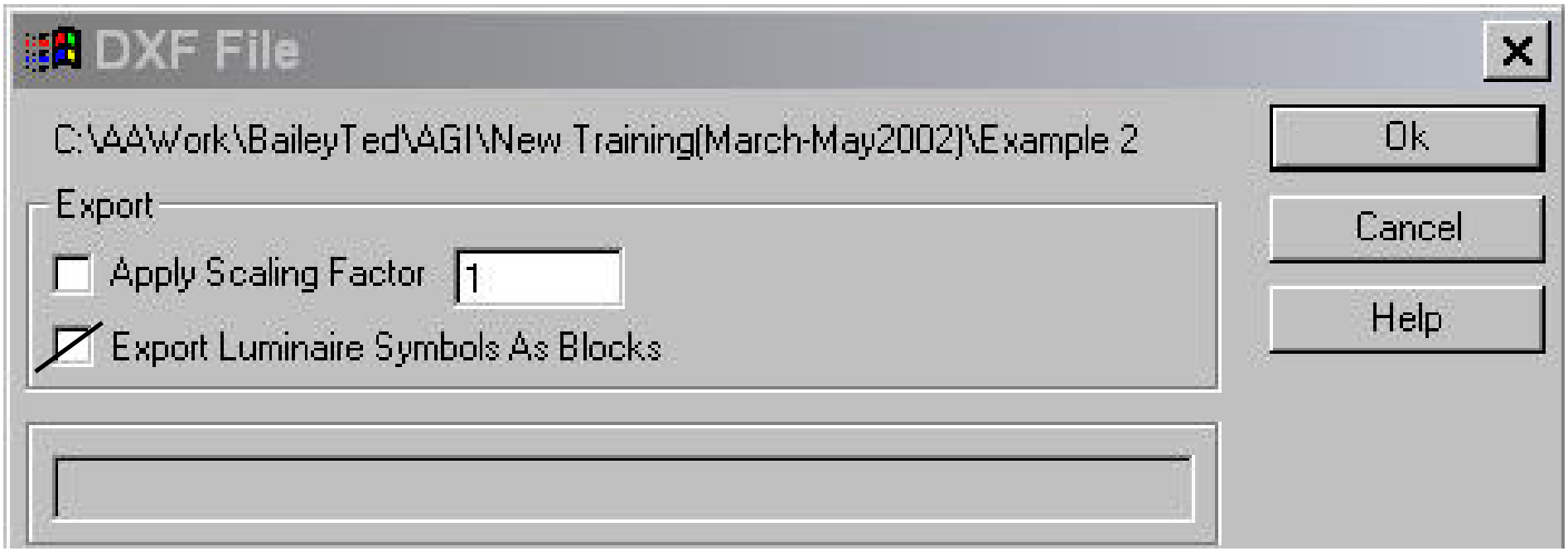
Open the file in AGI32 that you want to Export. Next go to File\Export.



Select a name and location for the exported file.

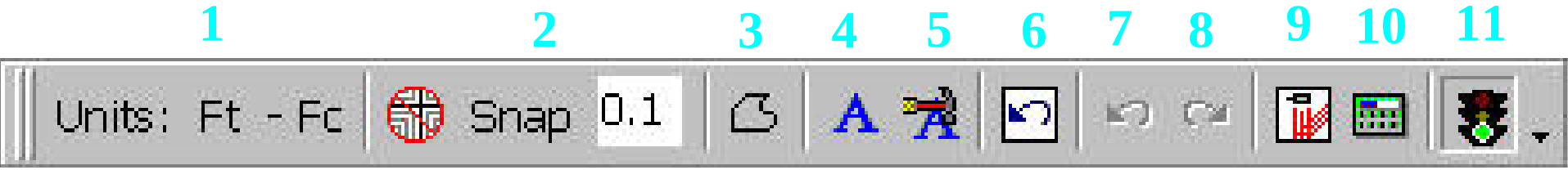
Exporting from AGI32 to DXF Cont...

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.) Text (Use to Place Text)

5.) Edit Text (Use to Edit Text)

6.) Undo Switch (Turns Undo Feature On/Off)

7.) Undo (You can also use Ctrl + Z)

8.) Redo

9.) 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.

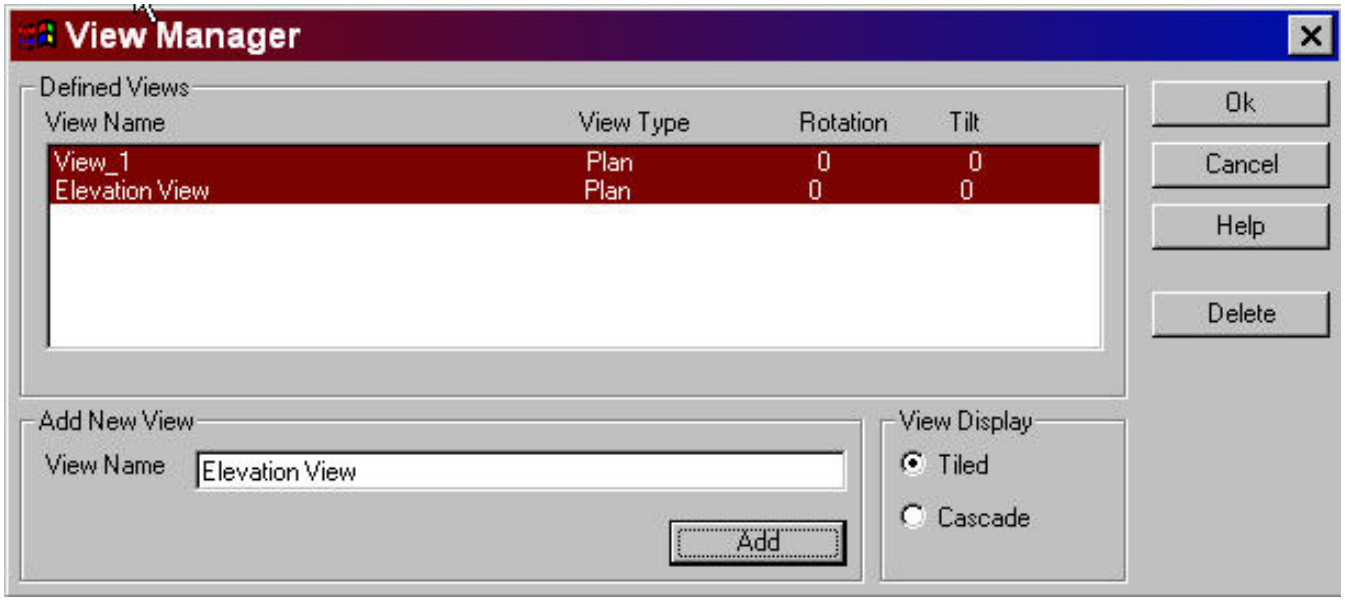
10.) Calculate Switch (Calculates the design file.)

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

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
6.) Zoom Out
7.) View 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 Manager (Allows you to add / create / name / manipulate(Turn ON/OFF) different views)
11.) Plan-Rotated (Rotates the view to any orientation that you wish)
12.) View Previous
13.) Plan View
14.) Elevation View (Select 2 pts from left to right in the direction of the cross section that you wish to view.)
15-18.) Preset Elevation Views (View North, South, East & West Elevation Views)
19.) Isometric View (Shows a skewed 3D view according to System Settings)
20-23.) Preset Isometric Views (View Northeast, Northwest, Southeast, Southwest Isometric Views)

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.**

Luminaires – Long Mast Arm

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)

200W = 22,000 Lumens, 250W = 28,000 Lumens
310W = 37,000 Lumens, 400W = 50,000 Lumens

Cobra Head Fixture - Specification

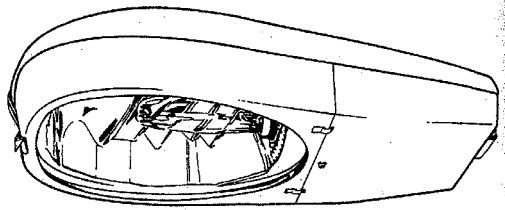
M-400A POWR/DOOR® LUMINAIRE WITH CUTOFF OPTICS

APPLICATIONS

Street, highway and parking lot lighting

SPECIFICATION FEATURES

- Powr/Module ballast assembly
- Filtered optics
- Universal two-bolt slipfitter
- Standardized reflector
- "Dead back" tunnel type FRP terminal board
- Metal bird guard – no guard needed for 2-in. pipe
- 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
- UL Listed unit available – See Options
- UL Listed to Canadian National Standards and Codes unit available – contact factory
- Standard construction is IP55
- System 2™ Bi-Level Controls available
- Magnapack packaging available – See Technical Section



Turtle-friendly luminaires available for coastal nesting areas. Contact factory.

ORDERING NUMBER LOGIC

MDCL 40 S 1 A 2 1 F MC3 1 F

PRODUCT ID. XXXX	WATTAGE XX	LIGHT SOURCE X	VOLTAGE X	BALLAST TYPE X	PE FUNCTION X	IGNITOR MOUNTING X	LENS TYPE X	IES DISTRIBUTION TYPE X X X	FILTER X	OPTIONS XXX
MDCL= M-400A with Cutoff Optics	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	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= 120X240 8= 240V Ballast 120V PE Receptacle not reconnectable D = 347 F = 120X347 T = 220 W = 230 50Hz 6 = 220 R = 230 Y = 240 NOTE: Dual voltage connected for lower voltage	See Ballast Selection Table A =Autoreg B =System 2 Bi-Level Controls Autoreg C =Merc-Reg G =Mag-Reg with Grounded Socket Shell H =HPF Reactor or Lag K =Hot Restart NOTE: K only has ballast in top housing L =Super Low Loss Autoreg M=Mag-Reg N =NPF Reactor or Lag P =CWI 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 Maximum) S = Short M= Medium C = Cutoff	See Photometric Selection Table 1=Type I 2=Type II 3=Type III 6=Special Type III 7=Special Type II	1=Fiber gasket 2=Charcoal with elastomer gasket	F = Fusing (Not available with multivolt or dual voltage) J =Line Surge Protector, Expulsion Type N =Suitable for severe vibration up to 3 G's. Ballast not mounted on Powr/Door module U =UL Listed Glass Lens and 60 Hz only

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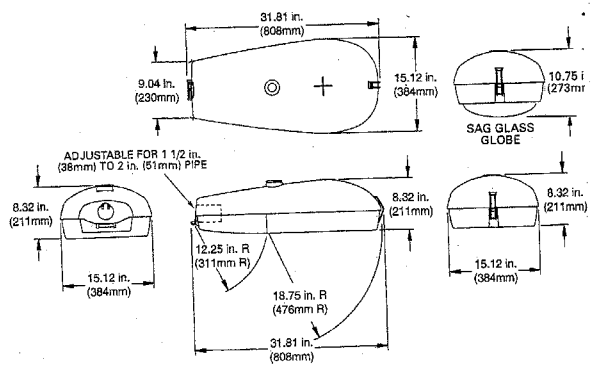
Cobra Head Fixture - Specification

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

DIMENSIONS



DATA

Approximate Net Weight:
33-39 lbs (15-18 kgs)
Effective Projected Area:
1.1 sq ft max (0.1 sq M max)
Suggested Mounting Height:
30-50 ft (9-15M)

PHOTOMETRIC SELECTION TABLE

CLEAR REFRACTORS. All light sources are clear.

Wattage	Light Source	IES Distribution Type Photometric Curve Number 35–45xxxx							
		Flat Glass		SAG Glass Globe					Polycarbonate
		MC2	MC3	MC1	SC2	SC3	MC2	MC3	
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	C/F
175 & 250	MH	0343	0002	N/A	N/A	N/A	0544	0545	C/F
400 "G"	MH	N/A	0484*	0281	N/A	N/A	0280	N/A	C/F
400 "G"	Merc	N/A	N/A	N/A	N/A	N/A	0375	0376	C/F
400 (Coated)	Merc	N/A	N/A	N/A	0282	C/F	N/A	N/A	C/F

N/A = Not Available C/F = Contact Factory *Tubular Lamp

REFERENCES

See Page 324 for Accessories
See Page 328 for Explanation of Options and Other Terms Used
See Page 332 for Pole Selection

BALLAST SELECTION TABLE

Wattage	Light Source	Multi-volt	Ballast Type/Voltage 60Hz										50Hz		
			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,K,M,N	G,K,M	G,K,M	G,K,M	G,M	G,H,M,N	G*,H,M*,N	G,K,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,P	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,L,M,N,P	A,G,H,L,M,N,P	A,G,H,L,M,N,P	A,G,L,M,P	A,G,L,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,B	A,B	A,B	A,B	A,B	A,B	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,B,M	A,B,G,L,M	A,B,G,H,L,M,N	A,B,G,H,L,M,N	A,B,G,L,M	A,B,G,L,M	A,B,G,M	A,B,G,M	A,B,G,H,M,N	H,A,N	H	A,H,M,N	N/A	A,H,M
70, 100,150	MH	H,N	H,N	H,N	H,N	H,N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75	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	A,C,N	A,C	A,C,H,N	A,C,H,N	A,C	C	N/A	A,C,H,N	N/A	N/A	A	N/A	H

NOTE: N/A = Not Available

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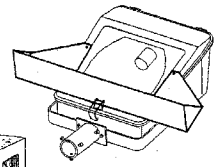
Cobra Head Fixture – Accessories

ACCESSORIES

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

BOTTOM VISOR

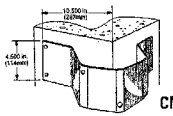
- **BVAL-V2FS** Aluminum
- **BVDB-V2FS** Dark Bronze



BV***

CORNER MOUNTING ADAPTER

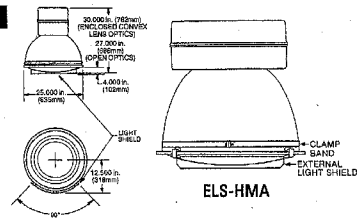
- **CMA-PB**



CMA-PB

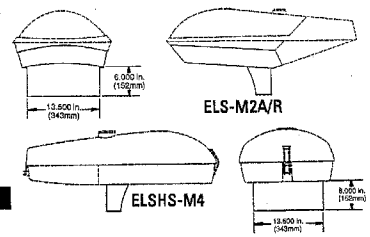
EXTERNAL LIGHT SHIELD

- **ELS-HMA**
  90° for High Mast (4-inch [102mm] aluminum)
- **ELS-HMA90AL**
  90° (10-inch [254mm] aluminum)
- **ELS-HMA180AL**
  180° (10-inch [254mm] aluminum)



ELS-HMA

- **ELS-M2A**
  For M-250A2
- **ELS-M2R**
  For M-250R2
- NEW **ELSHS-M4R**
  House side light shield for M400 and M400A non-cutoff, house and street side light shield for MSRL/MSCL/MDRL/MDCL
- NEW **ELSHS-M4AC**
  House side light shield for M-400 and M-400A Cutoff
- NEW **ELSHS-M4AC002**
  Street side light shield for M-400A Cutoff

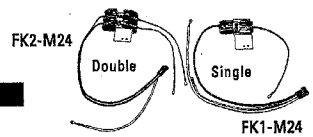


ELS-M2A/R

ELSHS-M4

FUSE KITS (LESS FUSES)

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

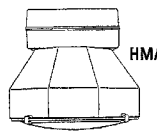


FK2-M24

FK1-M24

HAIL SHIELD

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

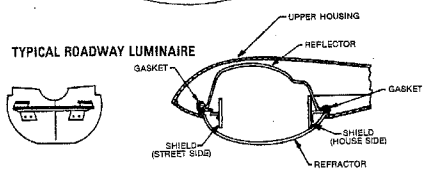


HMAA-HS

INTERNAL LIGHT SHIELD

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

TYPICAL ROADWAY LUMINAIRE



Data subject to change without notice

Cobra Head Fixture – Ballast Spec.

BALLAST ELECTRICAL DATA

NOTES

The letter in the box before each ballast description corresponds to the Ballast Type in the Ordering Number Logic for each product. For example, M is the Ordering Number Logic for magnetic regulator ballasts. See product pages for availability of each ballast type.

Ballast choices other than those described on these pages also appear on product pages. They are:

B = System 2™ Bi-Level Control autoregulator (see page 392)

G = the same ballast as M except G has a grounded socket shell;

K = Hot Restart (restrikes the lamp instantly after a power interruption; see page 230)

W = Whisper Quiet™ autoregulator (for situations where a quieter ballast is required). Contact factory for ballast electrical data.

The ballast electrical data listed on these technical data pages are for General Electric ballasts only. These ballasts are designed and manufactured at the GE Lighting Systems plant in Hendersonville, NC.

* For outdoor products the line watts are 481.

** Note that these starting currents are power factor capacitor currents which flow if the lamp draws no current, for example, hot restart conditions. Normal current will be lower.

*** Lowatts of constant-current transformer capacity per ballast recommended for proper operation.

WARNINGS

Size branch circuits to accommodate line-operating amperes or line starting amperes—whichever is larger.

The data listed is typical of that obtained when a ballast is tested under laboratory conditions as a separate component. When these components are encapsulated, or mounted in luminaires, the values listed below will vary depending upon the enclosure being used, lamp position and lamp variations. The component value method of testing is used so that uniform testing procedures may be followed on all ballasts.

1. Input voltage variations over the full range of allowable percentage range will vary lamp wattage as shown below: MH mag-regulator = 11%; MH regulator (CWI) = 11% to 17%; MH autoregulator (CWA) = 20%; MH lag = 25%; mercury regulator = 4%; mercury autoregulator (CWA) = 10%; mercury reactors and lags = 20%.
2. The voltage of high pressure sodium lamps changes with lamp life causing corresponding changes in lamp watts, so that the regulation cannot be stated in the same terms as for other HID lamp types. All HPS ballast types, over the full range of "allowable line voltage variation," control lamp watts within the prescribed limits of operation throughout the rated life of the lamp, as defined by trapezoidal limits in ANSI Standards for High Pressure Sodium lamps.
3. Mercury reactor ballasts listed in wattages 100 to 400 may be used at 50Hz as follows: 240 volts (60Hz) at 220 volts (50Hz). Reactors used on 220 volts are only adequate for lamp starting to 0°F.
4. All HID ballasts will provide satisfactory lamp starting to -20°F (-40°F for HPS) minimum over the recommended line-voltage variation.
5. Fusing: Not recommended as protection for individual HID ballast. If specified, fuse(s) should be rated 3 times maximum current. Fusing may cause nuisance interruptions. The fusing of a reactor type ballast should be avoided.
6. Ballast Losses = Line Watts - Lamp Watts

HPS BALLAST ELECTRICAL DATA—SINGLE VOLTAGE, 60Hz

M — HPS BALLAST–REGULATOR (LAG TYPE) – MAGNETIC REGULATOR ALLOWABLE LINE VOLTAGE VARIATION: ±10%

ANSI Lamp Type	Watts	Line Volts	Line-Operating Amperes	Line Watts	Power Factor %	Line-Starting Amperes	% Allowable Line Voltage Dip
S-51	400	120	4.1	475*		1.6	
		208	2.4	475		1.1	
		240	2.1	475		0.8	
		277	1.8	475		0.7	
		347	1.4	475		0.6	
		480	1.1	475		0.5	
S-129	350	120	3.4	410		2.1	
		208	2.0	410		1.4	
		240	1.7	410		1.2	
		277	1.5	410		1.0	
		347	1.2	410		0.8	
		480	0.9	410		0.6	
S-67	310	120	3.3	383		1.5	
		208	2.0	383		1.0	
		240	1.7	383		0.8	
		277	1.5	383		0.7	
		347	1.2	383		0.6	
		480	0.9	383		0.4	
S-50	250	120	2.7	312		1.0	
		208	1.6	312		0.6	
		240	1.4	312		0.5	
		277	1.2	312		0.4	
		347	0.9	312		0.3	
		480	0.7	312		0.3	
S-66	200	120	2.1	246		0.9	
		208	1.2	246		0.6	55
		240	1.1	246	90+	0.5	to
		277	0.9	246		0.4	20
		347	0.7	246		0.3	
		480	0.6	246		0.3	
S-55	150	120	1.7	195		0.9	
		208	1.0	195		0.5	
		220	1.0	195		0.5	
		240	0.9	195		0.5	
		277	0.8	195		0.4	
		347	0.6	195		0.4	
		480	0.5	195		0.3	
S-54	100	120	1.2	136		0.7	
		208	0.7	136		0.4	
		220	0.6	136		0.4	
		240	0.6	136		0.4	
		277	0.5	136		0.3	
		347	0.4	136		0.2	
		480	0.3	136		0.2	
S-62	70	120	0.9	99		0.5	
		208	0.5	99		0.4	
		220	0.5	98		0.3	
		240	0.5	99		0.3	
		277	0.4	99		0.3	
		347	0.3	99		0.2	
		480	0.2	98		0.2	

A — HPS BALLAST–AUTO-REGULATOR (LEAD TYPE) – CWA ALLOWABLE LINE VOLTAGE VARIATION: ±10%

ANSI Lamp Type	Watts	Line Volts	Line-Operating Amperes	Line Watts	Power Factor %	Line-Starting Amperes	% Allowable Line Voltage Dip
S-52	1000	120	9.6	1096		5.6	
		208	5.8	1102		3.5	
		220	5.4	1100		3.4	
		240	4.8	1096		2.9	18
		277	4.4	1096		2.7	to
		347	3.5	1104		2.2	2
		480	2.5	1102		1.6	
S-111	750	120	7.1	839		6.4	
		208	4.0	836		3.5	
		240	3.5	838		3.1	
		277	3.1	841		2.7	
		347	2.5	849		2.2	
		480	1.8	849		1.5	
S-51	400	120	3.9	466		3.0	
		208	2.2	467		1.9	
		220	2.2	475		1.3	
		240	2.0	468		1.6	
		277	1.7	468		1.4	
		347	1.4	468		1.0	
		480	1.0	470		0.8	
S-50	250	120	2.6	305		2.6	
		208	1.5	305		1.5	
		220	1.4	305		0.9	
		240	1.3	305		1.2	
		277	1.2	305	90+	1.1	35
		347	0.9	305	to	0.7	to
		480	0.7	305	65	0.6	10
S-66	200	120	2.1	238		1.2	
		208	1.2	238		0.7	
		220	1.1	240		1.4	
		240	1.0	238		0.6	
		277	0.9	238		0.6	
		347	0.7	240		0.5	
		480	0.6	240		0.4	
S-55	150	120	1.6	189		0.9	
		208	1.0	189		0.5	
		240	0.9	189		0.5	
		277	0.7	189		0.4	
		347	0.6	190		0.4	
		480	0.5	190		0.3	
S-54	100	120	1.2	127		0.7	
		208	0.7	126		0.4	
		240	0.6	126		0.4	
		277	0.5	126		0.3	
		347	0.4	127		0.2	
		480	0.3	127		0.2	
S-62	70	120	0.8	87		0.5	
		208	0.5	87		0.4	
		220	0.4	86		0.2	
		240	0.4	87		0.3	
		277	0.3	87		0.3	
		347	0.3	88		0.2	
		480	0.2	87		0.2	

Cobra Head Fixture – HPS Lamp Data

TECHNICAL DATA

GE Lighting Systems, Inc.

HIGH PRESSURE SODIUM LAMP DATA

ORDERING ABBREVIATION	ANSI CODE	FINISH	Light CENTER LENGTH INCHES	INITIAL LUMENS
35-WATT–LIFE AT 10 HOURS/START = 16,000 HOURS				
LU35/Med	S76-HA-35	Clear	3-13/32	2,250
LU35/D/Med	S76-HB-35	Diffuse	3-13/32	2,150
50-WATT–LIFE AT 10 HOURS/START = 24,000 * HOURS				
LU50/Med	S68-XX-50	Clear	3-13/32	4,000
LU50/D/Med	S68-YY-50	Diffuse	3-13/32	3,800
LU50	S68-MS-50	Clear	5	4,000
LU50/D	S68-MT-50	Diffuse	5	3,800
70-WATT–LIFE AT 10 HOURS/START = 24,000 * HOURS				
LU70/Med	S62-LG-70	Clear	3-13/32	6,400
LU70/D/Med	S62-LH-70	Diffuse	3-13/32	5,950
70-WATT–LIFE AT 10 HOURS/START = 24,000 * HOURS				
LU70	S62-ME-70	Clear	5	6,400
LU70/D	S62-MF-70	Diffuse	5	5,950
100-WATT–LIFE AT 10 HOURS/START = 24,000 * HOURS				
LU100/Med	S54-SG-100	Clear	3-13/32	9,500
LU100/D/Med	S54-SH-100	Diffuse	3-13/32	8,800
LU100	S54-SB-100	Clear	5	9,500
LU100/D	S54-MC-100	Diffuse	5	8,800
150-WATT–LIFE AT 10 HOURS/START = 24,000 * HOURS				
LU150/Med	S55-RN-150	Clear	3-1/2	16,000
LU150/D/Med	S55-RP-150	Diffuse	3-1/2	15,000
LU150/55	S55-SC-150	Clear	5	16,000
LU150/55/D	S55-MD-150	Diffuse	5	15,000
LU150/100	S56-SD-150	Clear	5	15,000
LU150/100/D	S56-SE-150	Diffuse	5	14,000
200-WATT–LIFE AT 10 HOURS/START = 24,000 * HOURS				
LU200	S66-MN-200	Clear	5-3/4	22,000
250-WATT–LIFE AT 10 HOURS/START = 24,000 * HOURS				
LU250	S50-VA-250	Clear	5-3/4	28,000
LU250/D	S50-VC-250	Diffuse	5	26,000
LU250/S	S50-VA-250	Clear	5-3/4	30,000
310-WATT–LIFE AT 10 HOURS/START = 24,000 * HOURS				
LU310	S67-MR-310	Clear	5-3/4	37,000
350-WATT–LIFE AT 10 HOURS/START = 18,000 * HOURS				
LU350	S129-AG-350	Clear	5-3/4	50,000
400-WATT–LIFE AT 10 HOURS/START = 24,000 * HOURS				
LU400	S51-WA-400	Clear	5-3/4	61,000
LU400/D	S51-WB-400	Diffuse	7	47,500
750-WATT–LIFE AT 10 HOURS/START = 24,000 * HOURS				
LU750	S111-NH-750	Clear	6-7/8	110,000
1000-WATT–LIFE AT 10 HOURS/START = 24,000 * HOURS				
LU1000	S52-XB-1000	Clear	8-3/4	140,000

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-LG-70/DX	Clear	3-1/2	3,800
LU70/DX/D/Med	S62-LH-70/DX	Diffuse	3-1/2	3,600
150-WATT–RATED LIFE AT 10 HOURS/START = 15,000 * HOURS				
LU150/DX/Med	S55-RN-150/DX	Clear	3-1/2	10,500
LU150/DX/D/Med	S55-RP-150/DX	Diffuse	3-1/2	9,900
LU150/55/DX	S55-MC-150/DX	Clear	5	10,500
LU150/DX/D	S55-MD-150/DX	Diffuse	5	9,900
250-WATT–RATED LIFE AT 10 HOURS/START = 15,000 * HOURS				
LU250/DX	S50-VA-250/DX	Clear	5-3/4	22,500
LU250/DX/D	S50-VC-250/DX	Diffuse	5	20,000
400-WATT–RATED LIFE AT 10 HOURS/START = 15,000 * HOURS				
LU400/DX	S51-WA-400/DX	Clear	5-7/32	37,400
LU400/DX/D	S51-WB-400/DX	Diffuse	5-7/32	35,500

NOTE

Similar wattage clear, diffuse, or deluxe HPS lamps may n have the same bulb size or light center length. If lamps ar interchanged, the socket position may need to be changec 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 lan 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.

50,000 2/21/02 verified

200W

250W

310W

400W

Data subject to change without notice

Page 396 January 1998

High Mast Fixture

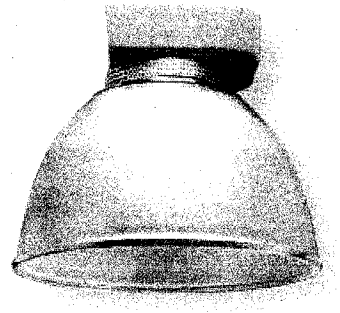
Dark Skies

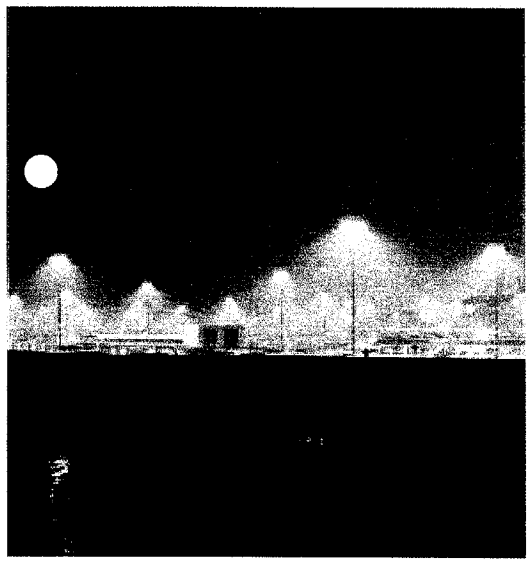
For 400W Clear, HPS, Cutoff, Type V High Mast use the Holophane **43842.ies** photometrics file.

400W = 50,000 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.

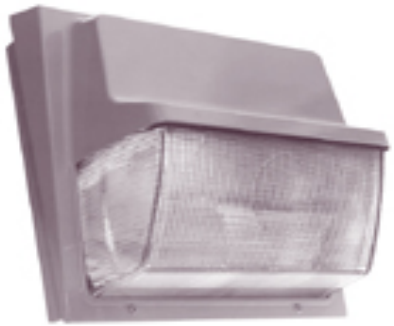
The open ventilated glass optical system provides both lower dirt depreciation and easy maintenance. When combined with a Holophane Lowering Device, the HMSD luminaire provides efficient and effective lighting with a system that reduces maintenance and relamping time.

HOLOPHANE
LEADER IN LIGHTING SOLUTIONS

HL-1853 12/01

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.

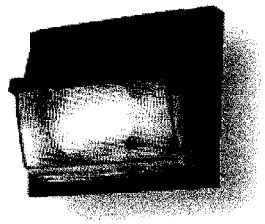
200W = *11,000 Lumens, 250W = *14,000 Lumens

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.

HOLOPHANE
LEADER IN LIGHTING SOLUTIONS

HL-1207 3/01

Wallpack – Special Provision / Cost Estimate

Luminaires

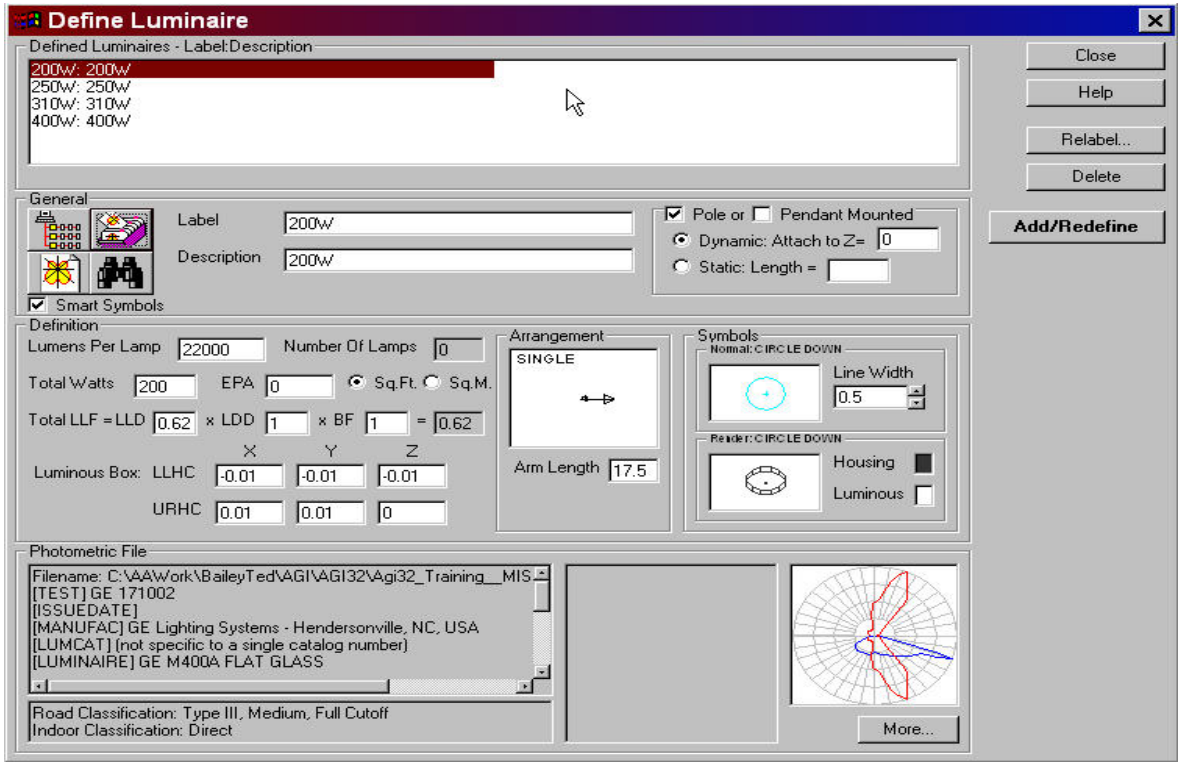
Section 9-29.10 is supplemented with the following:

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 downlight 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.

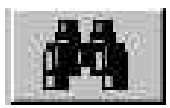
More info on 250W Wallpack III Underdeck Fixture(Mounted to wall with unistrut)
http://www.holophane.com/Product/CommOutdoor/wallpack.htm

Cost Estimate: Materials = $275 per Fixture w/Ballast
Installation Labor = 2.0hrs per Fixture

Defining Luminaires



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.)

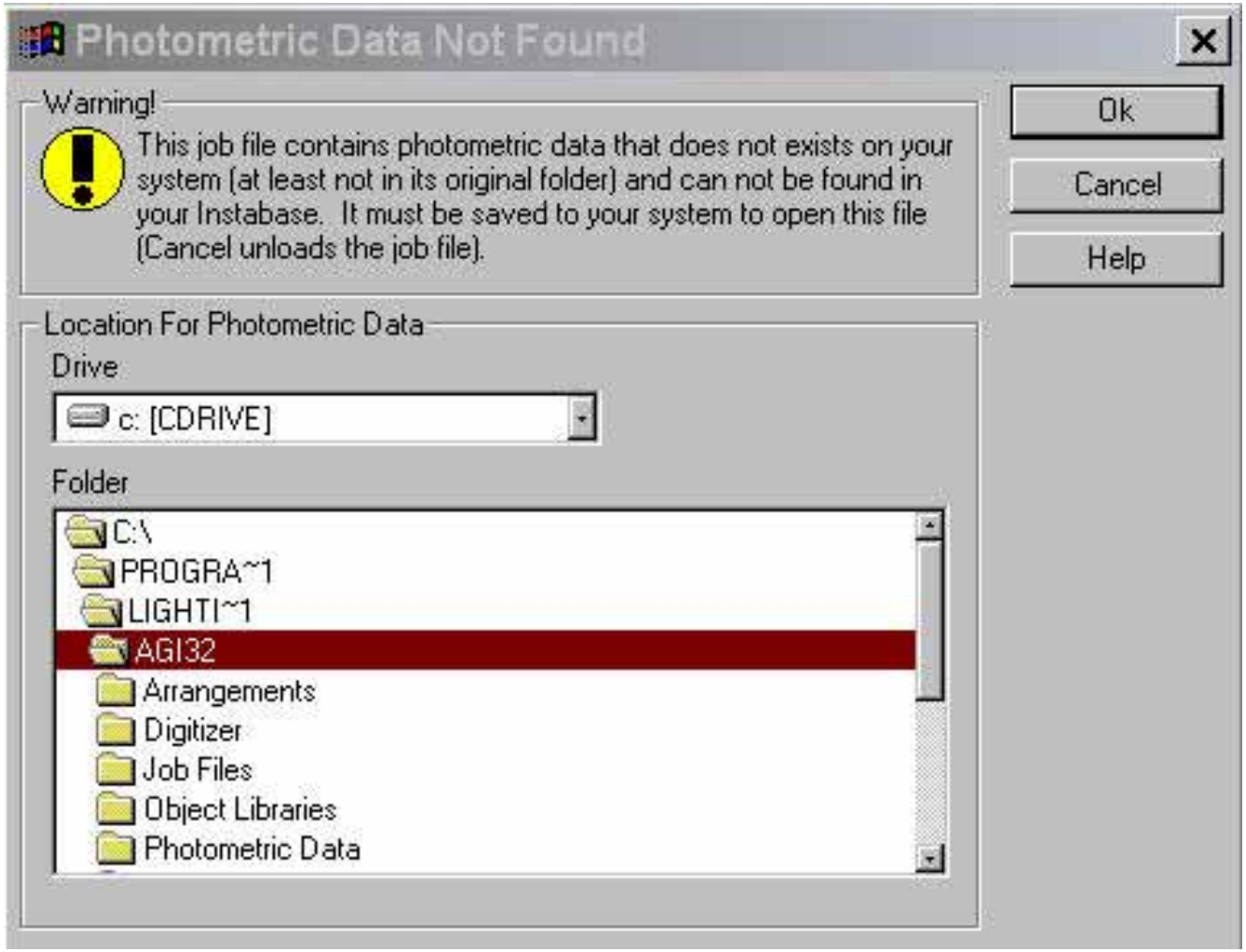
- **When you send an AGI file to another user, AGI sends along all of the IES (photometric) files that are needed for that file. When the other user opens up the file, they are asked where they would like to store that design file's IES file or files. See Next Slide.**

Defining Luminaires Cont…

- **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.

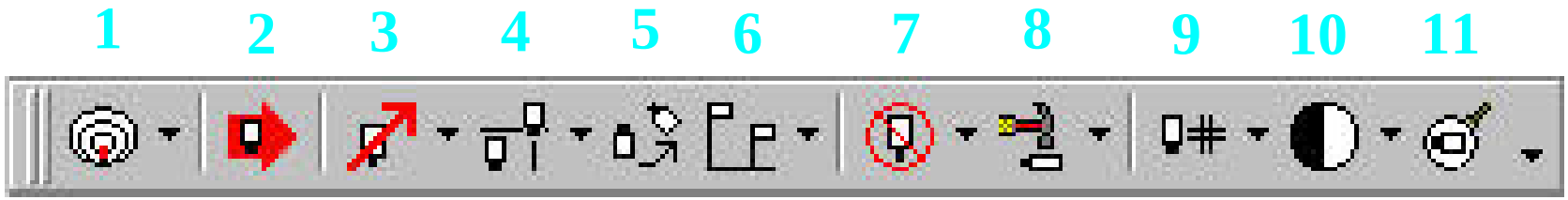
  Static the pole length remains constant regardless of the mounting height. (Use this for 3D designs were light standards are placed at elevations other than zero.
- **Symbol** Use the appropriate symbol to fit your application. The type of symbol dose not effect the lighting calculations. **Do Not** change the Housing or Luminous Area color.
- **Arrangement** select the one that fits your situation. Usually **Single or Back-Back.**

Defining Luminaires Cont...



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

Luminaire Tools



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

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

3.) Move Luminaire

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

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

6.) Luminaire - Change Height (Change luminaire heights. Use same aiming angles.)

7.) Delete Luminaire (Deletes the selected luminaire or luminaires.)

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

9.) Luminaire Labels (Place coordinates, mounting heights, descriptions, etc. on the drawing)

10.) Switch Luminaire (Turns luminaire On \ Off for consideration in the calculations.)

11.) Magnify Symbol (Magnifies the Luminaire Symbol, Insertion point remains constant.)

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.

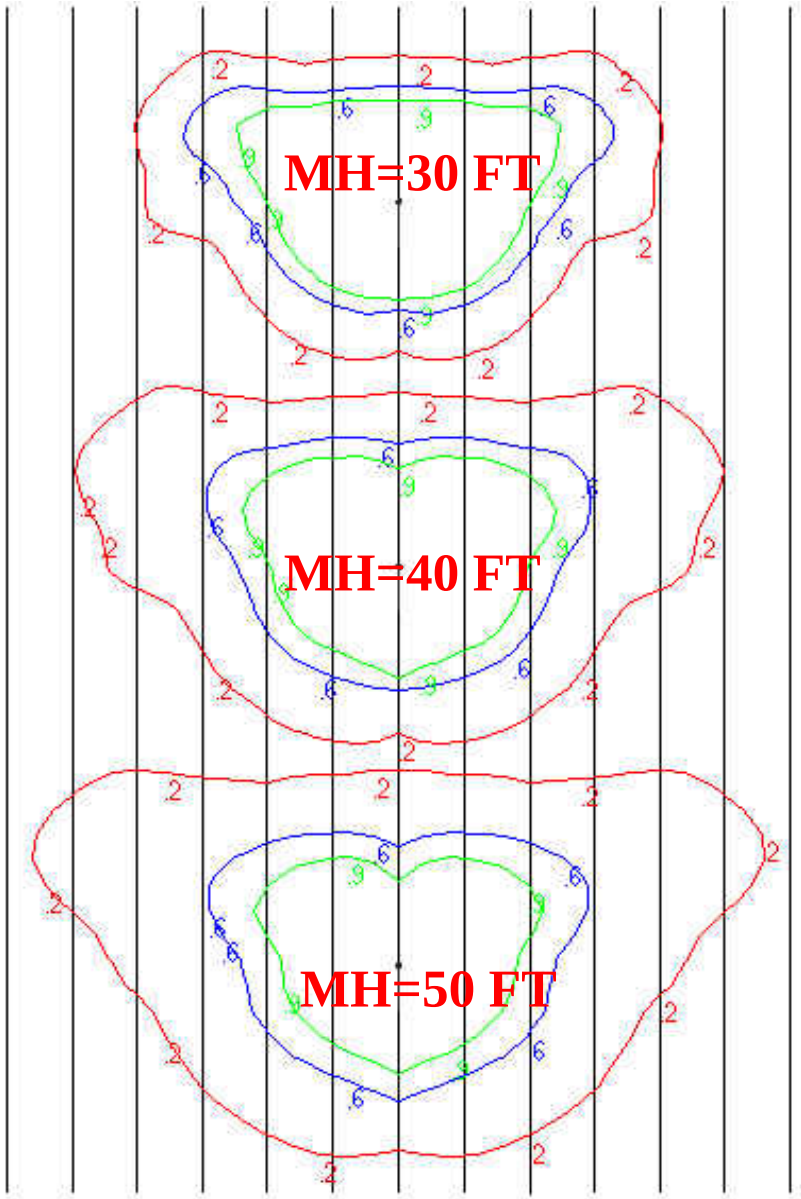
*(Remember to use a MH that is 1.5ft-2.5ft lower than the design height, see below)

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.))

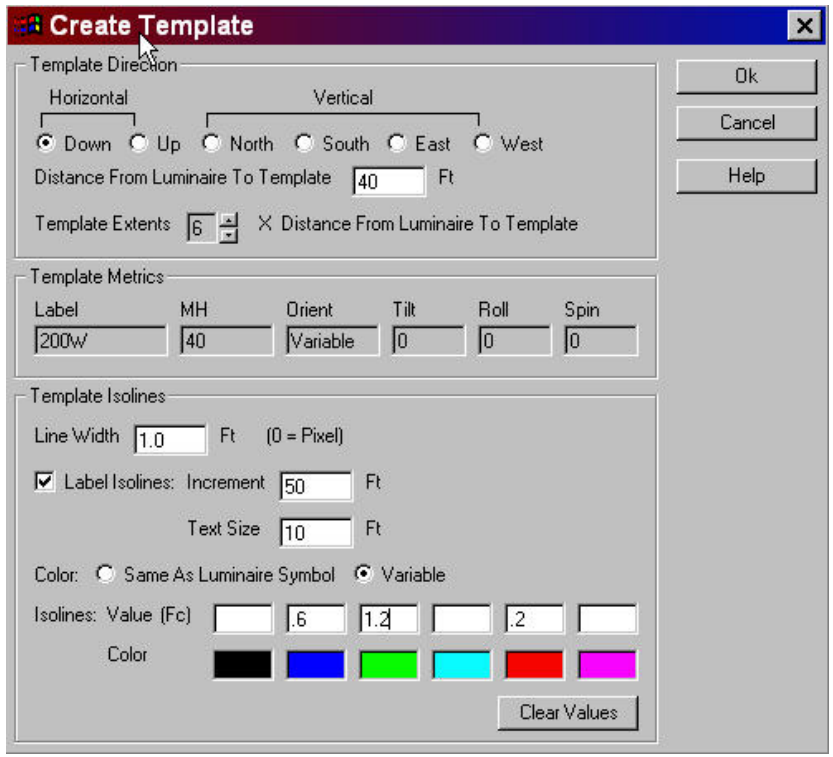
Luminaire Template



Press this Icon to create a luminaire template.

<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)

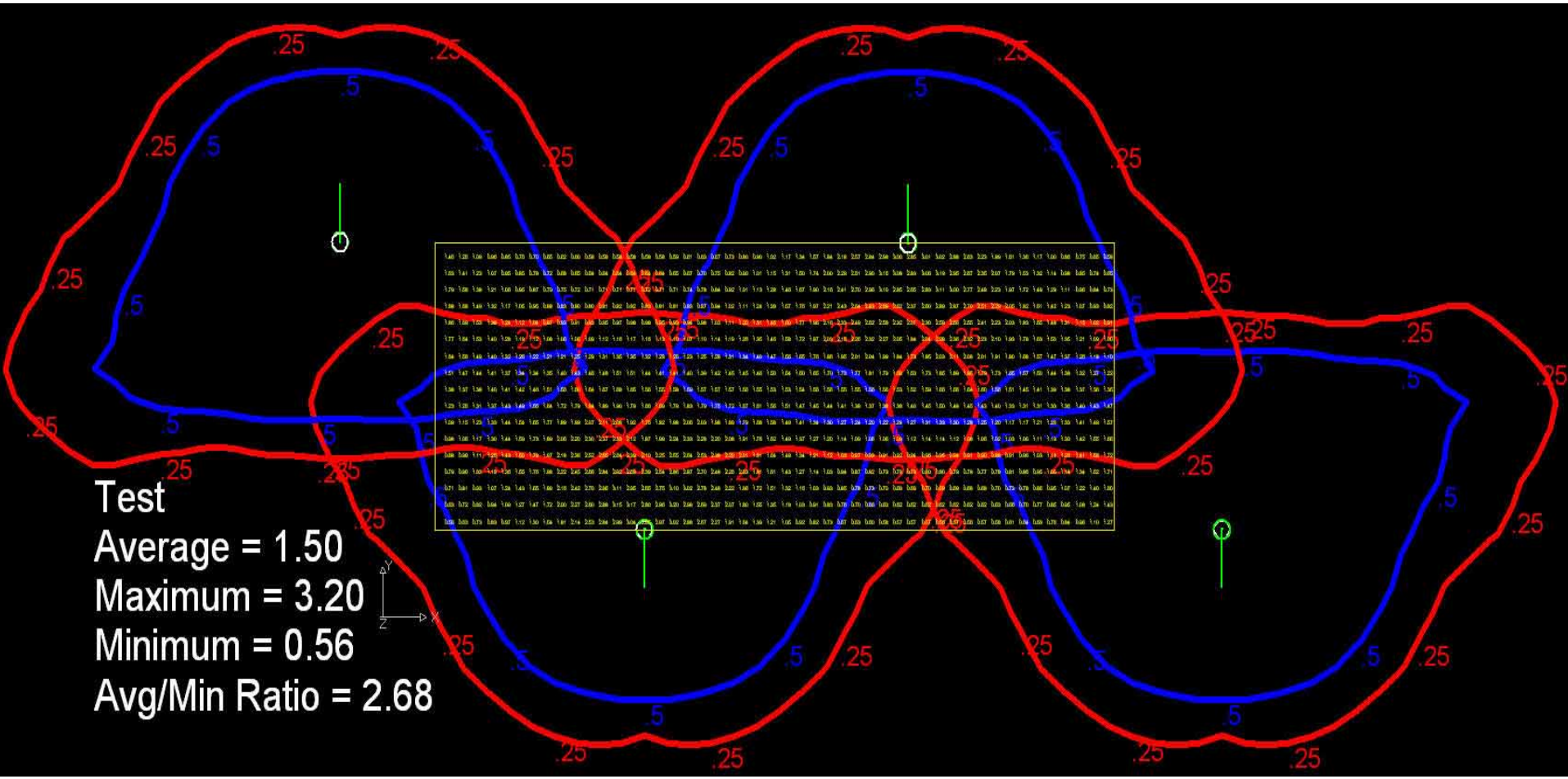
3.) Take 0.50 Ftc / 2 = 0.25 Ftc

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

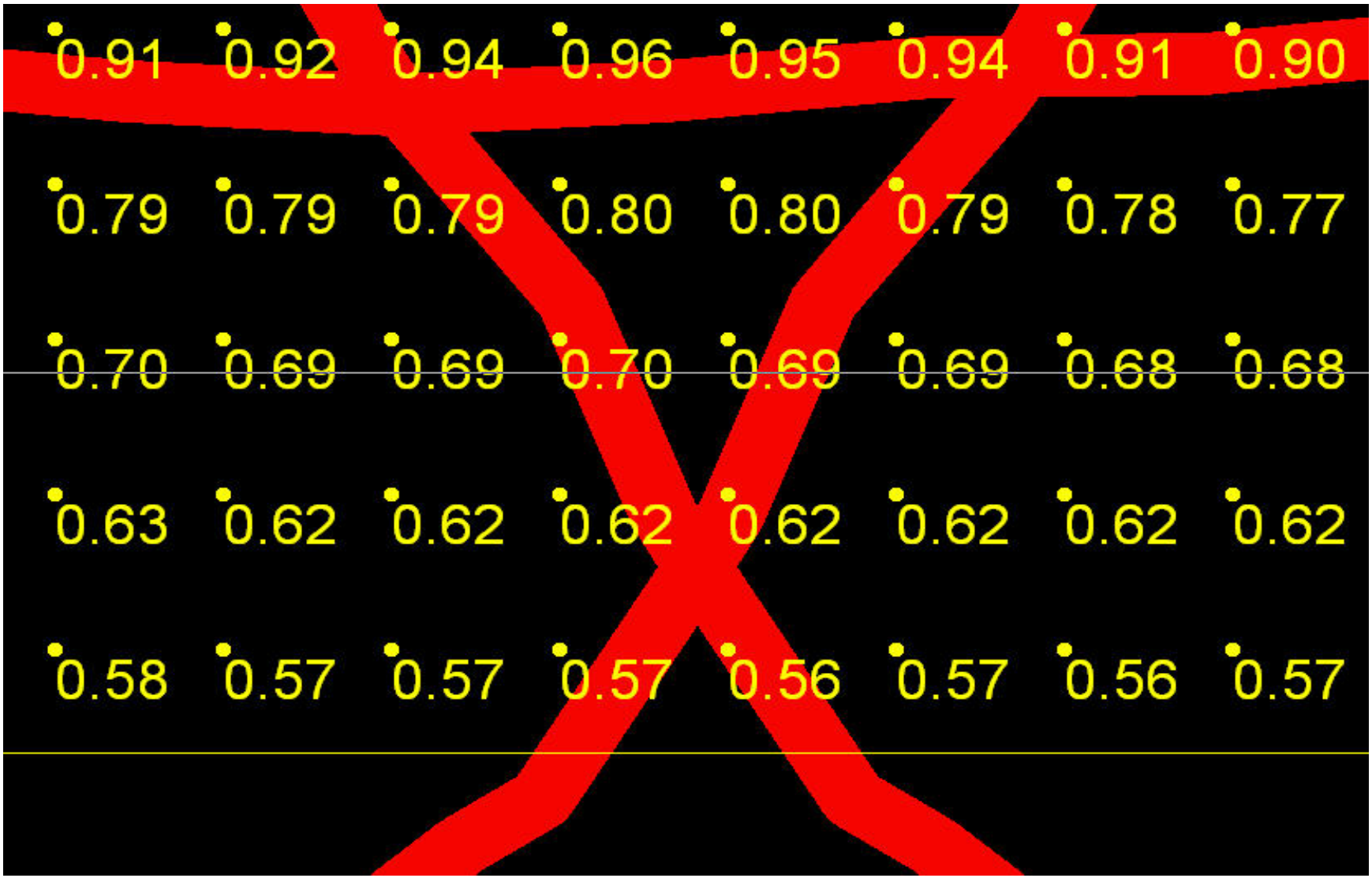
5.) After you calculate the Design File Repeat steps 2 thru 4. Substitute the actual calculated Average Illuminance for Step 2 in place of 1.4.

(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...

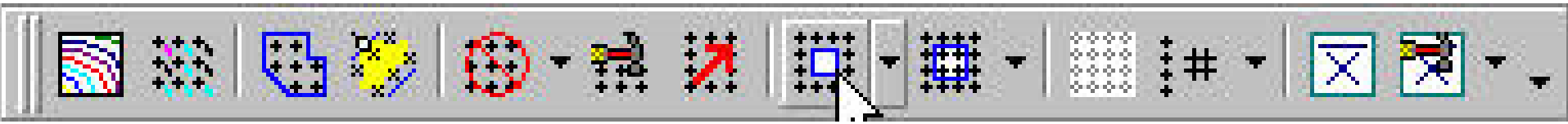


Luminaire Template Cont…



Calculation Point Tools

1 2 3 4 5 6 7 8 9 10 11 12 13



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.) Calc Pts – Polygon (Place calc points by drawing a polygon shape on the design plane.)

4.) Calc Pts – Roadway Luminance (Place a 3 point grid for calculating Roadway Luminance and Veiling Luminance. See the new commands manual for more explanation.)

5.) Delete Calc Pts (Deletes the entire calculation point plane that you select.)

6.) Edit Calc Pts (Allows you to modify the calculation point grid characteristics.)

7.) Move Calc Pts (Allows you to move the entire calculation point grid.)

8.) Calc Pts – Remove Pts (Removes some calculation points so they are not calculated.)

9.) Calc Pts – Replace Pts (Allows you to replace removed points.)

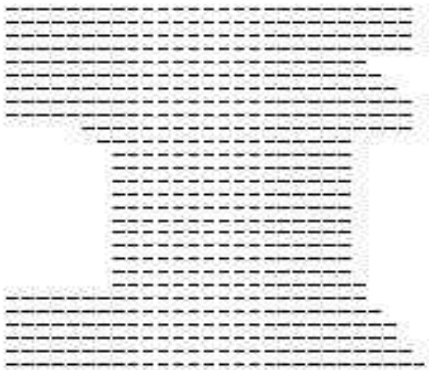
10.) Calc Pts – Status Manager (Allows you to change the Calculation Status(On/Off) of each grid, Visibility(On/Off) of each grid, Visibility(On/Off) each Grid in the design file.)

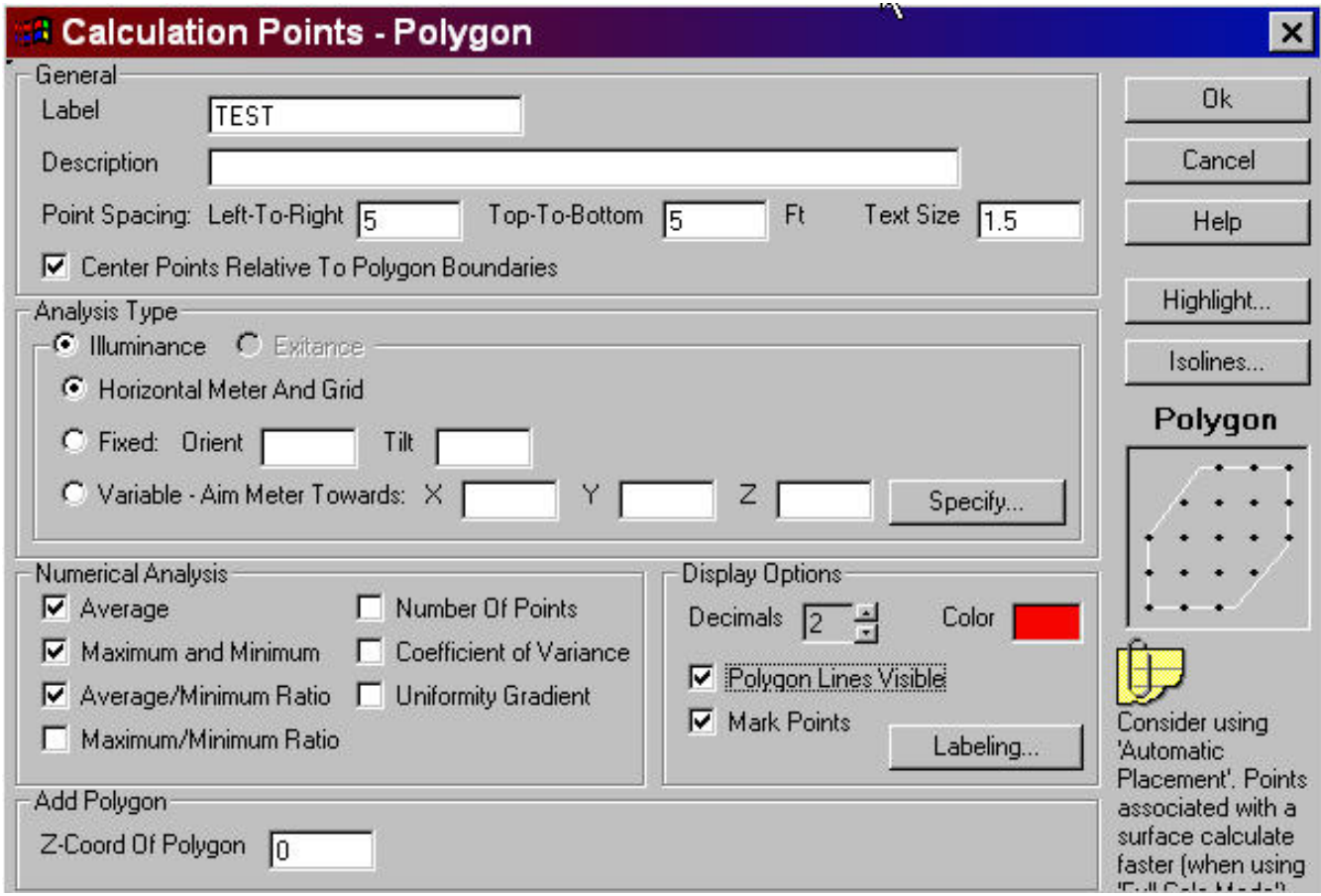
11.) Calc Pts – Labels (Allows you to delete or move calculation point labels.)

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.) Modify Statistical Area (Delete, Change properties (what values are being calculated), and Move Labels.

Calculation Point Grid Placement

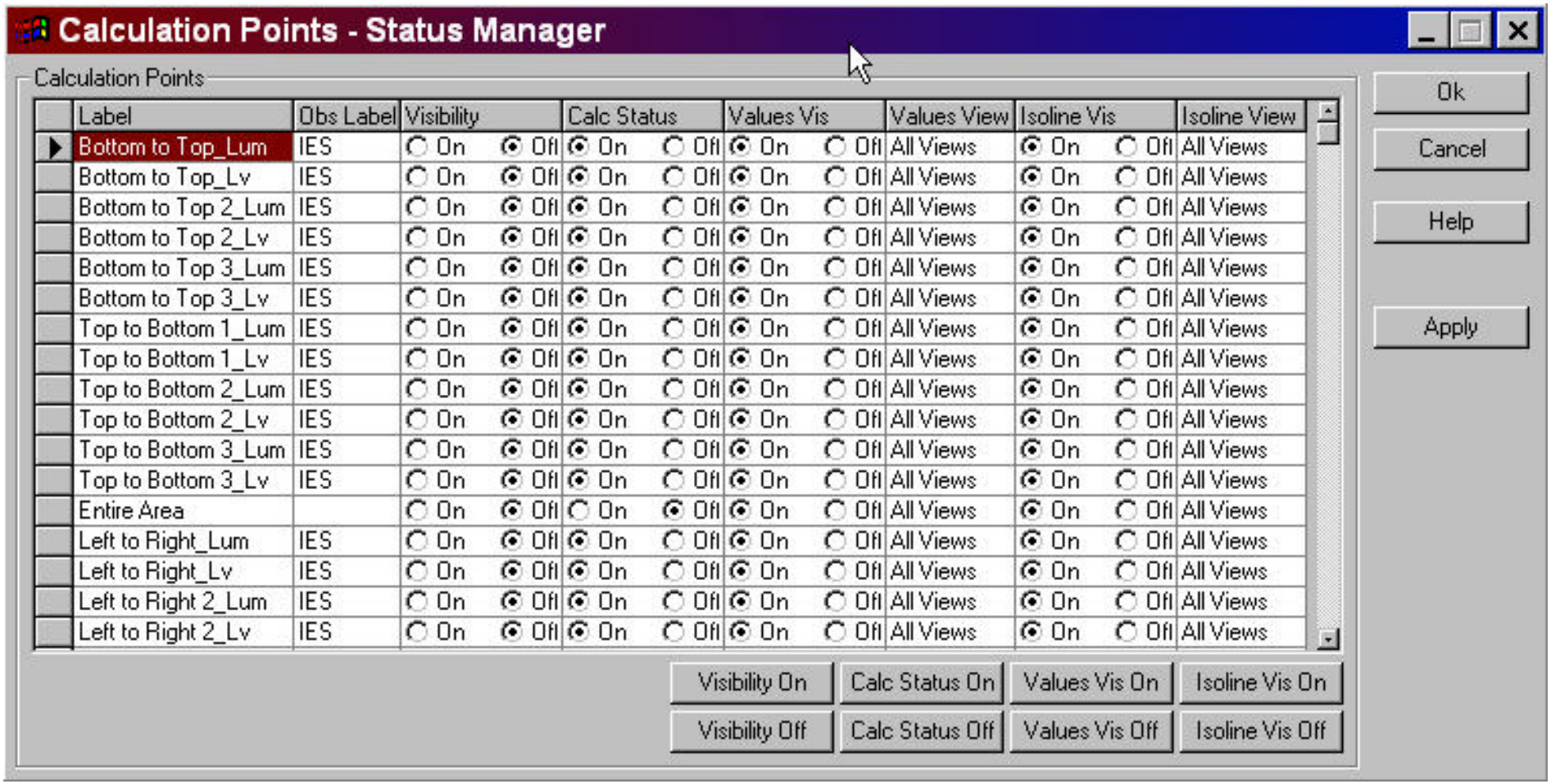




Use the values as shown above.

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

Calculation Point - Status Manager



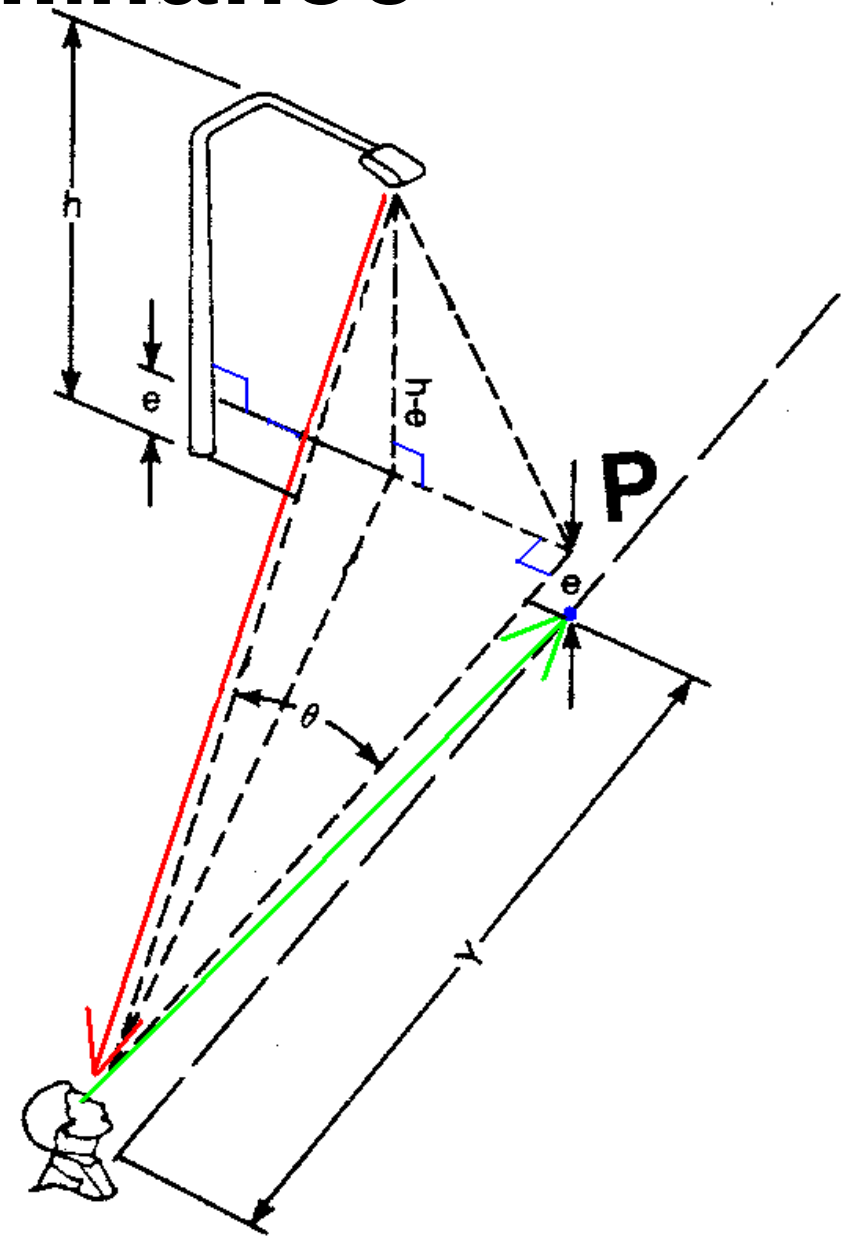
Label	Obs Label	Visibility	Calc Status	Values Vis	Values View	Isoline Vis	Isoline View
Bottom to Top_Lum	IES	○ On ◉ Off	◉ On ○ Off	◉ On ○ Off	All Views	◉ On ○ Off	All Views
Bottom to Top_Lv	IES	○ On ◉ Off	◉ On ○ Off	◉ On ○ Off	All Views	◉ On ○ Off	All Views
Bottom to Top 2_Lum	IES	○ On ◉ Off	◉ On ○ Off	◉ On ○ Off	All Views	◉ On ○ Off	All Views
Bottom to Top 2_Lv	IES	○ On ◉ Off	◉ On ○ Off	◉ On ○ Off	All Views	◉ On ○ Off	All Views
Bottom to Top 3_Lum	IES	○ On ◉ Off	◉ On ○ Off	◉ On ○ Off	All Views	◉ On ○ Off	All Views
Bottom to Top 3_Lv	IES	○ On ◉ Off	◉ On ○ Off	◉ On ○ Off	All Views	◉ On ○ Off	All Views
Top to Bottom 1_Lum	IES	○ On ◉ Off	◉ On ○ Off	◉ On ○ Off	All Views	◉ On ○ Off	All Views
Top to Bottom 1_Lv	IES	○ On ◉ Off	◉ On ○ Off	◉ On ○ Off	All Views	◉ On ○ Off	All Views
Top to Bottom 2_Lum	IES	○ On ◉ Off	◉ On ○ Off	◉ On ○ Off	All Views	◉ On ○ Off	All Views
Top to Bottom 2_Lv	IES	○ On ◉ Off	◉ On ○ Off	◉ On ○ Off	All Views	◉ On ○ Off	All Views
Top to Bottom 3_Lum	IES	○ On ◉ Off	◉ On ○ Off	◉ On ○ Off	All Views	◉ On ○ Off	All Views
Top to Bottom 3_Lv	IES	○ On ◉ Off	◉ On ○ Off	◉ On ○ Off	All Views	◉ On ○ Off	All Views
Entire Area		○ On ◉ Off	○ On ◉ Off	◉ On ○ Off	All Views	◉ On ○ Off	All Views
Left to Right_Lum	IES	○ On ◉ Off	◉ On ○ Off	◉ On ○ Off	All Views	◉ On ○ Off	All Views
Left to Right_Lv	IES	○ On ◉ Off	◉ On ○ Off	◉ On ○ Off	All Views	◉ On ○ Off	All Views
Left to Right 2_Lum	IES	○ On ◉ Off	◉ On ○ Off	◉ On ○ Off	All Views	◉ On ○ Off	All Views
Left to Right 2_Lv	IES	○ On ◉ Off	◉ On ○ Off	◉ On ○ Off	All Views	◉ On ○ Off	All Views

Use the Calculation Point – Status Manager to Change Visibility(On/Off), Calc Status(On/Off), Visibility of Values Only (On/Off), & Visibility of the Isolines(On/Off) for each individual grid.

Veiling Luminance

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

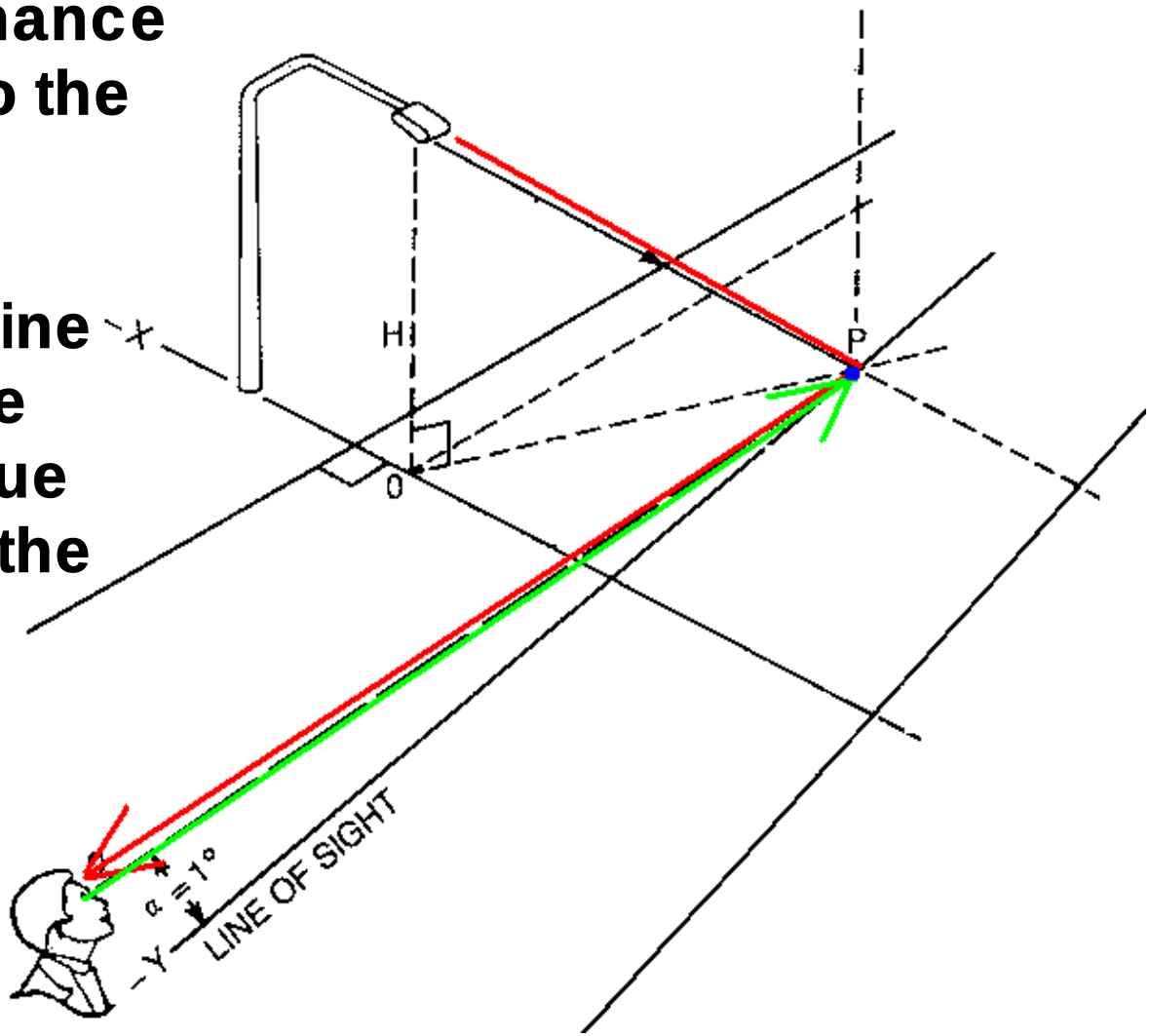
Green → Observers line of sight looking at the Veiling Luminance point value(Lv) to be calculated on the pavement surface.



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)**

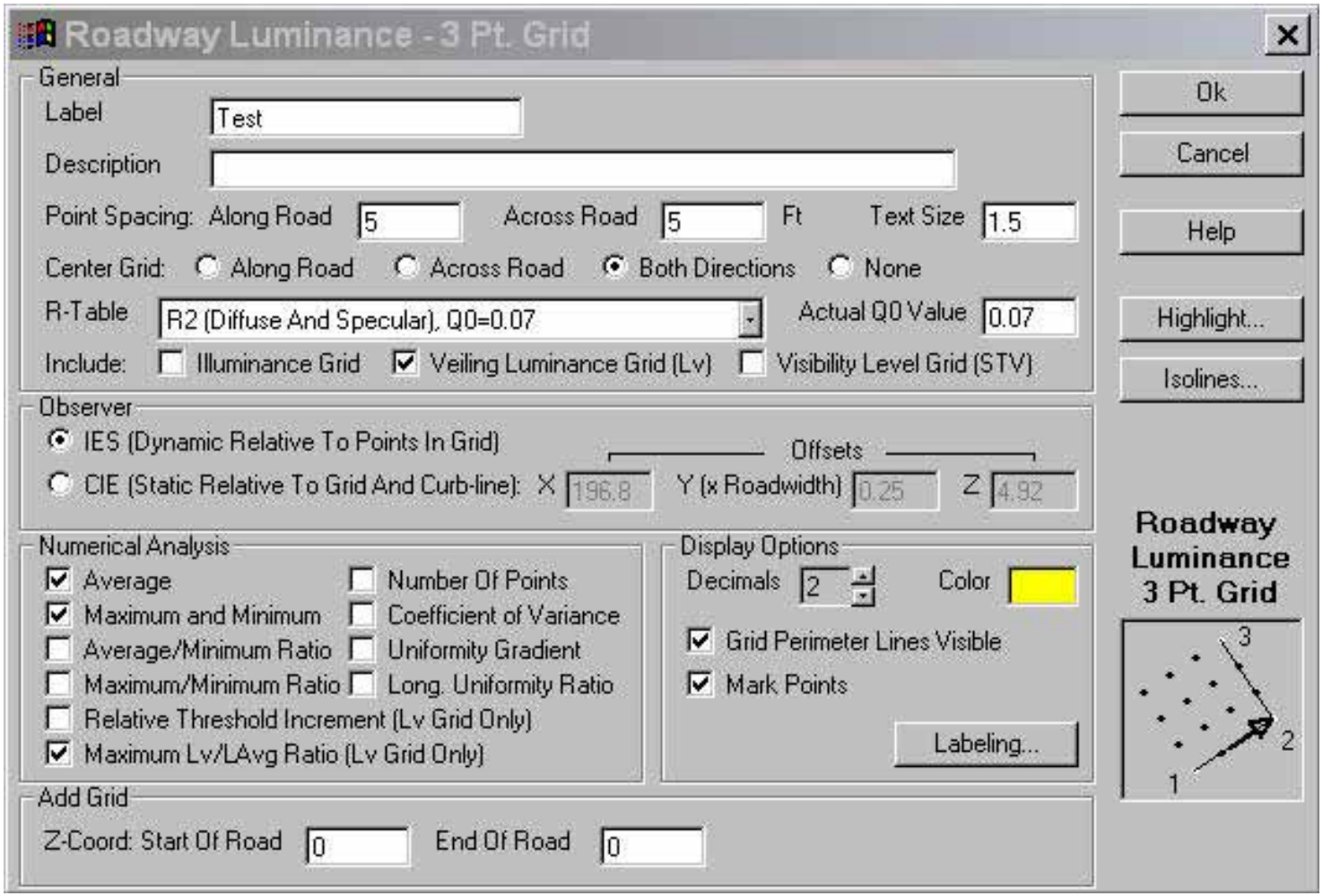
If you <u>Increase the Luminaire Wattage</u>:

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 even with the first luminaire that is encountered in the direction of travel. Extend the grid to the last luminaire in that direction of travel or completely through the design area, which ever is further.
5) When placing grids around a curve, use smaller grids with the direction of travel perpendicular to the radius of the curve.
6) Evaluate the results from each set of grids independently.
7) Follow steps 1-6 for all directions of travel including the minor approaches.
8) For continuous & straight illumination sections with EXACTLY the same Spacing, Mounting height, Overhang, & with at least 10 spacing cycles, do the following: Place a Luminance and Veiling Luminance grid over one luminaire spacing cycle in each direction of travel. Place the grid in a spacing cycle so there is 1 spacing cycle before and 3 spacing cycles after the specified grid area.

Roadway Luminance & Veiling Luminance Grids

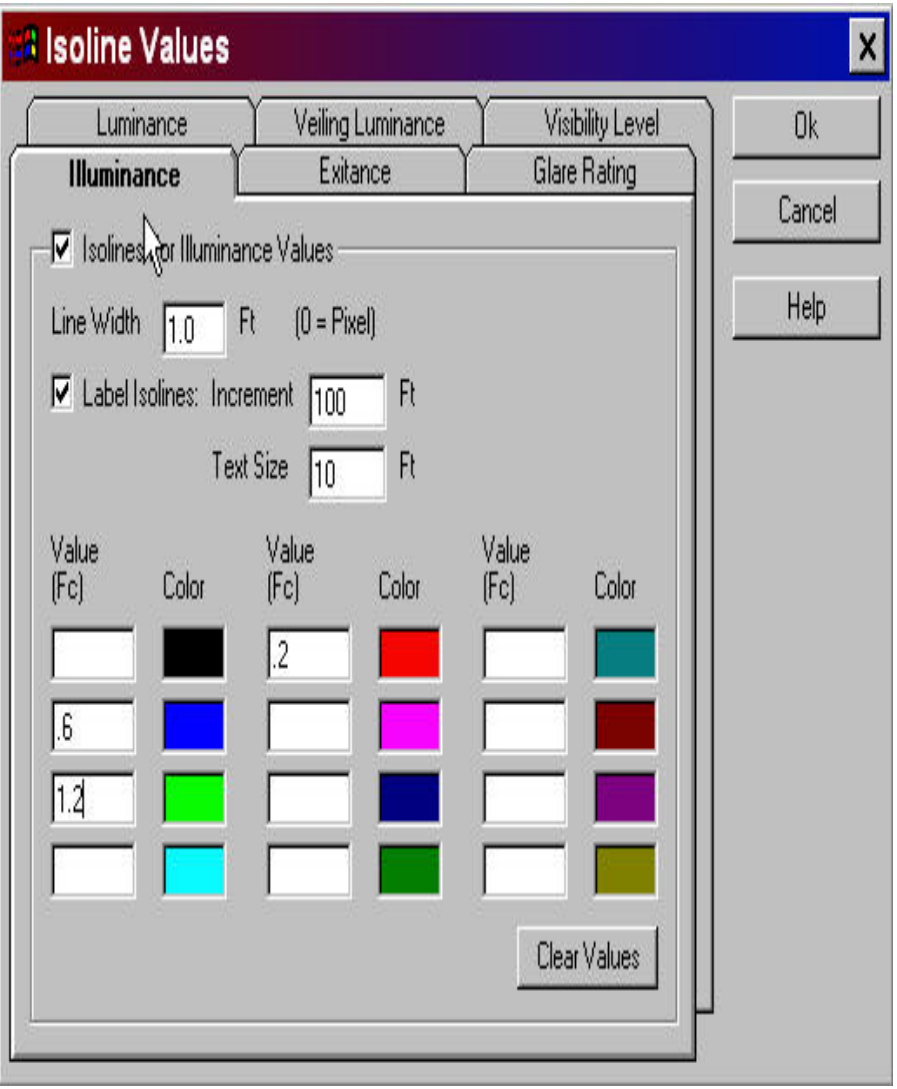


Use the settings as shown above.

Follow the directions in the **New Commands** manual.

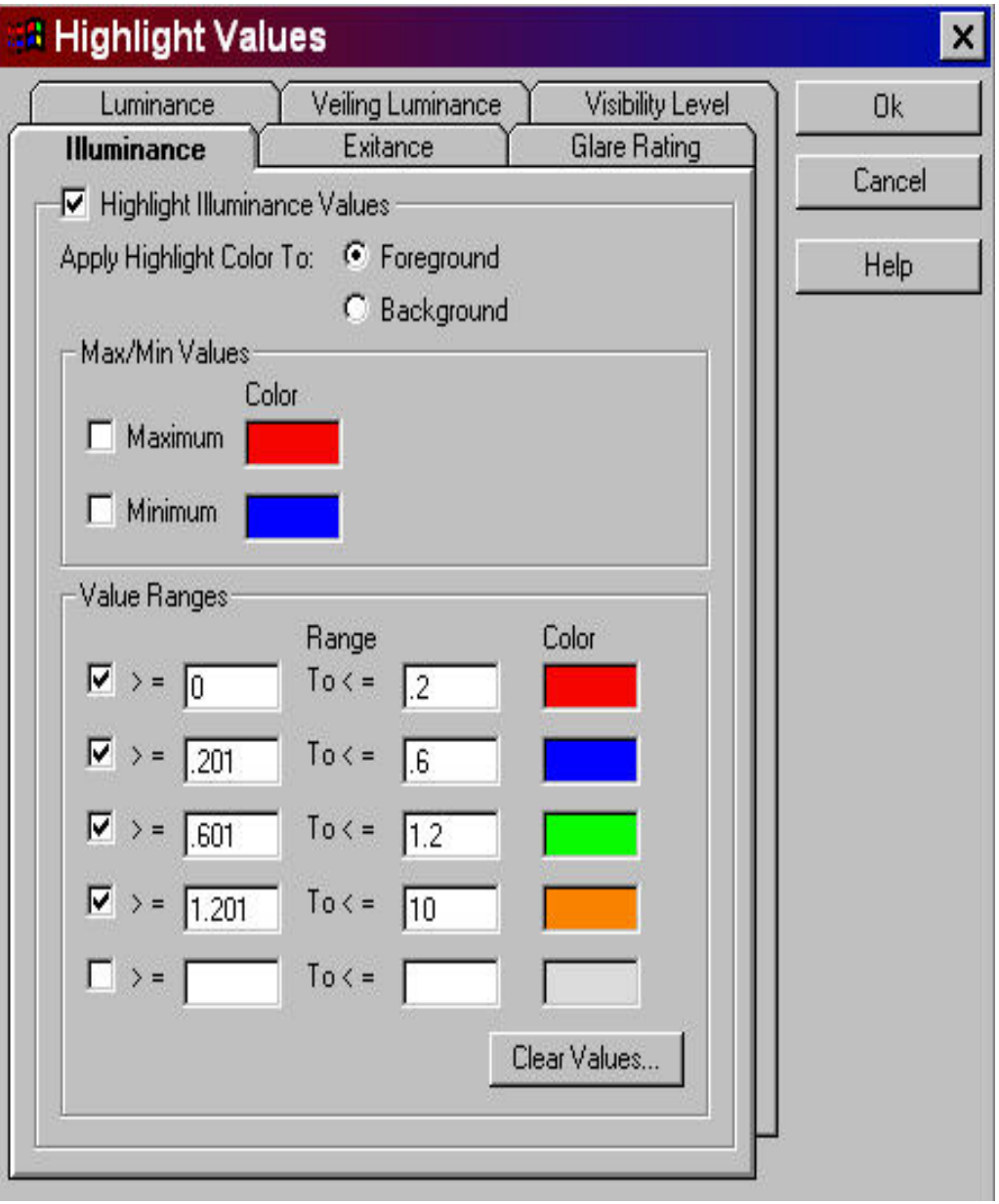
Place grid points 1 and 2 parallel to the directions of travel. Place the 3rd grid point perpendicular to the direction of travel to encompass the appropriate width.

Setting Isolines



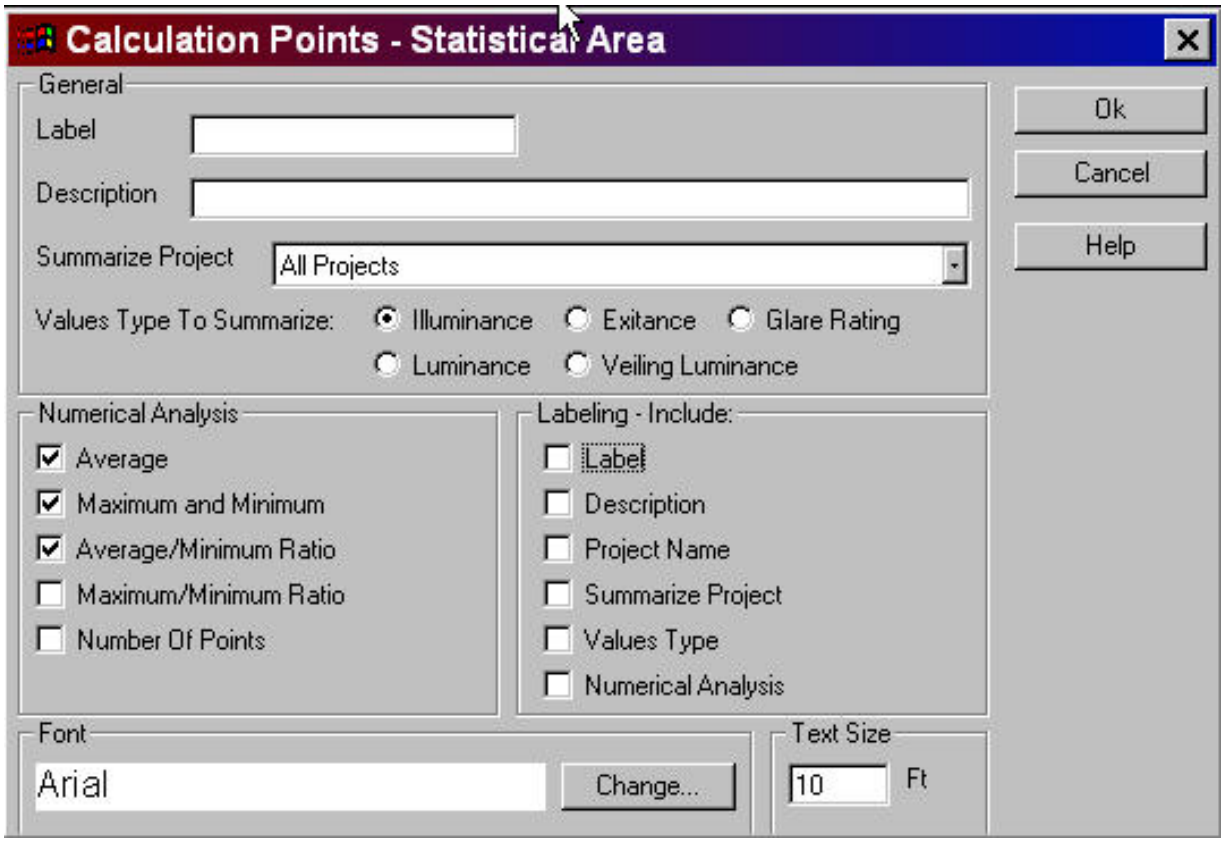
- You can set isoline values to whatever you want.
- Set separate values for Illuminance, Luminance and Veiling Luminance.
- You can modify the color of the isoline by double clicking on the colored rectangle.
- **<u>Illuminance</u>** Isolines are **great for helping to solve uniformity problems**. A 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)

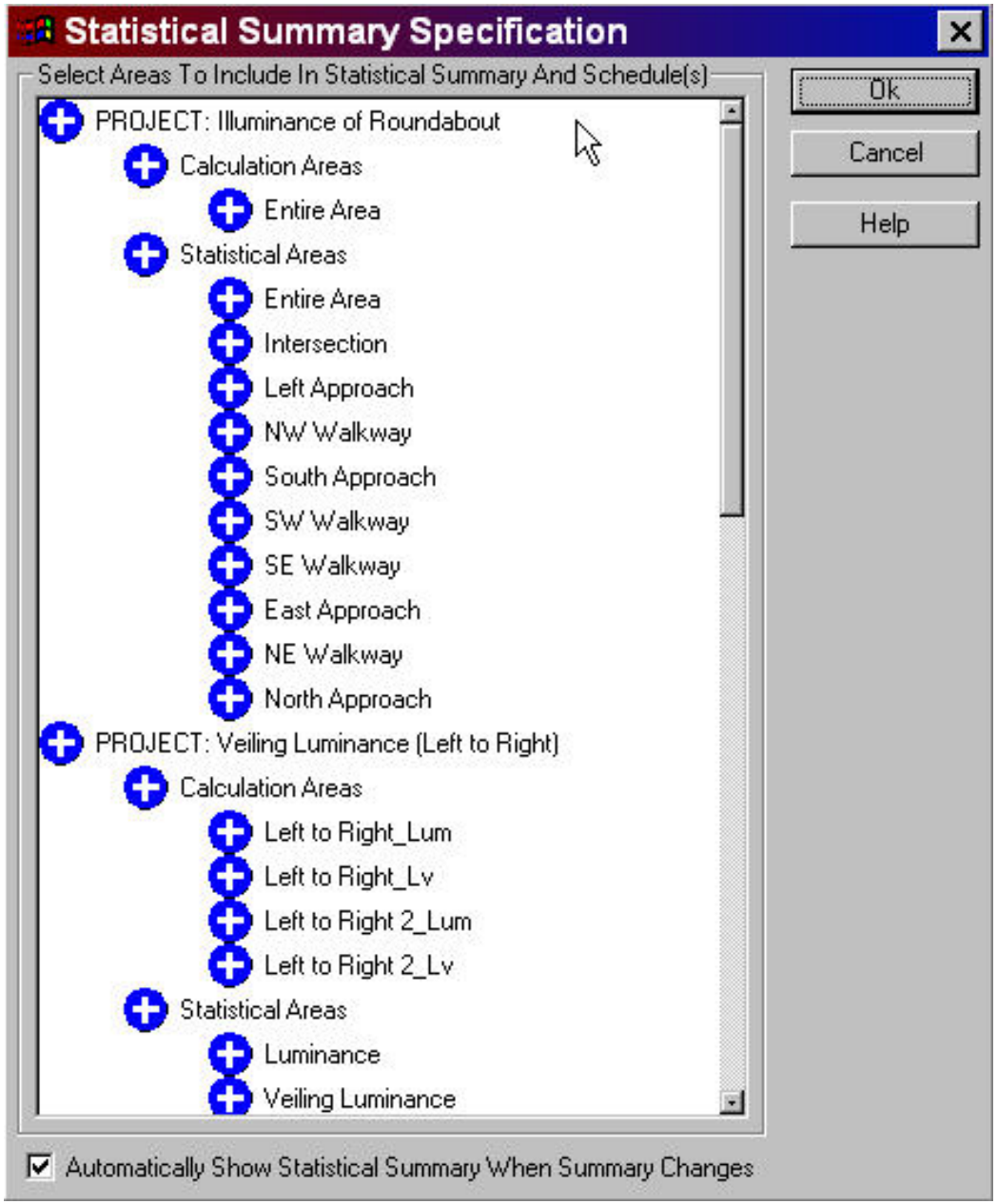
4.) For **Illuminance** → Select Average, Maximum and Minimum, Average/Minimum Ratio

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.

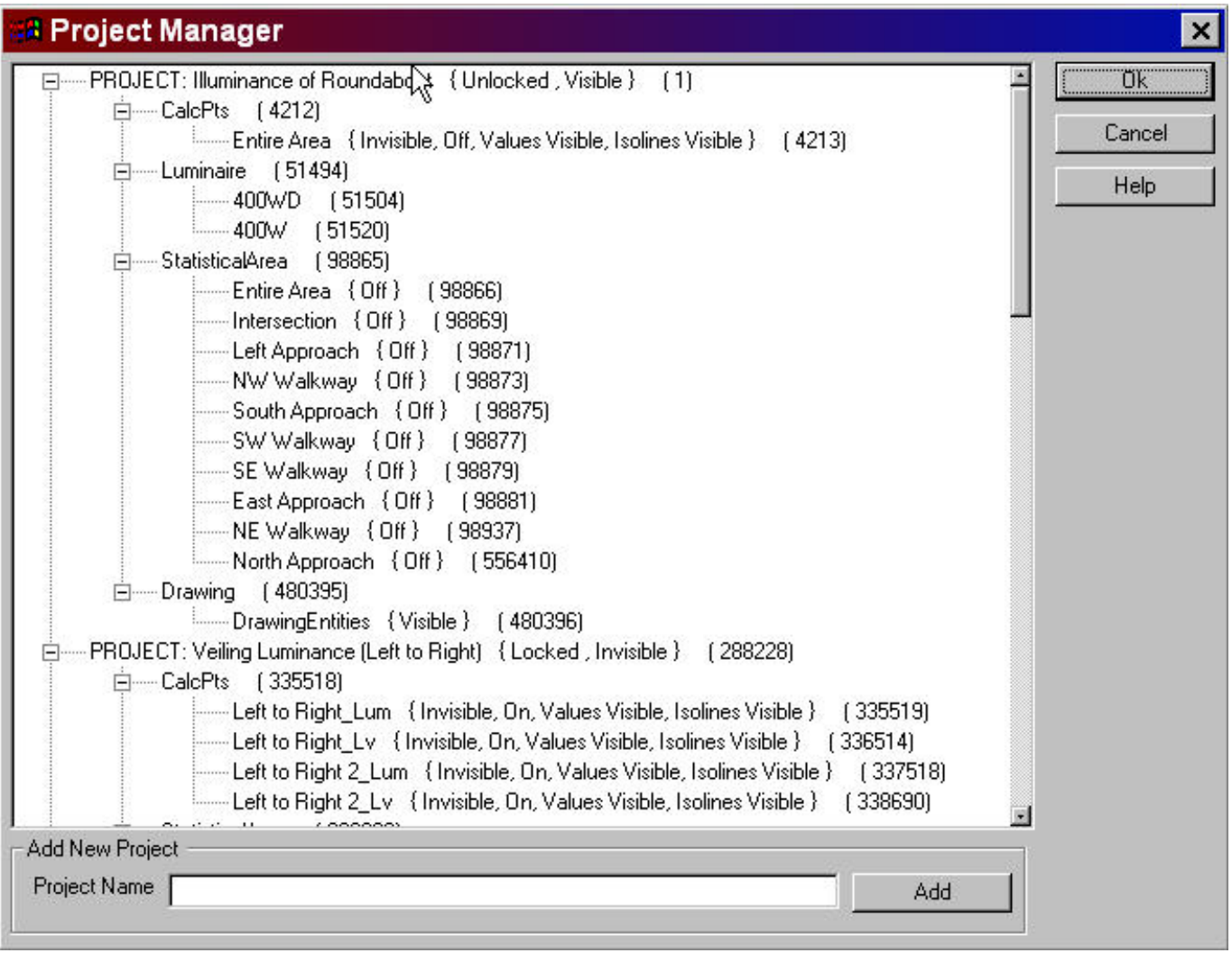
Statistical Summary



Decide which **<u>Calculation</u>** or **<u>Statistical Area</u>** Values you wish to view.

Just **right click** on the Blue-Plus symbol to make your choice.

Project Manager

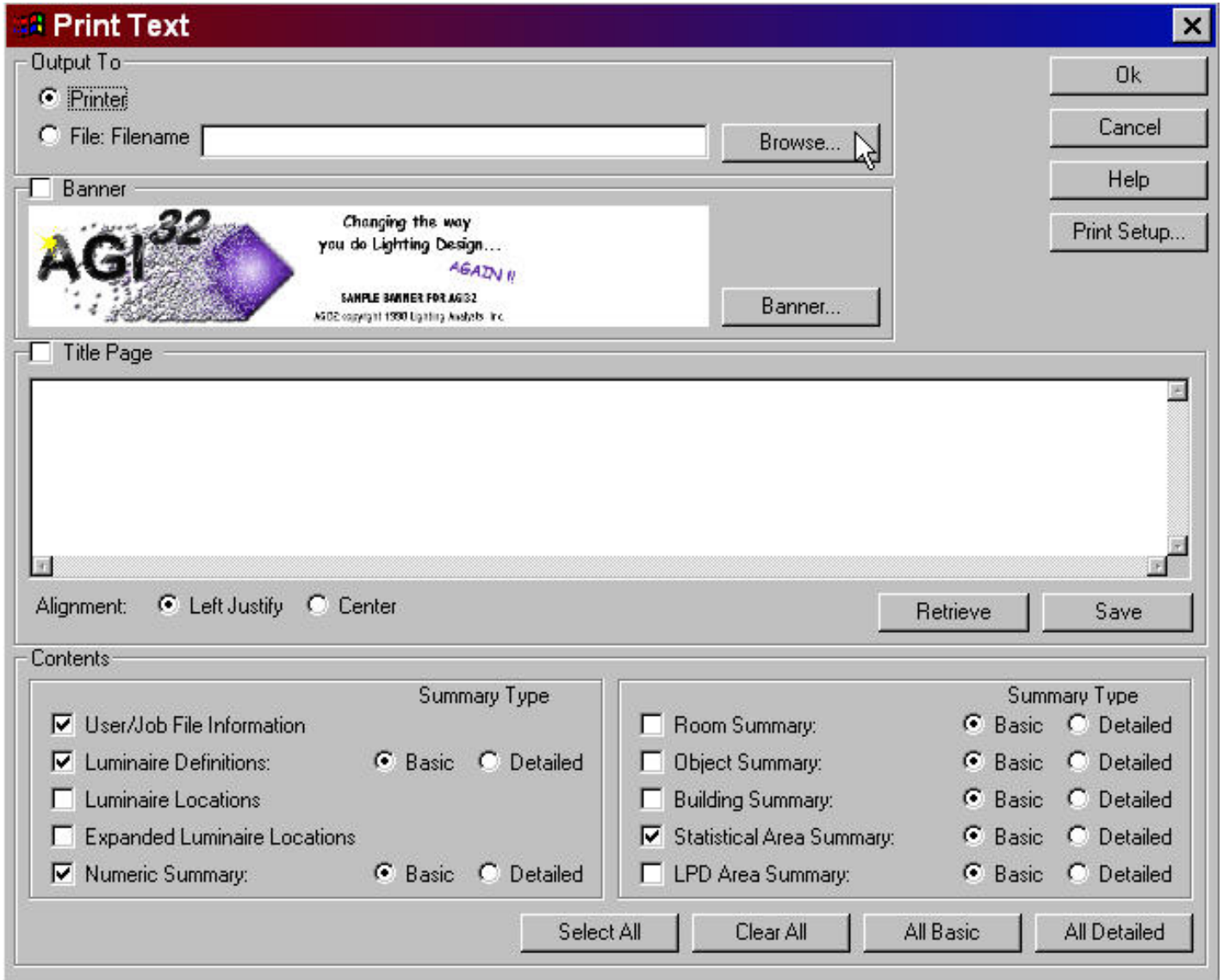


Use the project manager to turn On/Off Calc Points, Luminaires, Statistical Areas, Imported file Elements, etc.. Create multiple projects to decrease calculation time, and much more.

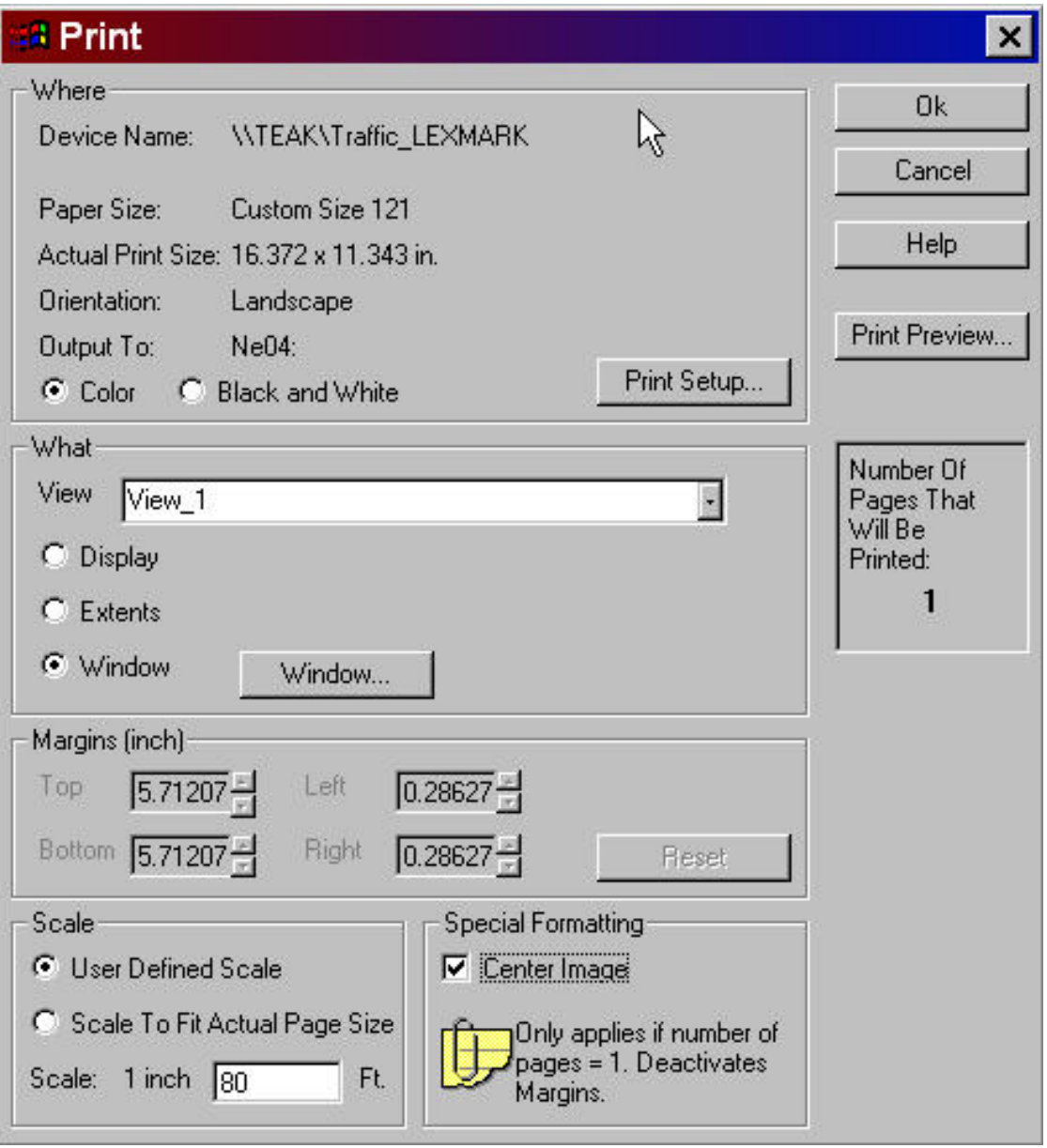
Just Right Click on any line heading to make your choice.

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.

Documentation

See Example 5

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.

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.

Create Activate Disk...

Activation Disk

1.) Go to **Tools / Create Activation Disk** on the computer with the Active License.

2.) Open AGI on the Computer with the **In-Active** License.

3.) Record the **Serial Number** form the **In-Active** License Computer.

4.) Type in the **Serial Number** on the **Active** License Computer.

5.) Create Activation Disk

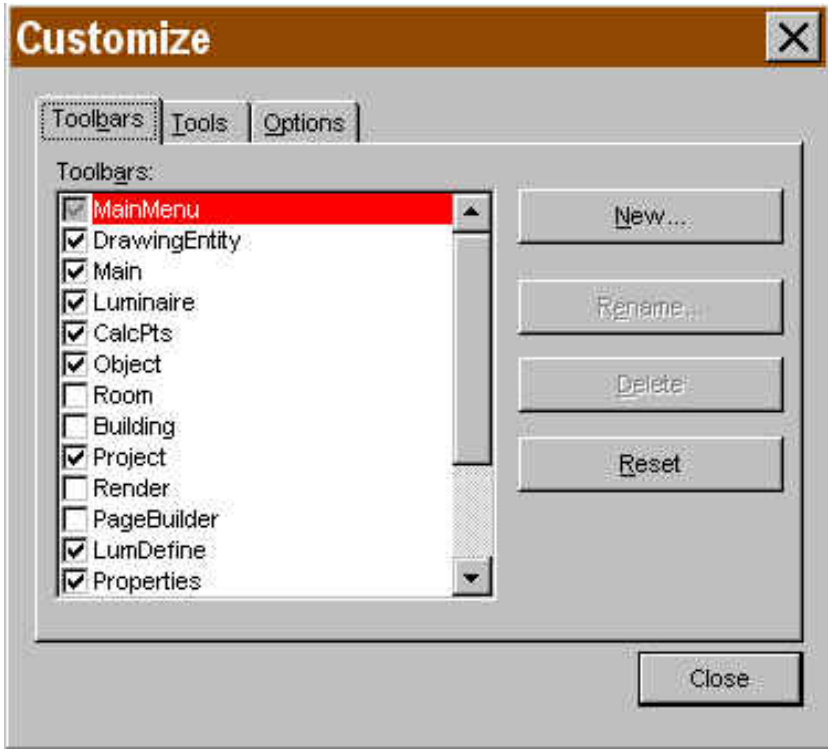
6.) Insert Activation Disk into the **In-Active** License Computer.

7.) Open AGI and Select the button that says “Have Activation Disk”.

8.) A message should appear saying that the License has been successfully activated.

9.) If you **miss record the Serial Number** from the In-Active License Computer, **both machines will be In-Active**. You will need to contact AGI with the **correct serial number** and your **LAI user** number. After you reload the software, they will issue you a new installation key that corresponds with that new Serial Number.

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, Type 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

John Wigginton
john@lightinganalyts.com Ph: (303)972-8852
Leora Radetsky
leora@lightinganalyts.com Ph: (303)972-8852
Fax: (303)972-8851

WSDOT Internal Support

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

Ted Bailey
baileyte@wsdot.wa.gov Ph: (360)705-7286
Fax: (360)705-6826
Terry Thayer
thayert@wsdot.wa.gov Ph: (360)705-7290
Fax: (360)705-6826

Computer Number (Shared Files)

*Ted Bailey **OSC30132**
*Terry Thayer **OSC31351L**

Go to Start/Search(Find - Windows NT)/Computer - enter (ex: **OSC31351L**).

Example 1 – Practice Using AGI32

Open File: "**1__START.A32**"

The design area is outlined in **green.**

→Highway Design Class – Principal Arterial

Pedestrian Area Classification - High

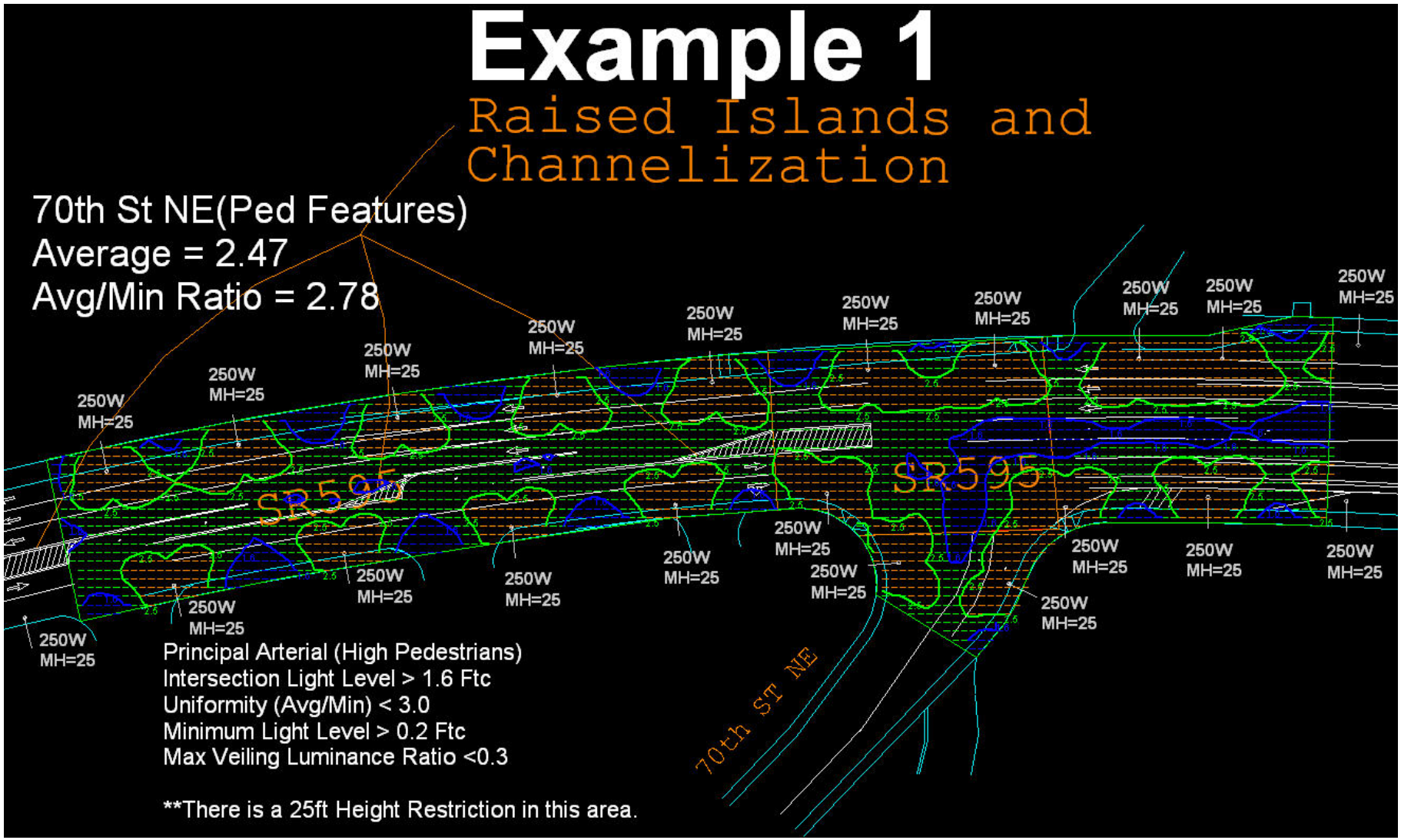
Design for:

1.) **Average Illuminance of *1.6 Ftc,**
2.) **Uniformity(Avg./Min Illuminance) <= *3.0**
3.) **Max Veiling Luminance Ratio (Max Veiling Luminance / Avg. Luminance) <=*0.3**

Note: * Design Values are from the Light Level and Uniformity Ratio Chart, Figure 840-6, Page 840-16 of the May 2000 Design Manual.

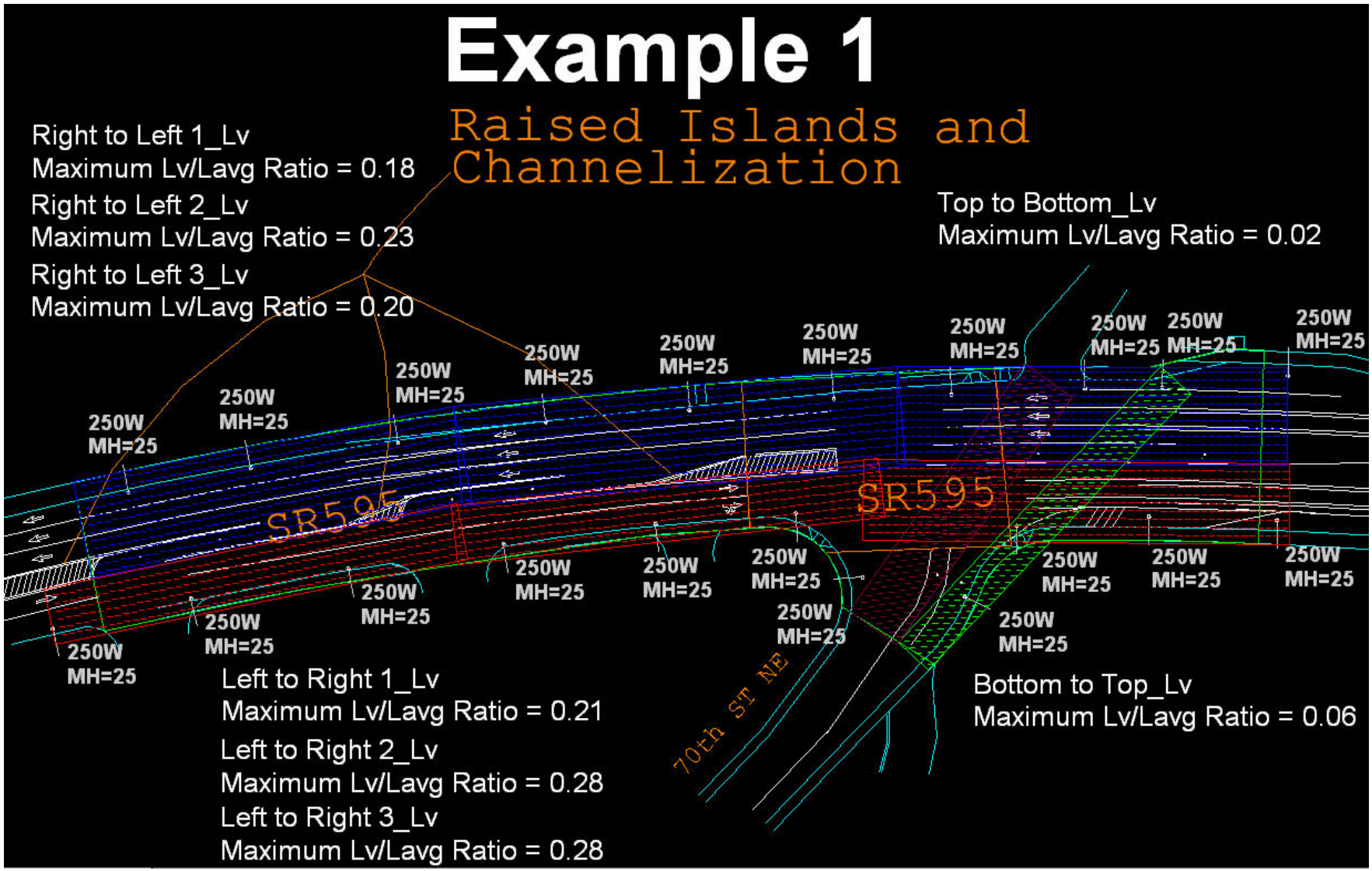
Example 1

File: 4__Illuminance ONLY_COMPLETED.A32



Max Veiling Luminance Ratio Calcs

File: 5__EXAMPLE 1_COMPLETED_Max Lv Ratio.A32



Example 2 – Practice Using AGI32

Open File: "**1__START.A32**"

→Highway Design Class – Minor Arterial

Pedestrian Area Classification - High

Design for: **1.) Average Illuminance of *1.2 Ftc,**

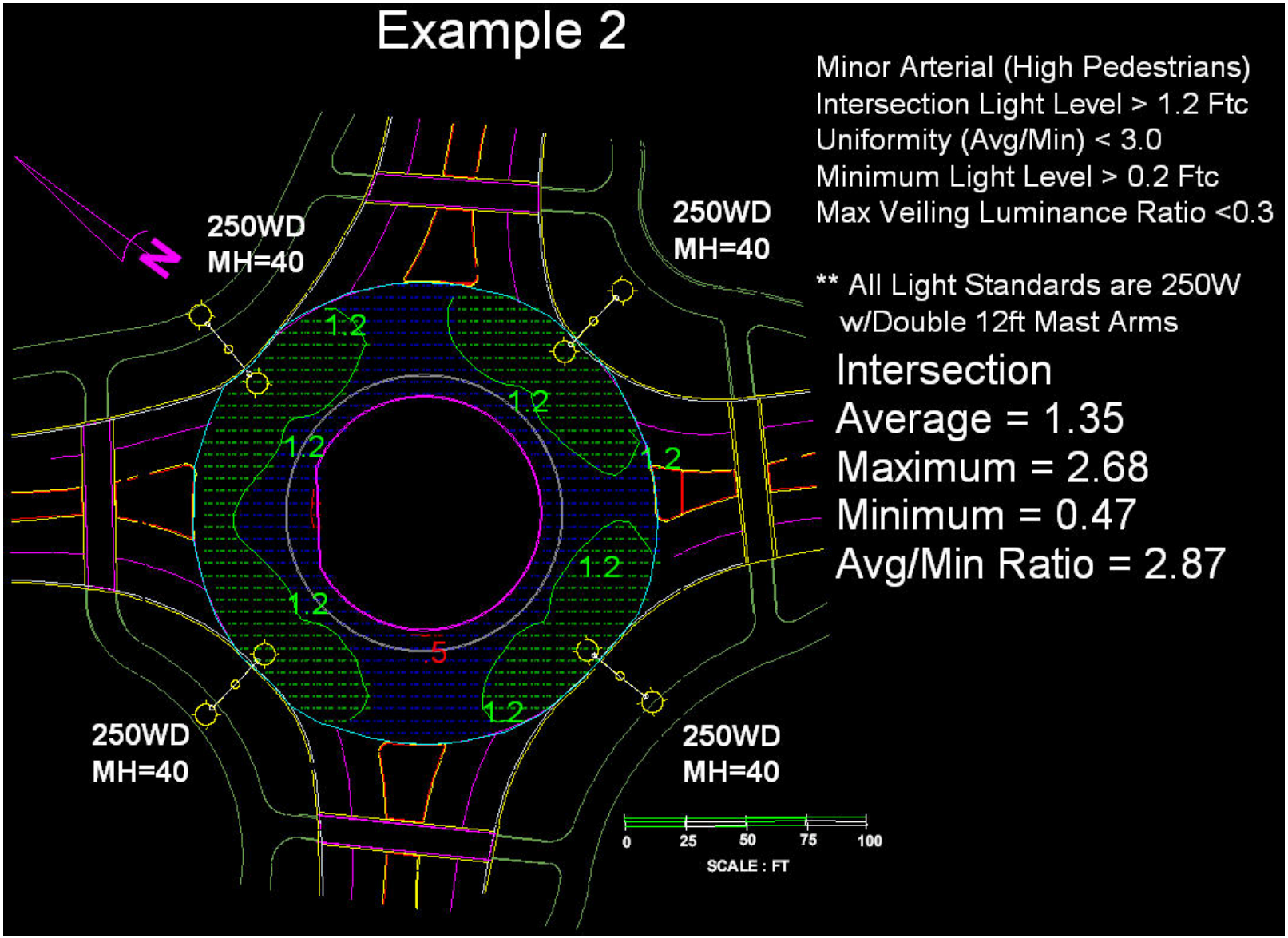
2.) Uniformity(Avg./Min Illuminance) <= *3.0

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

Note: * Design Values are from the Light Level and Uniformity Ratio Chart, Figure 840-6, Page 840-16 of the May 2000 Design Manual.

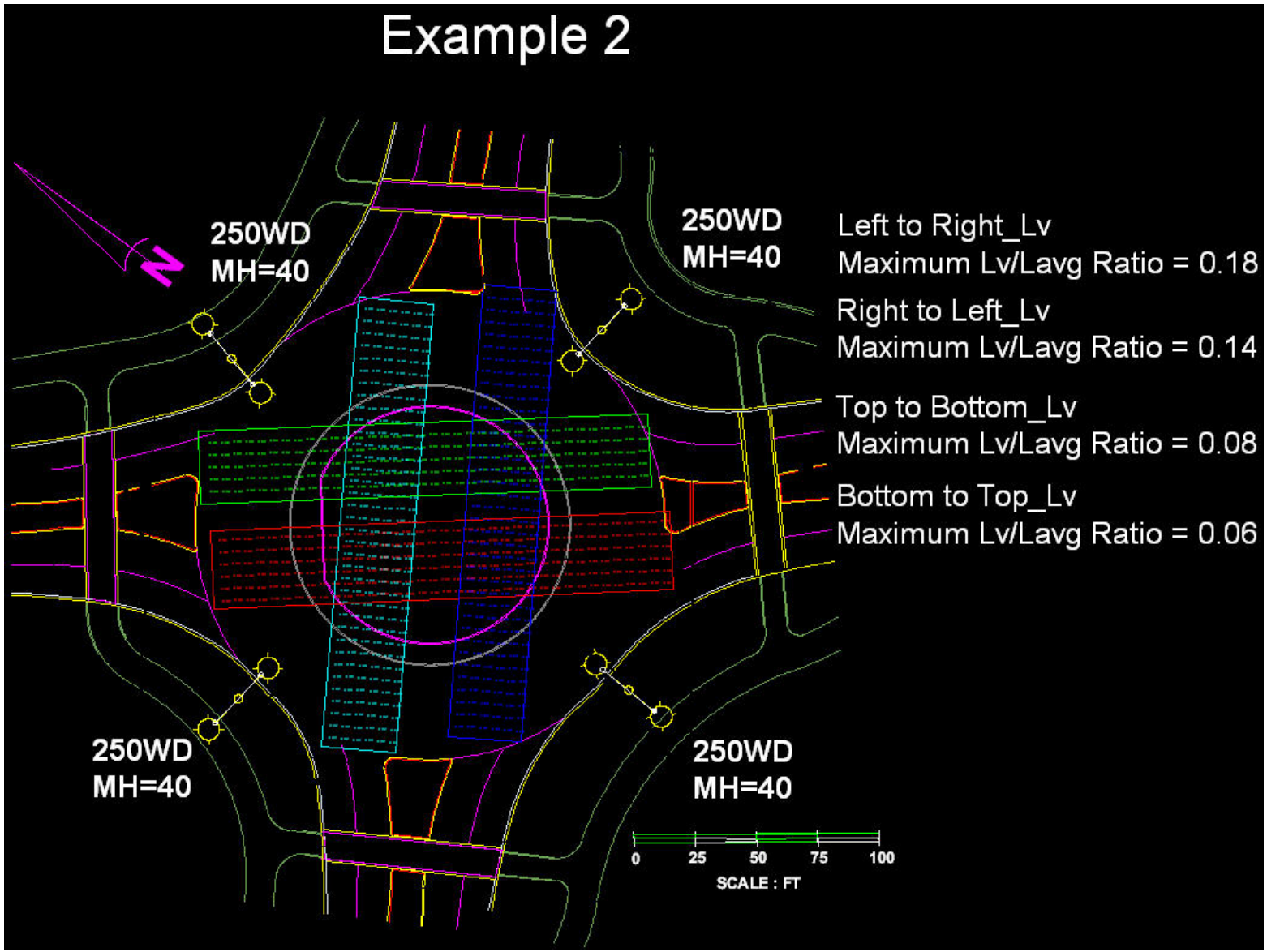
Example 2

File: 3__Illuminance ONLY_COMPLETED.A32



Max Veiling Luminance Ratio Calcs

File: 4__EXAMPLE 2_COMPLETED_Max Lv Ratio.A32



Example 3 – Practice Using AGI32

Open File: "**1__START.A32**"

→Highway Design Class – Principal Arterial

Pedestrian Area Classification - High

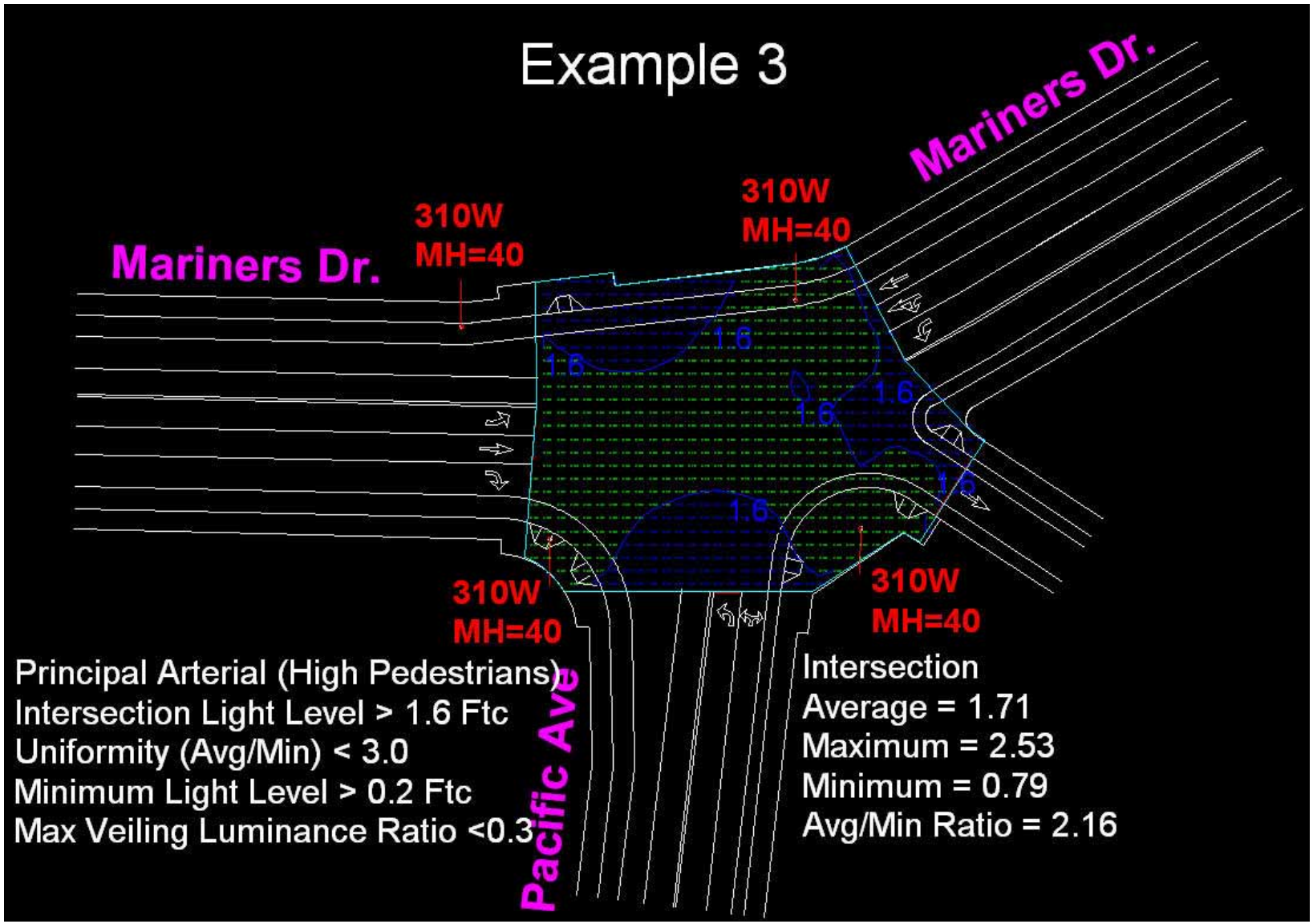
Design for:

1.) **Average Illuminance of *1.6 Ftc,**
2.) **Uniformity(Avg./Min Illuminance) <= *3.0**
3.) **Max Veiling Luminance Ratio (Max Veiling Luminance / Avg. Luminance) <=*0.3**

Note: * Design Values are from the Light Level and Uniformity Ratio Chart, Figure 840-6, Page 840-16 of the May 2000 Design Manual.

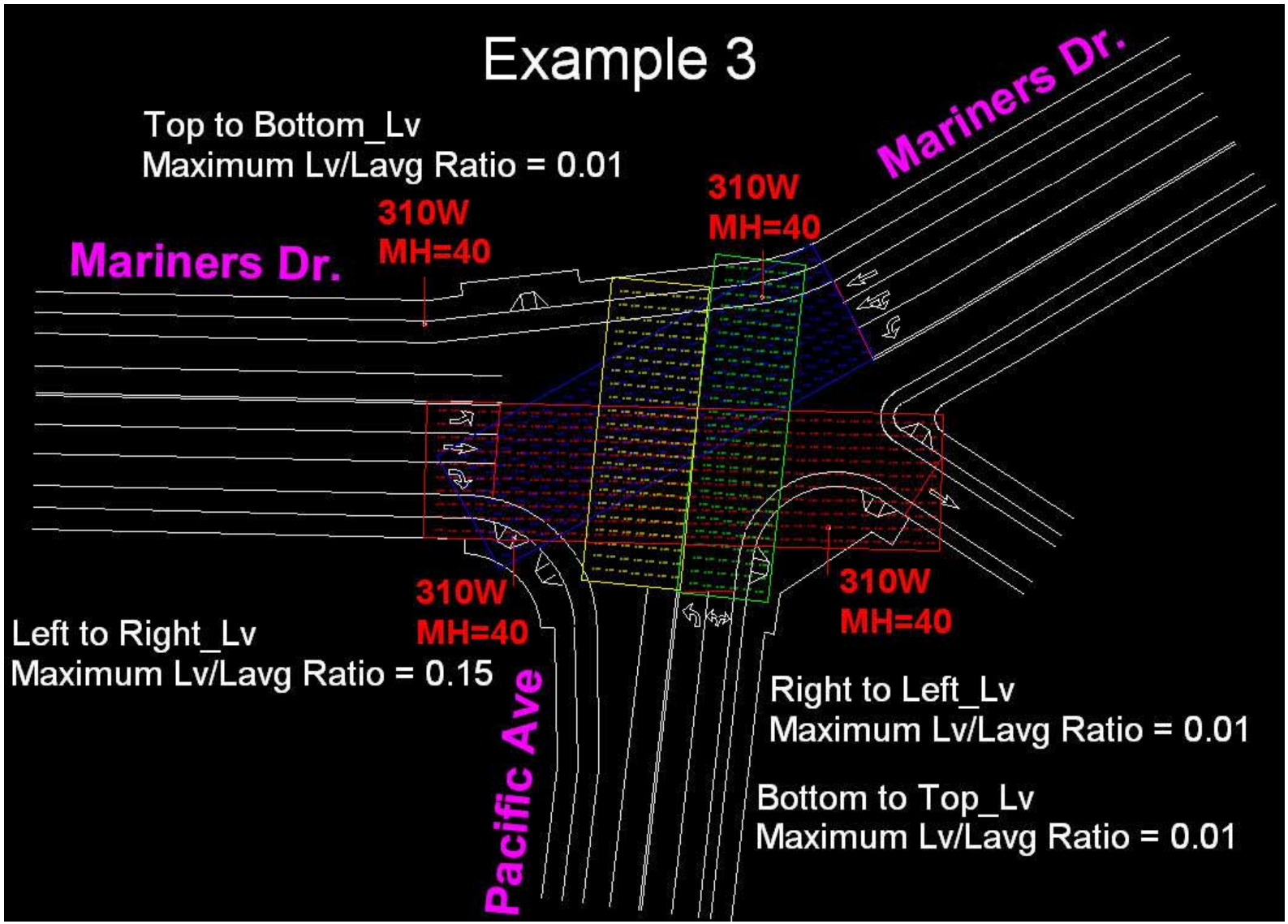
Example 3

File: 3__Illuminance ONLY_COMPLETED.A32



Max Veiling Luminance Ratio Calcs

File: 4__EXAMPLE 3_COMPLETED_Max Lv Ratio.A32



Example 4 – Practice Using AGI32

Open File: "**1__START.A32**"

→Highway Design Class – Principal Arterial

Pedestrian Area Classification - High

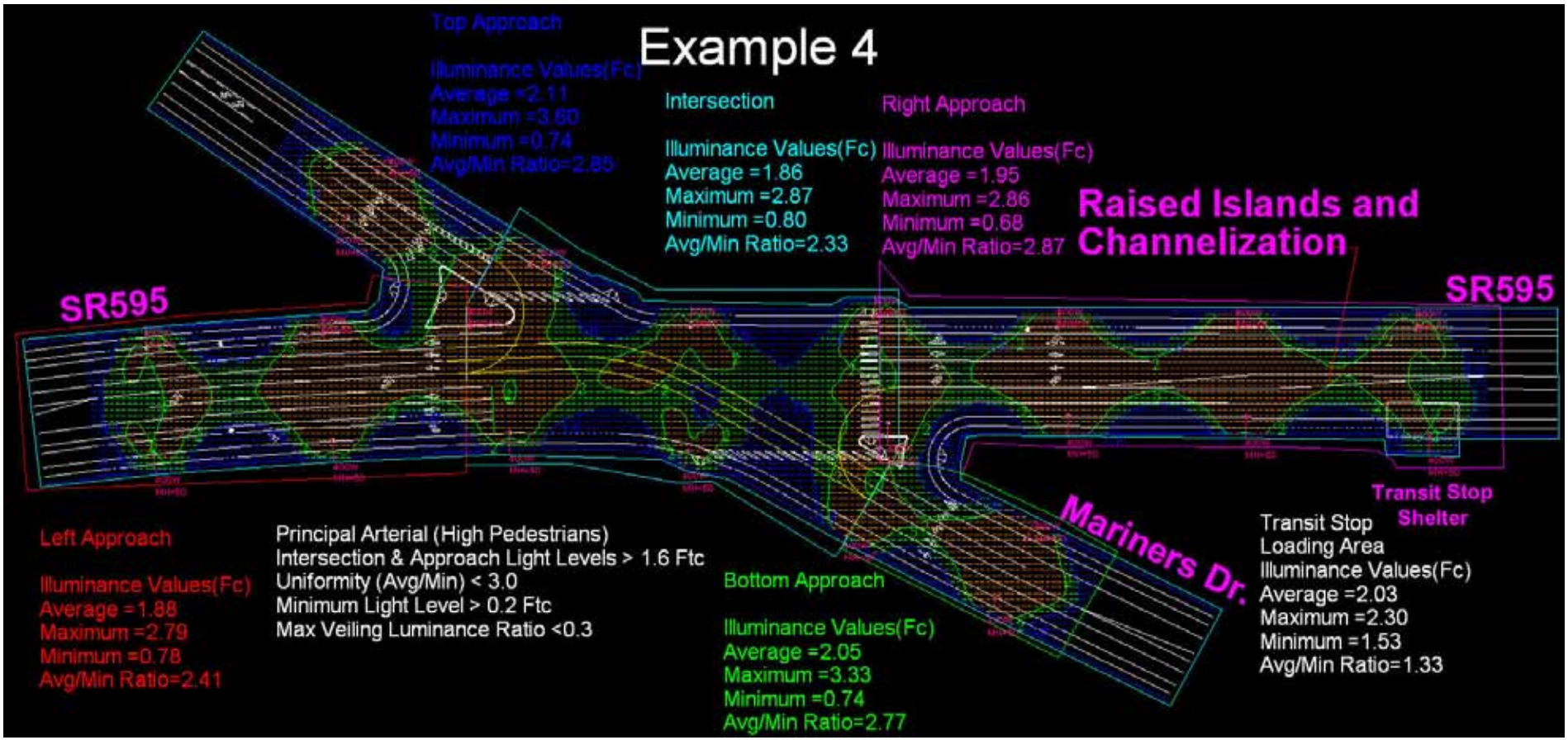
Design for:

1.) **Average Illuminance Intersection and Approaches of *1.6 Ftc.**
2.) **Average Illuminance Transit Stop *2.0 Ftc.**
3.) **Uniformity(Avg./Min Illuminance) <= *3.0**
4.) **Max Veiling Luminance Ratio (Max Veiling Luminance / Avg. Luminance) <=*0.3**

Note: * Design Values are from the Light Level and Uniformity Ratio Chart, Figure 840-6, Page 840-16 of the May 2000 Design Manual.

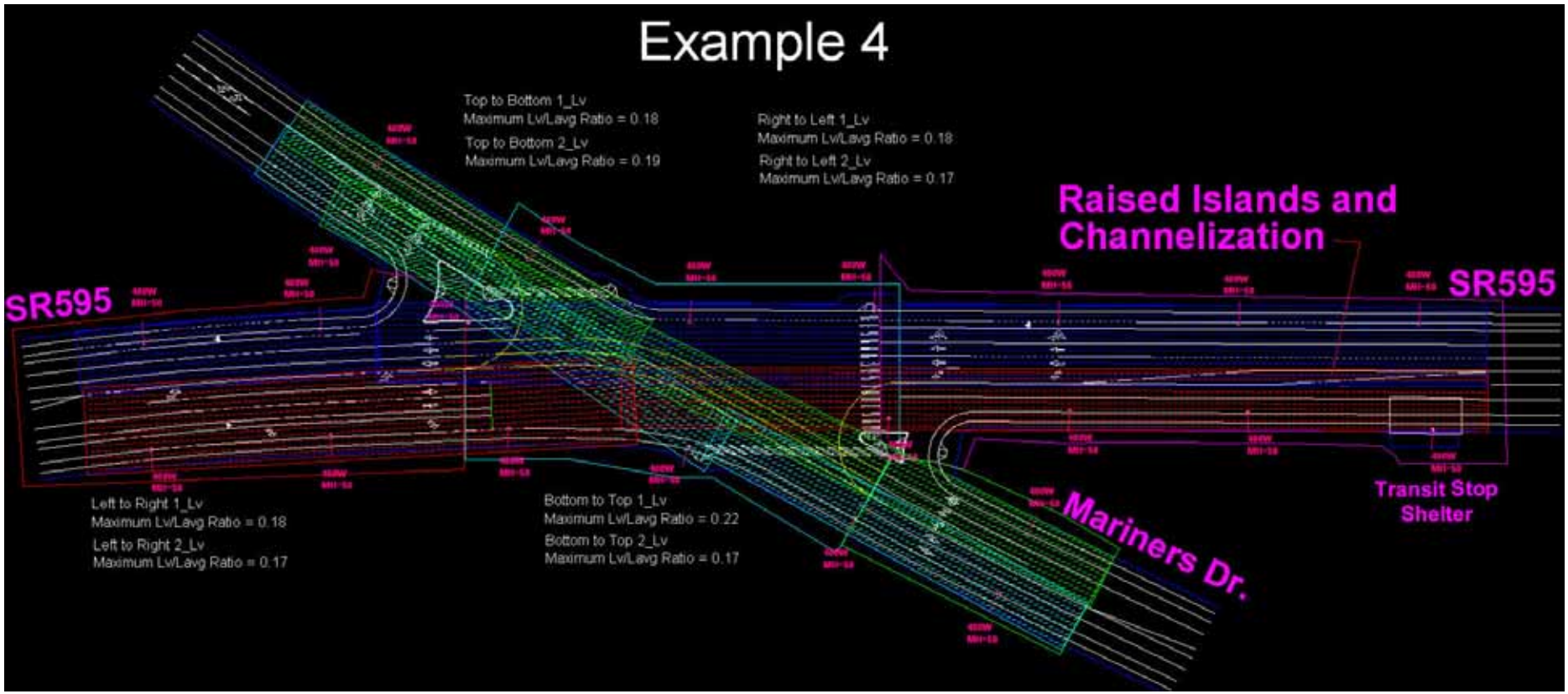
Example 4

File: 4__Illuminance_ONLY_COMPLETED.A32



Max Veiling Luminance Ratio Calcs

File: 5__EXAMPLE 4_COMPLETED_Max Lv Ratio.A32



Example 5 – Practice Using AGI32

Open File: "**1__START.A32**"

→Highway Design Class – Minor Arterial

Pedestrian Area Classification – High

Design for: **1.) Average Illuminance Approaches & Intersection → *1.2 Ftc,**

2.) Average Illuminance Walkways → *0.8 Ftc,

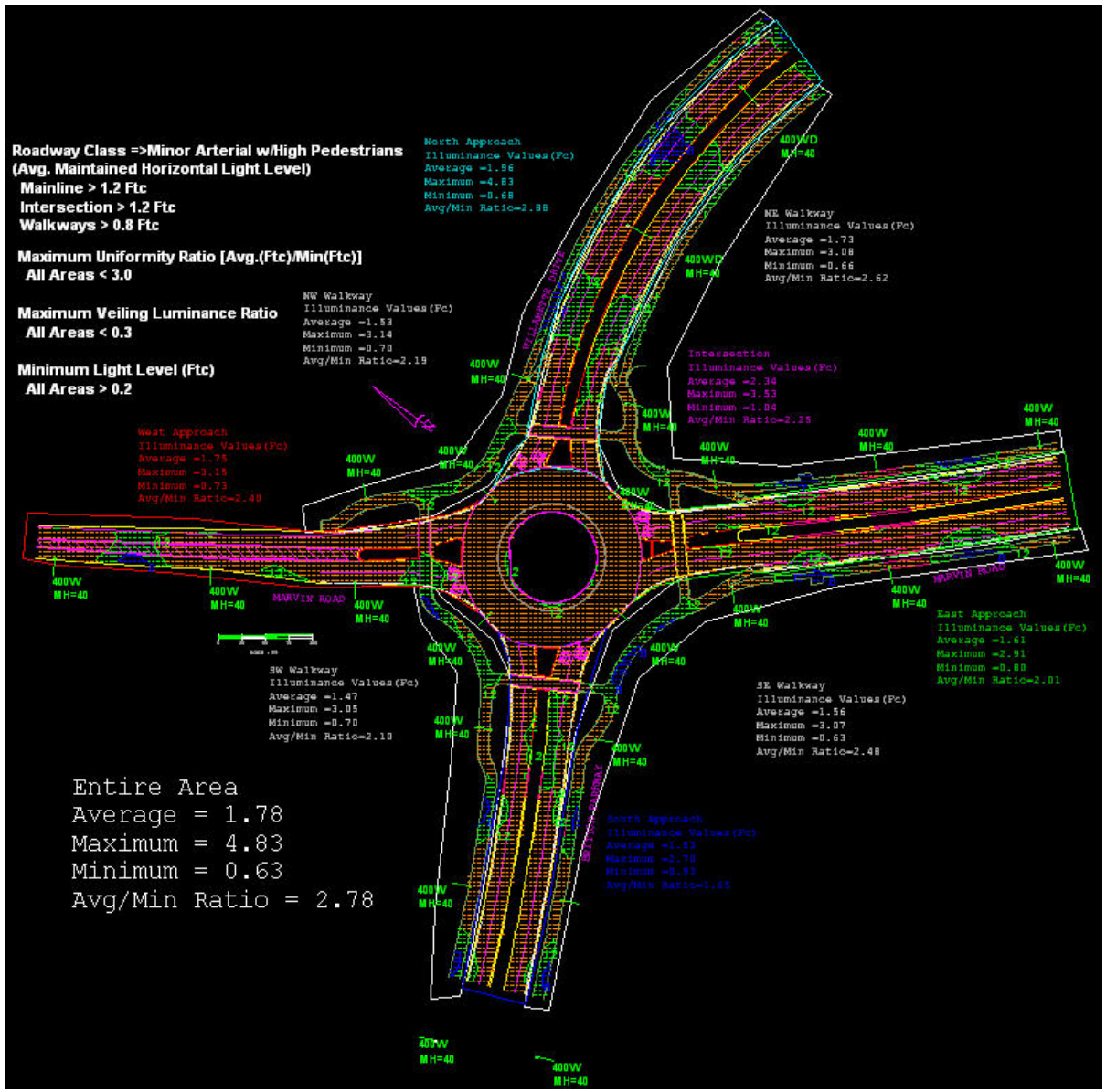
3.) Uniformity (Avg./Min Illuminance) <= *3.0

4.) Max Veiling Luminance Ratio (Max Veiling Luminance / Avg. Luminance) <=*0.3

Note: * Design Values are from the Light Level and Uniformity Ratio Chart, Figure 840-6, Page 840-16 of the May 2000 Design Manual.

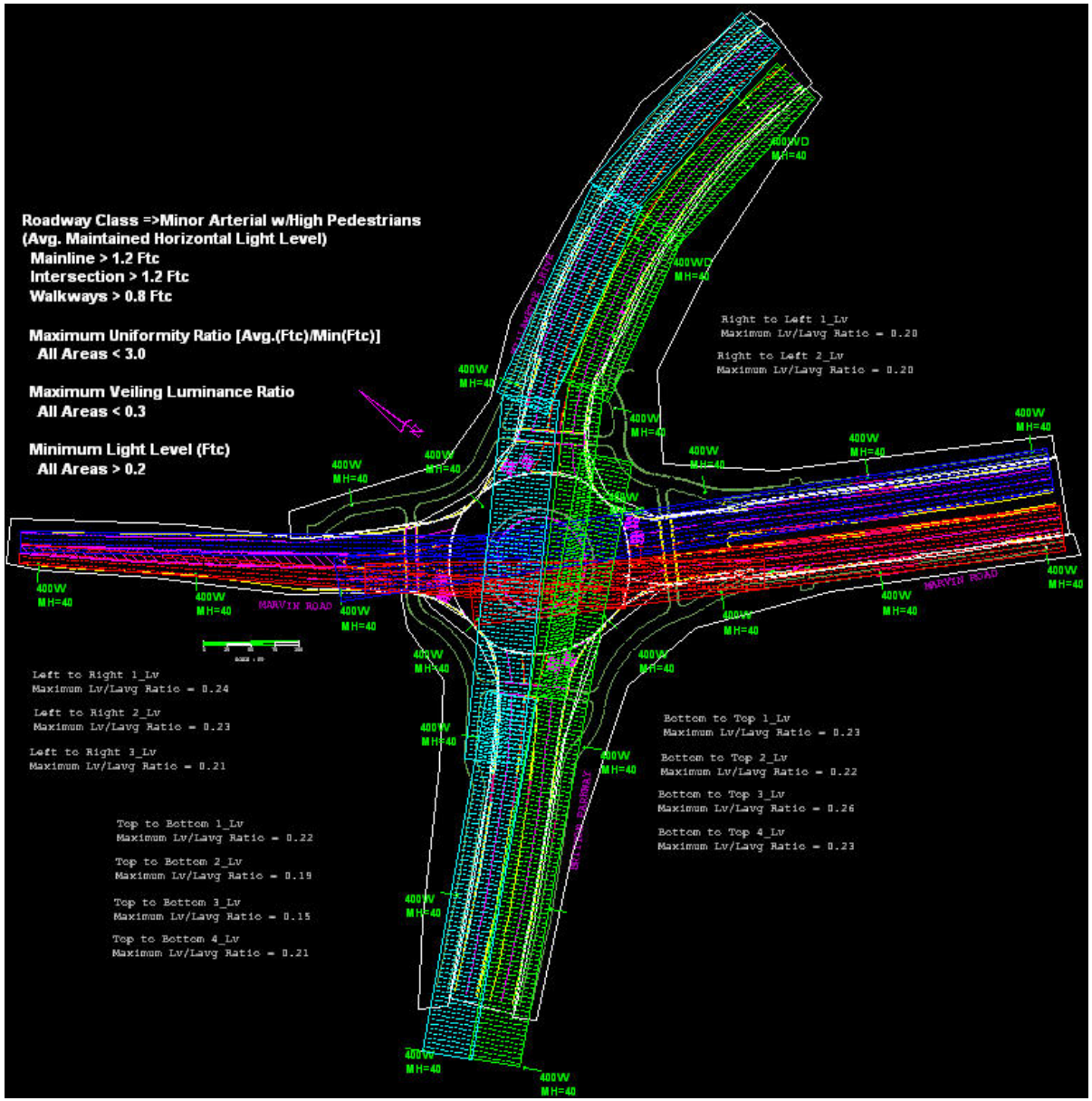
Example 5

File: 4__Illuminance ONLY_COMPLETED.A32



Max Veiling Luminance Ratio Calcs

File: 5__EXAMPLE 5 _COMPLETED_Max Lv Ratio.A32



TEST

1.) Import the DXF file that is located in the TEST folder.

2.) The entire area is to be continuously illuminated.

3.) The roadway classification: Principle Arterial

4.) Pedestrians: Nighttime peak hour volume is 50.

5.) Use any Mounting Height.

6.) Use ONLY the state Standard Luminaire.

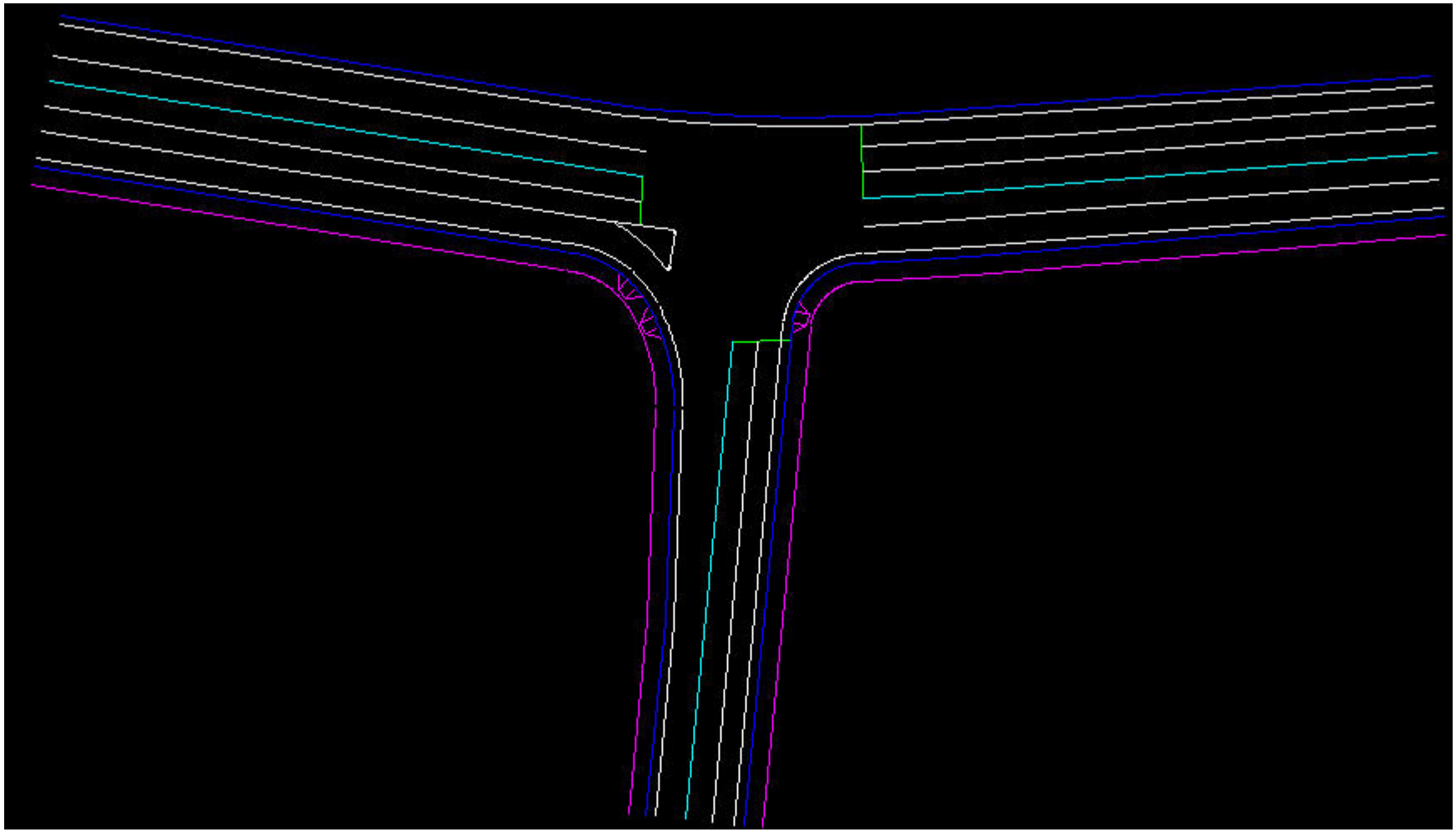
7.) Use any Mast arm Length.

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

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

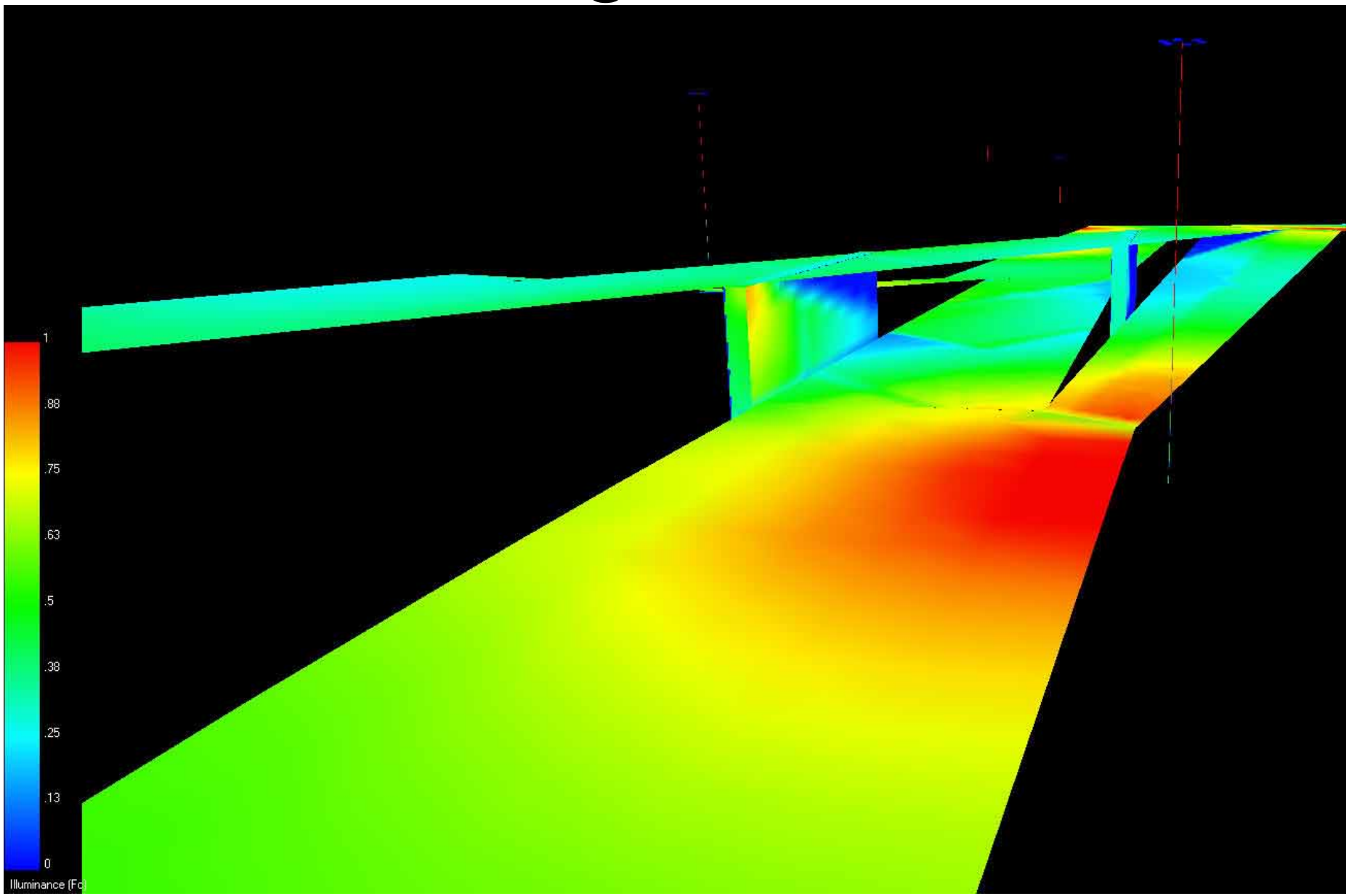
10.) Save the file as “Test-name”. (I.e. Test-Ted)

TEST Cont…



This is what the imported TEST.DXF file looks like.

3D in Agi32 (Version 1.53)

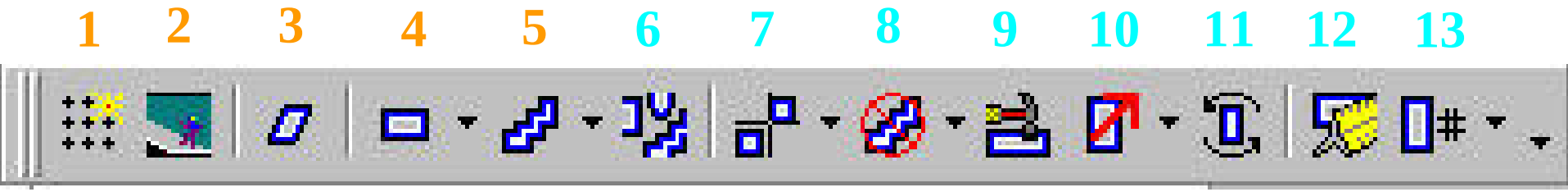


When Should I Consider a 3D Design?

If you meet any of following criteria you should consider doing a 3D Design.

1.) A significant vertical or sag curve. Especially when sight distance is an issue.
2.) Anything that might block light from the luminaire to the roadway surface.
   a. Bridge Deck
   b. Large Retaining Walls
   c. Large Trees or Landscaping (I.e. I5 & SR18 Interchange, Southcenter Interchange)
   d. Overhead Sign or Sign Bridge (You are required to install luminaires a MINIMUM of 50ft ahead or back from these structures.)
3.) A steep grade. (Greater than 4% or 5%)
4.) Continuously Illuminated Interchange
5.) High Mast Illumination
6.) Roadways that are side by side and at different elevations.

3D in AGI - Tools…



1.) **CalcPts – Automatic Placement** → Automatically places calculation points on the surface of any object.

2.) **Render** → See Reference Manual for more information.

3.) **Object – Planar** →Use for Ramps, Bridge decks, & Roadway surfaces.

4.) **Object – Rectangular** →Use for Bridge Decks, Columns, Piers,& Retaining Walls.

5.) **Object – Odd** →Same as #4 except you can draw any polygon shape.

6.) Add Library Object →Use to place pre-drawn objects, Vehicles, Trucks Etc..

7.) Copy Object →Copy any object.

8.) Delete Object →Delete any object.

9.) Edit Object →Change color, labels, some characteristics(different for each).

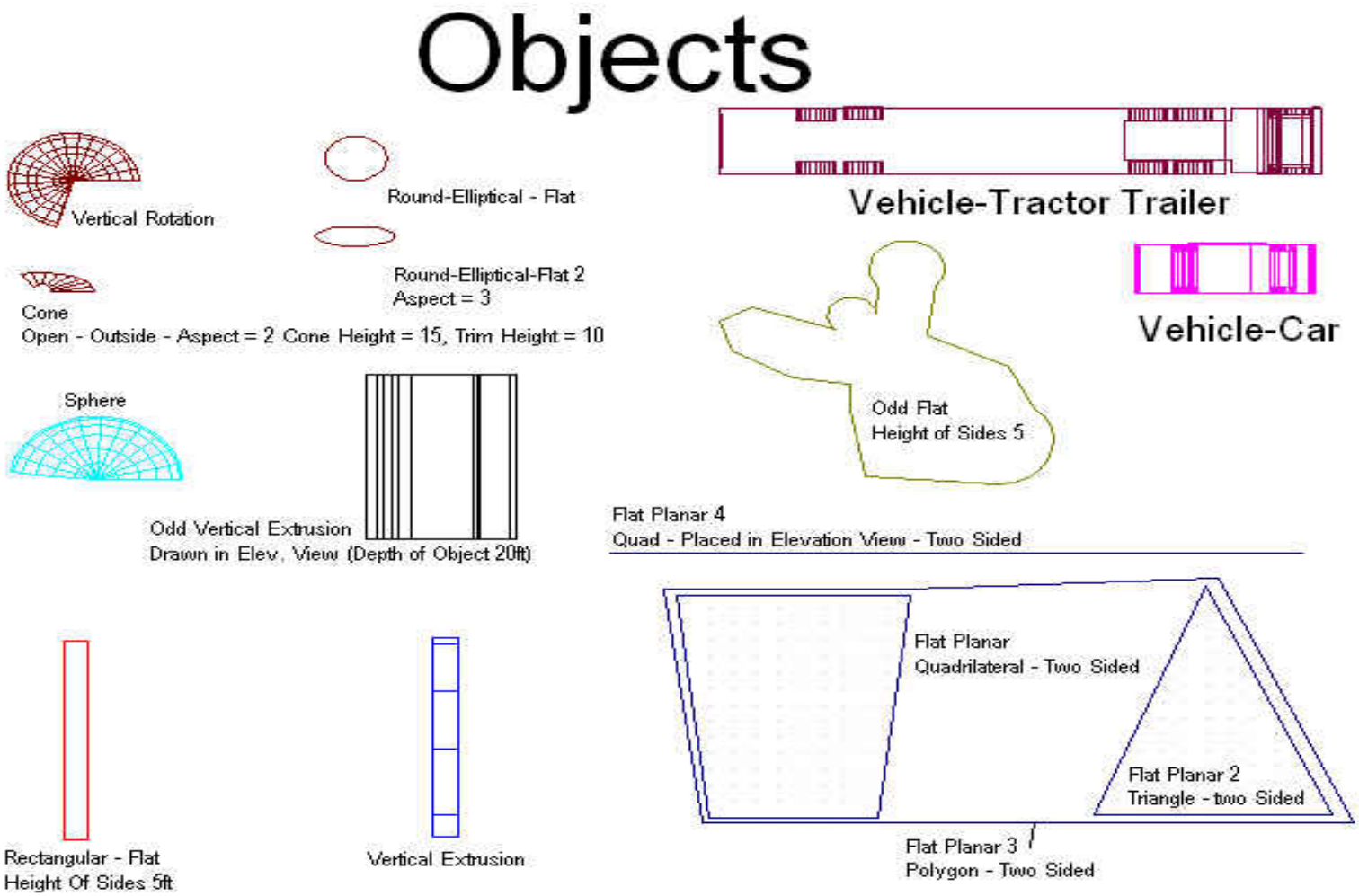
10.) Move Object →Move any object.

11.) Rotate Object →Rotate any object (In any plane X-Y, X-Z, Y-Z)-**Version 1.3**.

12.) Scale Object →Proportionally scale any object.

13.) Object Labels →Delete and/or Move any label.

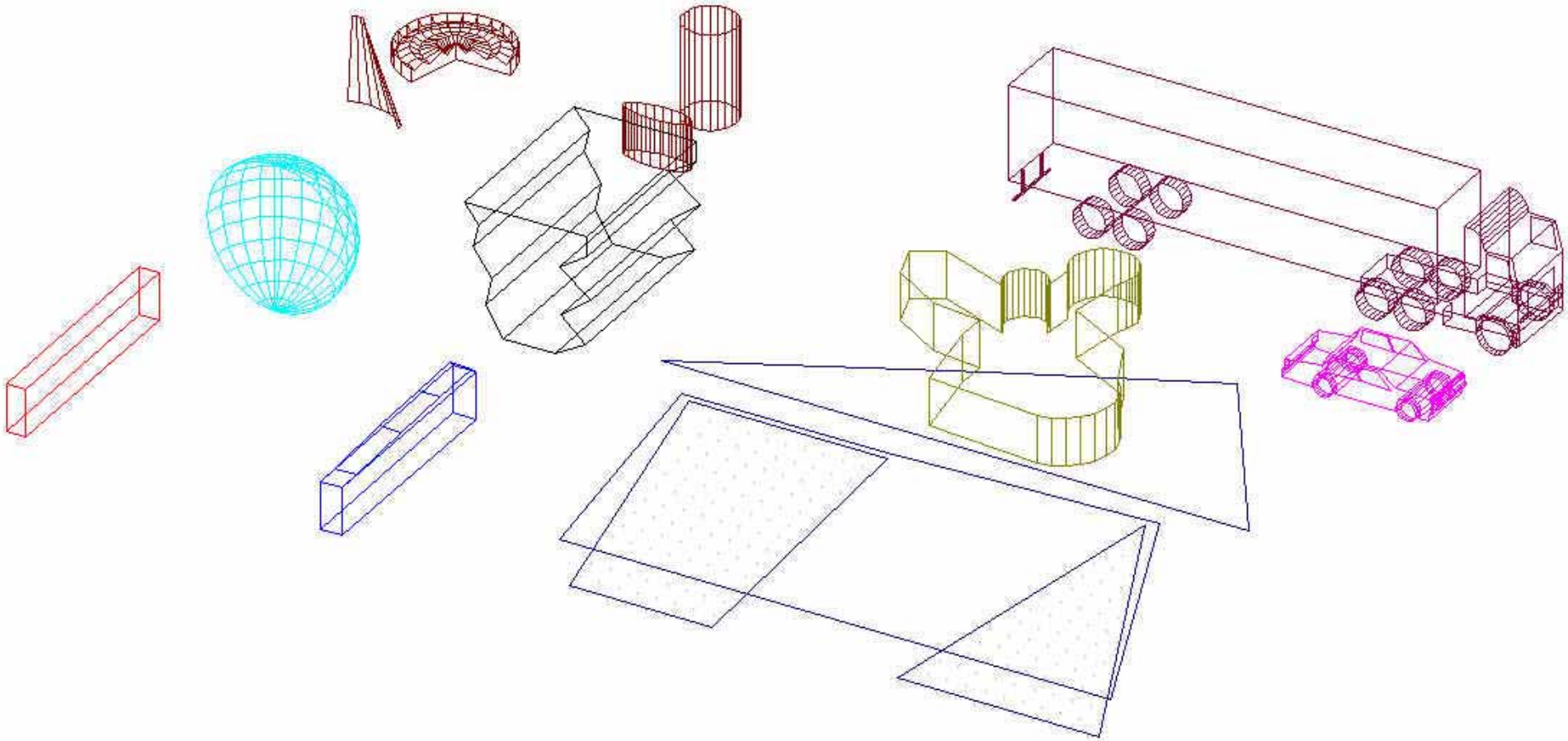
3D in AGI - File: Objects.A32



1.) When creating objects use **0.07**(7%) Reflectance for any concrete or asphalt surface.

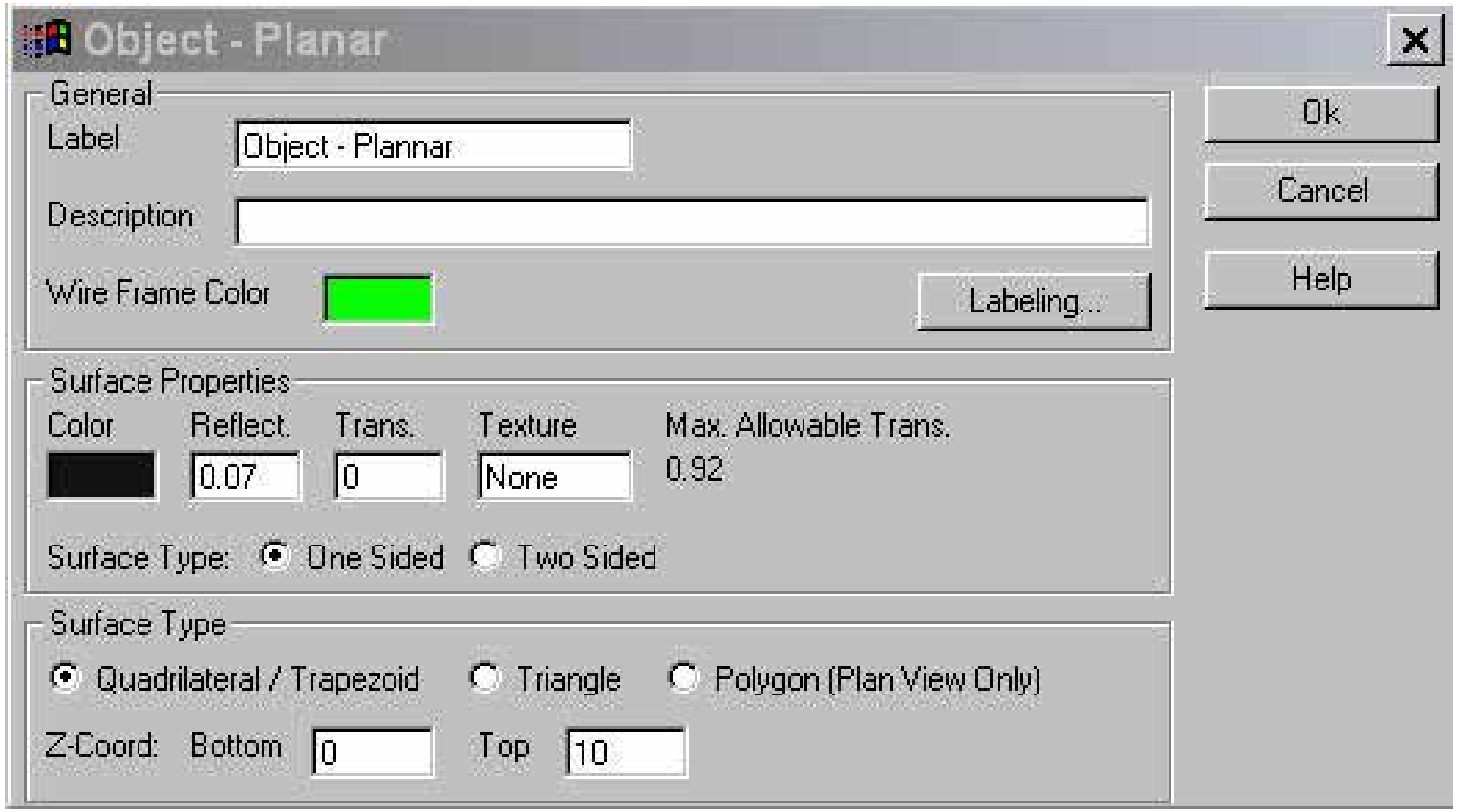
2.) When you start to draw an object, AGI places **notes(tips)** on what to do in the **bottom left hand corner** of the **screen**.

3D in AGI - File: Objects.A32 Cont…



Same Objects in an **Isometric View**.

3D in AGI – Object Planar

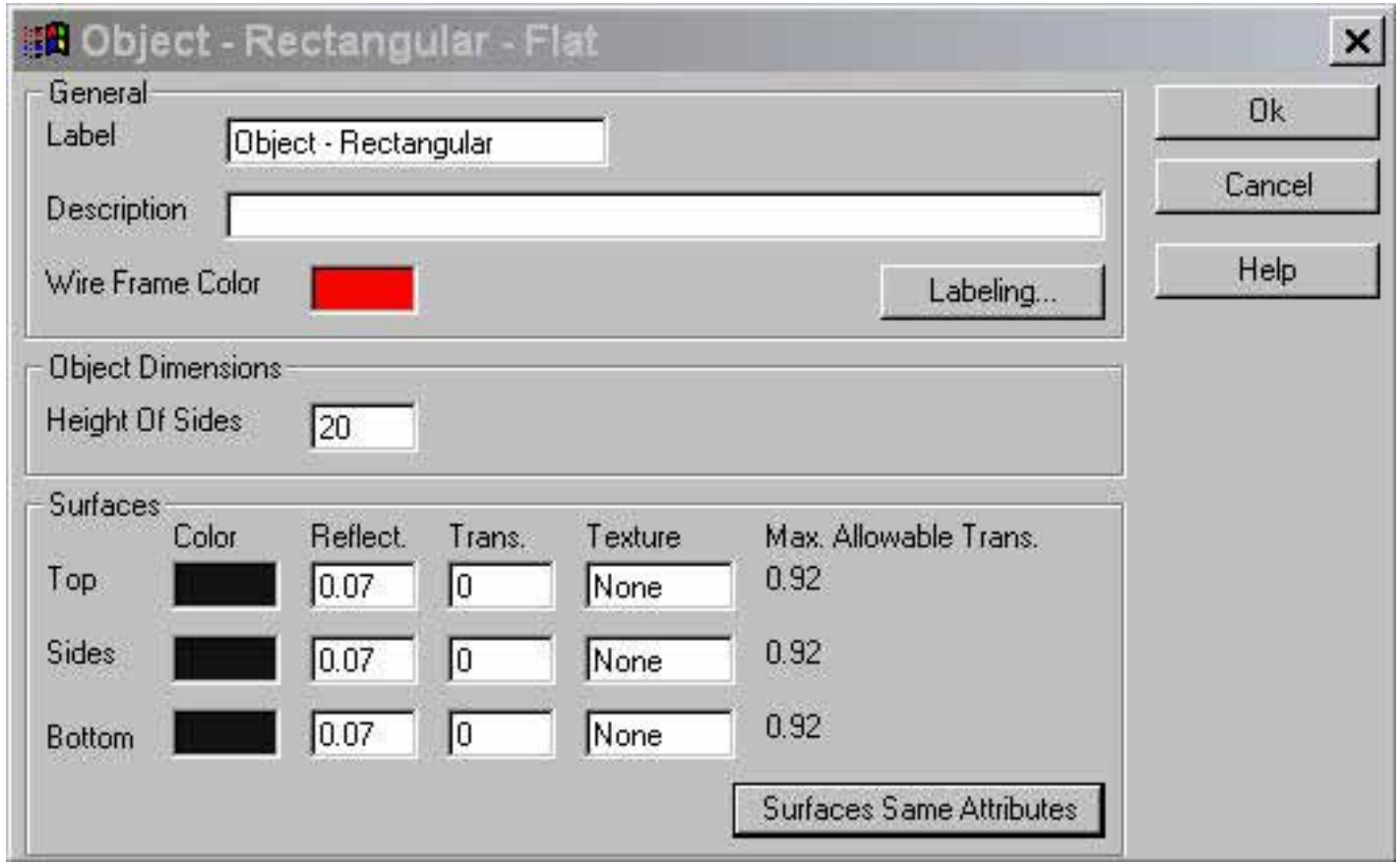


Use the settings as shown above.

Use the Quadrilateral / Trapezoid Shape for Slanted Roadway Sections.

Use the Polygon Shape for Horizontal Roadway Sections.

3D in AGI – Object Rectangular

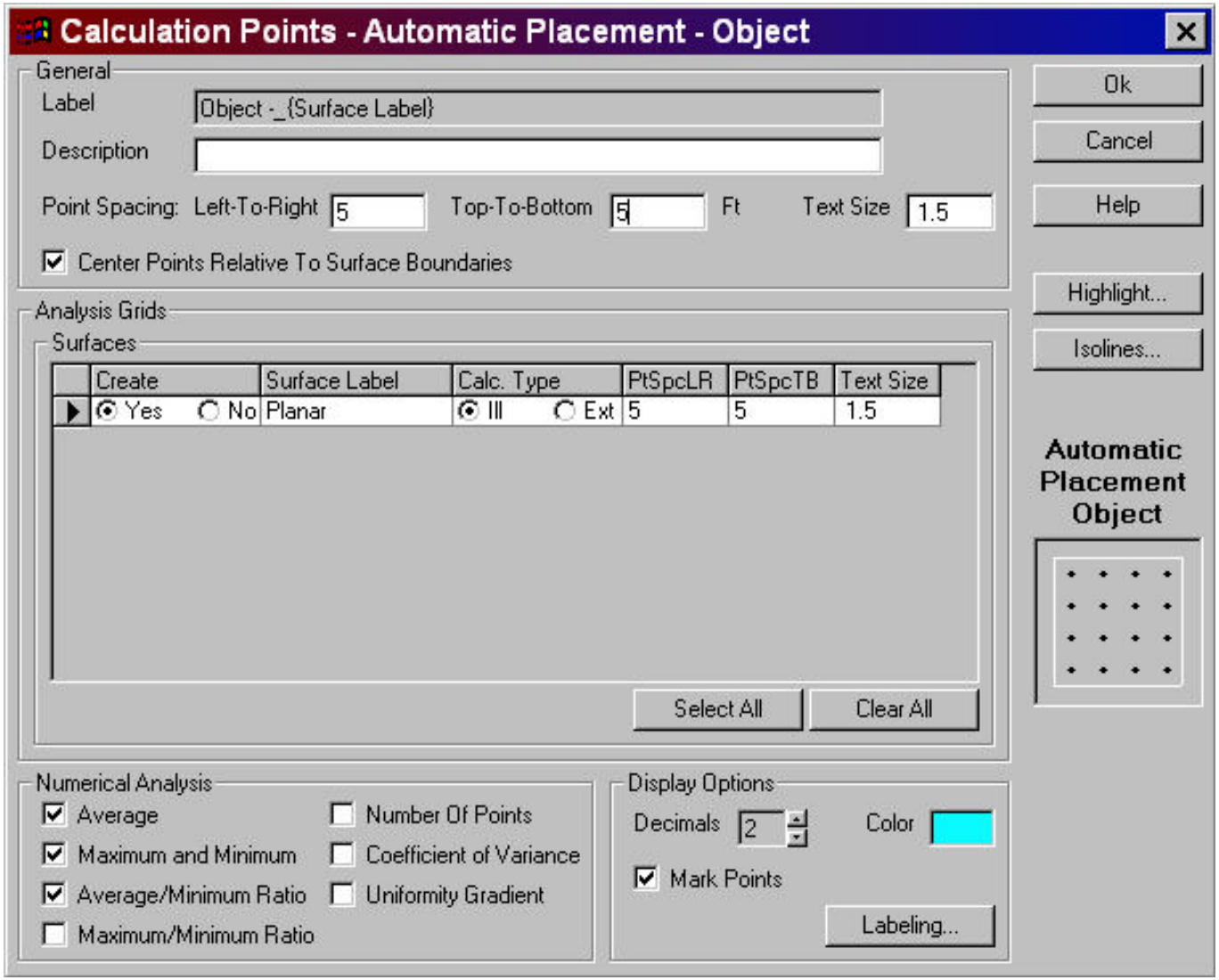


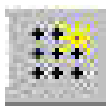
Use the settings as shown above.

The height of the object starts at Z=0.

ALL OBJECTS can extend above, below or through any other object.

3D in AGI - Automatic Point Placement





Press this Icon and then select an object.

Use the settings as shown above.

Make sure that you use a 5ft x 5ft grid spacing.

3D in AGI - Notes and Tips

1.) **Draw elevation lines** across the roadway at periodic increments **before you place any objects**. Preferably done in MicroStation before you export.

2.) When placing Luminaires be careful to **specify** the **mounting height above the roadway surface** and not just Z=0.

3.) You must use **Full Calculation Mode** to be able to render your results. Blocked light, due to objects, is considered in Direct Calculation Mode.

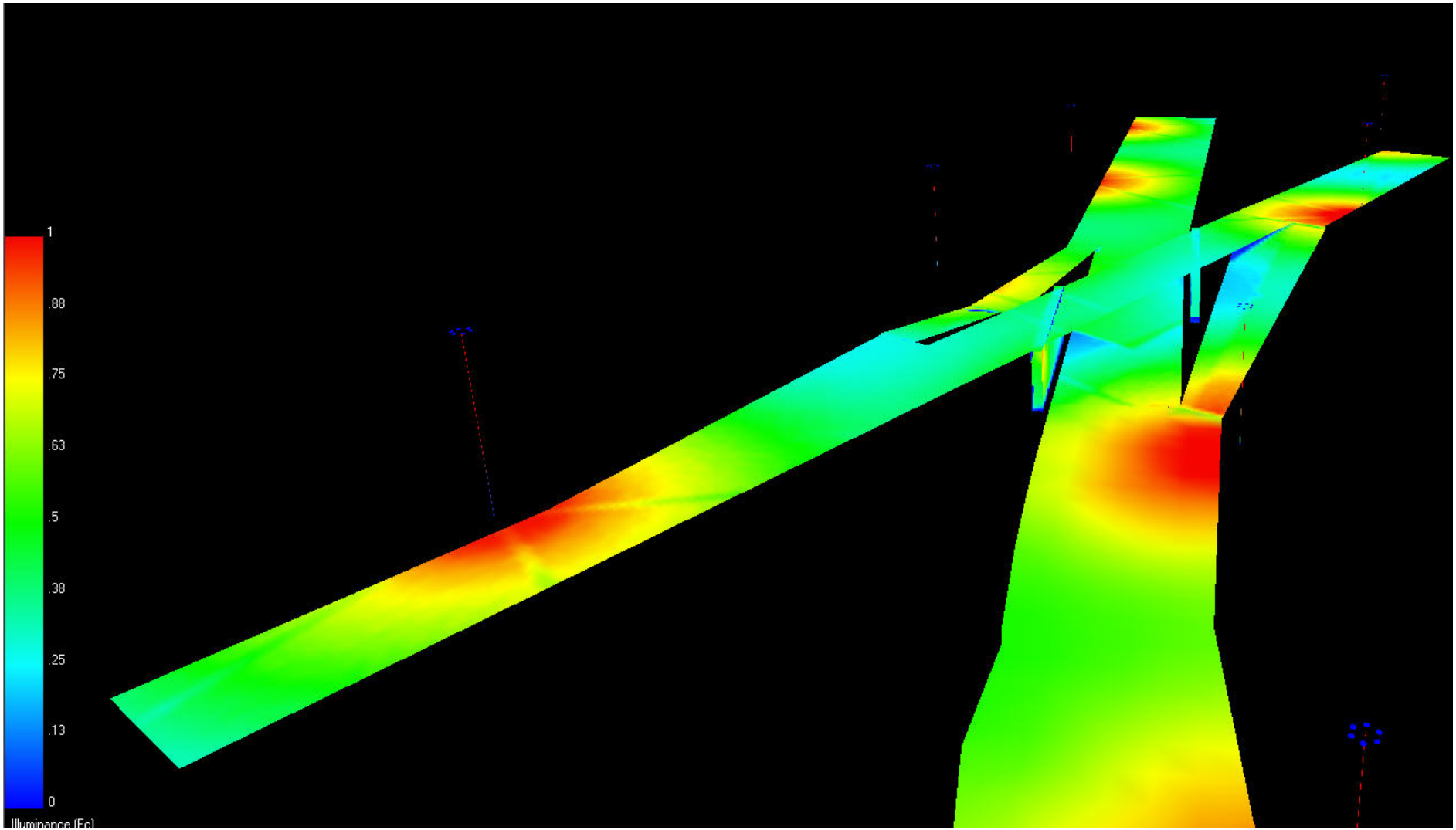
4.) **Turn off any objects or calculation planes** that you **don't need** to have on. This will increase the speed of operations in the file.

5.) **MAKE SURE THAT OBJECTS WITH CALCULATION POINTS DON'T OVERLAP. If overlapping occurs, delete the calculation points in the overlapped area.**

6.) **Draw objects a little larger than the roadway area** and then remove unwanted calculation points.

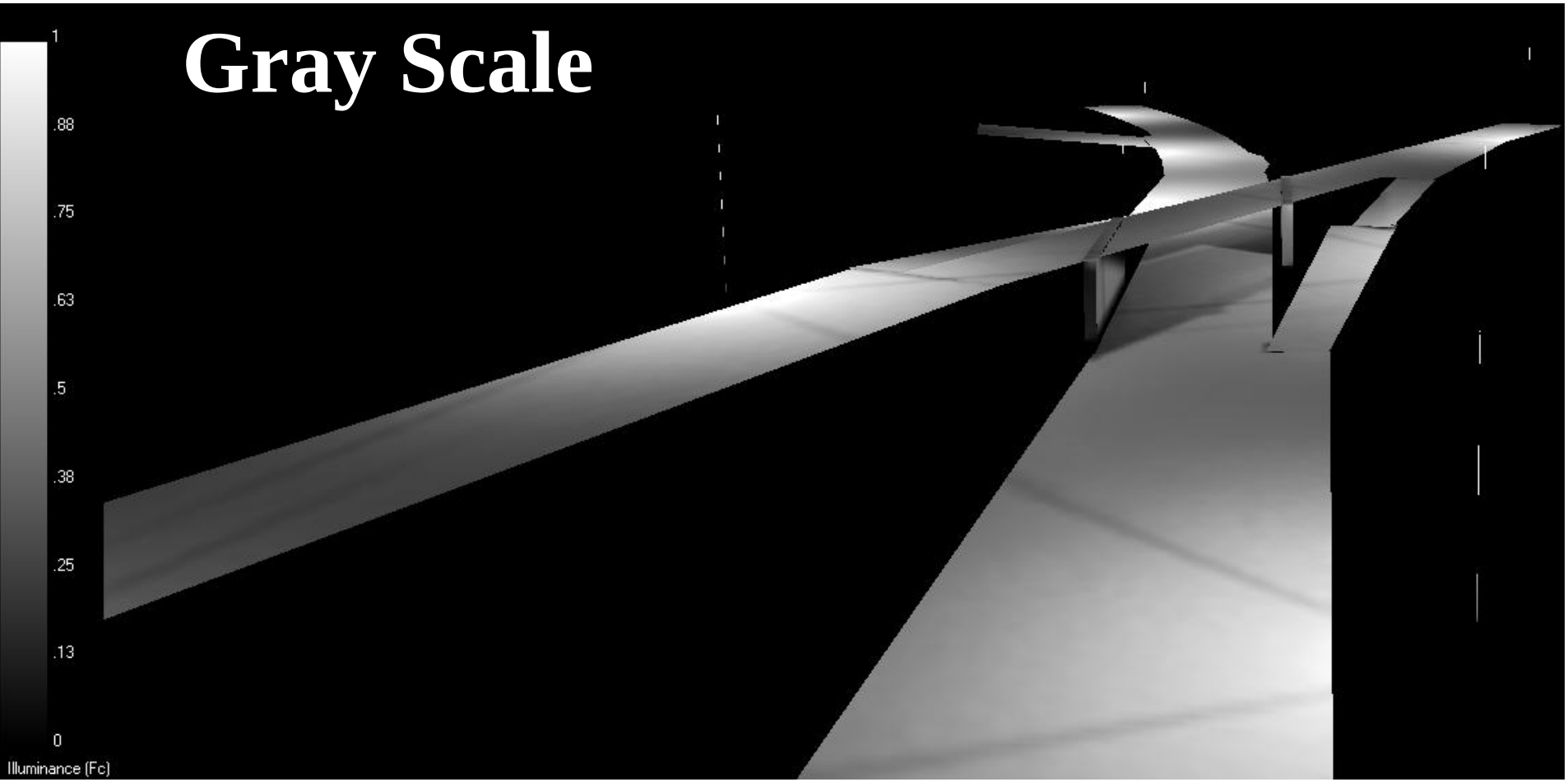
3D in AGI Render – Isometric View

(Version 1.53)



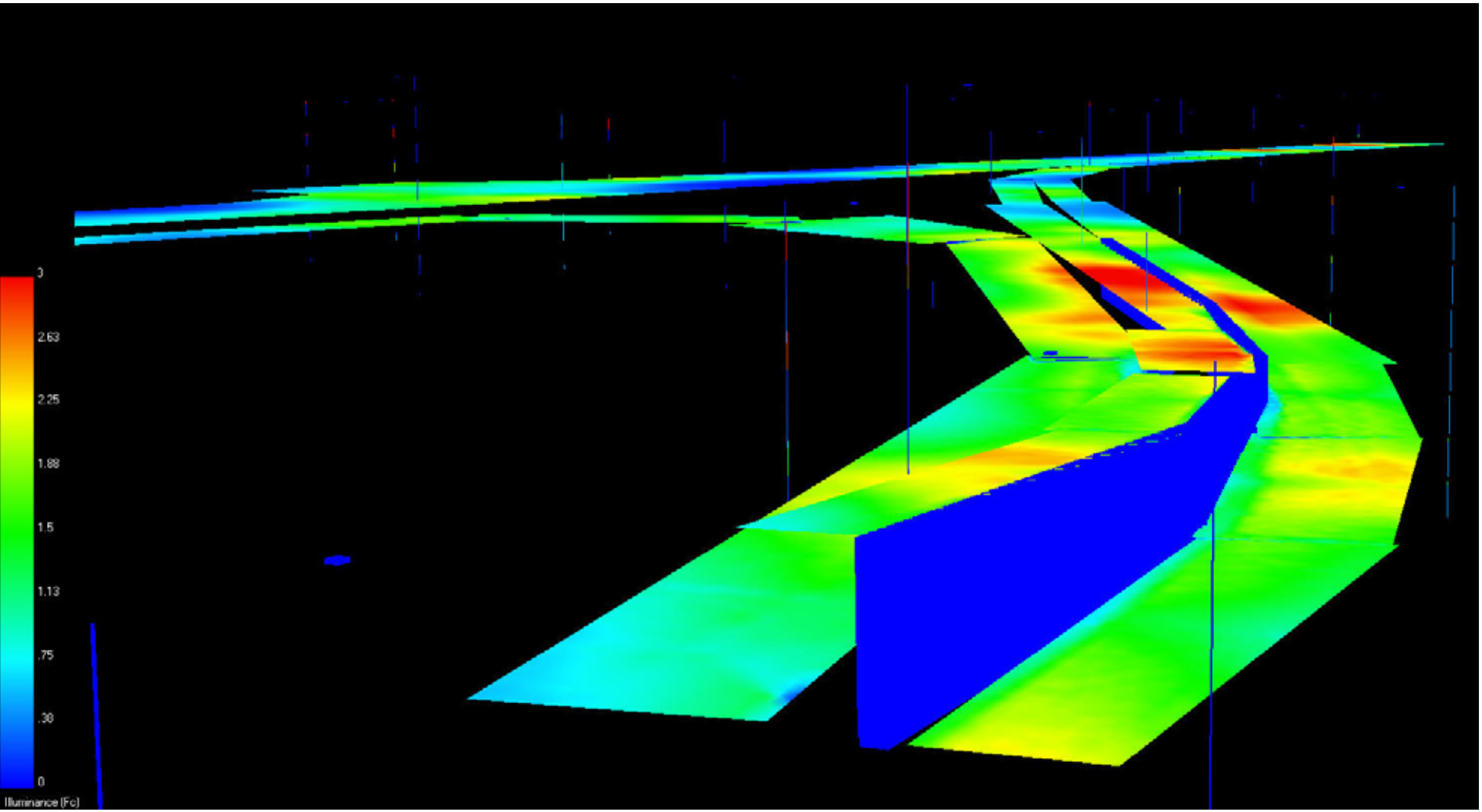
3D in AGI Render – Isometric View

(Version 1.53)

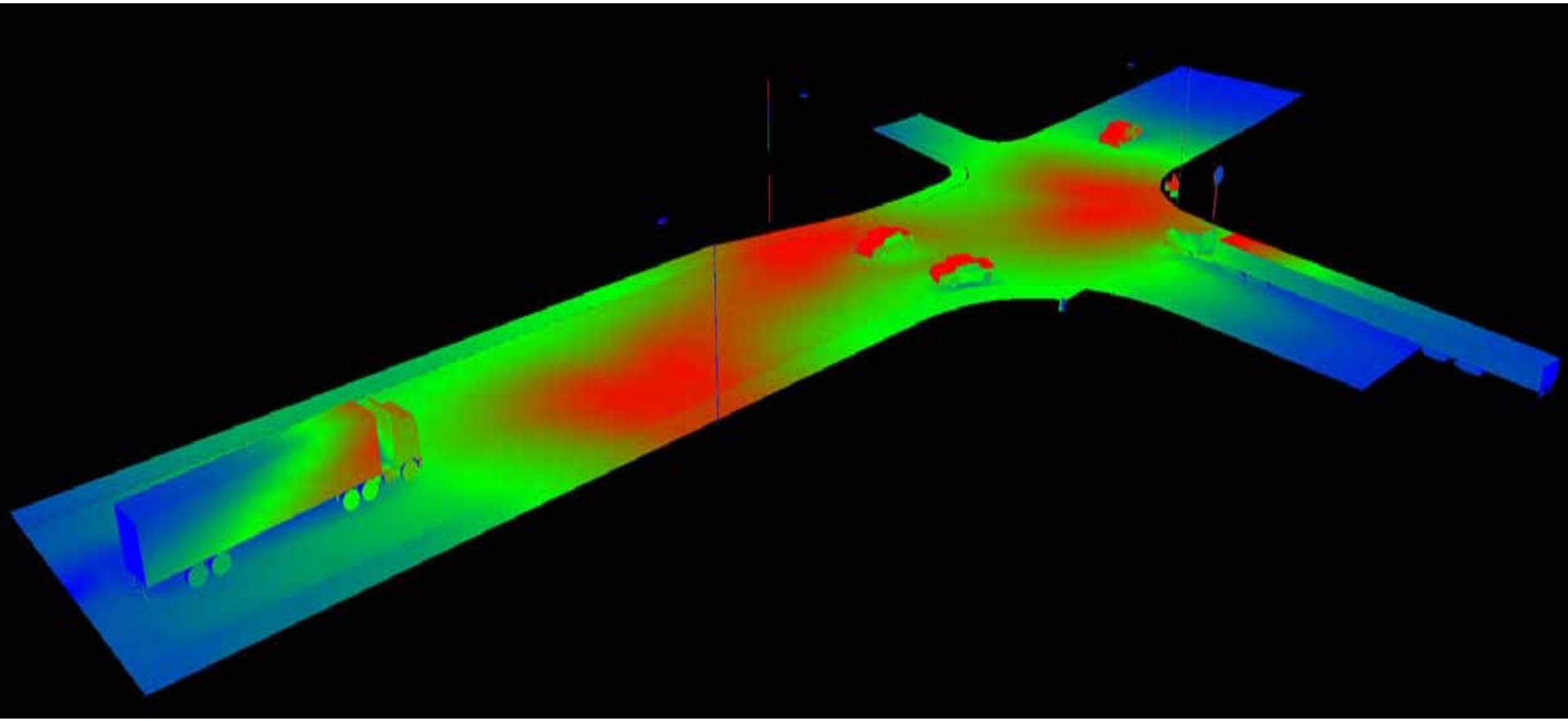


3D in AGI Render – Isometric View

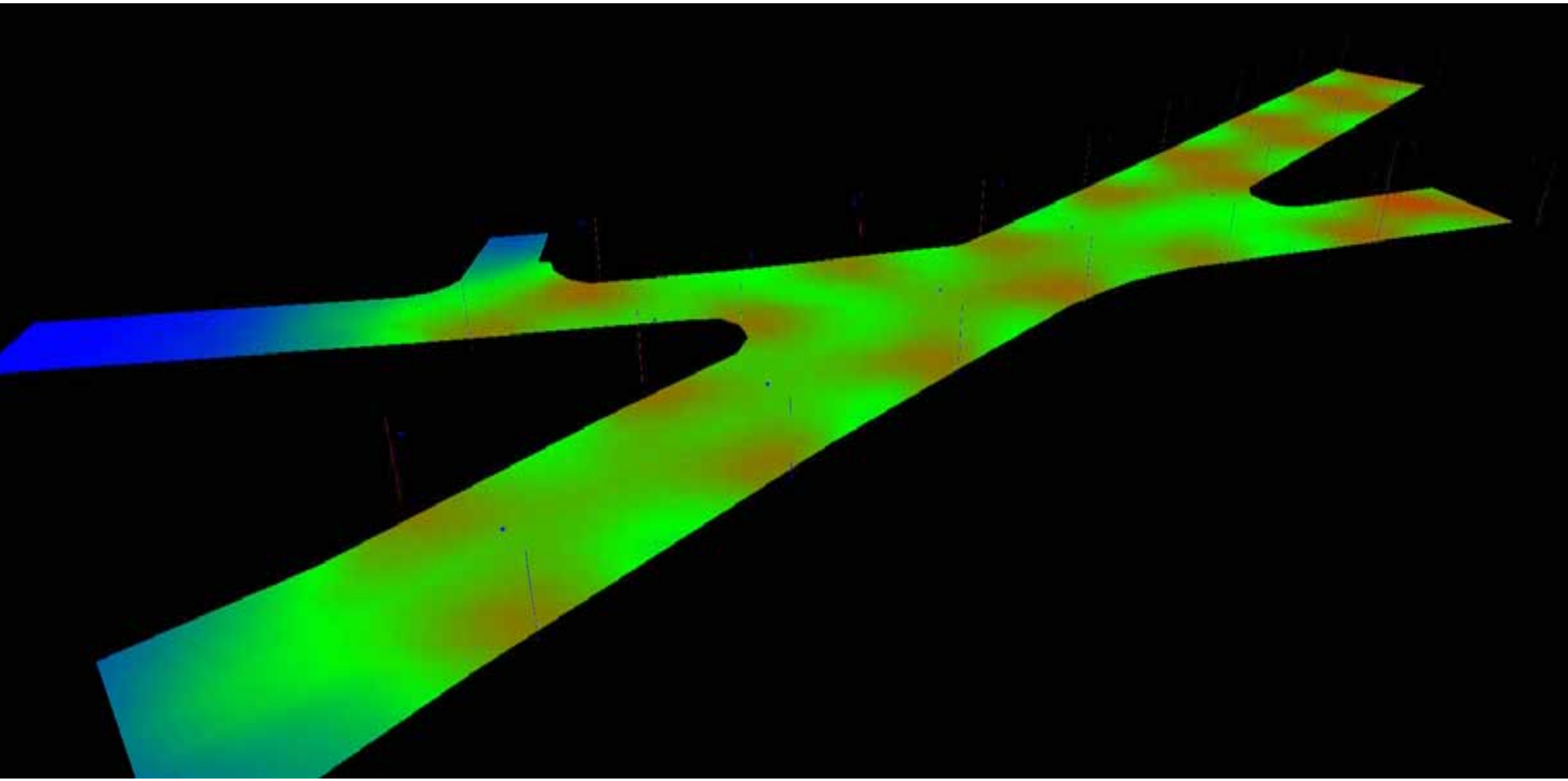
(Version 1.53)



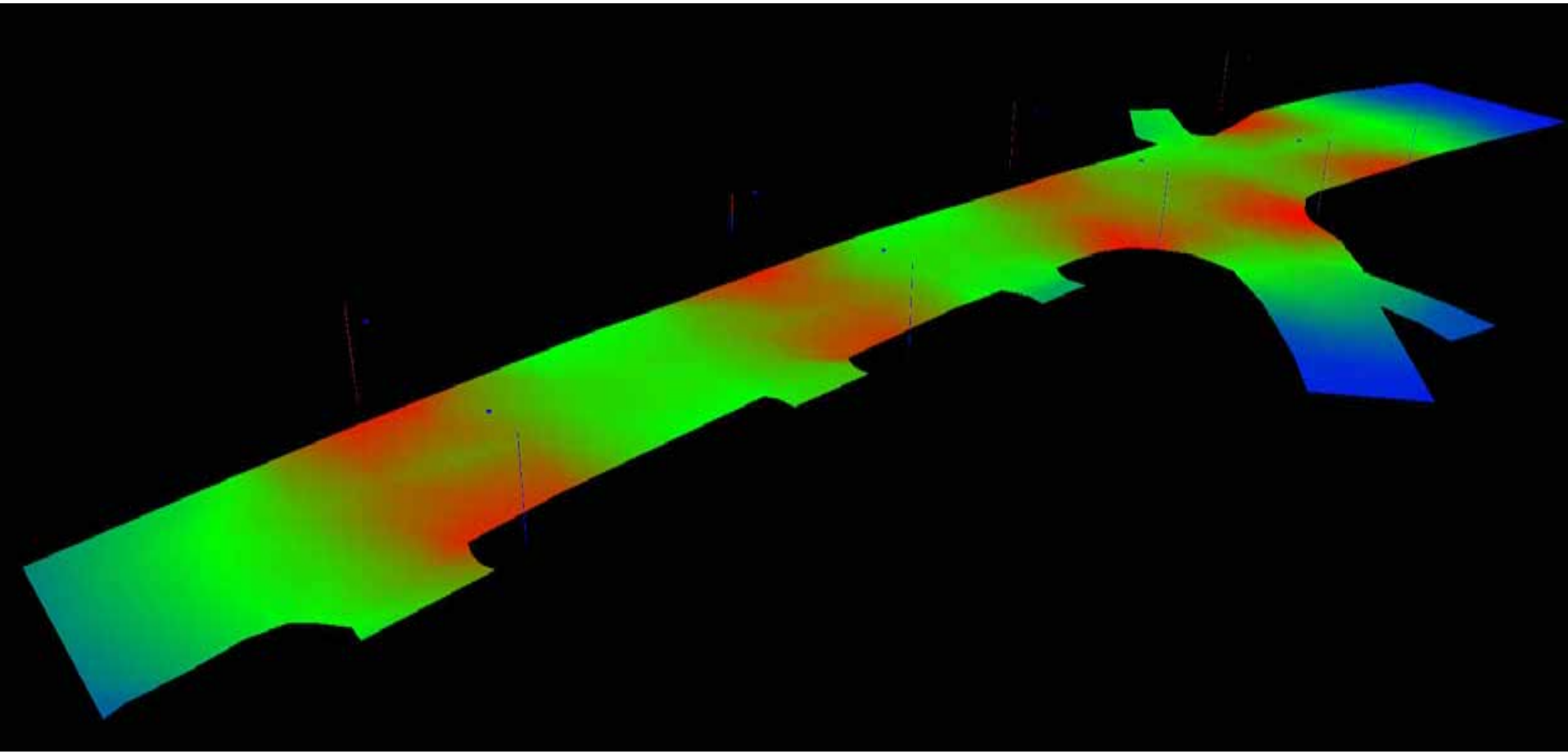
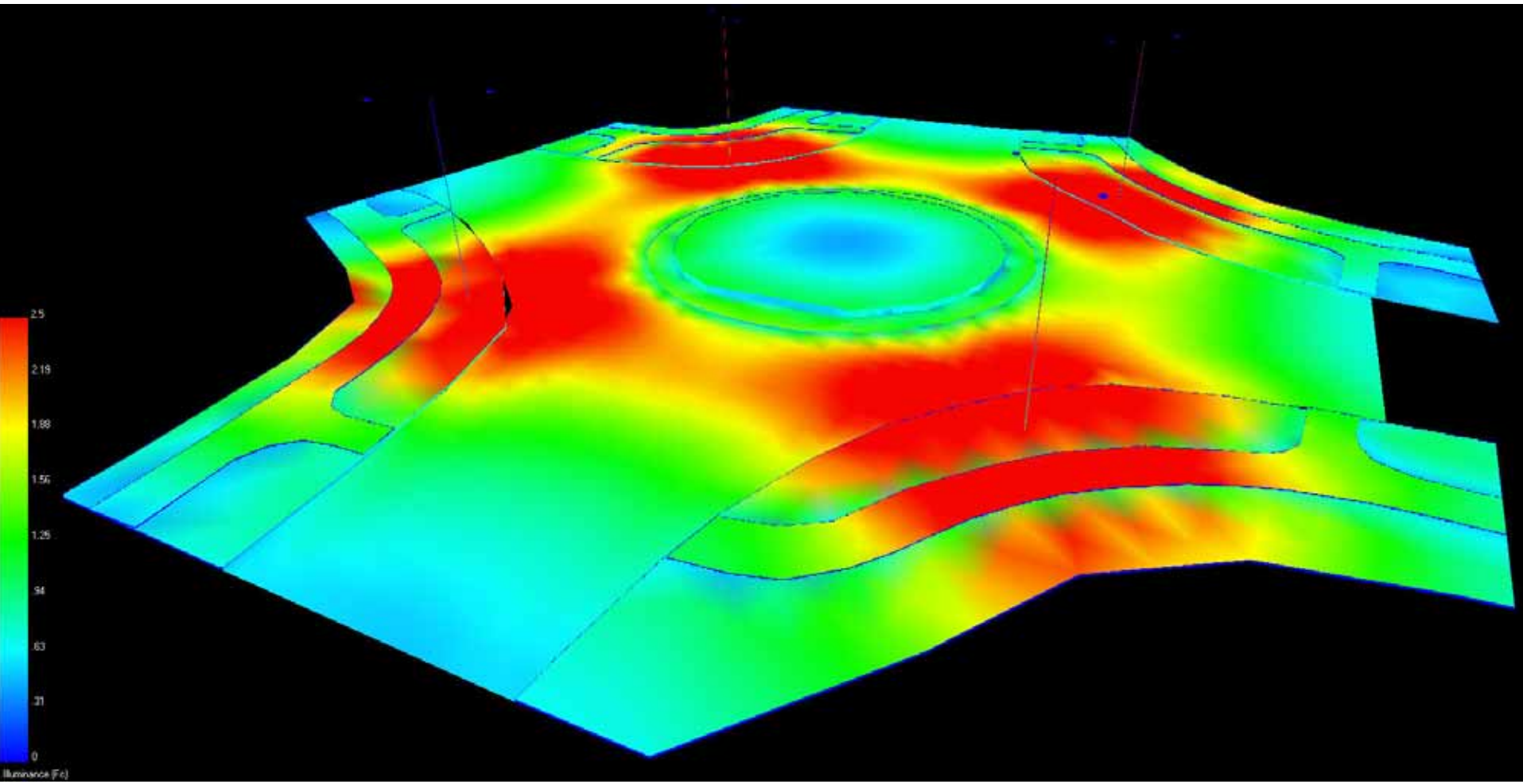
3D in AGI Render



3D in AGI Render



3D in AGI Render



3D in AGI Render – Example 4 (Version 1.53)