

Headquarters Traffic Operations

AGi32TM Basics for

WSDOT Highway Lighting

WSDOT AGi32 Basics (AGi32 v 16.6)

This is a self-study tutorial for designing and analyzing roadway illumination systems for WSDOT installations using AGi32 version 16.6. If you do not have this version, contact your IT Help Desk for installation. This is the current version for use at WSDOT, and is necessary due to changes in some of the cloud based services now tied into AGi32. This tutorial cannot be used for previous versions of AGi32 due to the significant changes between AGi32 version 16.6 and previous versions.

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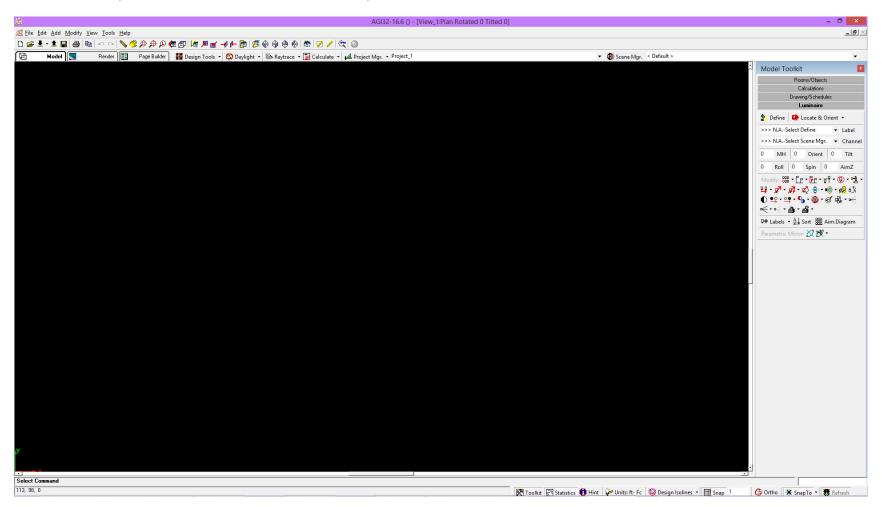
For WSDOT Staff:

If you do not have AGi32 version 16.6 installed, contact your IT Help Desk for installation. If there are any issues with getting AGI32 version 16.6 installed, or if you get a message about setting up the license server, please contact us at HQ traffic for assistance.

Note: AGi32 *is a registered trademark of Lighting Analysts, Inc. For more information, see <u>http://www.agi32.com</u>.*

Section 1 – Setting Up AGi32

When first starting AGI32, the screen should look something like this:



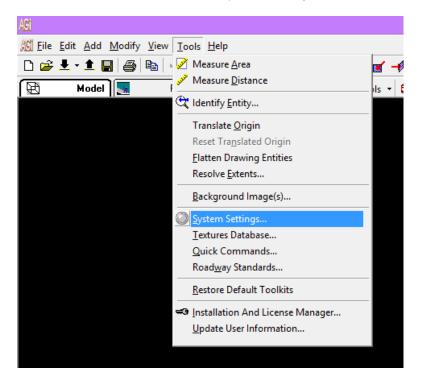
Your background may be white. It is highly recommended that you change the background color to black – addressed on pages 1-4 and 1-7.

On the main screen, in the lower right corner, set the toggle buttons as shown:

	*
🕅 Toolkit 🕅 Statistics 🚯 Hint 🖓 Units: ft- Fc 🛛 🔯 Design Isolines 🔹 🌐 Snap 1	🕓 Ortho 🛛 🛞 SnapTo 👻 👼 Refresh

Only the Toolkit and Statistics should be on (off shows the "Do Not" red circle and line). Units should be ft-Fc (feet – Foot-candles). The "Refresh" traffic signal is only a status indicator. You may turn the statistics window off until you run a calculation, if desired.

Under the "Tools" menu, choose "System Settings":



On the Units tab, verify that it matches the following:

	System Settings	×
General	View/Project File System Defaults) Ok
 Display Units ● Feet ○ Feet and Inches 	Illuminance Units Footcandles C Lux	Cancel Help
C Meters	Number Of Decimals 1	Reset Defaults
	Avg/Min, Max/Min	Advanced
Convert current units to new units	C Min/Avg, Min/Max	Save Settings As Startup Defaults

On the	Defaults	tab.	make	the	foll	owing	changes:

Syste	em Settings	
General Units View/Projec	ct File System Defaults	Ok
Default System Font		Cancel
Arial	Change	Help
Default Luminaire Symbols	Default Colors	
Model CIRCLE UP_DOWN Select	Frozen Entity Color	Reset Defa
Render CIRCLE UP_DOWN	🗖 Locked Luminaire Color	Advanced
,	Selected Entity Color	
Default Isometric View	Move Entity Color	📃 🖂 Save Setti
Rotation -30	Measure Distance/Area Color	As Startup Defaults
Tilt 60 Change	Temporary On Color	
Entity Dialog Defaults	Calc. Areas Text Color	
 Reset With Each File (New or Open) 	Stat. Areas Text Color	
C Reset At Startup Only	LPD/UWLR Areas Text Color	
C No Reset At Startup Or With Each File	Model Mode Background	
Reset All Dialog Defaults Now		
Reset All Dialog Locations/Size	Dimensions Precision (decimals)	
Default View Factors	Calculation Method	
Zoom Factor 1.25 × 0.8 ×	 Full Radiosity Direct Only 	
Pan Factor 0.75 (> 0 and <= 1)	C Direct Only - AutoCalc Enabled	
└ Virtual Axis	Smart Symbols	
COff	Full Radiosity Method	
C Display in Upper Left Hand Corner	Direct Only Method	
Attach to: X= 0 Y= 0	Symbol Logic	

1. Change the "Default System Font" to Arial by clicking the "Change" button. The Font window will appear:

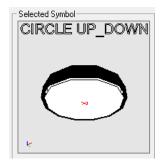
	F	ont	×
Name ©SimSun ©SimSun-ExtB ©Yu Gothic ©Yu Gothic Light ©Yu Mincho Demibold @Yu Mincho Light Agency FB Aharoni Aldhabi Algerian Andalus Angsana New Angsana New Angsana New Angsana New Angsana New Angsana New Angsana New Arabic Transparent Arabic Transparent Arabic Typesetting Arial Arial Baltic Arial Black Arial CE Sample Sample		Properties Bold Italic Underline Strikethrough Color	Ok Cancel Help

Find Arial in the list and select it, then click "OK"

- Luminaire Symbols Model Symbols Ok Symbols Folder General -Cancel BOX UP LS BOX UP BOX UP_DOWN CIRCLE DOWN LS CIRCLE DOWN CIRCLE Help RECESSED DOWN L (\cdot) + • + \odot \odot CIRCLE RECESSED CIRCLE UP DOWN CIRCLE UP LS CIRCLE CIRCLE CIRCLE RECESSED DOWN RECESSED UP LS RECESSED UP LS (\cdot) \odot Symbol Mirroring (\cdot) \odot \odot \odot Render Mode Symbol Same As Model Mode Symbol CIRCLE UF IRCLE UP_DOWN COBRA REFRACTOR COBRAHEAD CONE TOP Color BRA FL A GLASS Wireframe ۲ (\cdot) (\cdot) ⊐œ ⊐œ Symbol Scaling Act. Size Factor Size ×Γ x 2 = 2 CONTEMP ROU DECORATIVE1 CONTEMP ROUND ESENDO UPDN DECORATIVE DECORATIVE1 ΥĒ x 2 = 2 GLOWTOP SPHERE TRANS ZI x 0.3 = 0.3 ⊞ Selected Symbol-CIRCLE UP DOWN DOWNLIGHT DECORATIVE2 DECORATIVE3 FINELITE S12 ID FINELITE S12 FLOOD BOX RECESSED LS \odot • ₽ FLOOD CIRCLE FLOOD CIRCLE FLOOD LS FLOOD RECESSED FLOOD FLOOD-1 RECESSED LS RECESSED • · Ð \odot + \odot Insertion Point - Top • Insertion Point - Bottom
- 2. Change the Default Luminaire Symbols by clicking on the "Select" button to the right of each line. The Luminaire Symbols window will appear:

Find the "CIRCLE UP_DOWN" symbol in the library (usually one full page down) and click on it. Verify that it appears in the Selected Symbol window in the bottom right, then click "OK".

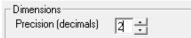
The process is identical for selecting both the Render and Model symbols. The windows are slightly different – the information on the right edge of the window is slightly different, and the rendering is shown differently. The Model window is shown at right; the Render "Selected Symbol" graphic is shown below:



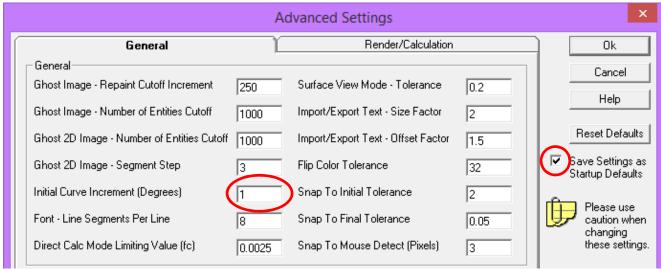
Col	lor ×
Basic colors:	
Custom colors: Define Custom Colors >> OK	Hue: 160 Red: 0 Sat: 0 Green: 0 Color/Solid Lum: 0 Blue: 0 Add to Custom Colors Add to Custom Colors 0 0 0

3. Click on the color box for the "Model Mode Background". Select black in the window that pops up, then click "OK"

4. Change the number in the Dimensions, Precision (decimals) to 2 by either typing it in or using the arrow buttons.



After completing these steps, click on the "Advanced..." button on the right side of the window for some additional changes.



In the Advanced Settings window, under the General Tab, change the "Initial Curve Increment (Degrees)" to 1:

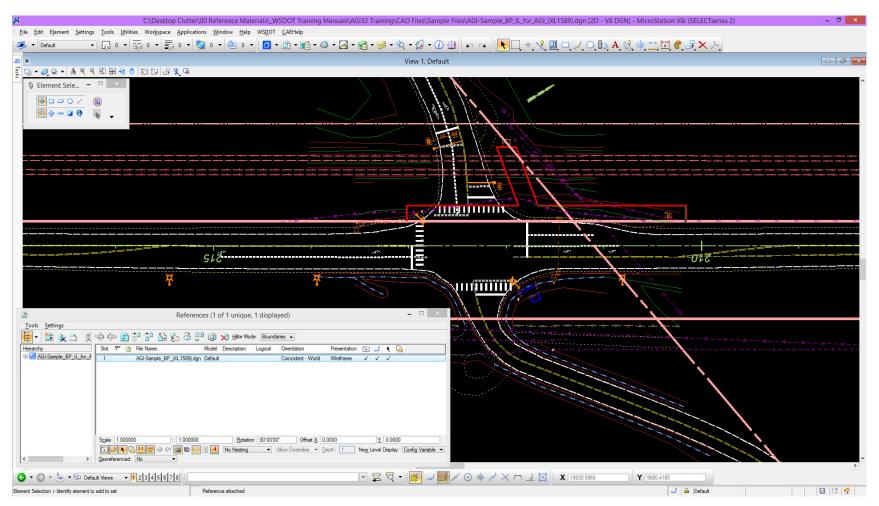
Check the "Save Settings as Startup Defaults" box, and then click "OK".

Back in the System Settings window, check the "Save Settings as Startup Defaults" box, and then click "OK".

These settings should not require any changes so long as you are using this version of the AGi32 software.

Section 2 – Preparing a CAD File for AGi32

Create a new CAD base file for export to AGi32. Recommended practice is to add a "_for_AGI" suffix to the existing base file (Ex: XL1589_BP_IL_for_AGI.dgn).



Detach references that do not contain necessary data. Merge any remaining references into the master file. References do not consistently export properly, so it is recommended to not have any references attached to the file you plan to export to AGi32.

	<u></u>		
	* * * * * * * * * * * * *	<u>A</u> ttach	
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		Open in New Session	
		Activate	
		Deactivate	
		Move	
		<u>C</u> opy	
		Scale	
		Rotate	
		Merge Into Master	
		Make Direct Attachment	
		Add Link to Element	
		Create Drawing Title	
	<u>D</u>	Clip <u>B</u> oundary	que, 1 displayed) – 🗖 💌 🚺
	Tools Settings	Clip Mask	
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	Hierarchy Slot 🏱 🗋 File Name	Settings	ion Logical Orientation Presentation 💽 🦪 Ҟ 🔓
	AGI-Sample_BP_IL_(XL1) AGI-Sample_BP	Settings _(x=1369).ugnberaul	Coincident - World Wireframe 🗸 🗸 🗸
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*			
÷	Element Selection > Identify element to add to set		

Open the references window.

Right click on the reference you want to merge and select "Merge Into Master".

All reference data will be merged into the current base file. For this reason, it is recommended that a separate base file be created for CAD exports to AGi32.

Data that should be included, at a minimum:

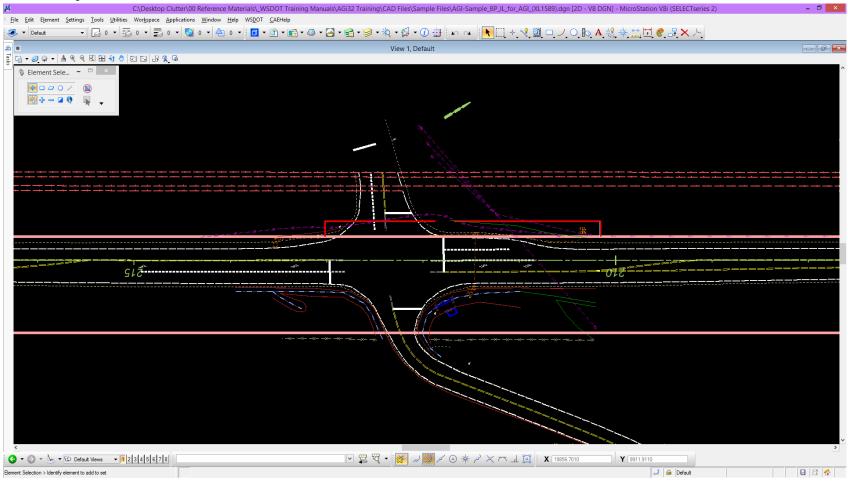
- Roadway and shoulder edges
- Pavement markings
- Right of Way lines (R/W is limited)
- Drainage features
- Structural features (bridges, sign structures, etc.)
- Other potential obstructions or topographic features which may affect placement of poles.

Delete as much extraneous information as possible – this helps keep the CAD data in AGi32 to a minimum.



Before cleanup (data to be deleted is highlighted in yellow):

After cleanup:



Some data you may wish to keep for reference (such as the railroad tracks and north arrow shown here).

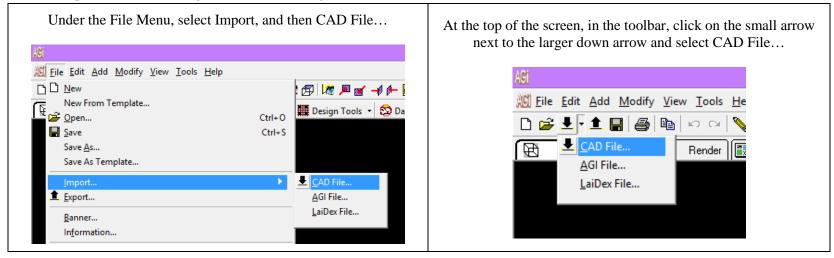
Export the CAD file to .DXF format:

븮	C:\Desktop Clutter\00 Reference Materials_WSDOT	Training Manuals\AGi32	Under the File	e Menu, choose "Export", and then	
: F	ile Edit Element <u>S</u> ettings <u>T</u> ools <u>U</u> tilities Wor <u>ks</u> pace <u>Applications Wi</u> ndow <u>H</u> elp WSDOT <u>C</u> AEHe	elp	"DCN DWC	DVE "in the drandown to the night	
. •) <u>N</u> ew Ctrl+N	💼 • 🚳 • 🔄 • 🥞	DON, DWG	, DXF" in the dropdown to the right.	
	Open Ctrl+O				
	Close Ctrl+W				
ic	Save Ctrl+S				
1	Save <u>A</u> s		Change the "S	Save as type" to "Autodesk(R) DXF Files (*.dxf) i	n
1	Compress +		your AGI fold	ler.	
	Save Settings Ctrl+F		your morrier	****	
8	Item Browser				
6	Project Explorer		<		>
) References				
	Raster Manager		File <u>n</u> ame:	AGI-Sample_BP_IL_for_AGI_(XL1589).dgn V	Save
4	Point Clouds		-		_
	Mode <u>ls</u>	_	Save as type:	MicroStation V8 DGN Files (*.dgn)	Cancel
5) Publish i-model			MicroStation V8 DGN Files (*.dgn)	
	Import +			MicroStation V7 DGN Files (*.dgn)	Options
	Export •	DGN, DWG, DXF		Autodesk(R) DWG Files (*.dwg)	
	Print Preview	<u>I</u> GES		Autodesk(R) DXF Files (*.dxf)	
2	a Print Ctrl+P	Parasolids		DGN Library Files (*.dgnlib)	
	Print Organizer	ACIS SAT		Redline Files (*.rdl)	
	Associate	<u>C</u> GM			
	Properties Alt+Enter	Step AP203/AP214			
		VRML World			
6	Protection	ST <u>L</u>			
	Sen <u>d</u>	SVG			
	1 C:\Desktop Clutter\00 Reference Materials_WSDOT Training\AGI-Sample_BP_IL_for_AGI_(XL1589).dgn	Luxology			
	2 C:\Desktop Clutter\00 Reference Materials_WSDOT Training Manuals\\AGI-Sample_BP_IL_(XL1589).dgn	OBJ			
	3 C:\Desktop Clutter\00 Reference Materials_WSDOT Training Manuals\AGi\AGI-Sample_BP_(XL1589).dgn	SketchUp			
	4 C:\Desktop Clutter\00 Reference Materials_WSDOT Training Manuals\AGi32 Trainin\XL1589_BP_SG.dgn	Google Earth			
	5 C:\Desktop Clutter\00 Reference Materials_WSDOT Training Manuals\AGi32 Trai\XI1589_BP_RW_2d.dgn	Collada			
	6 C:\Desktop Clutter\00 Reference Materials_WSDOT Training Manuals\AGi32 Training\CA\Easement.dgn	U3D			
	7 C:\Desktop Clutter\00 Reference Materials_WSDOT Training Manuals\\AGI-Sample_BP_Ex_(XL1589).dgn	Visible Edges			
	8 C:\Desktop Clutter\00 Reference Materials_WSDOT Training Manuals\AGi32 Tr\XI1589_2010-12-01.dgn	<u>3</u> D			
	9 C:\Desktop Clutter\00 Reference Materials_WSDOT Training Manuals\AGi3\XL1589_BP_ILT_for_AGI.dgn	-xxxxx-			
	10_G:\Design\Projects\SR305\XL4328 - SR 305 Suquamish Way IS Improvements\05 CAD\5\P4328_BP_ILS.dgn				
	Exit				
	-				

Your CAD file is now ready for use in AGi32.

Section 3 – Importing CAD Files

In AGi32, Import a CAD file using one of the following methods:



Browse to your AGI folder and select the DXF file that you previously created:

ACI	Import CAD F	ile	×
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Organize 🔻 New	folder	8== 👻 🔟	0
🔆 Favorites	▲ Name	Date modified Type Size	
📰 Desktop	🚰 AGI-Sample_BP_IL_for_AGI_(XL1589).dxf	3/4/2016 2:13 PM Autodesk Design 968	KB
 Downloads Recent places Desktop Clutter This PC Desktop Desktop Documents Downloads 	~		
FI	ile name: AGI-Sample_BP_IL_for_AGI_(XL1589).dxf	RealDWG CAD Files (*.DWG, Open Cance	

Import Import Adva Options Mapping Opt	nced ions			CAD Viewe			Help Cancel OK
55 Layers Selected For Import Smart Select Select All Clear Select 55 Total Layers Layers Layers Layers							ed Units And Scaling Units Specified In CAD File *?* Feet *?* 💌
Layer Name	On	Freeze	Lock	Color	LineType	LineWeight	▲ Units Will Be Converted To Feet 🗸
	<u> </u>	<u> </u>	£	7	Continuous	-3	Apply Scaling Factor 1
AL_HW_CLinePSE	- <u>_</u>		<u></u>	73	HW_ClineP!	13	Drawing Extents X Y Z
AL_HW_CLinePSETics			- - - -	73	Continuous	13	<u>Drawing Extents</u> <u>X</u> <u>Y</u> <u>Z</u> Minimum (LLHC): 1.92E+04 8800.4 0
BL_LN_BreaklineGeneric	- <u>_</u>	000000000000000000000000000000000000000		12	Continuous	0	Maximum (ÜRHC): 3.02E+04 2.37E+04 0
BL_LN_FillToe	- <u>_</u>		- <u></u>	12	Continuous	0	Total Extents : 1.10E+04 1.49E+04 0
DR_PP_DitchBottomNoDir	 Q Q		- 1	161	² _DitchBotton	13	Entities
R_ST_CulvertNew	- <u>_</u>		<u>_</u>	172	Continuous	13	Import All
evel 10			<u>_</u>	7	Continuous	0	C Import Drawing Entities ONLY
.evel 21	- <u>_</u>		<u>_</u>	7	Continuous	0	C Import 3D Entities ONLY
.evel 22	- <u></u>		8 8 8 8 8 8	7	Continuous	0	
RD_BR_Fence3D	- <u>_</u>		<u>_</u>	41)_BR_Fence:	0	Import 3D Entities As Objects
RD_CG_CurbAsphaltFace	- <u>_</u>		<u>_</u>	41	Continuous	0	C Import 3D Entities As Drawing Entities
RD_CG_CurbTop	e e		£	41	DGN Style 4	0	Group ALL 3D Entities Into A Single Object
RD_ED_DrivewayEdge			<u>_</u>	41	DGN Style 2	0	Object Name
RD_ED_DrivewayGravelEdge	- <u>_</u>			41	DGN Style 5	0	
RD_ED_RoadwayETWGravel	0 0 0 0 0 0 0		5.55	41	DGN Style 5	0	Comport Text
RD_ED_RoadwayETWPaved	- <u>_</u>		1	41	DGN Style 2	0	mport Block Attributes
RD_ED_ShoulderGravelEdge	- <u> </u>		<u>_</u>	41	DGN Style 5	0	
RD_ED_ShoulderPavedEdge	- <u>_</u>		- - - -	41	DGN Style 2	0	Flatten Drawing Entities All Z = 0
RD_MK_LineCrosswalkNew	- <u>_</u>		<u>_</u>	7	Continuous	53	Group ALL Drawing Entities Into A Single Layer
RD_MK_LineDblYellowCenter			- <u>6</u>	41	Continuous	0	Layer Name
RD_MK_LineEdgeWhite			- - - -	41	<pre>IK_LineEdge</pre>	13	
RD_MK_LineNoPass	<u> </u>		2	41	Continuous	13	☐ Blocks
RD_MK_LineSkipCenter	e e		1	41	IK_LineSkipC	13	Explode ALL Blocks On Import
RD_MK_LineStop	- <u> </u>		<u>_</u>	41	DGN Style 2	53	C Keep Low-Level Blocks ONLY
RD_MK_LineStopNew	_ Q	- 🔅	1	7	Continuous	53	C Keep High-Level Blocks ONLY

After selecting your file, click "Open". The Import CAD File window will appear:

Switch to the Advanced Options tab.

On the Import Options tab, change the Units Specified in CAD File to "*?* Feet *?*", if it doesn't already show it. After you have done this once, it should default to this setting.

Uncheck the "Import Text" and "Import Block Attributes" checkboxes.

If there are any layers that you know you do not want included, you can deselect them here by clicking on them. Deselected layers will not be imported.

DO NOT CHANGE THE SCALING FACTOR

If you change the scaling factor, you will not be able to directly import you luminaires back into CAD in their proper locations.

Import CAD	File (AGI-Sample_BP_IL_for_AGI_()	KL1589).dxf)		×
Import Import Advanced Options Mapping	CAD Viewer	Help	Cancel	ОК
Advanced Import Options Curve Increment				
 Advanced 3D Options Optimize Curved Surfaces (Faster) Use Curve Increment 				
Planar Tolerance 0.25 deg. Minimum Area Tolerance 0.00390625 in ² 2.52015625 mm ²				
✓ Merge Coplanar Surfaces Angle Tolerance 0.001 Distance Tolerance 0.001				
 Remove Duplicate Surfaces Consistent Surface Orientation 3D Entity Check Range 0.25 				
Save Current Settings As Defaults Reset To Recommended Defaults				

On the Advanced Options tab, verify that the Curve Increment box shows "1":

Click the "OK" button.

The Import Summary tab will appear after processing:

Import ummary Inporting Entities Ipdating Database Ipdating Database Inporting was con Entity Type Entity Type Inc Nock Reference Circle Ellipse Epline	Imported 562 457 98 91	00:00:01 Entities NOT Imported	% Imported 100 % 100 %	Initial	After Merging	Split	Surfa		Dupli-	Cancel	
Ipdating Database mporting was con Intity Type ine Polyline Mrc Nock Reference Circle Ilipse	Imported 562 457 98 91	Entities NOT	Imported 100 % 100 %	Initial	After Merging	Split			Dupli-		
ine Polyline Nock Reference Circle	Imported 562 457 98 91	Entities NOT	Imported 100 % 100 %	Initial	After Merging	Split			Dunli-		
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intity Type Polyline Arc Nock Reference Dircle	Imported 562 457 98 91	Entities NOT	Imported 100 % 100 %	Initial	After Merging	Split			Dunli-		
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	14		100 %								
iolid	4 2		100 % 100 %								
ext		1708	0%								
Point		8	0%								
		4									
latch			0%								

This window will let you know if there are any errors and any items that weren't imported.

It is normal for Text, Points, and Hatches not to be imported (as shown at left). Block References do not necessarily need to be imported either. If any other entity types show up in the "NOT Imported" column, then you are most likely missing line work that you may need to do your analysis.

After checking the summary, click on the "OK" button. The AGi32 window will show the extents of the CAD data that you just imported.

If you haven't already done so, save your AGI file. Recommended naming convention is P????_IL_AGI or XL????_IL_AGI. The file type suffix (.AGI) will be added automatically.

di 🛛		Save Fi	le		
Existing					Ok
Save in: 🚺 AGI	•	← 🗈 💣 🎟▼			Canc
Name		Date modified	Туре	Size	Help
	No items mate	h your search.			
					File Syste
<				>	
	AGI(XL1589)				
Save as type: AGi32 Job File	(.AGI)			-	

After naming the file, click "OK". The File Information window will pop up.

In the File Information window, you may choose to add descriptive information such as a description of the location or iterative information on changes if you're making revisions to a previous design:

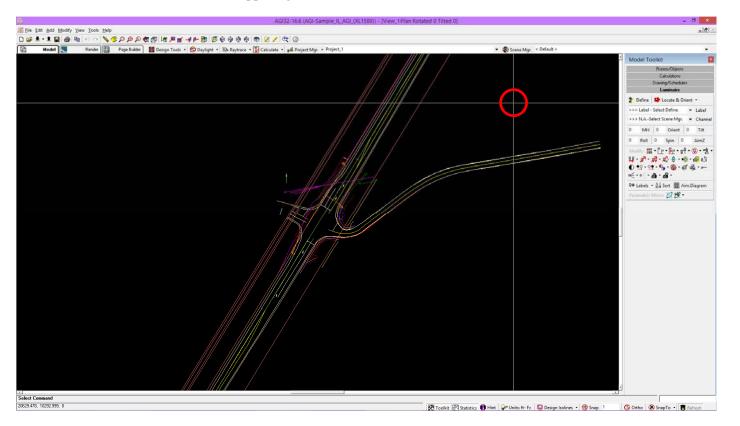
File Information	×
	Ok
Filename AGI-Sample_IL_AGI_(XL1589).AGI	ancel
L. Desktop Catter to hererence materials (_w5001 Haining Mahdas Adio2 Haining T	Help
Created Date 3/4/2016 2:15:36 PM Created Version 16.6.0	
Modified By W F Jackson	Print
Modified Date Modified Version	
Total Time (Hrs.)	er Info
Current User Name W F Jackson	
Description SR 507 at East Gate Rd	
Information	
Original - Basic Illumination for Intersection and Turn Pockets	
Add Time Down	
Add Time Stamp	
All File Information is current to the last time the file was saved. In other words, if you have not saved in awhile, the Total Time may not be accurate.	

When you are finished making any changes, click "OK". Your file is now saved. If you hit "Cancel" on this screen, the file will not be saved.

Section 4 – Getting Around in AGi32

Basic View Controls - Mouse Shortcuts:

The mouse scroll wheel will zoom in and out, centered on **where the cursor is** (*not the center of the current view*). Example: if you use the scroll wheel while the cursor is in the upper right corner of the window, it will zoom in or out centered on that location:



The center of the crosshairs (circled in red above) will become the new center of the window if you use the scroll wheel to zoom.

If you click and hold the scroll wheel, you can pan the window around (similar to CAD) as long as you hold down the scroll wheel. This is the same as selecting the Pan tool from the view toolbar.

Section 4 – Getting Around in AGi32 WSDOT AGi32 Basics, June 2016

Basic View Controls – Toolbar Commands:

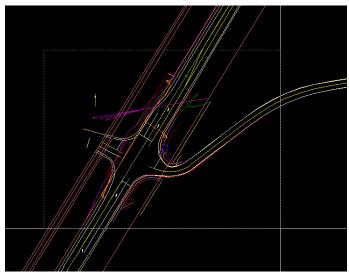
The View toolbar is the majority of the AGi32 toolbar. It contains both 2D and 3D view controls, as well as redraw tool and view manager.

AGI	AGI32-16.6 (A
I File Edit Add Modify View Tools Help	
	2 🥖 🔍 🔍
🔁 Model 🔄 Render 🔛 Page Builder 🗰 Design Tools 🔹 🐯 Daylight 🔹 🌇 Raytrace 🔹 🚺 Calc	culate 👻 4 Project
2D View Tools 3D View Tools (Not Covered in this Tutorial)	

Redraw current view – helpful to remove 'ghost' lines from moved luminaires, deleted items, etc.

Pan Tool

Zoom Window Tool: Zooms in on an area based on a rectangle defined by two opposite corner points.



Zoom Window

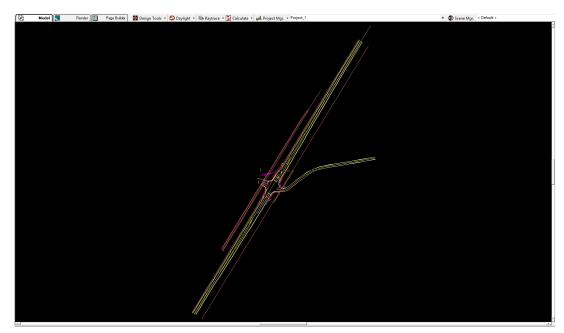


Zooms out so that all elements are visible (both drawing elements and AGI32 elements such as luminaires, templates, and grids.

₽ Zoom Limits Tool:

Zooms out to the limits of the overall drawing area. In a typical file, this will be so far out that you won't be able to see what you're working on. Rarely used, if ever.

Previous View Tool: Restores the view presented prior to your last view change.





Plan (or top) View Tool: Returns the view to

overhead (plan view) zoomed out to maximum extents (like the Zoom Extents Tool). Useful if you have accidentally clicked on one of the 3D view tools and the Previous View tool doesn't get you back to plan view.

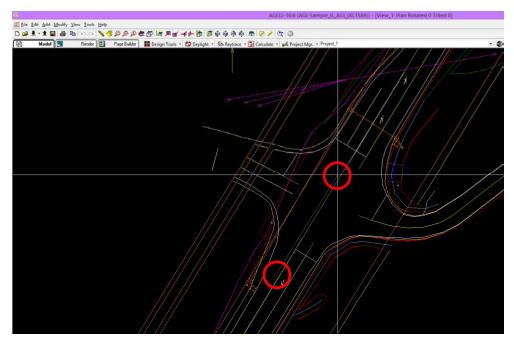
3D View controls are an advanced feature not used on most projects, and are therefore not covered by this tutorial. 3D work is limited to major freeway interchanges with multiple levels of roadways where light from upper roadways affects lower roadways.

View Rotation

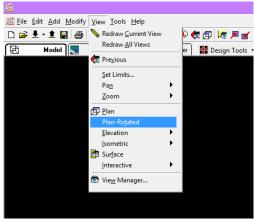
Since AGi32 relies heavily on rectangular grids, it is helpful to rotate the view such that the roadway runs left to right or top to bottom on the screen.

To rotate the view in AGi32, select Plan-Rotated under the View menu:

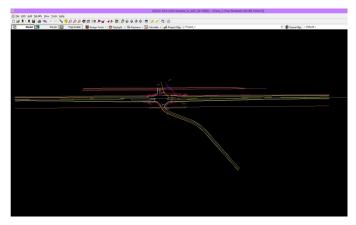
You will then set the view X-Axis using two points. The first point will set the pivot point for the rotation, and the second will set the direction of the X-Axis.



The screenshot at right shows the end result of the view rotation. Note that after rotation, the view automatically zooms to extents (drawing element limits).



The screenshot at left shows the first point (lower left) and the second point about to be placed (upper right). The X-Axis of the view will follow the line between these two points.



Section 4 – Getting Around in AGi32 WSDOT AGi32 Basics, June 2016

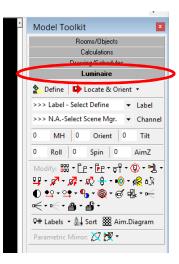
Section 5 - Defining Luminaires

In the Model Toolkit window, select the "Luminaire" tab:

2 Define Under this tab, click on the "Define" button:

This will bring up the Define Luminaire window:

Define Luminaire	×
Load Photometric File(s): 😂 Instabase 🗸 💱 Downloaded 🇯 Collection 🖨 Select 🛤 Find 🐔 Integet 🐼 Smart Symbols 📝 uto [Define
Defined Luminaires - Drag-and-drop herel Use Alt+Arrows keys to reorder list Label Tag Description Locations	Close
	Help
	Relabel
	Delete
General	Add/Redefine
General Label Tag Construction Tag Construction Construct	
Description	Current luminaire definition
Definition	has been altered. Select Add/Redefine to save
Lumens Per Lamp Number Ut Lamps BACK-BACK CIRCLE UP_DOWN Render Mode	modifications.
Luminaire Lumens Efficiency (%)	
Total LLF 0.621 Specify	
X Y Z Am Length 9.5 CIRCLE UP_DOWN Model Mode	
Luminous Box: LLHC 0.65 0.5 0.01	
URHC [0.65] 0.5] 0	
Photometric File Description Classification LCS	
\cap	
× 1	
More	



Before doing anything else, ensure that "Smart Symbols" is turned off at the top of the window.

Load Photometric File(s) 💬 Instabase 🖓 Downloaded 🗯 Collection 🚔 Select 🛔 In the Define Luminaire window, select the "Instabase" button:

This will bring up the "Instabase In The Cloud" window.

Section 5 – Defining Luminaires WSDOT AGi32 Basics, June 2016

Instabase In The Cloud:

8	Instabase In The Cloud	×
View/Search Favorites Recent Downloads	User Profile - Sign In	
Selected - None Select Manufacturers My Instabases:	in the cloud:	Analysis Analysis
🖬 🗶 🍫 🄌 🖉		
Search Parameters Source & Photometrics Lamp/Source Type:		mpact
Number Of Lamps: Wattage: ≥ and ≤	Page size: 1000	
Luminaire Lumens: ≥ and ≤ Lumens/Lamp: ≥ and ≤	Name Image Det	tails
Color Temp (K): ≥ and ≤ CRI: ≥ and ≤ LER: ≥ UWLR:	No data to paginate @ <>>> Page size: 1000	
Efficiency: ≥ % Classification IES Class:		
Longitudinal Class: ✓ Cutoff Type: ✓ CIE Type: ✓ NEMA Beam: H ✓ Bulg Reling: S ⊆ B ✓		
$\begin{array}{c c} & & & & \\ & & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ &$		
Mounting Type(s): Any All clear		
Classification Type(s): Any All clear		
Keyword:		
User Keyword:		
My Searches: 🔽 🗸		
My Favorites: DEFAULT		>
📕 🗙 🄄 🖻	Selected File Count: 0 Unselect All (max 25) (max 100) (max 100)	
Release: 2016.03.03.1255	Show User Guide Help Overview video User Profile video Tell us about your exp	periences!

The Instabase will initially be blank, with no manufacturers selected.

This tutorial will only step through adding the standard Type III distribution, medium, cutoff, HPS luminaire used by WSDOT for lighting analysis. For adding other luminaires, see **Appendix A**.

In the Instabase window, click on "Select Manufacturers" in the upper left corner:

View/Search	Favorites	Recent Downloads	User Profile - Sign In	
Selected - None				
		Select Manufacturer		
		Select Manuacturer	S	
My Instabases:		Select Manufacturer		
My Instabases: 📊 样 👒 🍺				
My Instabases: 📊 🗶 🧇 🤌 Search Paramete	8		1	Download to AGi32

This will bring up the Instabase Selection window:

□ O Unselect All	94C	Show Selected Show	w Adv
Name	Search Keywords	Last Update	
Abtech			
Abtech (24)	***	10 Apr 2015 09:55	
Acuity Brands			
AccuLamp (30)		18 Nov 2015 09:06	
American Electric Lighting (2180)	***	01 May 2015 15:29	
Antique Street Lamps (554)		01 May 2015 15:43	
Gotham Architectural Lighting (3790)	***	01 May 2015 18:23	
Holophane (6205)		01 May 2015 15:55	
- Hydrel (740)	***	01 May 2015 16:14	
Lithonia Lighting (15149)		01 May 2015 19:18	
Mark Architectural Lighting (292)	***	01 May 2015 16:16	
Peerless Lighting (768)		01 May 2015 16:19	
Tersen Lighting (7)	***	01 May 2015 16:19	
Winona Lighting (2606)		01 May 2015 16:24	
Appleton Electric LLC			
Appleton Electric LLC_November 13 (548)		30 Sep 2015 10:12	
ATX-Appleton Group (151)	***	30 Sep 2015 10:10	
Chalmit Lighting			
Chalmit - 16-9-14 (829)	***	17 Sep 2014 08:02	
Victor - 16-9-14 (563)		16 Sep 2014 07:58	
Con-Tech Lighting			
Con-Tech Lighting (751)		30 Sep 2015 10:14	
Indicates some of the files have primary [_SEARCH_] keywords ★ 100% IPORTANT: Many manufacturers are in the process of upgrading their data c			CATIO

To simplify selection, it is recommended to roll up all of the trees by clicking on the "-" button to the left of "Unselect All".

With the trees rolled up, click on the "+" to the left of GE Lighting, then check the box next to "GE Lighting Solutions".

B -	ECO Lighting Solutions
	Energie LLC
÷-	Erco
—	Finelite
.	G Lighting
Θ	GE Lighting
	GE Lighting Solutions (11913)
—	Gerard Lighting
	H.E. Williams
-	Hubbell Killark

★ Indicates some of the files have primary [_SEARCH_] keywords ★ 100% of files have pri IMPORTANT: Many manufacturers are in the process of upgrading their data compatibility. Sp. MOUNTING and CLASSIFICATION may not currently yield expected results for files without ke.

Once this box is checked, click the "OK" link at the bottom right of the window.

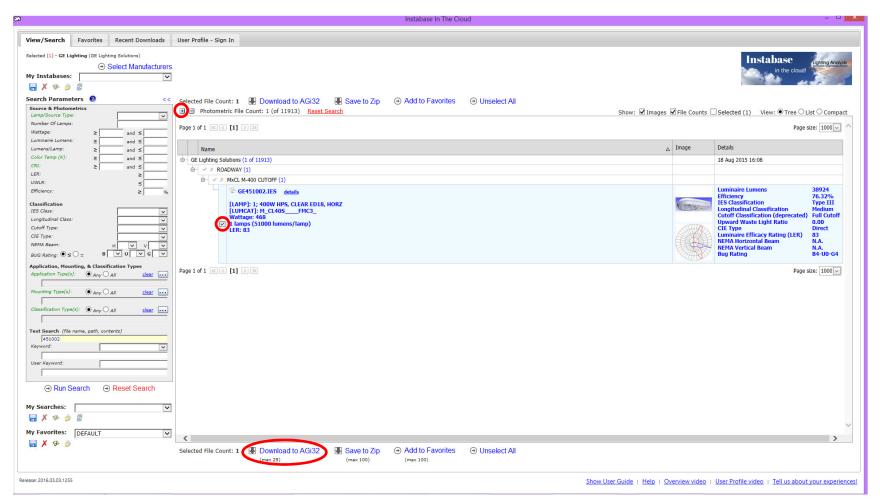
Section 5 – Defining Luminaires WSDOT AGi32 Basics, June 2016 The Instabase window will update and now show GE Lighting Solutions:

68				Instabase In The Cloud		
View	/Search	Favorites	Recent Downloads	User Profile - Sign In		
My I	nstabases:		ting Solutions) Select Manufacturers		Instabase in the cloud:	
Sou Lan Nun Wat	ch Paramet rce & Photom np/Source Type nber Of Lamps: tage:	etrics : ≥	<<	Selected File Count: 0 Download to AGi32 Download to AGi32 Download to AGi32 Page 1 of 1 ≪ < [1] >>>	Show: ØImages ØFile Counts □ Selected (0) View: ●Tree ○ List ○ Compact Page size: 1000 ♥	
Lun Cole CRI LER UW			and ≤ and ≤ and ≤ and ≤ ≥ ≤ ≥%	Name • GE Lighting Solutions (11913 of 11913) Page 1 of 1 << <td>(1) >>></td> <td>Image Details 18 Aug 2015 16:08 Page size:</td>	(1) >>>	Image Details 18 Aug 2015 16:08 Page size:

To get to the correct file, enter **451002** in the Text Search box in the lower left part of the window:

NEMA Beam: $H \lor \lor \lor$ $BUG Rating: \odot \le \bigcirc = B \lor \lor \lor \lor G \lor$			
Application, Mounting, & Classification Types Application Type(s): • Any All			
Mounting Type(s): Any All clear			
Classification Type(s): O Any All clear			
Text Search (file name, path, contents) 451002 × Nonword:	>		
User Keyword:			
 			
My Searches:			
My Favorites: DEFAULT	<		
a X 🌣 🔌	Selected File Count: 0	Download to A((max 25)	
elease: 2016.03.03.1255			Then Click on "Run Search"

Section 5 – Defining Luminaires WSDOT AGi32 Basics, June 2016 Click on the expand all "+" to show the file in the tree (which has now been filtered):



Check the box next to the file, then click on "Download to AGi32" at the bottom of the window.

The Define Luminaire window will update with the new luminaire:

Define Luminaire	×
Load Photometric File(s): 🛱 Instabase 🔹 🛱 Downloaded 🍃 Collection 🚔 Select 構 Find 🐔 Internet 🛛 🐼 Smart Symbols 🖌 Auto Define	
Defined Luminaires - Drag-and-drop here! Use Alt+Arrows keys to reorder list	Close
Label Tag Description Locations ✓ □ GE451002 M_CL40SFMC3_ 0	Help
	Relabel
	Delete
	Add/Redefine
General Veneral SE 451002	
C Dynamic: Attach to Z=	
Description M_CL40SFMC3_ Defaults © Static: Length = 40	
Definition Arrangement Symbols Lumens Per Lamp 51000 Number Of Lamps I	
Luminaire Lumens 38926 Efficiency (%) 76 SINGLE CIRCLE UP_DOWN Render Mode	
Luminaire Watts 468 S/P Ratio 1	
Total LLF 1.000 Specify	
X Y Z Arm Length 0 CIRCLE UP_DOWN Model Mode	
Luminous Box: LLHC 0.65 0.5 0.01	
Photometric File	
Filename: C:\ProgramData\AGI32\PhotometricData_DownloadedFromCloi	
(TEST) 1 30702AA PUBLISHED CURVE CREATED (TEST) 1 30702AA PUBLISHED CURVE CREATED	
ISSUEDATE 17/2/2013 MANUFAC] GE LIGHTING SOLUTIONS www.gelightingsolutions.com	
[LUMINAIRE] M-400 CUTOFF	
ILAMPCATJ GE LU400 ILAMP11; 400W HPS, CLEAR ED18, HORZ	
IESNA:LM-63-2002	
	u .
More	

For all luminaires, the Total Light Loss Factor must be changed:

Definition Lumens Per Lamp	51000	Number Of Lamps	1
Luminaire Lumens	38926	Efficiency (%)	76
Luminaire Watts	468	S/P Ratio	1
Total LLF	1.000	Specify	
Luminous Box: LL Uf	X HC -0.65 RHC 0.65	Y Z -0.5 -0.01 0.5 0	

Change the following entries:

LLD: 0.73

LDD: 0.85

Verify that the Total Light Loss Factor at the bottom of the window is 0.621, then click on the "OK" button.

The Total LLF will have updated to 0.621:

Definition			
Lumens Per Lamp	51000	Number Of Lamps	1
Luminaire Lumens	38926	Efficiency (%)	76
Luminaire Watts	468	S/P Ratio	1
Total LLF	0.621	(Specity)	
Luminous Box: LL Uł	X HC -0.65 RHC 0.65	Y Z -0.5 0.5 0	

In the Definition area of the Define Luminaire window, click on the "Specify..." button to the right of the Total LLF box:

This will bring up the Light Loss Factor Specification window:

Light Loss Facto	or Spec	ification	×
Specify Light Loss Factor		-	ОК
Description Lamp Lumen Depreciation	Abby. LLD	Factor	Cancel
Luminaire Dirt Depreciation	LDD	0.85	Help
Ballast Factor	BF		
Luminaire Ambient Temperature Factor	LATF		
Room Surface Dirt Depreciation	RSDD		
Luminaire Surface Depreciation	LSD		
Lamp Burnout Factor	LBO		
Voltage-To-Luminaire Factor	VTLF		
Ballast-Lamp Photometric Factor	BLPF		
Heat Extraction Thermal Factor	HETF		
Equipment Operating Factor	EOF		
User Defined Factor	UDF		
Total Light Loss Factor	LLF	0.621	

The following changes vary with each luminaire wattage and mounting arrangement:

The following example is for a 250W HPS fixture installed at a 30 ft mounting height (H1) with a 12 foot arm:

	Define Luminaire
Load Photometric File(s): 😳 Instabase 🝷 🝄 Downloaded 🍅 Collectio	on 🗃 Select 👪 Find 🐔 Internet 🖌 Smart Symbols 🖌 Auto Define
Defined Luminaires - Drag-and-drop here! Use Alt+Arrows keys to reorder list	Close
Label Tag Description	
<u>®</u>	Relabel
General	Add/Redefine
Label 250 12-30 3-M-C F 🔽 Tag	O Dynamic: Attach to Z= 0 NOTE:
Description GE 250W HPS 12ft Arm 30ft III-Medium-Cutoff	G Defaults Static: Length = 30 Current luminaire definition has been altered. Select
Lumens Per Lamp 28000 Number Of Lamps 1	Arrangement Symbols Add/Redefine to save modifications.
Luminaire Lumens Efficiency (%)	Housing
Luminaire Watts 314 E S/P Ratio 1	
Total LLF 0.621 Specify	
<u> </u>	Arm Length 13.5 CIRCLE UP_DOWN Model Mode
Luminous Box: LLHC 0.65 0.5 0.01 URHC 0.65 0.5 0	
Photometric File	
Description Classification LCS	Candela C LCS
Filename: C:\ProgramData\AGI32\PhotometricData_DownloadedFromCloi A [TEST] 130702AA PUBLISHED CURVE CREATED [TESTLAB] GE LIGHTING SOLUTIONS [ISSUEDATE] 7/2/2013 [MANUFAC] GE LIGHTING SOLUTIONS www.gelightingsolutions.com [LUMCAT] M_CL40SFMC3 [LUMINAIRE] M-400 CUTOFF [LAMPCAT] GE LU400 [LAMP] 1; 400W HPS, CLEAR ED18, HORZ [ESNA:LM-63-2002 [_FILETYPE] RELATIVE	
< >>	More

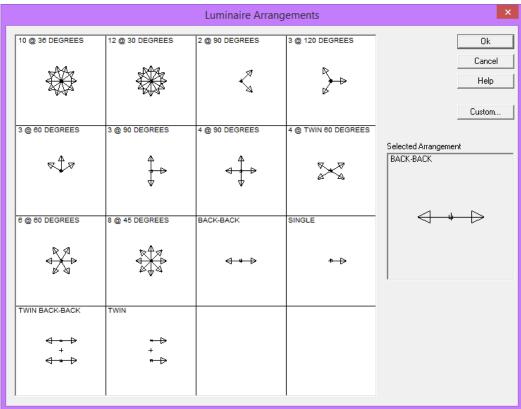
Section 5 – Defining Luminaires WSDOT AGi32 Basics, June 2016 A - Pole Length: Click the radio button next to "Static: Length =", then enter the H1 height (in this case, 30 for a 30 ft mounting height). Note: this only defines the drawn post length for the pole vertical – it **does not set the luminaire height above the ground**. The actual placement height is done later.

B – **Arm Arrangement**: The default is a single arm. To change to a double arm, click on the graphic to bring up the Luminaire Arrangements window. For a double arm pole, select the "BACK-BACK" arrangement.

C – **Arm Length**: Enter the arm length plus an additional 1.5 feet. In this example, a 12 foot arm is entered as 13.5 feet. This is because AGi32 defines the insertion point by the center of the luminaire glass.

D – **Lumens Per Lamp**: This defines the initial lumens output by the luminaire. For a 250W HPS luminaire, enter 28000. The following table shows the lumens to enter for standard wattages:

Wattage	Lumens
200	22000
250	28000
310	37000
400	51000



E - Luminaire Watts: This defines the actual power consumed by the luminaire. This is not critical, but should still match the luminaire being used. For a 250W luminaire, enter 314. The following table shows the watts to enter for standard wattages:

Wattage	Actual Watts
200	248
250	314
310	387
400	479

 \mathbf{F} – Label: This is a shorthand "tag" for each luminaire type. Due to the way some of the editing tables are set up in AGi32, a standard labeling scheme has been developed that will fit the character limits of these editing tables. For a 250W luminaire mounted at 30 ft with a 12 ft mast arm, the label should read "250 12-30 3-M-C". For other luminaire variations, see the following table:

Wattage	Arm Length (ft)	Mounting Ht (ft)	Distribution	Label
200	16	20	Type III – Medium - Cutoff	200 16-20 3-М-С
200	8 (Double Arm)	20	Type III – Medium - Cutoff	200 D8-20 3-M-C
250	16	30	Type III – Medium - Cutoff	250 16-30 3-М-С
310	12	40	Type III – Medium - Cutoff	310 12-40 3-М-С
400	12 (Double Arm)	40	Type III – Medium - Cutoff	400 D12-40 3-M-C
400	16	50	Type III – Medium - Cutoff	400 16-50 3-М-С

Labels are constructed as follows: AAA BBB-CC D-E-F, where

- AAA is the luminaire wattage (200, 250, 310, 400, etc.)
- BBB is the arm length in feet and type (Single Arms: 8, 10, 12, 16, etc.; Double Arms: D8, D10, D12, etc.)
- CC is the mounting height (H1) in feet (20, 30, 40, 50, etc.)
- D is the Distribution Type (3 = III, 2 = II, 5 = V, etc.)
- E is the Distribution Distance (M = Medium, L = Long, S = Short, etc.)
- F is the Cutoff Type (C = Cutoff, NC = Non-Cutoff, etc.)

G – **Description**: This is the longhand label for each luminaire type. Here, you should type out and expand on the information in the label field. For example, for the "250 12-30 3-M-C" 250W luminaire, the description would read:

GE 250W HPS 12ft Arm 30ft III-Medium-Cutoff

Although the IES file information is still included in the Photometric File Description in the lower left hand corner of the screen (Item H), the manufacturer is added to the description (in this case, GE) as a reference to the source IES file.

	Define Luminaire	×
Load Photometric File(s): 💬 Instabase 🝷 💱 Downloaded 🏼 🐌 Collectio	ion 🗃 Select 📕 Find 🐔 Internet 🖌 Smart Symbols 🗸 Auto Define	
Defined Luminaires - Drag-and-drop here! Use Alt+Arrows keys to reorder list		lose
Label Tag Descriptio		
✓ E 451002 M_CL40S ✓ 250 12-30 3-M-C GE 250W	5FMC3H / HPS 12ft Arm 30ft III-Medium-Cutoff 0	lelp
₩ 250 12-30 3-M-C GE 250 W		abel
		elete
⊂ General	Add/Red	etine
Label GE451002	Pole or Pendant Mounted	
	Dynamic: Attach to Z=	
Description M_CL40SFMC3_	✓ Defaults C Static: Length =	
Definition	⊂ Arrangement ───── ⊂ Symbols	
Lumens Per Lamp 51000 Number Of Lamps 1	SINGLE SHOEBOX Render Mode	
Luminaire Lumens 38926 Efficiency (%) 76	Housing	
Luminaire Watts 468 S/P Ratio 1	▲→ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
Total LLF 1.000 Specify		
	Arm Length 0.817 SHOEBOX Model Mode	
X Y Z	+ Line Width/Color	
Luminous Box: LLHC -0.65 -0.5 -0.01		
URHC 0.65 0.5 0		
Photometric File		
Description Classification LCS	Candela C LCS	
Filename: C:\ProgramData\AGI32\PhotometricData_DownloadedFromClor		
[TEST] 1307024A PUBLISHED CURVE CREATED [TESTLAB] GE LIGHTING SOLUTIONS		
[ISSUEDATE] 7/2/2013		
[MANUFAC] GE LIGHTING SOLUTIONS www.gelightingsolutions.com [LUMCAT] M CL40S FMC3		
LUMINAIRE M-400 CUTOFF		
[LAMPCAT] ĜE LU400 [LAMP] 1; 400W HPS, CLEAR ED18, HORZ		
IESNA:LM-63-2002		
< >>	More	

Once this has been updated, click on the "Add/Redefine" button on the right side of the window. The updated luminaire will be added to the list:

To remove the placeholder file (GE451002), check the box next to the label, and then click on the "Delete" button.

If you have made a mistake in the Label field, you can click the "Relabel" button to correct it. Any other errors require you to click the "Add/Redefine" button instead.

To add additional luminaires which share many of the same characteristics, the simplest way is to modify an existing definition and then click "Add/Redefine". So long as you have used a different label, it will add each new luminaire to the list. **If you do not change the label, then you will overwrite the existing definition for that label with the new information**.

Define Luminaire	Define Luminaire		
Load Photometric File(s): 🛱 Instabase 🔹 💱 Downloaded 🍃 Collection 🝃 Select 構 Find 🐔 Internet 🛛 🗸 Smart Symbols 🗸 Auto Define	Load Photometric File(s): 😂 Instabase 🔹 💱 Downloaded 🍃 Collection 🍃 Select 構 Find 🤌 Internet 🖌 Smart Symbols 🗸 Auto Define		
Defined Luminaires - Drag-and-drop here! Use Alt+Arrows keys to reorder list Close	Defined Luminaires - Drag-and-drop here! Use Alt+Arrows keys to reorder list Close		
Label Tag Description Locations	Label Tag Description Locations		
Z 50 12:30 3 M-C GE 250W HPS 12t Am 30t III-Medum-Cutoff 2 Help	Z 250 12-30 3M-C GE 250W HPS 12ft Am 30ft III-Medium-Cutoff 2 Help		
250 16:30 3M-C GE 250V/ HPS 16it Am 30it III-Medium-Cutoff 3	v		
2 400 12-40 3M-C GE 400W HPS 12/t Am 40t III-Medium-Cutoff 0 Relabel	□ 25016-30.3M-C GE 250// HPS 16t Arm 30t III Medium-Cutolf 3 □ 40012-40.3M-C GE 400// HPS 12t Arm 30t III Medium-Cutolf 0 ■ PRelabel PRelabel PRelabel		
400 16 40 3M C GE 400% HPS 18k Am 40t III Median Cutoff 0	4001 E-40 3M-C EE 400W HPS 161 Am 400 III M-duim-Cutoff 0		
GE 400v/ HPS Double 12h Arm 40ft III-Medium-Cutoff 0 Delete	400 D12-40 3M-C E E 400W HPS Double 12th am 400 III-Medium-Cutoff 0 Delete		
□ Hold D840 3M-C GE 400V HPS Dauble RM and Att Ill Medium-Cutoff 0	400 DF4/0 SM-C GE 400W HPS Double 121 Kim 400 III Medium-Cutoff 0		
Add/Redefine	Add/Redefine		
General	General		
Label 250 12:30 3M-C 🔽 Tag C Dynamic: Attach to Z=	Label 250 12:30 3:M-C Tag C Dynamic: Attach to Z=		
Description GE 250w HPS 12th Arm 30th III-Medium-Cutolf Defaults G Static: Length = 30	Description GE 250W HPS 12ft Arm 30ft III-Medium-Cutoff Defaults Static: Length =		
Definition Arrangement Symbols	Definition has been altered. Select Add/Redefine to save		
Lumens Per Lamp 28000 Number Of Lamps 1 Since Circle up Down Render Mode	Lumens Per Lamp 28000 Number Of Lamps 1 SINGLE COVIN Render Mode modifications.		
Luminaire Lumens 21371 Efficiency (%) 76 Housing	Luminaire Lumens 21371 Efficiency (%) 76 Housing		
Luminaire Watte Data S/P Batio	Luminaire Watts 214 S/P Babin 1		
Total LLF In 621 Specify	Total LLF 0.621 Specify		
Arm Length 13.5 CIRCLE UP_DOWN Model Mode	Am Length Long CIRCLE UP DOWN Model Mode		
URHC [0.65] [0.5] [0.5] [0.5] [0.5] [1.5] [Pixel -			
Photometric File	Photometric File		
Description Classification LCS	Description Classification LCS		
Filename: C:VProgramDataVAGI32:VPhotometricData_DownloadedFromClor A	Filename: C:\ProgramData\AGI32\PhotometricData_DownloadedFromClor A		
ITESTI 130702AA PUBLISHED CURVE CREATED	TEST1130702AÄ PUBLISHED CURVE CREATED TESST1130702AÄ PUBLISHED CURVE CREATED		
[ISSUEDATE] 7/2/2013	[ISSUEDATE] 7/2/2013		
MANUFACI GE LIGHTING SOLUTIONS www.gelightingsolutions.com	MANUFACI GE LIGHTING SOLUTIONS www.gelgkhingsolutions.com		
LAMPCATI GE LU400	LAMPCATIGE LU400 LIAMPI1: 400W HPSI, LL4AR ED18, HORZ		
IFIETPRELATIVE	I ESNALM-832002 I FILETYPETRELATIVE		
A more manual sector	Kare		
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In the above example, only the Pole Static Length has been changed (from 30 to 40 – circled in red). Note that a warning box has come up on the right, alerting that a change to the definition has been made.

If the Label **is not** changed, the "Add/Redefine" button will function as **Redefine**, and will change the definition of the luminaire with the label *250 12-30 3-M-C*. If luminaires with this label have already been placed, it will change all of those luminaires as well.

If the Label **is** changed, then the "Add/Redefine" button will function as **Add**, provided the new label does not match any other existing luminaire label in the list, and a new luminaire definition will be created.

Using Add/Redefine to add similar luminaire definitions can save a lot of time, as only basic changes need to be made to each definition – typically lumens, wattage, height, arm length, and / or arm arrangement – definitions do not need to be entered from scratch every time.

After adding multiple luminaires, you will end up with a list that looks something like this:

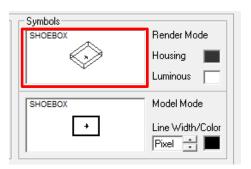
					Define Luminaire	
Lo	oad Photon	netric File(s): 😰 Instat	oase 🝷 🗊 Downloaded	🎒 Co	lection 🗃 Select 👫 Find 🐔 Internet	🖌 Smart Symbols 🖌 Auto De
	Defined Lumii	naires - Drag-and-drop her	e! Use Alt+Arrows keys to r	eorder li	t	
	Label		Tag	De	ription	Locations
	/ 250	12-30 3-M-C		GE	50W HPS 12ft Arm 30ft III-Medium-Cutoff	0
	250	16-30 3-M-C		GE	50W HPS 16ft Arm 30ft III-Medium-Cutoff	0
6	🖉 🗖 400 °	12-40 3-M-C		GE	00W HPS 12ft Arm 40ft III-Medium-Cutoff	0
	400 1	16-40 3-M-C		GE	00W HPS 16ft Arm 40ft III-Medium-Cutoff	0
	400	D12-40 3-M-C		GE	00W HPS Double 12ft Arm 40ft III-Medium-Cuto	ff O
	400	D8-40 3-M-C		GE	00W HPS Double 8ft Arm 40ft III-Medium-Cutoff	0
Ľ	General abel)escription	250 12-30 3-M-C GE 250W HPS 12ft Am	■ Ta n 30ft III-Medium-Cutoff	ig 🗌	0	Pole or Pendant Mounted Dynamic: Attach to Z= Static: Length = 30

To sort the list, click on the "Label" header.

Once you have finished adding luminaires, close the window by clicking the "Close" button on the right side of the window.

Changing Luminaire Symbols

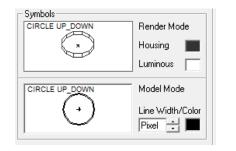
In the event the luminaire symbols aren't coming in automatically as CIRCLE UP_DOWN, you can change the symbols yourself. Note that this has no effect on calculations – it merely changes how the luminaire is displayed (drawn) in AGi32.



In the Luminaire Symbols window, scroll down and select "CIRCLE UP_DOWN".

Verify that CIRCLE UP_DOWN appears in the Selected Symbol area to the right, then click the "OK" button.

Both symbols will be updated in the Symbols area of the Define Luminaire window:



To change the luminaire symbols:

In the Symbols portion of the window, click on the upper symbol (in this case SHOEBOX) to bring up the Luminaire Symbols window.

ymbols Folder G	eneral		•			Ok Cance
BOX UP LS	BOX UP	BOX UP_DOWN	CIRCLE DOWN LS	CIRCLE DOWN	CIRCLE RECESSED DOWN L	Help
٠	·	·	⊙	\odot	•	Symbol Mirroring Model Mode Symbol Same As Render Mode Symbol
CIRCLE RECESSED DOWN	CIRCLE RECESSED UP LS	CIRCLE RECESSED UP	CIRCLE RECESSED	CIRCLE UP DOWN LS	CIRCLE UP LS	Color Housing
\odot	o	o	\odot	⊙	•	Luminous Area
						Symbol Scaling Factor Size Act. Size
CIRCLE UP	CIRCLE UP_DOWN	COBRA FLATGLASS	COBRA REFRACTOR	COBRAHEAD	CONE TOP	$\begin{array}{c c} X & 1 \\ Y & 1 \\ Y & 1 \\ \end{array} \times \begin{array}{c} 2 \\ 2 \\ \end{array} = \begin{array}{c} 2 \\ 2 \\ \end{array}$
\odot	\odot	œ	⊐æ		٠	Z 1 x 0.3 = 0.3
CONTEMP ROUND		RESENDO UPDN	DECORATIVE	DECORATIVE1	DECORATIVE1	Selected Symbol
GLOWTOP		CRESENDO OPDN	SPHERE	TRANS	DECORATIVET	VIRULE OF_DUW
٠	•		•	ы	•	
DECORATIVE2	DECORATIVE3	DOWNLIGHT	FINELITE S12 ID	FINELITE S12	FLOOD BOX	
_		•			RECESSED LS	
-	•					ĸ
FLOOD CIRCLE RECESSED LS	FLOOD CIRCLE RECESSED	FLOOD LS	FLOOD RECESSED	FLOOD	FLOOD-1	 Insertion Point - Top Insertion Point - Bottom
©			•	•	Ð	If Pole Mounted - Recommend: Minimum Arm Length 1 167
\odot						Minimum Arm Length 1.167 Minimum Offset Length 1.167

Creating and Using a Collection

To avoid the need to define the same luminaires repeatedly for multiple projects, it is highly recommended that you create a Collection. A Collection is a set of luminaires that are defined and stored on your computer's local hard drive (you cannot change this to an alternate location like a network drive at this time) which will store everything but the label for any defined luminaire. These will be available for any AGi file.

To create a Collection, click on the Collection button at the top of the Define Luminaire window: 20 Collection



This will bring up the Luminaire Collection window.

First, click on the "New..." button at the bottom of the window to create a new collection. This will bring up the Create Collection window.

Create Collection	×
Collections	Close
	Delete
Create New Collection Collection Name	

Type a name for the new collection in the Collection Name box at the bottom of the window (such as WSDOT Std HPS), then click the "Add" button.

Define Luminaire List Label: Description 250 12-30 3:M-C: GE 250W HPS 12ft Arm 30ft III-Medium-Cutoff 250 16-30 3:M-C: GE 250W HPS 16ft Arm 30ft III-Medium-Cutoff 400 12-40 3:M-C: GE 400W HPS 12ft Arm 40ft III-Medium-Cutoff 400 16-40 3:M-C: GE 400W HPS 16ft Arm 40ft III-Medium-Cutoff 400 D12-40 3:M-C: GE 400W HPS Double 12ft Arm 40ft III-Medium-Cutoff 400 D8-40 3:M-C: GE 400W HPS Double 8ft Arm 40ft III-Medium-Cutoff	Ok Cancel Help
Add Selected Luminaires to Collection Collection Collection Description Add Selected Luminaires to Defined List	
New Delete	

The new collection name will appear in the list of Collections at the top of the window.

After naming a collection, click the "Close" button. The new collection name will now appear in the dropdown list at the bottom of the Luminaire Collection Window.

Luminaire Collection	
– Define Luminaire List Label: Description	Ok
250 12-30 3-M-C: GE 250W HPS 12ft Arm 30ft III-Medium-Cutoff 250 16-30 3-M-C: GE 250W HPS 16ft Arm 30ft III-Medium-Cutoff	Cancel
400 12:40 3:44:C; GE 400W HPS 161 Aim 401 III-Medium-Cutoff 400 16:40 3:44:C; GE 400W HPS 161 Aim 401 III-Medium-Cutoff 400 D12:40 3:44:C; GE 400W HPS 100 Light Am 401 III-Medium-Cutoff 400 D12:40 3:44:C; GE 400W HPS Double 181 Am 401 III-Medium-Cutoff	Help
Add Selected Luminaires to Collection	
]
Collection WSDDT Std HPS Add Selected Luminaires to Description	

With a collection name, luminaires can now be added to the collection. Select the luminaires to be added to the collection at the top of the window (shift click and Ctrl click can be used to select multiple luminaires). After selecting the luminaires to be added, click the down arrow button next to "Add Selected Luminaires to Collection".

The luminaires will be added to the collection, listed by their <u>Description</u>. Note that the labels are not included in the collection definitions.

Create Collection	×
Collections WSDOT Std HPS	Close Help
	Delete
Create New Collection Collection Name WSDOT Std HPS	
, Add	

Luminaire Collection	×
Define Luminaire List Label: Description 250 12-30 3:M-C: GE 250W HPS 12ft Arm 30ft III-Medium-Cutoff 250 15-30 3:M-C: GE 250W HPS 16ft Arm 30ft III-Medium-Cutoff 400 12-40 3:M-C: GE 400W HPS 12ft Arm 40ft III-Medium-Cutoff 400 D12-40 3:M-C: GE 400W HPS Double 12ft Arm 40ft III-Medium-Cutoff 400 D12-40 3:M-C: GE 400W HPS Double 8ft Arm 40ft III-Medium-Cutoff 400 D18-40 3:M-C: GE 400W HPS Double 8ft Arm 40ft III-Medium-Cutoff	Ok Cancel Help
Add Selected Luminaires to Collection Collection Collection USDDT Std HPS Description Collection Co	
New Delete	

To add a luminaire from a collection to the luminaire definitions, click on the Collection button at the top of the Define Luminaire window. For a file with no previously defined luminaires, the Luminaire Collection window will look something like the window shown at right.

To add a luminaire, select the luminaire(s) to be added from the list at the bottom of the window. Click on the up arrow next to "Add Selected Luminaires to Defined List" to add the luminaire(s) to the file's luminaire definitions. After clicking the arrow, the Collection Labeling window will appear.

Collection Labeling	×
C Automatic Labeling C Automatic Labeling C Use Current Default Labeling Scheme Filename	Ok Cancel
Alphanumeric: Starting With (enter a letter) A Numeric: Starting With (enter a number)	Help
Manual Labeling Label Description A Description BE 400W HPS 12ft Arm 40ft III-Mediur	

Luminaire Collection	×
Define Luminaire List Label: Description	Ok
	Cancel
	Help
I Add Selected	
Luminaires to Collection	
Luminaire Collection	
Collection WSDOT Std HPS Add Selected	
Description Defined List	
GE 250W HPS 12ft Arm 30ft III-Medium-Cutoff GE 250W HPS 16ft Arm 30ft III-Medium-Cutoff	
GE 400W HPS 12ft Arm 40ft III-Medium-Cutoff GE 400W HPS 16ft Arm 40ft III-Medium-Cutoff	
GE 400W HPS Double 12ft Arm 40ft III-Medium-Cutoff GE 400W HPS Double 8ft Arm 40ft III-Medium-Cutoff	
1	
New Delete	

Click the button next to Manual Labeling, and then click in the blank space under the Label header. Enter a label following the standard labeling scheme previously defined in this section. If you selected multiple luminaires, there will be a line for each luminaire selected. After entering the labels, click the "OK" button. The luminaires will now appear in the top of the Luminaire Collection window with their labels. Click the "OK" button, and the luminaires will now be listed in the Define Luminaires window.

Luminaire Collection	×
Define Luminaire List Label: Description 250 12-30 3-M-C: GE 250W HPS 12ft Arm 30ft III-Medium-Cutoff 250 16-30 3-M-C: GE 250W HPS 16ft Arm 30ft III-Medium-Cutoff 400 12-40 3-M-C: GE 400W HPS 12ft Arm 40ft III-Medium-Cutoff	Ok Cancel Help

Section 6 - Adding Calculation Areas

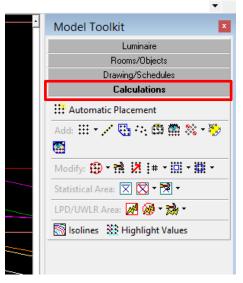
To place calculation areas, click on the "Calculations" tab in the Model Toolkit window:

There are three types of calculation areas that will be used: Calculation Points – Polygon, Calculation Points – Road, and Statistical Areas.



Calculation Points – Polygon:

Calculation Points - Polygon				
General Label Intersection_Area Description Point Spacing: Left-To-Right 5 Top-To-Bottom Center Points Relative To Polygon Boundaries Analysis Type Light Meter Horizontal Meter And Grid Fixed: Orient Tilt Variable - Meter Aiming Point: X Y	A 5 It BText Size 1.5 2 Specify	Ok Cancel Help Highlight Isolines Polygon		
Summary Average C Maximum and Minimum Average/Minimum Ratio Maximum/Minimum Ratio Maximum/Average Ratio Number Of Points Coefficient of Variation Uniformity Gradient % Points in Range: 25 To 500 Creation Method Manually Specify Polygon: Z-Coord Of Polygon 0 Create Polygon From Existing Drawing Entities, Room or	Display Options Decimals 2 Color Polygon Lines Visible Mark Points Meter Indicator Labeling	Consider using Automatic Placement'. Points associated with surface calculate faster (when using 'Full Radiosity Method').		



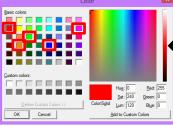
In the Calculation Points – Polygon window, change the following items:

Label (**A**): Change to a basic description that is easy to remember. Underscores are recommended instead of spaces.

Point Spacing (B): Both the Left-To-Right and Top-To-Bottom values should be 5 feet.

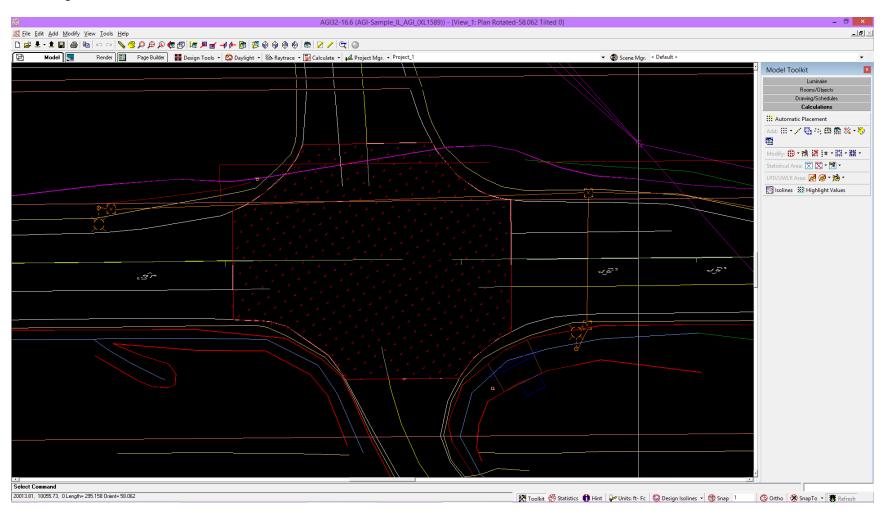
Summary (C): Only Average, Maximum and Minimum, and Average/Minimum Ratio should be checked.

Display Options (D): Polygon Lines Visible and Mark Points should be checked. Change the decimals to 2.



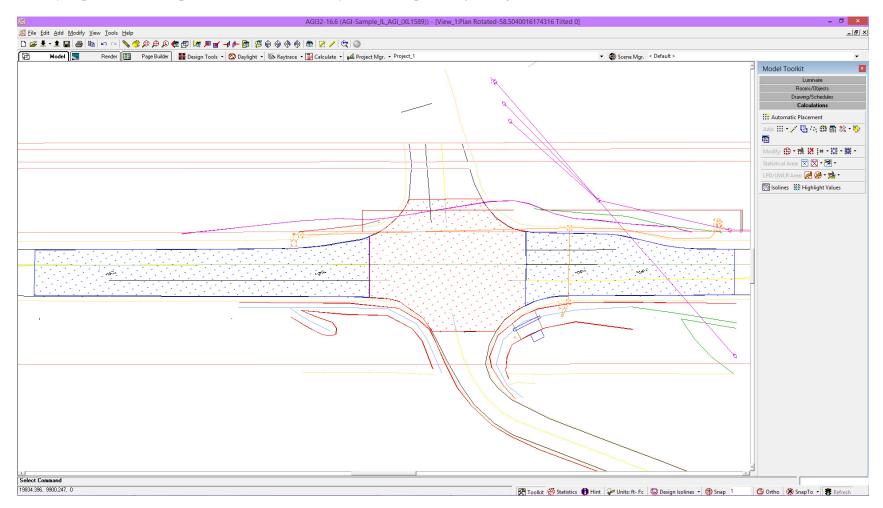
Change the color by clicking on the color swatch. Recommended colors are red, blue, green, orange, and magenta (as shown at right), as these are visible on both white and black backgrounds.

Click the "OK" button after making these changes. The grid area is then placed by clicking at points along the perimeter. To remove the last point clicked without starting over, use "Ctrl Z" on the keyboard (backtrack as many points as desired). Segments between points on curves will require points spaced closer together to approximate the curve. After clicking the last point, right click to finish the shape. The end result should be something like this:



The grid boundaries are visible in red, and the point placeholders are shown with "?" symbols. These will change to numbers after calculation.

Place any additional grids as needed. It is recommended that different colors be used for adjacent grids to aid in determining where one grid ends and the next begins. The example shown below shows three adjacent grids for a highway intersection (note that only the intersection area is actually required – the turn pocket areas are shown only as an example of adjacent grids).



*Note: This screenshot uses a white background for clarity only - black background is more visible on a computer screen.



Calculation Points - Roadway:

The Calculation Points – Roadway grid is used for veiling luminance. It can also be used for straight sections of uniform width roadway in one direction, if desired. These grids are directional, and rely on a specific direction of travel.

	Calculation Points - Road	×							
💾 All Units Are In Feet	Ceneral	Ok							
Calculation Metrics	Label Northbound	Cancel							
Check To Include In Calculation Select To Set Individual Metric Settings		nfigure Help							
Roadway Luminance	Number Of Lanes: In Direction Of Travel 1 In Opposite Direction 0								
Visibility Level (STV)	Driver's Side Of Roadway: 🔿 Left 🛛 📀 Right	Highlight							
✓ Veiling Luminance	Point Spacing Along Roadway Based On (available options based on settings in Standard):	Isolines							
	Set Spacing [5 (Maximum Allowable Spacing = 16.4)								
	C Number Of Luminaire Cycles 0	B Road							
С	- Roadway Surface								
	Maximum/Minimum Hatio Maximum/Average Ratio Number Of Points Coefficient of Variation Uniformity Gradient Observer Indicators Visible								
	D								

Calculation Metrics (A): Only Roadway Luminance and Veiling Luminance should be checked. Click on Veiling Luminance to ensure that the indicator arrow (black triangle) is pointing at Veiling Luminance.

General Section (B):

Change the Label to something brief but useful.

Ensure that the Roadway Standard selected is IES RP-8-14 (choose from dropdown if needed).

Change the Number of Lanes to the total number of lanes in the same direction of travel for the entire length of the calculation area. Too many is better than too few.

Change the Set Spacing to 5 for the Point Spacing Along Roadway Based On.

Roadway Surface (C): Change to "R2 (Diffuse And Specular), Q0=0.07".

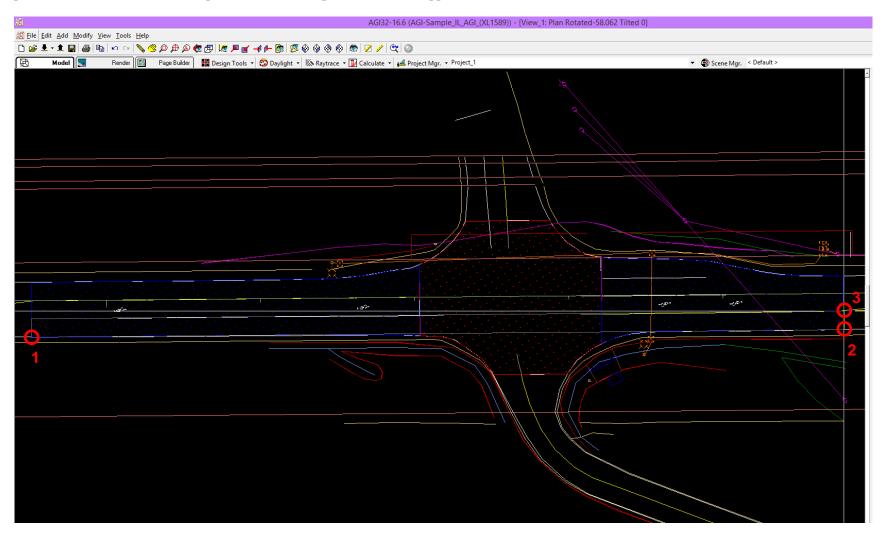
Selected Metric Summary (D): Check only Average, Maximum and Minimum, and Maximum Lv/LAvg Ratio.

Selected Metric Display Settings (E): Change the color to something different from both adjacent grids and grids that will be overlapped.

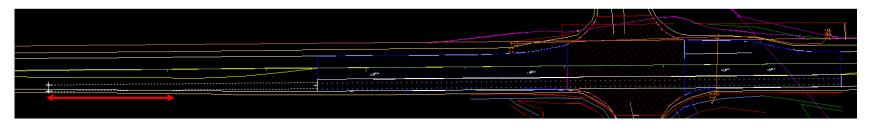
General Display Settings (F): All boxes should be checked.

After making these changes, click the "OK" button to place the grid.

Section 6 – Adding Calculation Areas WSDOT AGi32 Basics, June 2016 Roadway grids are rectangular and placed using three points. The first point is on either the right or left edge of the lane(s) to be covered at the farthest upstream point. The second point is on the same lane edge (left or right) as the first point, but at the farthest downstream point. The third point is at the same downstream point as the second point, but on the opposite side of the lane(s):



The resulting grid will look something like this:



Roadway grids for Luminance and Veiling Luminance show observer points in advance of the grid. Veiling Luminance requires a minimum flat tangent section of 272 feet in order to be calculated. For an effective measurement the grid should be a minimum of ??? feet **beyond the initial 272 feet of tangent section**, for a total minimum tangent section length of ??? feet. Any curvature, horizontal or vertical, invalidates the veiling luminance calculation, as it places the observation point in a location where a driver cannot physically be.

In the example shown above, the veiling luminance grid is actually too long (to the left), as the observer points drift outside of the lane width towards the far left of the observer lines (area shown with red dimension line above).

To correct the display of the veiling luminance grid, and to turn off extraneous information (Luminance data), click on the Project Mgr. button at the top of the view:

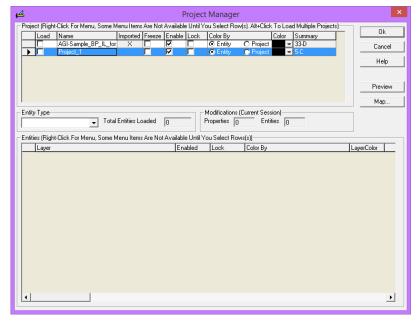
AGI32-16.6 (AGI-Sa	mple_IL_AGI_(XL158
Eile Edit Add Modify View Tools Help	
D 🖆 보 - 1 🖬 증 🖻 ∽ ~ 📏 🥝 🔎 🕫 🐼 🕼 🖉 📈 🖉 🔐 🖉 🚽 🔶 🚱 🛞 🛞 🛞 🖉 🥖 🗮 🌍	
🔁 Model 🔙 Render 📰 Page Builder 🗰 Design Tools 🔹 😒 Daylight 🚽 ذ Raytrace 🔹 📝 Calculate 🔹 🚧 Project My	gr. 👻 Project_1
Project	t Manager

This will bring up the Project Manager window:

There should be two items in the upper list: your project, and your imported CAD file. To adjust the veiling luminance grid colors, check the box under the "Load" column next to your project (in this case, Project_1).

Checking the box will populate the Entity portion of the window at the bottom:

₽	Proje	ect Manager	×					
Project (Right-Click For Menu, Some Menu Items Are Not Available Until You Select Row(s), Alt+Click To Load Multiple Projects) Load Name Imported Freeze Enable Lock Color By Color Summary AGI-Sample_BP_IL_for X G C Entity C Project 33:0 Project S C C C C C C C C C C C C C C C C C C								
Entity Type		Medifications (Correct Service)	Preview Map					
CalcPts Tota								
Entities (Right-Click For Menu, Some Label Intersection_Area North_Leg North_bound_Luminance Northbound_Veil_Lum South_Leg	Menu Items Are Not Available Unt CalcType Obs Desc Illuminance Luminance Veiling Lumin Illuminance Illuminance	ul You Select Hows[s] Enabl Lock, Vis PtsVi PtsView IsoVis IsoView	LrVis Sum • 10 10 •					



Since no luminaires have been placed, the dropdown in the upper left portion of this area will only list "CalcPts". Clicking on the "Label" header in the table will sort the list alphabetically by label name.

To display only the veiling luminance grid (and summary data), boxes in the columns should be checked as follows:

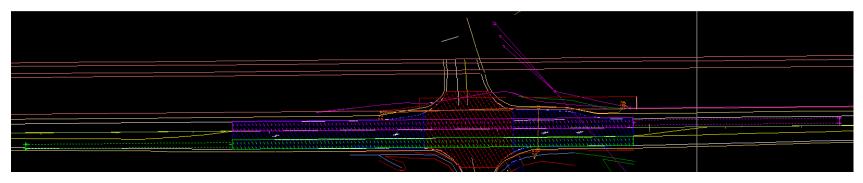
Enabled (A): All checked; Lock (B): All unchecked; Vis (C), PtsVis (D), LnVis (E) and Sum (F): All checked except for luminance grids.

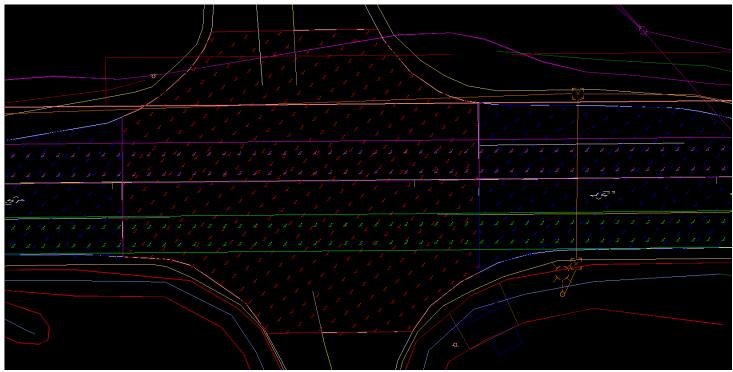
The example shown below has the boxes checked correctly. As an aid, only grids with "Luminance" in the CalcType column or with black in the color column should be turned off (Vis, PtsVis, LnVis, and Sum). Unchecking the Enabled box will disable all associated grids, including the veiling luminance grids tied to luminance grids. This example also shows a combined Illuminance and Veiling Luminance grid (Southbound).

_t ⊿			Proje	ct Manager		×
Project (Right-Click For Menu, Some Menu Items Are Not Available	e Until You Select Row(s). Alt+C	lick To Load Multiple Projects)			
Load Name	Imported		abled Lock	Color By	Color Summary	Ok
AGI-Sample_BP_IL_for_AGI_(XL1589) -	- 2016-Mar-04 X	य य य		Entity C Project	🚽 33-D	Cancel
Project_1				Entity C Project	✓ 8-C	
						Help
						Preview
						Мар
						Мар
Entity Type	Modifications (Current S					
CalcPts Total Entities Loaded 8	Properties 19 E	ntities 0				
Entities (Right-Click For Menu, Some Menu Items Are Not Availabl		I=	L . L	1	le con le con	
Label CalcType	Obs Desc	Enabled	Lock Vis	PtsVis PtsView	IsoVis IsoView LnVis	Sum Label Color
Intersection_Area Illuminance Northbound_Luminance		<u>v</u>				
Northbound_Luminance Luminance Veiling Luminance		<u>v</u>				
North_Leg Illuminance						
Southbound_Illum Illuminance			<u> </u>		• V All • V • V All • V • V All • V	
Southbound_Luminance Luminance					- V AI - C	
Southbound_Veil_Lum Veiling Luminance				I All		V
South_Leg Illuminance				All All		∀ <u>-</u> <u>-</u>
			D (~ D	_ _	-
		Α	B	C D	E	F

It may be necessary to scroll right to see all columns. Alternatively, the window can be stretched until all columns are visible (as shown here).

After making these changes, click the "OK" button. All grids will now show the correct colors. For a combined Illuminance and Veiling Luminance grid, when both grids are turned on only the Illuminance grid will be visible.





Editing a Grid

To make changes to a grid, click on the Edit Calculation tool:



Click on any point or edge of the grid to be edited (for Roadway Veiling Luminance grids, you can also click on the observer lines outside the grid).

Either the Calculation Points - Polygon or Calculation Points - Roadway window will pop up (depending on the type of grid selected).

Make any changes needed in the window. If the grid needs to be redrawn, click on the "Re-Specify Polygon..." (Polygon grid) or "Re-Specify Roadway..." (Roadway grid). The grid will have to be placed from scratch using the same methods described above for placing each grid type.

Optional - Statistical Areas

Statistical Areas can be used to evaluate multiple areas at the same time, for an overall picture of the lighting in an area.

To place a Statistical Area, AGi32 must be in un-rotated plan view. The simplest way to do this is to click on the Plan (or top) View button in the upper toolbar:

After reorienting the view, you can pan and zoom, but you cannot rotate the view if you want to place a Statistical Area.



Under the "Calculations" tab in the Model Toolkit window, click on the Create Statistical Area tool:

The Calculation Points – Statistical Area window will pop up.

Calculation Points - Statistical Area	×
General	Ok
Label Overall_Intersection	
Description	Cancel
Summarize Project_1	Help
Values Type	
Line Color	
Summary	
✓ Average	
🔽 Maximum and Minimum	
✓ Average/Minimum Ratio	
🗖 Maximum/Minimum Ratio	
Maximum/Average Ratio	
Number of Points	
Coefficient of Variation	
□ % Points in Range: 25 To 500	
Creation Method	
Manually Specify Polygon	
C Create Polygon From Existing Drawing Entities, Room Or Object	

Change the label to something brief, yet useful.

In the Summarize Project dropdown, you can change this to your current project.

Tools Help

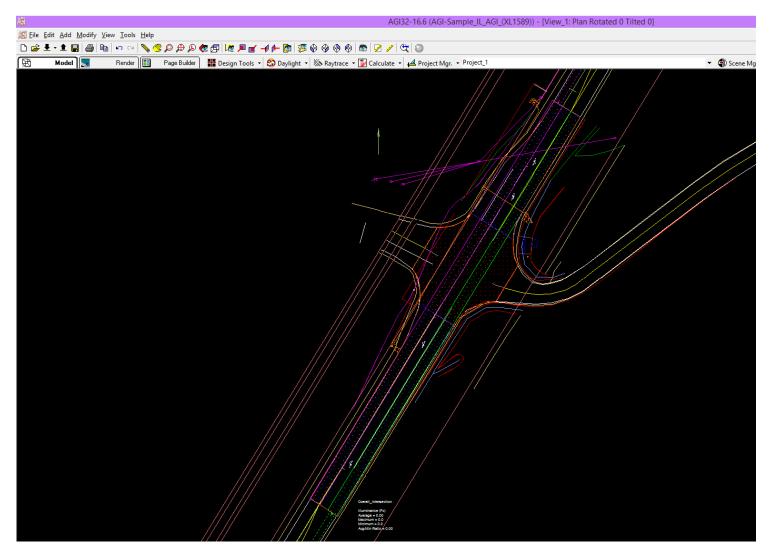
In the Values Type dropdown, ensure that this reads "Illuminance".

Change the line color to something visible (see page 6-1). Click on the "Labeling..." button to adjust the statistical area label text. For text size, anything from 5 to 20 ft should be legible (will depend on size of area being evaluated).

In the Summary section, only Average, Maximum and Minimum, and Average/Minimum Ratio should be checked.

Click the "OK" button, and then place the grid as a polygon exactly the same way as the Calculation Points – Polygon grid was placed.

After the statistical area is placed, you will only be able to see the perimeter line and the summary data label:



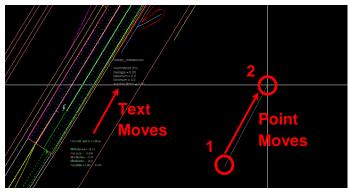
Section 6 – Adding Calculation Areas WSDOT AGi32 Basics, June 2016 To make changes to the Statistical Area options, click on the Edit Statistical Area tool 🕅, then click on the statistical area. To change the shape of the Statistical Area, you will have to delete the area and place a new one.

To relocate the Statistical Area text, click on the down arrow next to the Edit Statistical Area tool and click on "Move Label". Click on the text to select it, then click once as a "move from" point (1), and click a second time in the new "move to" location (2).

a: 🔀 🔀 🕶 🔀 🕶
ea: 🛃 🔀 <u>E</u> dit
Move Label



Note that the move from and move to points can be anywhere in the window – the selected items will move to a new relative location identical to the grey line shown between the two points (see example at right).



Section 7 - Placing Luminaires

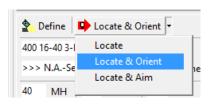
To place luminaires, click on the Luminaire tab in the Model Toolkit window.

Choose the luminaire type to place in the Label drop down. This is one location where the shorthand label helps, by allowing the window to stay narrow.

After selecting the luminaire type, enter an installation height in the MH box. ***This is very important!*** This sets the height of the luminaire above the roadway. If the MH is left at zero, the luminaire will be on the ground. Do not change any other values.

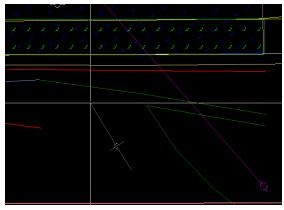
The placement tool should say "Locate & Orient". If it does not, click on the down arrow and select "Locate & Orient". After doing this once, it should default to this option automatically.

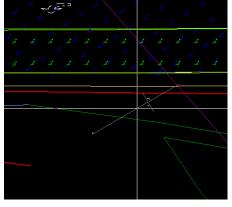
Click on "Locate & Orient". A luminaire outline will now appear under the cursor.

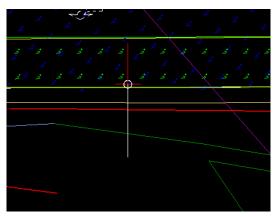


Model Toolkit
Rooms/Objects
Calculations
Drawing/Schedules
Luminaire
💁 Define 🛛 🕩 Locate & Orient 👻
400 16-40 3-M-C: GE 400W HP 🔻 Label
>>> N.ASelect Scene Mgr. 🔻 Channel
40 MH 0 Orient 0 Tilt
0 Roll 0 Spin 0 AimZ

The insertion point for the luminaire is the pole location, with the luminaire shown at the end of the mast arm with a cross-hair (for ease of location). Clicking once places the pole. The luminaire arm can now be rotated to the proper orientation. Rotate the arm to the proper location, then click again to set the luminaire. The luminaire should be placed such that the crosshair is over the fog line.







Locate

Orient

Final Placement (Set)

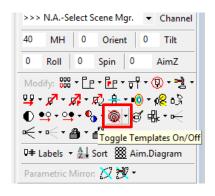
Section 7 – Placing Luminaires WSDOT AGi32 Basics, June 2016

Before placing any additional luminaires of the same type, create a luminaire template.

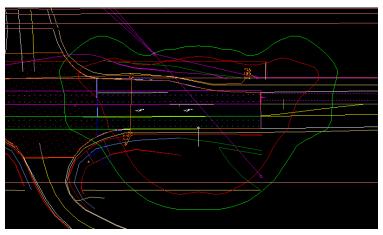
To create a luminare template, click on the Toggle Templates On/Off Tool.

This will bring up the Template Settings window.

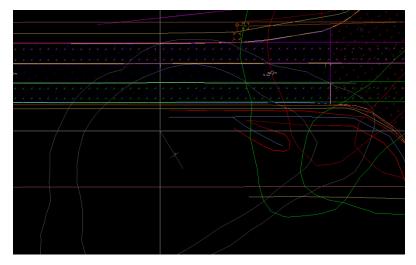
Template Settings	×
Template Specification Isolines Value (Fc) Older Values ColorType: • Variable Same As Luminaire Symbol	Ok Cancel Help
Line Width 0 ft (0 = Pixel) Label Isolines: Increment 10000 ft Text Size 1 ft	Reset Defaults
Template Extents 6 式 X Distance To Template Template Workplane Height 0 ft	



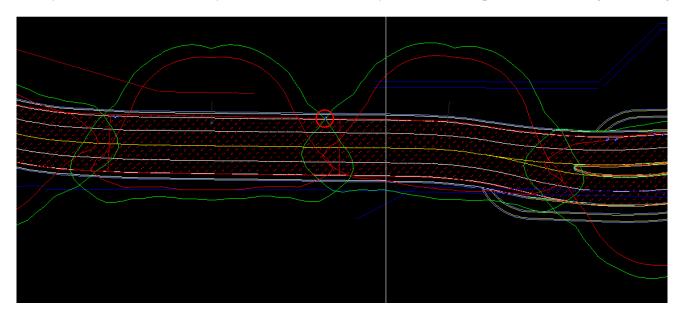
Variable isolines are easier to see. Enter 0.1 for green and 0.2 for red. Then click "OK". The isoline template will be generated automatically for all luminaires at the height they were placed (the MH value entered for each luminaire).



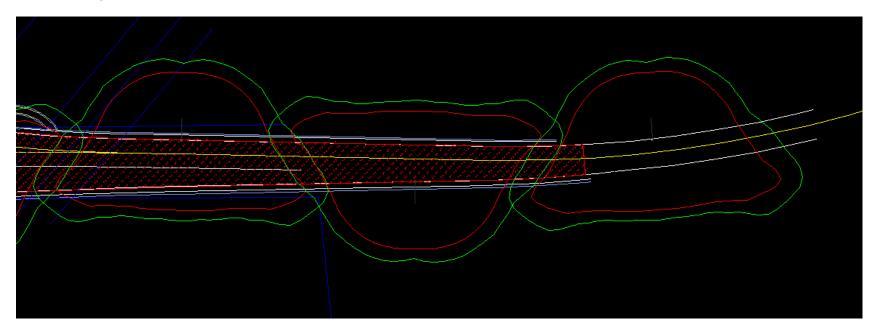
When placing additional luminaires, an outline of the template will now be visible. With the template visible, it is easier to arrange luminaires. Ideal arrangement is such that the green (0.1 fc) lines from adjacent luminaires cross at the outside edges of the calculation area(s).



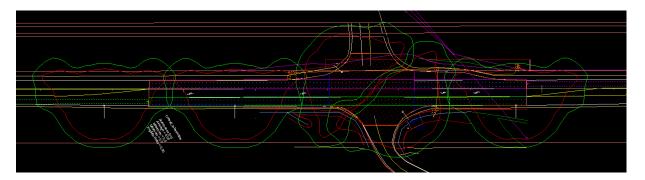
The example below shows such a crossing circled in red. Note that since this particular example ended up requiring consecutive luminaires on the same side of the roadway, the far side of the roadway from the red circle actually has more overlap than an alternating side arrangement.



Section 7 – Placing Luminaires WSDOT AGi32 Basics, June 2016 Crossing the green lines is an effective starting point. Over the course of analysis, the luminaire spacing may need to be adjusted closer together or farther apart. The example below shows where the luminaires had to be spaced closer together, in this case to achieve proper uniformity across the entire design area.



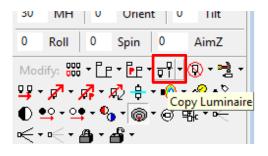
It is not recommended that the template footcandle values be changed between calculations, as they provide a valuable spacing reference for placement. Initial layout of luminaires should look something like this:



Section 7 – Placing Luminaires WSDOT AGi32 Basics, June 2016 One option for placing additionalluminaires is to copy them. To copy a luminaire, click on the Copy Luminaire tool.

Click on the luminaire (or luminaire template) to be copied. At the bottom left corner of the screen, the status box will let you know that a luminaire is selected (the layout screen won't change).

Mod_Lum_Copy_SWA : (1) selected (press right mouse or enter to copy)	
19851.896, 9762.993, U	



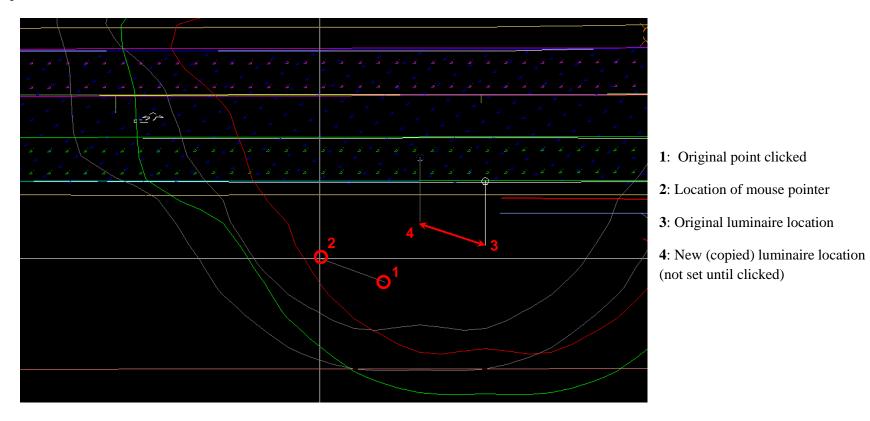
It is possible to select multiple luminaires to copy at once, but this is not frequently useful.

After selecting the luminaire to copy, right click to 'activate' the luminaire. The luminaire (and template) will now turn grey. Copying luminaires is based off of relative points. Click once to select the move from point – this can be anywhere on the screen. The original luminaire will go back to color, and a moving grey luminaire will appear with a line back to the point that you clicked.

In the bottom left corner of the screen, you can see the length of this line. This can help if you are trying to copy a specific distance.

	•								
	Mod_Lum_Copy_SWA : Select or enter point to copy to								
ĺ	19851.517, 9759.655, 0	Length= 117.187							

The new luminaire will be copied to a point that is the same distance and direction from the original luminaire as the line from the first clicked point.

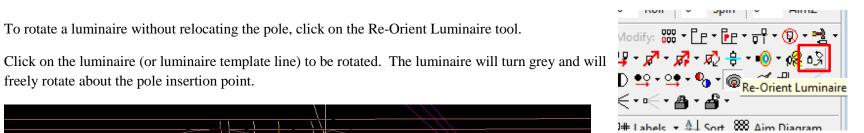


After you have positioned the copied luminaire in the desired location, click to set it. Note that when copying a luminaire, the arm orientation does not change. Orientation can be corrected by rotating the luminaire.

To rotate a luminaire without relocating the pole, click on the Re-Orient Luminaire tool.

freely rotate about the pole insertion point.

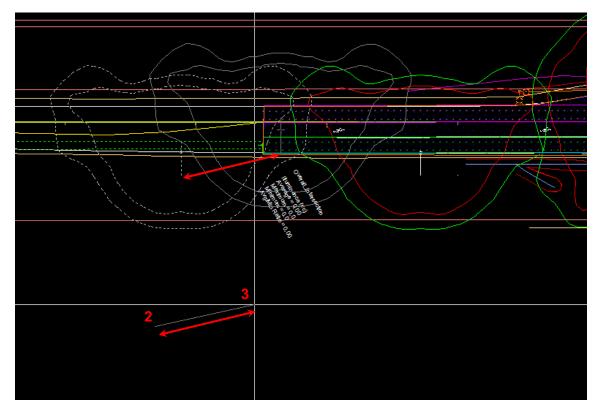
-1,E-1 1

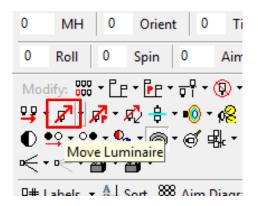


Rotate the luminaire to its new position, and then click to set it. Normally, corner luminaires should be at either 90 or 45 degree angles. In the above example, these were later adjusted to 45 degree angles.

Section 7 – Placing Luminaires WSDOT AGi32 Basics, June 2016 Once your initial layout is complete, it is recommended that you run a calculation to see how your initial placement works (See Section 8 – Calculations).

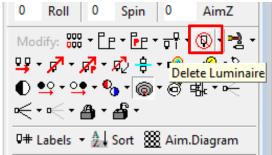
After running a calculation, you may need to modify your layout. To move a luminaire, click on the Move Luminaire tool. Click on the luminaire you want to move (either the luminaire itself or one of the template lines). Click a second time (2) to set a move from point. Click a third time (3) to set the move to point. The luminaire will move the same distance and direction as shown by the move tool line:





The move tool will stay active until you right click (Note: this is different from previous versions of AGi32).

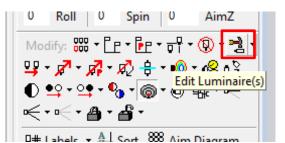
If you need to delete a luminaire, click on the Delete Luminaire tool. Select any luminaires that you wish to delete, and then right click to delete them.



To modify a luminaire's characteristics, click on the Edit Luminaire(s) tool.

Click on any luminaires that you wish to edit, and then right click to bring up the Edit Luminaires window.

ž				Edit	Lumina	aires					_	
If Location	Changes Use: 🧿 S	Same Aiming Angles	C Same	Aiming Poir	nt							
Lum.No	o Label	Channel	X	Y	Z	Orient	Tilt	Roll	Spin	XaimPt	YaimPt	ZaimPt
▶ 16	250 16-30 3-M- 👻	N.A. 💌	19868.312	9589.821	30	148.5	0	0	0	N.A.	N.A.	N.A.
14	250 16-30 3-M- 👻	N.A. 👻	19958.774	9732.559	30	148.5	0	0	0	N.A.	N.A.	N.A.
Bulk Mod	lifications						Γ	Űk		Canc	el	Help



Any item in the table may be revised. To change the mounting height, click on the value in the "Z" column and type in the new value. To change the luminaire type, click on the drop down in the "Label" column. This is where the label shorthand is most useful. Although it is possible to expand the width of the columns in this window, the Label dropdown will always be a fixed width (see example at right). The label shorthand was developed to help overcome this issue.

The "Bulk Modifications..." button is addressed in the following section.

2	-		<			
If Location Changes Use:	- Channel X → 250 12-30 3-M-C 198		Z Orient 30 148.5 30 148.5	Tilt O O	Roll 0 0	0
▲ Bulk Modifications		Ūk	Cancel]	Help	•

Bulk Modifications

Bulk modifications allow for making changes to large numbers of luminaires grouped in one of two ways:

- 1. All luminaires in a project
- 2. All luminaires with the same definition Label.

To use bulk modifications, select any number of luminaires with the Edit Luminaire tool. When the Edit Luminaires window comes up, click on the "Bulk Modifications..." button in the lower left corner.

The Bulk Luminaire Modifications window will pop up. This window has two main sections: Apply Modifications To, and Modifications.

퀑		Edit	Luminaires			-		×
If Location Changes Use: 💿 Sa	ame Aiming Angles	C Same Aiming Poir	nt					
Lum.No Label ▶ 16 250 16-30 3-M-C 14 250 16-30 3-M-C			Channel 250112:30 3-M-C 250116:30 3-M-C 400112:40 3-M-C 400116:40 3-M-C 400016:40 3-M-C 4000000000000000000000000000000000000	X Y 19868.312 9589.8 19958.774 9732.5	21 30 14	ent Tilt 3.5 0 3.5 0	Roll 0 0	<u> </u>
1					1 -			١
Bulk Modifications				Ok	Cance	<u> </u>	Help	
		Bulk Luminair	e Modifcations			×		
 Selected Lun Modifications General Channel Label Description Coordina Y-Coordina Mounting H 	uminaires uminaires Of Label Description ninaires Only (highligh 250 12-30 3-M-C GE 250W HPS 12 GE 250W HPS 12 ate Leight Lei	,			Cancel Help			

Apply Modifications To

This section determines which luminaires will be modified. There are three ways to select luminaires:

1. All Loaded Luminaires will modify every placed luminaire.

Apply Modifications To					
O All Loaded Luminaires					
C All Loaded Luminaires Of Label	250 12-30 3-M-C	•			
Description	GE 250W HPS 12ft Arm 30ft III-Medium-Cutoff				
Selected Luminaires Only (highlighted in Edit grid)					

- 2. All Loaded Luminaires of Label will modify every placed luminaire with the selected label. The dropdown list will have all defined luminaires (see Chapter 5).
- 3. Selected Luminaires Only will only modify those luminaires selected in the Edit Luminaires window. This can be done by holding down the Ctrl key and selecting the rows of the luminaires to be modified through Bulk Modifications. You must click in the grey box to the left of the row you want to select (circled in red below).

2	Edit Luminaires – 🗖 🗙												
lf L	ocation C	Changes Use: 🔎 S	ame Aiming Angles	○ Same	Aiming Poir	nt							
	Lum.No	Label	Channel	Х	Y	Z	Orient	Tilt	Roll	Spin	XaimPt	YaimPt	ZaimPt
	13	250 12-30 3-M- 🔫	N.A. 🖃	19968.685	9889.335	30	17.26	0	0	0	N.A.	N.A.	N.A.
-	12	250 12-30 3-M- 📼	N.A. 👻	20086.567	9938.134	30	185.333	0	0	0	N.A.	N.A.	N.A.
►	7	250 16-30 3-M- 🔫	N.A. 🖃	20148.121	10042.649	30	148.505				N.A.	N.A.	N.A.
	14	250 16-30 3-M- 🖵	N.A. 👻	19974.541	9757.745	30	148.5	0	0	0	N.A.	N.A.	N.A.

Modifications

There are four subsections of Modifications. Only one can be used at a time. Only the first two are addressed, as Aiming Angles and Aiming Point are not used on WSDOT projects with the exception of special circumstances. Contact the WSDOT HQ Traffic Office for assistance with these sections.

Modifications - General:

Select the General button if you want to completely change the luminaire type to a different luminaire definition. Check the box next to Label and then select the new luminaire definition to be used. The associated description will appear in the Description box.

Modifications • General –		_
🔲 Channel	_	
🗖 Label	250 12-30 3-M-C	
Description	GE 250W HPS 12ft Arm 30ft III-Medium-Cutoff	

Channel is part of features that are not used by WSDOT and are not covered in this tutorial.

Modifications - Location:

Allows for changes to the X, Y, or Z (Mounting Height) of the selected luminaires. This section is most useful for changing the mounting heights of multiple luminaires at once. However, if the X or Y coordinates are the same for many luminaires, such as along a straight stretch of roadway, then offset adjustments can be made in groups if the road or

⊡ □	
X-Coordinate	
Y-Coordinate	
Mounting Height	
Use: 💿 Same Aiming	angles 🔿 Same Aiming Point(s)

shoulder width changes. Only the coordinate(s) checked will be modified.

After selecting which luminaires to modify, and what modifications to make, click the "OK" button. The selected modifications will be made, and you will be returned to the Edit Luminaires window. Any luminaires listed that were affected by the bulk modification will show the new values applied. Click the "OK" button again to close the Edit Luminaires window.

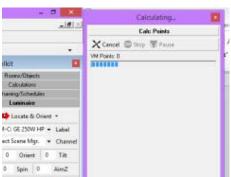
Section 8 – Running Calculations

After setting up calculation areas and placing luminaires, calculations can be run.

To run the calculations, click on the Calculate button (or hit the F12 key):

AGI	GI32-16.6 (AGI-Sample_IL_AGI_(XL1589)) - [Vi
💯 <u>F</u> ile <u>E</u> dit <u>A</u> dd <u>M</u> odify <u>V</u> iew <u>T</u> ools <u>H</u> elp	
□ ☞ ᆂ - 主 🖬 曇 喩 ∽) 🖉 🥒 🔍 🔘
🔁 Model 🔜 Render 🔛 Page Builder 🗰 Design Tools 🔹 😒 Daylight 👻 🗞 Raytrace 🕯 🚺	Calculate 🔻 4 Project Mgr. 👻 Project_1
	Click to calculate current job file (F12)
The button should show red lines going down from a luminaire and then up at an angle. If it shows anything else, click on the down arrow next to the button and select "Full Radiosity Method". For most files, calculations should run fairly quickly. For larger or more complex files with multipl areas and many luminaires, calculations can take quite a while (up to 30 or 40 minutes for very large with 3D analyses, depending on the computer).	
AGi32 Calculating A0132-16.6 (AGI-Sample_IL_AGI_(XL1589)) - [View_1:Plan Rotated-58.5040016174316 Tilted 0]	<u>B</u> atch Processor <u>C</u> alculation Summary
Image: Second state Image: Second state<	Calculating.

While calculating, the title bar of the file will add "AGi32 Calculating...", and the Calculating... window will pop up somewhere on the screen.



When the calculations are complete, click on the Statistics button at the bottom of the screen to open the calculations data (Statistics) window.



The Statistics window will display the calculation results. There are certain values that need to be checked against the requirements of the table in Exhibit 1040-25, in Section 1040 of the WSDOT Design Manual.

Illuminaince areas will have only a name (in **RED**), with "Illuminance (Fc)" on the line below the name. Three values need to be checked on these grids:

- Average: Must be greater than or equal to Minimum Average Maintained Horizontal Light Level as required by Exhibit 1040-25 and the applicable Pedestrian/Area Classification.
- Minimum: Must be greater than or equal to 0.2.
- Avg/Min: This is the uniformity ratio. This value must be less than or equal to 4 (as required by the Maximum Uniformity Ratio listed for all locations, except transit stops, in Exhibit 1040-25).
 AGi32 only gives the number to the left of the colon in the ratio. In this example, the "Intersection_Area" uniformity ratio is 3.20:1, which is below the limit of 4:1.

Statistical areas (titles are **BLUE**) present the same information as illuminance areas, and should have the same values checked.

Veiling luminance areas (when applicable) use the same name as the illuminance grid (if placed using the Calculation Area – Roadway tool), with a suffix of "_Veil_Lum" added to it. Veiling grids have one value that needs to be checked:

- MaxLvRatio: This is the Maximum Veiling Luminance Ratio. This value **must be less than or equal to 0.3** (as required by the Maximum Veiling Luminance Ratio listed in Exhibit 1040-25). As with the uniformity ratio, AGi32 only gives the number to the left of the colon in the ratio. In this example, the "Southbound_Veil_Lum" area has a Max Veiling Luminance Ratio of 0.33:1, which is above the limit of 0.3:1.

If any values exceed the allowable limits, luminaires must be revised or relocated until all values meet criteria.

Section 8 – Running Calculations WSDOT AGi32 Basics, June 2016

Highlighting High and Low Values

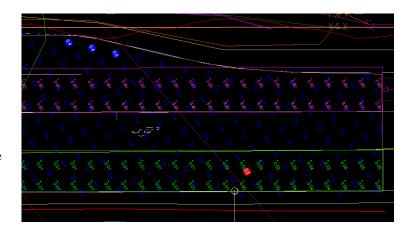
A helpful way to find areas that need improvement if the Uniformity Ratio (Avg/Min) is too high is to highlight low values in a grid. Typically, the Uniformity Ratio exceeds limits when the minimum value in a grid is too low. To highlight low values (and high values) in a grid, click on the Highlight Values tool in the Calculations section of the Model Toolkit.

Highlight Values	×
Threshold Incr. PPFD	Ok
Daylight Factor Intensity (Cd) Veiling Luminance Visibility Level	Cancel
GR/UGR Luminance	
Illuminance Exitance	Help
Includes: Illum, Mesopic, Surround-Illum, Vert-Illum, Semi-Illum, Hemi-Illum	
Apply Highlight Color To: C Foreground	
Background	
Values	
Color	
Minimum	
Uniformity Gradient	
Value Ranges	
- Range Color	
□ >= To<=	
□ >=To<=	
□ >=	
□ > = □ To < = □	
Clear Values	

After clicking "OK", the high and low values in a grid will be highlighted (see example at right). These locations can be used to determine where more light is needed to bring the minimum up in order to improve the Uniformity Ratio.

In the Highlight Values window, click on the Illuminance tab, then check the "Highlight Illuminance Values" box. Change the Apply Highlight Color To: to "Background", otherwise the color will cover up the numbers. Finally, check the boxes next to Maximum and Minimum – it is recommended to keep the default red for maximum and blue for minimum. Then click the "OK" button.

Model To	olkit		
	Luminaire		
	Rooms/Objects		
	Drawing/Schedules		
	Calculations		
Hutomat	ic Placement		
Add: 🖽 • 📈 强 👯 🛱 💸 • 🏷			
(1)			
Modify: 🚯	- # - E - # -		
Statistical Ar	ea: 🔽 🔀 • 😿 •		
LPD/UWLR A	Area: 🛃 🛞 🕶 🐋 🕶		
	👯 Highlight Values		



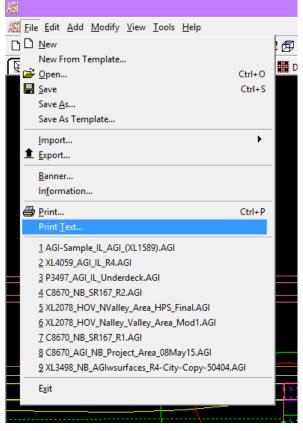
Section 9 – Printing Results

After developing a layout that meets the required criteria, the project should be printed for record keeping.

There are two parts to printing the project: printing the data, and printing the layout. Printing the layout from AGI32 is optional, as it can be done through CAD as well.

To print the data, select "Print Text" under the File menu.

This will bring up the Print Text menu.



Print	Text	×
Output To	Browse	In the Print Text window, set up to print the data as follows: - Uncheck the banner box (1) - Check the following boxes:
Title Page	Banner	 User/Job File Information (2) Luminaire Definitions (3) Calculation Summary (4) After matching the screen at right, click on the "Print Setup" button to select and set up your printer.
≺ Alignment:	Retrieve Save	Print Setup
Contents ✓ User/Job File Information 2 ✓ Luminaire Definitions: 3 ✓ Luminaire Locations	Summary Type □ Room Summary: □ Object Summary: □ Calculation Summary: ↓ ① Basic ○ Detailed □ Calculation Summary: ↓ ② Basic ○ Detailed	Where: PDF995PORT
Expanded Luminaire Locations Scene Summary Select	LPD/UW/LR Area Summary: Basic C Detailed	Size: Letter

It is highly recommended that you print to PDF, so that you can verify you have the necessary information, and can print the output only when a hard copy is needed. Most WSDOT computers have the PDF995 option as a printer, allowing for direct to PDF file printing. This software is available to all WSDOT employees – ask your IT Help Desk to install it if you do not have it.

After selecting your printer and paper size, click the "OK" button to return to the Print Text window. Click the "OK" button to print the report.

The options selected above will print out the following items:

User/Job File Information: Prints all of the data from the File Information window (see Section 3 – Importing a CAD File), as well as user data and timestamp information.

User and Job File Information

	User Information	
	W F Jackson	
	WSDOT	
HQ Traffic		
	310 Maple Park Ave SE	
	Olympia, WA 98501	
		360-705-7392
	Fax Number :	
		flint.jackson@wsdot.wa.gov
	Emaily addresses .	initianteen er neder in a ger
	Job File Information	
	Filename :	AGI-Sample IL AGI (XL1589).AGI
	Location :	C:\Desktop Clutter\00 Reference Materials_WSDOT Training Manuals\AGi32 Training\AGI File:
	Created By :	WFJackson
	Created Date :	3/4/2016 2:15:36 PM
	Created Version :	16.6.0
	Modified By :	W F Jackson
	Modified Date :	3/11/2016 1:10:26 PM
	Modified Version :	16.6.0
	Total Time (Hrs) :	28.95
	Description :	SR 507 at East Gate Rd
	Debonption .	off bor at East date fla

Luminaire Definition(s): This will print the luminaire data for luminaires used in the final layout. It will not print the data for every defined luminaire in the file. This helps to keep track of the luminaires used.

Luminaire Definition(s)

Information : Original - Basic Illumination for Intersection and Turn Pockets

Filename	GE451002	IES	
Lumens Per Lamp	28000		
Number of Lamps	1 28000		
Total Lamp Lumens Arrangement Lamp Lumens	28000		
Arrangement Luminaire Lumens	21371		
Luminaire Lumens	21371		
Luminaire Efficiency (%)	76		
Lamp Lumen Depreciation (LLD)	0.730		
Luminaire Dirt Depreciation (LDD)	0.850		
Total Light Loss Factor	0.621		
Luminaire Watts	314		
Arrangement Watts	314		
Arrangement	SINGLE		
Arm Length	13.5		
Offset	0		
Pole Mounted	-		
Road Classification		edium, Full	Cutoff (deprecated)
Upward Waste Light Ratio	0.00		
Luminaire Classification System (LCS)	Lumens		% Luminaire
LCS-FL	1958.2	7.0	9.2
LCS-FM	6419.6	22.9	30.0
LCS-FH	4519.6	16.1	21.1
LCS-FVH LCS-BL	1783.7		0.1 8.3
LCS-BM	4614.1		21.6
LCS-BH	2008.3	7.2	9.4
LCS-BVH	38.9	0.1	0.2
LCS-UL	0.0	0.0	0.0
LCS-UH	0.0	0.0	0.0
Total	21371.3	76.3	100.0
BUG Rating	B3-U0-G3		
Indoor Classification	Direct		
LER	68		

250 16-30 3-M-C

<u>Calculation Summary</u>: This prints the data presented in the Statistics window (see Section 8 – Running Calculations). Each area also includes the type of area (Polygon, Roadway, etc.), the point spacing, and additional basic grid information. This is the required calculation data for verification against Exhibit 1040-25 in Section 1040 of the WSDOT Design Manual.

Calculation Summary

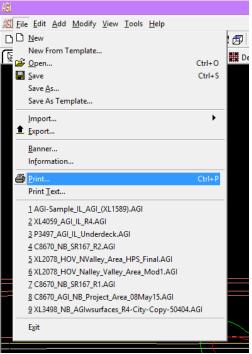
Intersection Area		
Project: Project_1 Polygon Coordinates in Feet		
Point Spacing L-R Point Spacing T-B Grid Orient Grid Tilt Meter Type	5 5 0 0 Horizontal	
Illuminance (Fc) Average Maximum Minimum Avg/Min	1.29 2.9 0.4 3.23	
Northbound Veil Lum		
Project: Project_1 Roadway Standard: IES RP- R2 (Diffuse And Specular), Q Coordinates in Feet		
Point Spacing L-R Point Spacing T-B Grid Orient Grid Tilt	5 6.017 58.606 0	
Veiling Luminance (Cd/SqM) Average Maximum Minimum Maximum Lv/Lavg Ratio	0.07 0.23 0.00	0.24

North Log

After printing the calculation data, the layout may either be printed in AGi32 or transferred to CAD for printing. Printing in CAD may be easier at times, as adding custom labels (text) is a little simpler, and it may be presented in a plan sheet layout.

To print the layout from AGi32, first zoom out so that the entire calculation area can be visible. Starting from Zoom Extents and then working inward is usually the simplest method.

After adjusting the view, select "Print" from the File menu. This will bring up the Print window.



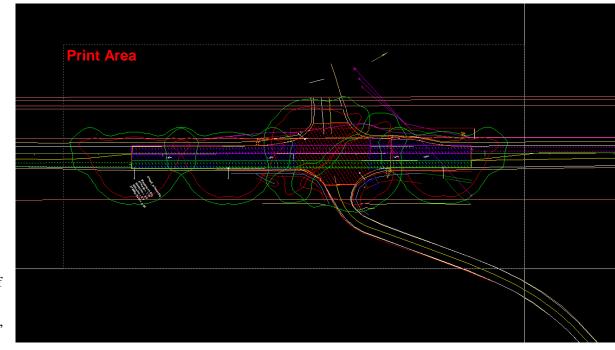
Print	×
Where PDF995 Paper Size Tabloid, 11 x 17 in. Actual Print Size 16,997 x 10,997 in. Orientation Landscape	Ok Cancel Help
Dutput To Ne00: 1 Color Color Black and White Print Setup What View Name View_1 View Type Display Extents Limits Window Specify Window 	Print Preview Number Of Pages That Will Be Printed: N.A.
Margins (inch) Top 0.002 ★ Bottom 0.002 ★ Bottom 0.002 ★ Scale Special Formatting C User Defined Scale Scale Special Formatting C User Defined Scale Scale Special Formatting C Donly applies if number of pages = 1. Deactivates Margins.	

In the Print window, make the following changes:

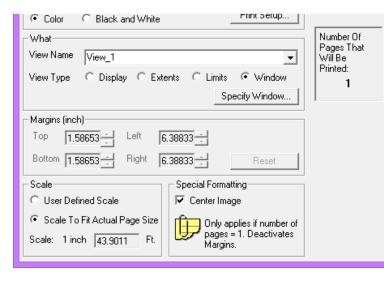
- Click on the "Print Setup..." button (1). This will bring up the same Print Setup window as before (for Print Text). Change the paper size to 11x17 to allow for a larger print. Change the layout to landscape if appropriate.
- Keep the output as Color (2). Print to PDF, then print a hard copy in color or grayscale as desired.
- Change the Scale to "Scale to Fit Actual Page Size" (3). This will scale the drawing limits to fit the paper automatically.
- Check the "Center Image" box (4) in the Special Formatting section. This will center the visible drawing elements on the paper.
- Click the "Window" radio button (5) in the What section. Then click the "Specify Window..." button.

Clicking on the "Specify Window" button will allow you to select the print area, similar to doing a fence plot in Microstation. The Print Window box will pop up first. Click the "Specify..." button to draw the print area manually.

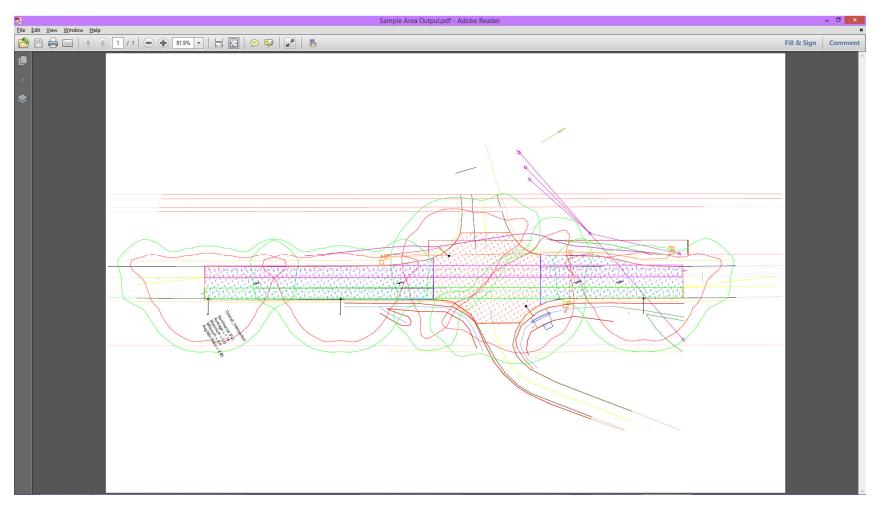
Print W	indow	×
Window Coordinates	z	(Ök)
First Corner: 0 100	0	Cancel
Other Corner: 0 100	0	Help
	Specify	



After clicking to set the second corner of the rectangle area, you will be returned to the Print window. The margins, scale, and number of pages will have updated.



The printout should look something like this:

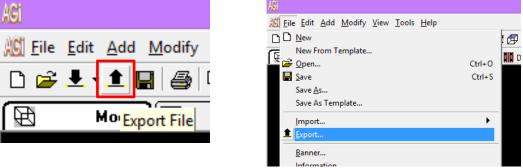


You may then print a hard copy if needed.

Printing from CAD is discussed in Section 10 – Exporting to CAD.

Section 10 – Exporting to CAD

To transfer the AGI32 layout back to CAD for plan sheet development, start by either clicking the Export File button or selecting "export" from the File menu.



In the Save As window that pops up, save your file as a "RealDWG 2007 DXF (*.DXF)" type file. DXF files seem to fare better than DWG files, and choosing an older format is less likely to have compatibility issues with Microstation.

AGI		Save As	S				×
🔄 🏵 🕆 🚺	« AGi32 Training > AGI Files > Sam	ple Files	~	¢ S	earch Sample File	5	Q
Organize 👻 Ne	w folder					•	0
Desktop Documents Downloads Music Pictures Videos CDrive (C:)	Name	*	Date r	modified ır search.	Туре		Size
	OLVMELOD (H Y K						>
File <u>n</u> ame:	AGI-Sample_IL_AGI_(XL1589).dxf						~
Save as <u>t</u> ype:	RealDWG 2007 DXF (*.DXF)						~
Hide Folders				[<u>S</u> ave	Cance	I:

Click on the "Save" button to bring up the CAD Export window.

CAD Export: AGI-Sample	e_IL_AGI_(XL1589).dxf
Export	_
Current Units Feet 💌	Reset Origin
Units Will Be Converted To Feet	× 0
	Y 0 +
Apply Scaling Factor 1	Z O
Export Types	
Luminaires 1 Calculations Draw	ving Entities <u>Rooms/Objects</u>
	Drawing 🔲 Rooms
	iext 🔽 Objects Schedules
Aiming Vectors LPD/UWLR Areas	chequies
Export Model Symbol	
C Export Render Symbol	Select All Clear All
 ▲ Filename ▲ Project Name ▲ Project Name ▲ Entity Type (Abbreviated ■ Entity Name ■ Date & Time Stamp 	
Miscellaneous	
Override All Fonts With The Standard CAD Font	Open Folder After Export
 Use AutoCAD (ACI) Colors Use True Color (RGB) 	
	Make Block Names Unique

In the CAD Export window, make the following changes:

- Select only the following in the Export Types section: Luminaires, Templates, and Calc Points (also include Statistical Areas, if used). The simplest way to do this is to click the "Clear All" button, and then check these three boxes. **Note**: Templates are included to aid in locating the luminaires in CAD, as the luminaire line work can be difficult to see.
- Select only the Project Name and Entity Type (Abbreviated) in the Export Layers section.

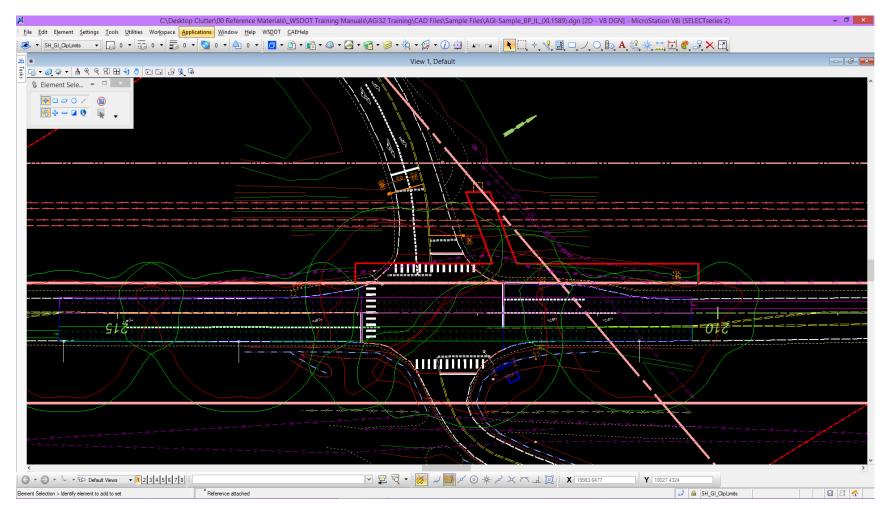
Do not change anything in the Export section (scaling, units, origin). Any changes here will result in the exported file not lining up with the original CAD file.

In the Miscellaneous section, you may uncheck the "Open Folder After Export" box.

After making these changes, click the "OK" button to save the file. Clicking "Cancel" will result in the file not being saved.

After saving the file, open Microstation. Open the base file where you will place the luminaires for your plans.

Attach the DXF as a reference, using Coincident World. If the "DWG/DXF Units" window pops up, ensure that the Units dropdown says "US Survey Feet", then click the "OK" button. Once attached, your CAD file should look something like this:



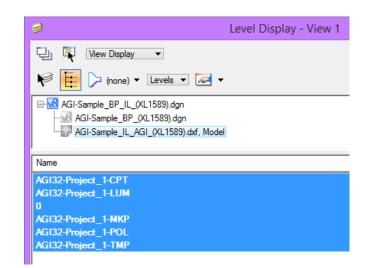
The level list for the imported DXF file is shown at right.

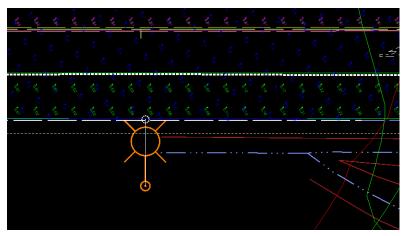
The luminaires are divided into three parts:

- LUM: the actual luminaire (light fixture).
- POL: the pole and mast arm.
- TMP: the luminaire template.

The calculation points are divided into two parts:

- CPT: the perimeter of the calculation area.
- MKP: the point data for the calculation area.



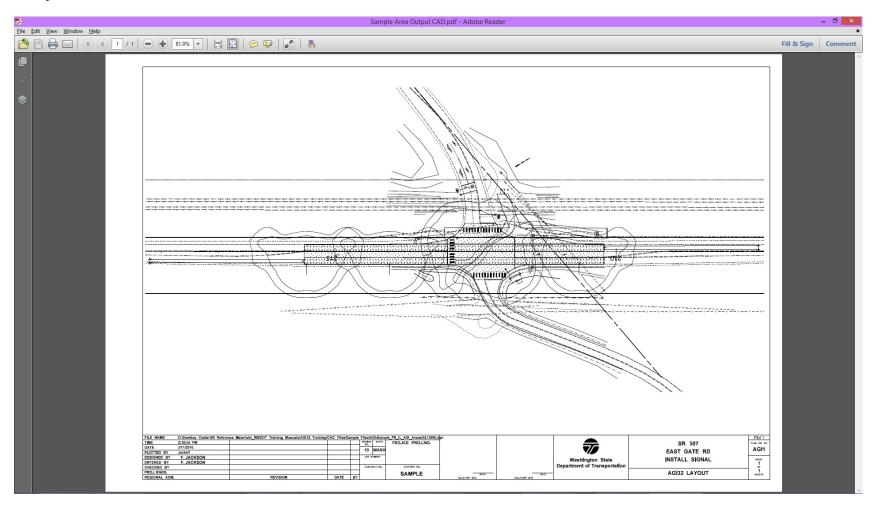


Place light standard cells based on the pole locations provided by the DXF file.

After placing the light standards, the DXF file can either be turned off or detached. If updates are required, AGi32 files can be exported using the same DXF filename, which can then be updated in CAD simply by refreshing the reference files.

Printing the AGi32 Layout from CAD (Optional)

The AGi32 layout can be printed from CAD using a standard fence plot, or by setting up a sheet file (or files) complete with title block (see example below).



Appendix A - Defining Custom Luminaires (Adding WSDOT Approved LED Luminaires)

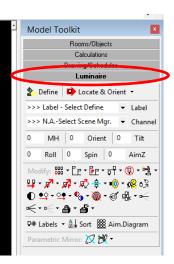
This section describes how to add luminaires other than the WSDOT standard luminaires described in Section 5. This example adds the current WSDOT approved LED luminaires to the luminaire definitions.

In the Model Toolkit window, select the "Luminaire" tab and click on the "Define" button.

2 Define

This will bring up the Define Luminaire window:

Define Luminaire	
Load Photometric File(s): 😰 Instabase 🔹 💱 Downloaded 🍃 Collection 😂 Select 👪 Find 🐔 Internet 🗸 Smart Symbols 🗸 Auto Define	
Defined Luminaires - Drag-and-drop here! Use Alt+Arrows keys to reorder list Labe! Tag Description Locations	Close
	Help
	Relabel
	Delete
	dd/Redefine
General	
● Dynamic: Attach to ∠= 0	
Description Defaults C Static: Length =	
Lumens Per Lamp Number Of Lamps Single Circle UP DOWN Render Mode	
Luminaire Lumens Efficiency (%)	
Luminaire Watts S/P Ratio 1 Luminous	
Total LLF 1.000 Specify	
X Y Z Arn Length CIRCLE UP_DOWN Model Mode	
Luminous Box. LLHC Line Wridth/Color	
Photometric File Description Classification LCS	
More	



Two different methods will be addressed here – adding files from the Instabase, and adding files stored locally (on a hard drive or network drive).

A.1 Adding files from the Instabase

To search through the Instabase, click on the "Instabase" button:

Load Photometric File(🕵 💬 Instabase) 💱 Downloaded 🏼 🗿 Collection 🖆 Select 🏚

This will bring up the "Instabase In The Cloud" window:

	Instabase In The Cloud	
w/Search Favorites Recent Downloa	ds User Profile - Sign In	
ected - None		Instabase diction Ann
 Select Manufacture 		Instabase Ughting And
Instabases:	Y	
X 🧇 🍺 🖥		
arch Parameters 🕐	Selected File Count: 0 📱 Download to AGi32 📳 Save to Zip \ominus Add to Favorites 🕤 Unselect All	
arree & Photometrics amp/Source Type:	Photometric File Count: 0 (of 0)	w: ☑ Images ☑ File Counts 🗌 Selected (0) View: ④ Tree ○ List ○ Comp
umber Of Lamps:	No data to paginate @ < 2 >>>	Page size: 1000
'attage: ≥ and ≤ uninaire Lumens: ≥ and ≤		
imens/Lamp: ≥ and ≤	Name	△ Image Details
<i>blor Temp</i> (<i>K</i>): ≥ and ≤ <i>U</i> : ≥ and ≤	No data to paginate @ < 2 >>>	Page size: 1000 -
RI: ≥ and ≤ ER: ≥		
WLR:		
ficiency: ≥	3 5	
assification S Class:		
itoff Type: E Type:		
E Type: MA Beam: H V		
EMA Beam: JG Rading. ● ≤ ○ _ B V V C		
plication, Mounting, & Classification Types		
oplication Type(s): Any All clear		
ounting Type(s): Any All		
lassification Type(s): Any All		
xt Search (file name, path, contents)		
[
eyword:		
ser Keyword:		
Searches:		
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Favorites: DEFAULT		
X 🕫 🔌	X	>
	Selected File Count: 0 Unselect All	
	(riner ave) (riner ave)	
: 2016.03.03.1255		de Help Overview video User Profile video Tell us about your exper

The Instabase may initially be blank, with no manufacturers selected. Manufacturers' product lists may have to be added in order to search through them.

In the Instabase window, click on "Select Manufacturers" in the upper left corner:

View/Search	Favorites	Recent Downloads	User Profile - Sign In	
Selected - None				
	()	Select Manufacturers		
My Instabases	-	Select Manufacturers		
My Instabases 🔚 🗶 🐢 👂	:	Select Manufacturers	5	
My Instabases 🔲 X 🧇 🔌 Search Parame		Select Manufacturers	1	Download to AGi32

This will bring up the Instabase Selection window:

-	📃 👝 Instabase 🖻			>
Đ			Show Selected	Show Advanced
	Name	Search Keywords	Last Update	
Ð.	Abtech			
	Abtech (24)	***	10 Apr 2015 09:55	
÷-	Acuity Brands			
	AccuLamp (30)		18 Nov 2015 09:06	
	American Electric Lighting (2180)	***	01 May 2015 15:29	
	Antique Street Lamps (554)		01 May 2015 15:43	
	Gotham Architectural Lighting (3790)	***	01 May 2015 18:23	
	- Holophane (6205)		01 May 2015 15:55	
	- Hydrel (740)	***	01 May 2015 16:14	
	Lithonia Lighting (15149)		01 May 2015 19:18	
	Mark Architectural Lighting (292)	***	01 May 2015 16:16	
	Peerless Lighting (768)		01 May 2015 16:19	
	Tersen Lighting (7)	***	01 May 2015 16:19	
	Winona Lighting (2606)		01 May 2015 16:24	
-	Appleton Electric LLC			
	Appleton Electric LLC_November 13 (548)		30 Sep 2015 10:12	
	ATX-Appleton Group (151)	***	30 Sep 2015 10:10	
-	Chalmit Lighting			
	Chalmit - 16-9-14 (829)	***	17 Sep 2014 08:02	
	Victor - 16-9-14 (563)		16 Sep 2014 07:58	
-	Con-Tech Lighting			
	Con-Tech Lighting (751)		30 Sep 2015 10:14	
<				>

Appendix A – Defining Custom Luminaires WSDOT AGi32 Basics, June 2016 To simplify selection, it is recommended to roll up all of the trees by clicking on the "-" button to the left of "Unselect All".

With the trees rolled up, click on the "+" to the left of the manufacturer(s) to be added. To add WSDOT Approved LED Luminaires, expand the following manufacturers and select the following product lines:

- Acuity Brands
 - o American Electric Lighting
- Eaton

-

- EATON STREETWORKS _ FORMER COOPER LIGHTING
- Leotek Electronics USA Corp
 - o Leotek Electronics
- Philips Lumec
 - o Philips Lumec

Acuity Brands – American Electric Lighting:

Olympic Office All	Show Sta	rred Show Selected Show Advan
Name	Search Keywords	Last Update
Abtech		
Ə- Acuity Brands		
AccuLamp (30)	***	16 Mar 2016 11:34 (recent)
American Electric Lighting (2180)	***	16 Mar 2016 11:44 (recent)
Antique Street Lamps (554)	***	01 May 2015 15:43
Gotham Architectural Lighting (3790)		01 May 2015 18:23
Holophane (6205)	***	01 May 2015 15:55
Hydrel (740)		01 May 2015 16:14
Lithonia Lighting (15149)	***	01 May 2015 19:18
Mark Architectural Lighting (292)		01 May 2015 16:16
Peerless Lighting (768)	***	01 May 2015 16:19
Tersen Lighting (7)		01 May 2015 16:19
Winona Lighting (2606)	***	01 May 2015 16:24
■ Appleton Electric LLC		
Chalmit Lighting		
- Con-Tech Lighting		
- Concealite		
E Cyclone Lighting		
Darkon		
⊕– Delta Light USA		
DW Windsor Lighting		
- Eagle Lighting Australia		
<		3

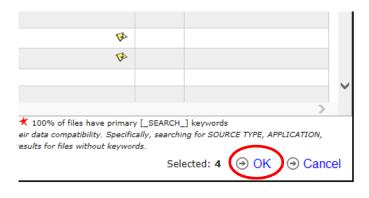
Eaton – Streetworks (former Cooper Lighting):

)	Show Sta	rred Show Selected Show Adva	nced
Eagle cognuing Australia			
	In In In		
EATON - ALL-PRO _ FORMER COOPER LIGHTING (75)	***	13 Nov 2015 11:06	
EATON - AMETRIX _ FORMER COOPER LIGHTING (1899)	***	07 Oct 2015 15:14	
EATON - CORELITE _ FORMER COOPER LIGHTING (2114)	***	12 Feb 2016 07:36	
EATON - FAIL-SAFE _ FORMER COOPER LIGHTING (1278)	****	11 Mar 2016 08:46	
EATON - HALO _ FORMER COOPER LIGHTING (2664)	***	11 Apr 2016 16:01 (recent)	
EATON - HALO COMMERCIAL _ FORMER COOPER LIGHTING (2850)	****	26 Aug 2015 11:38	
EATON - INVUE FORMER COOPER LIGHTING (7871)	****	05 Apr 2016 10:53 (recent)	
EATON - IO _ FORMER COOPER LIGHTING (92)	****	07 Oct 2015 15:16	
EATON - IRIS _ FORMER COOPER LIGHTING (8216)	***	26 Aug 2015 12:22	
EATON - LUMARK _ FORMER COOPER LIGHTING (4752)	***	31 Mar 2016 10:19 (recent)	
EATON - LUMIERE _ FORMER COOPER LIGHTING (3753)	***	05 Apr 2016 07:30 (recent)	
EATON - McGRAW-EDISON _ FORMER COOPER LIGHTING (10075)	***	05 Feb 2016 09:51	
EATON - METALUX FORMER COOPER LIGHTING (4269)	***	31 Mar 2016 08:11 (recent)	
EATON - NEO-RAY _ FORMER COOPER LIGHTING (708)	****	12 Apr 2016 10:39 (recent)	
EATON - PORTFOLIO _ FORMER COOPER LIGHTING (18996)	***	25 Feb 2016 12:11	
EATON - RSA _ FORMER COOPER LIGHTING (182)	***	26 Aug 2015 14:10	
EATON - SHAPER _ FORMER COOPER LIGHTING (923)	***	30 Nov 2015 12:36	
EATON - STREETWORKS _ FORMER COOPER LIGHTING (14728)	***	09 Feb 2016 11:46	
EATON - SURE-LITES _ FORMER COOPER LIGHTING (145)	***	14 Mar 2016 16:02 (recent)	
EATON Crouse-Hinds (710)	***	17 Mar 2016 13:18 (recent)	
EATON CROUSE-HINDS CEAG (184)		11 Feb 2016 09:54	
EATON CROUSE-HINDS Pauluhn (397)	***	01 Oct 2015 09:43	
ECO Lighting Solutions			
C C C C C C C C C C C C C C C C C C C			>

Leotek Electronics and Philips Lumec:

	🔜 👝 Instabas	e in the cloud!		Burlindon ergneeng stream
•	O Unselect All Jesco Lighting Group	4	Show Sta	rred Show Selected Show Adva
	Klik Systems Australia	v-		
	KOPA GLOBAL			
6	Leotek Electronics USA Corp			
T	Leotek Electronics (413)		***	08 Apr 2016 17:09 (recent)
	Lighting Solutions Group LLC			
	LIGMAN			
	LSI Industries	V		
	Lucifer Lighting Company	₩.		
	LUX Dynamics			
	MACS Lighting			
	Metalumen			
	MONO:LED			
	Neri S.p.A	1		
	Philips			
6	Philips Lumec			
	Philips Lumec (3502)		***	06 Apr 2016 14:16 (recent)
•	Pinnacle Architectural Lighting			
•	Precision - Paragon			
•	RAB Lighting			
•	SIMES S.p.A	F		
	Solas Ray Lighting			
•	Sternberg Lighting			
<				

After selecting these manufacturers' product lines, click the "OK" link in the bottom right corner to add them to your local Instabase.



The Instabase window will update and now show the additional manufacturers:

				Instabase In The Clo	ud					_ 6
ew/Search Fav	orites Recent Dow	vnloads User Profile - Sign In								
lected (5) - Acuity Bran	is (American Electric Ligh	ting), Eaton (EATON - STREETWORKS _ FOF	RMER COOPER LIGHTING $\star\star\star$), GE Lighting (GE Lighting Solution	ons★★★), Leotek Electronics	USA Corp (Leotek Electronics),	, Philips Lumec (Philips Lume	ec★★★)	Ins	tabas	e de la compañía de la
	Select Manuf	facturers						1		cloud!
Instabases:		\checkmark							1.00	44
X 🦘 🔌 🖉	-									
rch Parameters	0	Selected File Count: 15	Download to AGi32 Save to Zip	Add to Favorites	Unselect All					
urce & Photometrics mp/Source Type:		Photometric File	Count: 32735 (of 32736)				Show: 🗹 Images	File Counts Selected (15)	view: • T	ree O List O Comp
umber Of Lamps:		Page 1 of 1 << [1] >								Page size: 1000 🗸
attage:	≥ and ≤									Page size: 1000
uminaire Lumens:	≥ and ≤								Image	Details
mens/Lamp: lor Temp (K):	≥ and ≤	Name								
	≥ and ≤	American Electric Lightin	ng (2180 of 2180)							16 Mar 2016 11:44
	≥ and ≤	EATON - STREETWORK	S _ FORMER COOPER LIGHTING (14728 of 14728)							09 Feb 2016 11:46
u:										18 Aug 2015 16:08
11: R:	≥	GE Lighting Solutions (1	(1913 of 11913)							
RI: ER: WLR:	≥ ≤[GE Lighting Solutions (1 GE Lighting Solutions (1 GE Lighting Solutions (1								
RI: iR: VLR: ficiency:	2		of 413)							08 Apr 2016 17:09
RI: ER: WLR: fficiency: oprox. Shape & Size	≥ ≤ ≥ Width Length ⊙ in (% ■ Leotek Electronics (412	of 413) 3502)							08 Apr 2016 17:09 06 Apr 2016 14:16 Page size: 1000 ~

To get to the appropriate luminaires, you will have to expand the appropriate trees. Every manufacturer uses a different tree structure, so some files will be nested deeper than others. The following example will demonstrate how to add the 200W HPS equivalent LED luminaire from American Electric Lighting (AEL).

Start by clicking on the "+" next to American Electric Lighting to get the product group list.

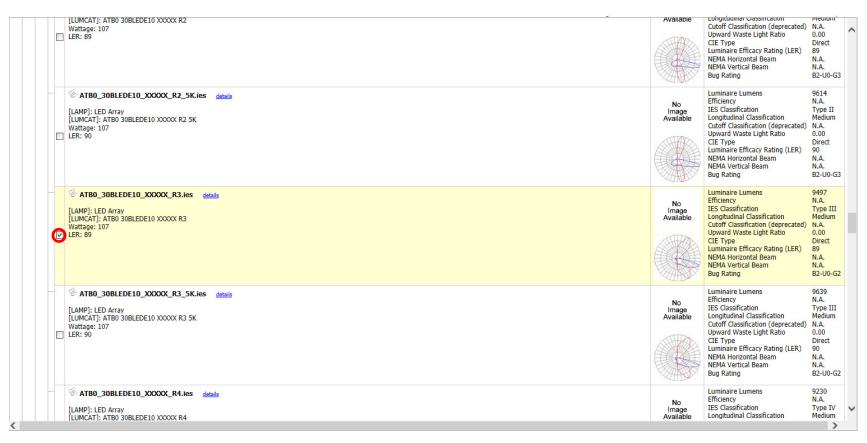
	Name	
m	erican Electric Lighting (2180 of 2180)	
Н	American Electric Lighting (44)	
μ	✓ X Area and Site Lighting (111)	
H	Zecorative Post Top (1417)	
Н	✓ X Flood Lighting (148)	
H	Koadway Lighting Luminaires (430)	
H	✓ X Security Lighting (30)	
AT	ON - STREETWORKS _ FORMER COOPER LIGHTING (14728 of 14728)	
E١	Lighting Solutions (11913 of 11913)	
eot	tek Electronics (412 of 413)	

Next, click on the "+" next to "Roadway Lighting Luminaires" to get the roadway luminaire models:

me	rican Electric Lighting (2180 of 2180)
-	American Electric Lighting (44)
-	X Area and Site Lighting (111)
ŀ	Decorative Post Top (1417)
	Flood Lighting (148)
	🗸 🗶 Roadway Lighting Luminaires (430)
1	🚽 🗸 🗶 Autobahn ATB0 (63)
I	∋– 🗸 🗶 Autobahn ATB2 (94)
I	∋– ✓ X Autobahn ATBM (32)
I	₽- ✓ X Autobahn ATBS (73)
I	⊕- ✓ × InterState II-775 (4)
I	
I	
I	B− ✓ X Roadway-115 Cutoff (15)
I	
I	B− ✓ X Roadway-125 Cutoff (23)
1	B− ✓ X Roadway-125 Induction (3)
I	⊕ ✓ × Roadway-20 (9)
I	⊕- → × Roadway-30 (14)
I	⊕- → X Roadway-315 (12)
1	B- 🛷 🗡 Roadway-315 Cutoff (7)
I	🖶 🛷 🗶 Roadway-325 (5)
I	₽- ✓ X Roadway-325 Cutoff (14)
I	∋– ✓ X Roadway-327 (2)
I	🛛 🗸 🗶 Roadway-Area-SRX (1)
I	₽ - ✓ X Roadway-CVL (6)
I	₽ → X Roadway-CVM (10)
I	₽- ✓ X Signlite 875 (2)
_	B− ✓ X UnderPass 581 (3)

Then click on the "+" next to the "Autobahn ATB0" line:

	Nam	е								
0	Americar	lect	ric Lighting (2180 of 2180)							
	e- 🗸)	Ame	erican Electric Lighting (44)							
	e- 🗸)	Area	a and Site Lighting (111)							
	±/)	Dec	orative Post Top (1417)							
	e- 🧹)	× Flood Lighting (148)								
	e/)	dway Lighting Luminaires (430)								
	Θ	√ X	Autobahn ATBO (63)							
			ATB0_20BLEDE10_XXXXX_R2.ies details [LAMP]: LED Array [LUMCAT]: ATB0 20BLEDE10 XXXXXX R2 Wattage: 73 LER: 88							
			ATB0_20BLEDE10_XXXXX_R2_5K.ies datails [LAMP]: LED Array [LUMCAT]: ATB0 20BLEDE10 XXXXX R2 5K Wattage: 73 LER: 89							
			ATB0_20BLEDE10_XXXXX_R3.ies details [LAMP]: LED Array [LUMCAT]: ATB0 20BLEDE10 XXXXX R3 Wattage: 73 LER: 86							



Scroll down until you find "ATB0_30BLEDE10_XXXXX_R3.ies". Check the box next to it to select it.

The following are the tree locations for the following IES files. The Autobahn ATB0 luminaire shown in the example on the previous pages is included as an aid to following the Instabase tree structure.

+American Electric Lighting	+EATON – STREETWORKS _ FORMER COOPER LIGHTING			
	—			
+Roadway Lighting Luminaires	+ROADWAY			
+Autobahn ATB0	+NVN NAVION			
(200W) ATB0_30BLEDE10_XXXXX_R3.ies	+4000K CCT – STANDARD			
+Autobahn ATB2	+1000mA – STANDARD			
(250W) ATB2_40BLEDE10_XXXXX_R3.ies	(200W) NVN-AE-02-E-U-T3R.ies ⁽¹⁾			
(310W) ATB2_60BLEDE10_XXXXX_R3.ies	(250W) NVN-AE-03-E-U-T3R.ies ⁽¹⁾			
(400W) ATB2_80BLEDE85_XXXXX_R3.ies	(310W) NVN-AE-04-E-U-T3R.ies ⁽¹⁾			
	(400W) NVN-AE-06-E-U-T3R.ies ⁽¹⁾			
	Note (1): This should be changing to NVN-AF in the near future			
+Leotek Electronics	+Philips Lumec			
+GC1 NW Type 2 3	+Roadfocus			
+GC1-60F	+RFL			
+Type 3	+R3M			
(200W) IES GC1-60F-MV-NW-3-XX-700 030315.IES	(200W) RFL-145W64LED4K-T-R3M (S1410222m).ies			
+GC1-80F	(250W) RFL-180W80LED4K-T-R3M (S1410222m).ies			
+Type 2	(310W) RFL-215W96LED4K-T-R3M (S1410222m).ies			
(250W) IES GC1-80F-MV-NW-2-XX-700 S 060215.IES	(400W) RFL-241W112LED4K-T-R3M (S1410222).ies			
+GC2 NW Type 2 3				
+GC2-120F				
+Type 3				
(310W) IES GC2-120F-MV-NW-3-XX-700 020415.IES				
LIDE Equivalante chourn in normatheorie Eq. (250W)	These files are surrent as of June 6 2016*			

HPS Equivalents shown in parenthesis - Ex: (250W).

These files are current as of June 6, 2016*.

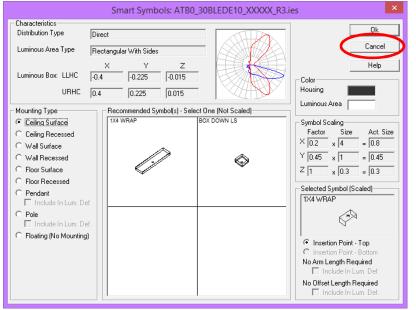
As an alternative, these filenames can be entered into the Text Search box in the lower left corner of the window (see page 5-4 of Section 5 for more information on using Search).

*Note: Contact WSDOT HQ Traffic to verify current IES files for LED luminaires.

After selecting these files, check that the "Selected File Count:" shows 15, then click on "Download to AGi32" (15 assumes that all of the files in the table on page A-9 are being added).



The luminaires will then be added to the luminaire definitions list. If the Smart Symbols window appears, click on the "Cancel" button (it will appear for every luminaire added if it appears at all).



Luminaires will be added to bottom of the list in the Define Luminaire window in the order that they appear in the Instabase:

Load Photometric File(s): 🗊 Instabase 🔹 💱 Do	ownloaded 🍃 Collection 🗃 Select 🏄 Find 🐔 Internet	🗸 Smart Symbols 🖌
Defined Luminaires - Drag	-and-drop here! Use Alt+Arr	ows keys to reorder list	
Label	Tag	Description	Location
🖌 🔲 400 D8-40 3-M-C		GE 400W HPS Double 8ft Arm 40ft III-Medium-Cutoff	0
ATB0_30BLEDE	10_XXXXX	ATB0 30BLEDE10 XXXXX R3	0
ATB2_40BLEDE	10_XXXX	ATB2 40BLEDE10 XXXXX R3	0
ATB2_60BLEDE	10_XXXXX	ATB2 60BLEDE10 XXXXX R3	0
ATB2_80BLEDE	85_XXXX	ATB2 80BLEDE85 XXXXX R3	0
NVN-AE-02-E-U-	T3R	NVN-AE-02-E-U-T3R	0
NVNLAE.03.E.U.	TRR	NI/NLAE.03.E.IL.T3R	0

A.2 Adding a locally stored file (located on a computer drive or network drive)

To add a local file, click on the "Select" button: Load Photometric File(s): 💬 Instabase 🗸 🎲 Downloaded 🍃 Collection 😂 Select 🎒 Find 🐔 Internet

The Select Photometric File(s) window will appear:

ok in: 🕎 This PC	-	• 🗈 💣 🎞 🗸			L
Name	Туре	Total Size	Free Space		
Folders (6)			•		
📜 Desktop	System Folder				
Documents	System Folder				
Downloads	System Folder				
Music	System Folder				
E Pictures	System Folder				
🛃 Videos	System Folder				
Devices and drives (1)			^		
CDrive (C:)	Local Disk	237 GB	29.6 GB		
Network locations (4) -			•		
TRAFFIC (\\OROL	Network Drive	299 GB	26.6 GB		
Jacksfl\$ (\\OROLY	Network Drive	299 GB	26.6 GB		
Public (\\OROLY	Network Drive	151 GB	37.7 GB		
Corporate (\\wsd	Network Drive	92.7 GB	69.1 GB	<	
name:					

In the dropdown menu at the top left of the window ("Look in:"), select "This PC" (under Windows 8) or a similar location which shows all of your local and network drives.

In the window below, navigate to where your local IES file is stored.

After locating the IES file to load, select it - multiple files may be selected by holding down the "Ctrl" key and clicking on additional files. After selecting the file(s) to load, click the "OK" button. This example uses WSDOT approved high mast LED luminaires.

		Selec	ct Photometric	File(s)
Look in: 📙 LED IES Files 💌	← 🗈 💣 📰 -			
Name ^	Date modified	Туре	Size	Cancel
ATB0_30BLEDE10_XXXXX_R3.ies	2/24/2016 1:19 PM	Bentley Lighting	9 KB	Help
ATB2_40BLEDE10_XXXXX_R3.ies	2/24/2016 1:19 PM	Bentley Lighting	25 KB	
ATB2_60BLEDE10_XXXXX_R3.ies	2/24/2016 1:19 PM	Bentley Lighting	25 KB	
ATB2_80BLEDE85_XXXXX_R3.ies	2/24/2016 1:19 PM	Bentley Lighting	25 KB	
B GC1-60F-MV-NW-3-XX-700 Ili-15049-2.ies	2/24/2016 1:19 PM	Bentley Lighting	76 KB	
3 GC1-80F-MV-NW-2-GY-700 S.IES	2/24/2016 1:19 PM	Bentley Lighting	64 KB	
3 GC2-120F-MV-NW-3-XX-700 Ili-15028-3.i	2/24/2016 1:19 PM	Bentley Lighting	76 KB	
3 HMLED2_09_4K_XX_X_AW.ies	4/15/2016 4:05 PM	Bentley Lighting	2 KB	
HMLED2_12_4K_XX_X_M.ies	4/15/2016 3:57 PM	Bentley Lighting	14 KB	
NVN-AE-02-E-U-T3R.IES	2/24/2016 1:19 PM	Bentley Lighting	7 KB	
NVN-AE-03-E-U-T3R.IES	2/24/2016 1:19 PM	Bentley Lighting	7 KB	
NVN-AE-04-E-U-T3R.IES	2/24/2016 1:19 PM	Bentley Lighting	7 KB	
NVN-AE-06-E-U-T3R.IES	2/24/2016 1:19 PM	Bentley Lighting	7 KB	
RFL-180W80LED4K-T-R3M (S1410222m).ies	2/24/2016 1:19 PM	Bentley Lighting	28 KB	
RFL-215W96LED4K-T-R2M (S1410224m).ies	2/24/2016 1:19 PM	Bentley Lighting	28 KB	
RFL-241W112LED4K-T-R3M (S1410222).ies	2/24/2016 1:19 PM	Bentley Lighting	39 KB	
			>	
name: ["HMLED2_12_4K_XX_X_M.ies" "HMLE	D2_09_4K_XX_X_AW.i	es"		
s of type: All Types (*.ies;*.cib;*.tml;*.cls;*.cc;*.exl;*	.ldt)		-	

If the Smart Symbols window pops up, click the "Cancel" button (it will appear for every luminaire selected). As with Section A.1 above, luminaires will be added to bottom of the list in the Define Luminaire window in the order that they appear in the Instabase.

Appendix A – Defining Custom Luminaires

WSDOT AGi32 Basics, June 2016

A.3 Updating and Labeling LED Luminaires

For all LED luminaires, the Total Light Loss Factor (LLF) must be revised as shown here.

- Definition			
Lumens Per Lamp	N.A.	Number Of Lamps	1
Luminaire Lumens	9497	Efficiency (%)	N.A
Luminaire Watts	107	S/P Ratio	1
Total LLF	1.000	Specify	

LLD: 0.850

LDD: 0.900

Verify that the Total Light Loss Factor (LLF) at the bottom of the window is 0.765, then click the "OK" button.

Verify that the Total LLF has updated in the luminaire definition:

- Definition			
Lumens Per Lamp	N.A.	Number Of Lamps	1
Luminaire Lumens	9497	Efficiency (%)	N.A
Luminaire Watts	107	S/P Ratio	1
Total LLF	0.765	(Specity)	

The LLF for LED luminaires is different from that for HPS luminaires. After clicking on the "Specify..." button to bring up the Light Loss Factor Specification window, enter the following values for LLD and LDD:

Light Loss Facto	or Speci	ification	×
Specify Light Loss Factor Description Lamp Lumen Depreciation Luminaire Dirt Depreciation Ballast Factor	Abbv. LLD LDD BF	Factor 0.850 0.900	OK Cancel Help
Earlast Factor Luminaire Ambient Temperature Factor Room Surface Dirt Depreciation Luminaire Surface Depreciation Lamp Burnout Factor	LATF RSDD LSD LBO		
Voltage-To-Luminaire Factor Ballast-Lamp Photometric Factor Heat Extraction Thermal Factor Equipment Operating Factor User Defined Factor	VTLF BLPF HETF EOF UDF		
Total Light Loss Factor	LLF	0.765	

The following changes vary with each luminaire wattage and mounting arrangement:

The following example is for a 200W HPS equivalent LED fixture installed at a 30 ft mounting height (H1) with a 12 foot arm:

	Define Luminaire ×
Load Photometric File(s): 🖾 Instabase 🝷 🍄 Downloaded 🍃 Collectio	on 🗃 Select 👫 Find 🐔 Internet 🖌 Smart Symbols 🖌 Auto Define
Defined Luminaires - Drag-and-drop here! Use Alt+Arrows keys to reorder list	Close
	BLEDE10XXXX R3 0 Help
Matb2_608LEDE10_XXXX ATB2_608	BLEDE10XXXX R3 0 Relabel
NVN-AE-02-E-U-T3R NVN-AE-0	BLEDE85 XXXX R3 0 02-E-U-T3R 0 Delete
	03-E-U-T3R 0 nA.E-ULT3R n Add/Redefine
General Label 200A, 12-30, 3-M-C F ▼ Tag	Pole or □ Pendant Mounted O Dynamic: Attach to Z= NOTE:
Description AEL AB 200W LED 12ft Arm 30ft III-Medium-Cutoff	G Defaults F Static: Length = 30 A Current luminaire definition has been altered. Select
Definition Lumens Per Lamp N.A. D Number Of Lamps 1 Luminaire Lumens 9497 Efficiency (%) N A	Arrangement Symbols Add/Redefine to save modifications.
Luminaire Lumens 9497 Efficiency (%) N.A Luminaire Watts 107 E S/P Ratio 1	B Housing Luminous
Total LLF 0.765 Specify	Arm Length 13.5 CIRCLE UP_DOWN Model Mode
Luminous Box: LLHC -0.4 -0.225 -0.015	C (+) Line Width/Color
URHC 0.4 0.225 0.015	
Description Classification LCS	○ Candela ○ LCS
Filename: C:\ProgramData\AGI32\PhotometricData_DownloadedFromCloi [TESTIAB] SCALED PHOTOMETRY [ISSUEDATE] 8/16/2014 [MANUFAC] American Electric Lighting [LUMINAIRE] ATB0 SBRIES 107W LED 1050MA TYPE 3 4000K CCT [LAMPCAT] LED [LAMP] LED Array [BALLAST] LED Driver H IESNA:LM-63-2002	
< >	More

Appendix A – Defining Custom Luminaires WSDOT AGi32 Basics, June 2016

A - Pole Length: Click the check box next to "Pole" and the radio button next to "Static: Length =", then enter the H1 height (in this case, 30 for a 30 ft mounting height).

B – **Arm Arrangement**: The default is a single arm. To change to a double arm, click on the graphic to bring up the Luminaire Arrangements window. For a double arm pole, select the "BACK-BACK" arrangement.

C - Arm Length: Enter the arm length plus an additional 1.5 feet. In this example, a 12 foot arm is entered as 13.5 feet. This is because AGi32 defines the insertion point by the center of the luminaire glass.

D – **Lumens Per Lamp**: For LED luminaires, do not change the default value.

E – **Luminaire Watts**: For LED luminaires, do not change the default value.

 \mathbf{F} – **Label**: Enter the shorthand "label" for each luminaire type. The shorthand labels for LED luminaires are slightly different from those for HPS luminaires. An additional marker is added to signify the manufacturer:

- A: Acuity (American Electric Lighting / AEL)
- E: Eaton (Cooper)
- L: Leotek
- P: Philips (Lumec)

For a 200W HPS equivalent LED luminaire from AEL, mounted at 30 ft with a 12 ft mast arm, the label should read "200A 12-30 3-M-C". For other luminaire variations, see the table on the next page:

	Luminaire Arrangements ×						
10 @ 36 DEGRE	ES 12 @ 30 DEGREES	2 @ 90 DEGREES	3 @ 120 DEGREES	Ok			
		\checkmark		Cancel Help			
3 @ 60 DEGREE	S 3 @ 90 DEGREES	4 @ 90 DEGREES	4 @ TWIN 60 DEGREES	Custom			
\$\$\$			×	Selected Arrangement BACK-BACK			
6 @ 60 DEGREE	S 8 @ 45 DEGREES	BACK-BACK	SINGLE				
₽		4 + Þ	*->				
TWIN BACK-BAC	K TWIN			-			
⊲ • β + ⊲ • β							

Example Labels for LED Luminaires

Wattage (HPS Equivalent)	Manufacturer	Arm Length (ft)	Mounting Ht (ft)	Distribution	Label
200	Acuity (AEL)	16	20	Type III – Medium - Cutoff	200A 16-20 3-M-C
200	Acuity (AEL)	8 (Double Arm)	20	Type III – Medium - Cutoff	200A D8-20 3-M-C
250	Eaton (Cooper)	16	30	Type III – Medium - Cutoff	250E 16-30 3-M-C
310	Eaton (Cooper)	12 (Double Arm)	40	Type III – Medium - Cutoff	310E D12-40 3-М-С
250	Leotek	12	30	Type III – Medium - Cutoff	250L 12-30 3-M-C
310	Leotek	16	40	Type III – Medium - Cutoff	310L 16-40 3-M-C
400	Philips (Lumec)	12 (Double Arm)	40	Type III – Medium - Cutoff	400P D12-40 3-M-C
400	Philips (Lumec)	16	50	Type III – Medium - Cutoff	400P 16-50 3-M-C

Labels are constructed as follows: AAAB CCC-DD E-F-G, where

- AAA is the luminaire wattage (200, 250, 310, 400, etc.)
- B is an indicator for the luminaire manufacturer (A = Acuity, E = Eaton, L = Leotek, P = Philips, etc.)
- CCC is the arm length in feet and type (Single Arms: 8, 10, 12, 16, etc.; Double Arms: D8, D10, D12, etc.)
- DD is the mounting height (H1) in feet (20, 30, 40, 50, etc.)
- E is the Distribution Type (3 = III, 2 = II, 5 = V, etc.)
- F is the Distribution Distance (M = Medium, L = Long, S = Short, etc.)
- G is the Cutoff Type (C = Cutoff, NC = Non-Cutoff, etc.)

G – **Description**: This is the longhand label for each luminaire type. Here, you should type out and expand on the information in the label field. For example, for the "200A 12-30 3-M-C" 200W equivalent LED luminaire, the description would read:

AEL AB 200W LED 12ft Arm 30ft III-Medium-Cutoff

Although the IES file information is still included in the Photometric File Description in the lower left hand corner of the screen (Item H), the manufacturer and model ID is added to the description (in this case, AEL AB) as a reference to the source IES file. The following is a list of examples for each manufacturer:

Manufacturer	Label	Description	
Acuity (AEL)	200A 16-20 3-M-C	AEL AB 200W LED 16ft Arm 20ft III-Medium-Cutoff	
Eaton (Cooper)	250E D8-30 3-M-C	Eaton NVN 250W LED Double 8ft Arm 30ft III-Medium-Cutoff	
Leotek	310L D12-40 3-M-C	Leotek GC 310W LED Double 12ft Arm 40ft III-Medium-Cutoff	
Philips (Lumec)	400P 16-50 3-M-C	Philips RF 400W LED 16ft Arm 50ft III-Medium-Cutoff	

For reference, the manufacturer and model codes are constructed as follows:

Manufacturer	Model Series	Manufacturer and Model ID Code
Acuity (AEL)	Autobahn	AEL AB
Eaton (Cooper)	Navion	Eaton NVN
Leotek	Green Cobra	Leotek GC
Philips (Lumec)	RoadFocus	Philips RF

Most manufacturers have a shorthand code for their LED luminaire model series. This code is typically part of the IES file name.

Examples:

Manufacturer	IES Filename	Model Code	Model Series
Acuity (AEL)	ATB2_60BLEDE10_XXXXX_R3.ies	ATB#	Autobahn (# is 0 or 2)
Eaton (Cooper)	NVN-AE-03-E-U-T3R.ies	NVN	Navion
Leotek	GC1-80F-MV-NW-2-XX-700 S 060215.IES	GC#	Green Cobra (# is 1 or 2)
Philips (Lumec)	RFL-215W96LED4K-T-R3M (S1410222m).ies	RF?	RoadFocus (? is S, M, or L)

For a more complete set of examples of Labels and Descriptions, see page A-20.

Appendix A – Defining Custom Luminaires

WSDOT AGi32 Basics, June 2016

Once the luminaire information has been updated, click on the "Add/Redefine" button on the right side of the window. The updated luminaire will be added to the list:

	Define Luminaire	×
Load Photometric File(s): 🗭 Instabase 🝷 🍄 Downloaded 🍃 Collectio	on 🗃 Select 🛤 Find 🐔 Internet 🖌 Smart Symbols 🖌 Auto Define	
Defined Luminaires - Drag-and-drop here! Use Alt+Arrows keys to reorder list		Close
Label Tag Description	on Locations	
	V80LED4K-T-R3M 0	Help
	N/96LED4K-T-R3M 0	
	v/112LED4K-T-R3M 0	Relabel
	12 4K XX X M 0	Delete
	09 4K XX AW 0 200W LED 12ft Arm 30ft III-Medium-Cutoff 0	
1200A 12-30 3-M-C AEL AB 20	COUW LED 12rt Alm Suit III-Medium-Cutoir U	Add/Redefine
General	Pole or Pendant Mounted	
Label 200A 12-30 3-M-C 🚽 Tag	C Dynamic: Attach to Z=	
Description AEL AB 200W LED 12ft Arm 30ft III-Medium-Cutoff	✓ Defaults ● Static: Length = 30	
Definition	Augustus Constal	
Lumens Per Lamp N.A. Number Of Lamps 1	Arrangement Symbols SINGLE CIRCLE UP DOWN Render Mode	
Luminaire Lumens 9497 Efficiency (%)		
	Housing Housing	
	Luminous	
Total LLF 0.765 Specify		
X Y Z	Arm Length 13.5 CIRCLE UP_DOWN Model Mode	
Luminous Box: LLHC -0.4 -0.225 -0.015	(+) Line Width/Color	
	Pixel 🕂 🔳	
URHC 0.4 0.225 0.015		
Photometric File	Candela CLCS	
Description Classification LCS	Candela C LCS	
Filename: C:\ProgramData\AGI32\PhotometricData_DownloadedFromClor		
TEST1502129P5		
(TESTLAB) SCALED PHOTOMETRY (ISSUEDATE) 8/16/2014		
[MANUFAC] American Electric Lighting		
[LUMCAT] ATB0 30BLEDE10 XXXX R3 [LUMINAIRE1ATB0 SERIES 107W LED 1050MA TYPE 3 4000K CCT		
[LOMINAINE] AT BUSENIES TO WEED TO SOMATTER S 4000K CCT		
[LAMP] LED Array		
[BALLAST] LED Driver	XXXXXXX	
IESNA:LM-63-2002 🗸		
< >	More	

To remove the placeholder file (ATB0_30LEDE10_XXXXX_R3), check the box next to the label, and then click on the "Delete" button.

If you have made a mistake in the Label field, you can click the "Relabel" button to correct it. Any other errors require you to click the "Add/Redefine" button instead.

To add additional luminaires, you can make changes to an existing luminaire definition, and then click "Add/Redefine". So long as you have used a different label, it will add each new luminaire to the list. If you do not change the label, then you will overwrite the existing definition for that label with the new information.

After adding multiple luminaires, you will end up with a list that looks something like this:

_	Define Luminaire							
Loa	Load Photometric File(s): 😰 Instabase 🔸 💱 Downloaded 🔰 Collection 🚔 Select 👫 Find 🐔 Internet 🛛 🗸 Smart Symbols 🗸 Auto D							
_ De	efined Lumin	aires - Drag-and-drop her	e! Use Alt+Arrows keys to	reor	der list			
	Label		Tag		Description	Locations		
\checkmark	1 🗖 250 1	2-30 3-M-C			GE 250W HPS 12ft Arm 30ft III-Medium-Cutoff	0		
	250 1	6-30 3-M-C			GE 250W HPS 16ft Arm 30ft III-Medium-Cutoff	0		
\otimes	400 1	2-40 3-M-C			GE 400W HPS 12ft Arm 40ft III-Medium-Cutoff	0		
	400 1	6-40 3-M-C			GE 400W HPS 16ft Arm 40ft III-Medium-Cutoff	0		
	🗌 🔲 400 D)12-40 3-M-C			GE 400W HPS Double 12ft Arm 40ft III-Medium-Cutoff	0		
	🔲 400 D	98-40 3-M-C			GE 400W HPS Double 8ft Arm 40ft III-Medium-Cutoff	0		
	1							
_ G∈	eneral —				Pole or Pene	dant Mounted		
La	bel	250 12-30 3-M-C	▼ [⊺]	ag	O Dynamic: Attach	to Z=		
De	escription	GE 250W HPS 12ft Am	n 30ft III-Medium-Cutoff		Defaults Static: Length =	30		

To sort the list, click on the "Label" header.

Once you have finished adding luminaires, close the window by clicking the "Close" button on the right side of the window.

Label and Description Examples for All Manufacturers

Manufacturer	IES Filename	Label	Description
Acuity (AEL)	ATB0_30BLEDE10_XXXXX_R3.ies	200A 12-20 3-M-C	AEL AB 200W LED 12ft Arm 20ft III-Medium-Cutoff
Acuity (AEL)	ATB2_40BLEDE10_XXXXX_R3.ies	250A 12-30 3-M-C	AEL AB 250W LED 12ft Arm 30ft III-Medium-Cutoff
Acuity (AEL)	ATB2_60BLEDE10_XXXXX_R3.ies	310A 12-40 3-M-C	AEL AB 310W LED 12ft Arm 40ft III-Medium-Cutoff
Acuity (AEL)	ATB2_80BLEDE85_XXXXX_R3.ies	400A 12-50 3-M-C	AEL AB 400W LED 12ft Arm 50ft III-Medium-Cutoff
Eaton (Cooper)	NVN-AE-02-E-U-T3R.ies	200E 12-20 3-M-C	Eaton NVN 200W LED 12ft Arm 20ft III-Medium-Cutoff
Eaton (Cooper)	NVN-AE-03-E-U-T3R.ies	250E 12-30 3-M-C	Eaton NVN 250W LED 12ft Arm 30ft III-Medium-Cutoff
Eaton (Cooper)	NVN-AE-04-E-U-T3R.ies	310E 12-40 3-M-C	Eaton NVN 310W LED 12ft Arm 40ft III-Medium-Cutoff
Eaton (Cooper)	NVN-AE-06-E-U-T3R.ies	400E 12-50 3-M-C	Eaton NVN 400W LED 12ft Arm 50ft III-Medium-Cutoff
Leotek	GC1-60F-MV-NW-3-XX-700 030315.IES	200L 12-20 3-M-C	Leotek GC 200W LED 12ft Arm 20ft III-Medium-Cutoff
Leotek	GC1-80F-MV-NW-2-XX-700 S 060215.IES	250L 12-30 3-M-C	Leotek GC 250W LED 12ft Arm 30ft III-Medium-Cutoff
Leotek	GC2-120F-MV-NW-3-XX-700 020415.IES	310L 12-40 3-M-C	Leotek GC 310W LED 12ft Arm 40ft III-Medium-Cutoff
Philips (Lumec)	RFL-145W64LED4K-T-R3M (S1410222m).ies	200P 12-20 3-M-C	Philips RF 200W LED 12ft Arm 20ft III-Medium-Cutoff
Philips (Lumec)	RFL-180W80LED4K-T-R3M (S1410222m).ies	250P 12-30 3-M-C	Philips RF 250W LED 12ft Arm 30ft III-Medium-Cutoff
Philips (Lumec)	RFL-215W96LED4K-T-R3M (S1410222m).ies	310P 12-40 3-M-C	Philips RF 310W LED 12ft Arm 40ft III-Medium-Cutoff
Philips (Lumec)	RFL-241W112LED4K-T-R3M (S1410222).ies	400P 12-50 3-M-C	Philips RF 400W LED 12ft Arm 50ft III-Medium-Cutoff

The examples in this table use single 12 ft arm lengths only – revise as needed for double arms or different arm lengths.