

Glen Brook Way - Waiver Request - ZBA March 6, 2024



GBW requests a modification of the comprehensive permit to include a waiver of Section 7.1.2(E)(3) of the Bylaw limiting hours of operation of outdoor lighting.

Section 7.1.2(E)(3) of the Bylaws states:

3. Hours of Operation. Outdoor lighting shall not be illuminated between 11:00 p.m. and 6:00 a.m., with the following exceptions:
 - a. Outdoor lighting shall be permitted on the premises of a business open to customers or **where employees are working**; or for an institution or place of public assembly where an activity is being conducted, outdoor lighting shall be permitting during the activity and for not more than one-half hour after the activity ceases.
 - b. Low-level lighting sufficient for the security of persons or property, provided the **average illumination** on the ground or on any vertical surface is not greater than 0.5 foot candles.

View of the entry to Glen Brook Way from West Street. Please note that the lighting in the foreground is from the street light not Glen Brook Way lighting



Background

Glen Brook Way is 100% affordable housing.

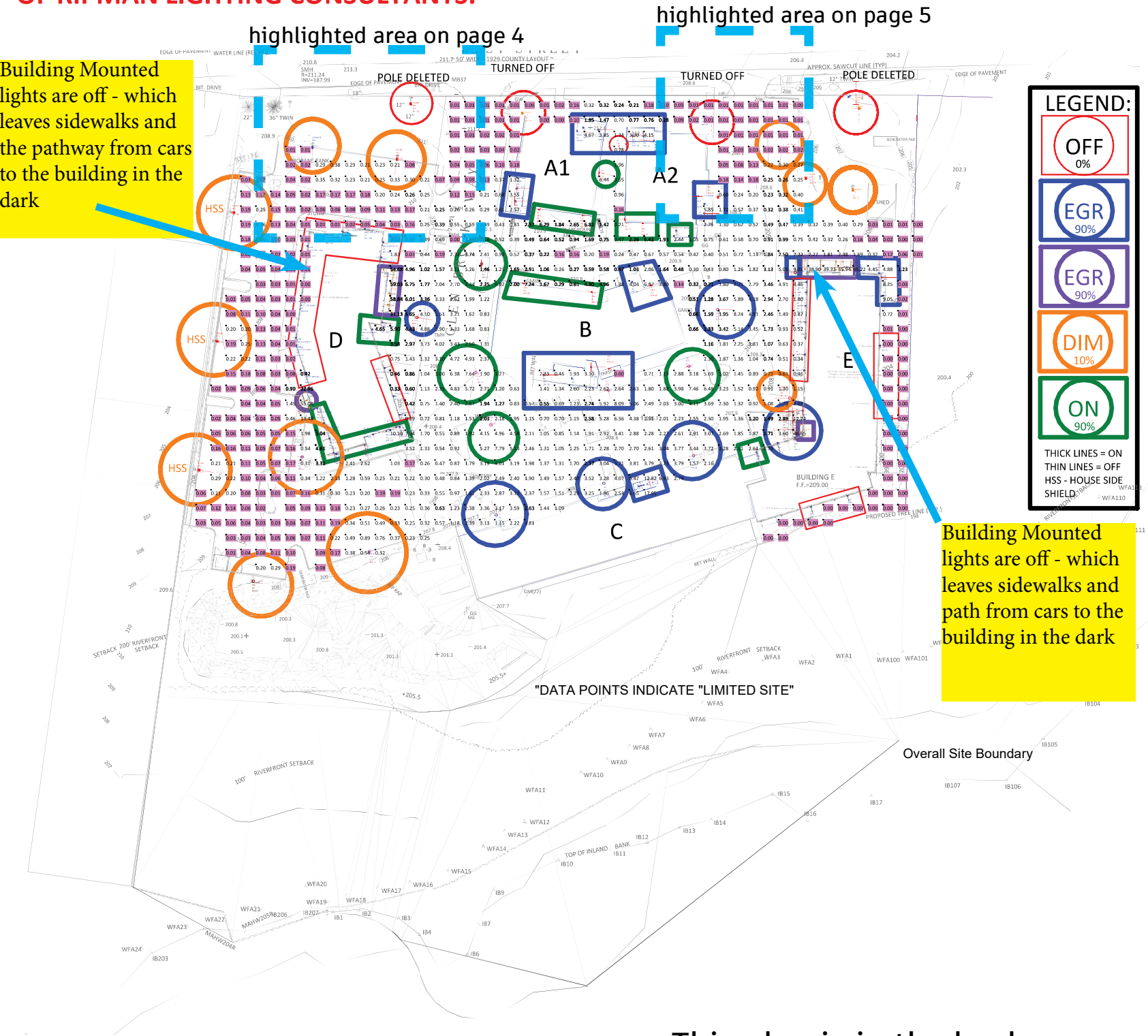
Phase 1 is 48 units of family housing

- 16 units one bedroom
- 21 units two bedroom
- 11 units three bedroom

Phase 2 is 44 units of elderly housing.

CURFEW CONDITION: 11PM TO DAWN
ALL FIXTURES ON, BOTH NON-EGRESS AND EGRESS, SOME DIMMED AS NOTED.
DATA POINTS HIGHLIGHTED IN PINK DO NOT CONFORM WITH
IES/ANSI RECOMMENDATIONS FOR MINIMUM FOOT-CANDLES (0.2 MINIMUM OR GREATER).
NON-CONFORMANCE IS CONSIDERED SIGNIFICANT IN THE OPINION
OF RIPMAN LIGHTING CONSULTANTS.

Building Mounted lights are off - which leaves sidewalks and the pathway from cars to the building in the dark



Scale: 1 inch= 40 Ft.
GRIDS ARE 10'X10' TYPE

This plan is in the back up data labeled 26.7 V5

Why grant a waiver?

Simply the lighting levels to achieve compliant lighting on the site are too low to be adequate for residents. The 11PM-6AM time period is an arbitrary time period. Residents who work the night shift or walk dogs are still active on the site.

This photometric plan shows a compliant lighting from 11 PM to 6 AM.

- All the Pole lights in “orange” are dimmed to 10%.
- The building mounted lights shown in red are off
- The blue lights were not included in the calculation because they are required for egress.

On the next few pages we will zoom in to show examples why this lighting, although compliant with the by-laws does not provide adequate lighting for residents who may work night shifts or for Emergency Responders or family members serving the elderly population in the buildings.

Everything shown in Pink are light levels below minimum Illuminating Engineering Society Standards (IES). Information on IES standards is included as part of the data immediately following this introduction.

These building mounted lights are required to be off to meet the .5 FC standard leaving this sidewalk in darkness. We are concerned about the safety of the residents.



On the left the photometric data shows compliant lighting to meet the 11PM-6AM period. The photographs below show lighting before that time period - building lights that are on in the photo would have to be off and poles would be dimmed.

Pole lights dimmed to 10%

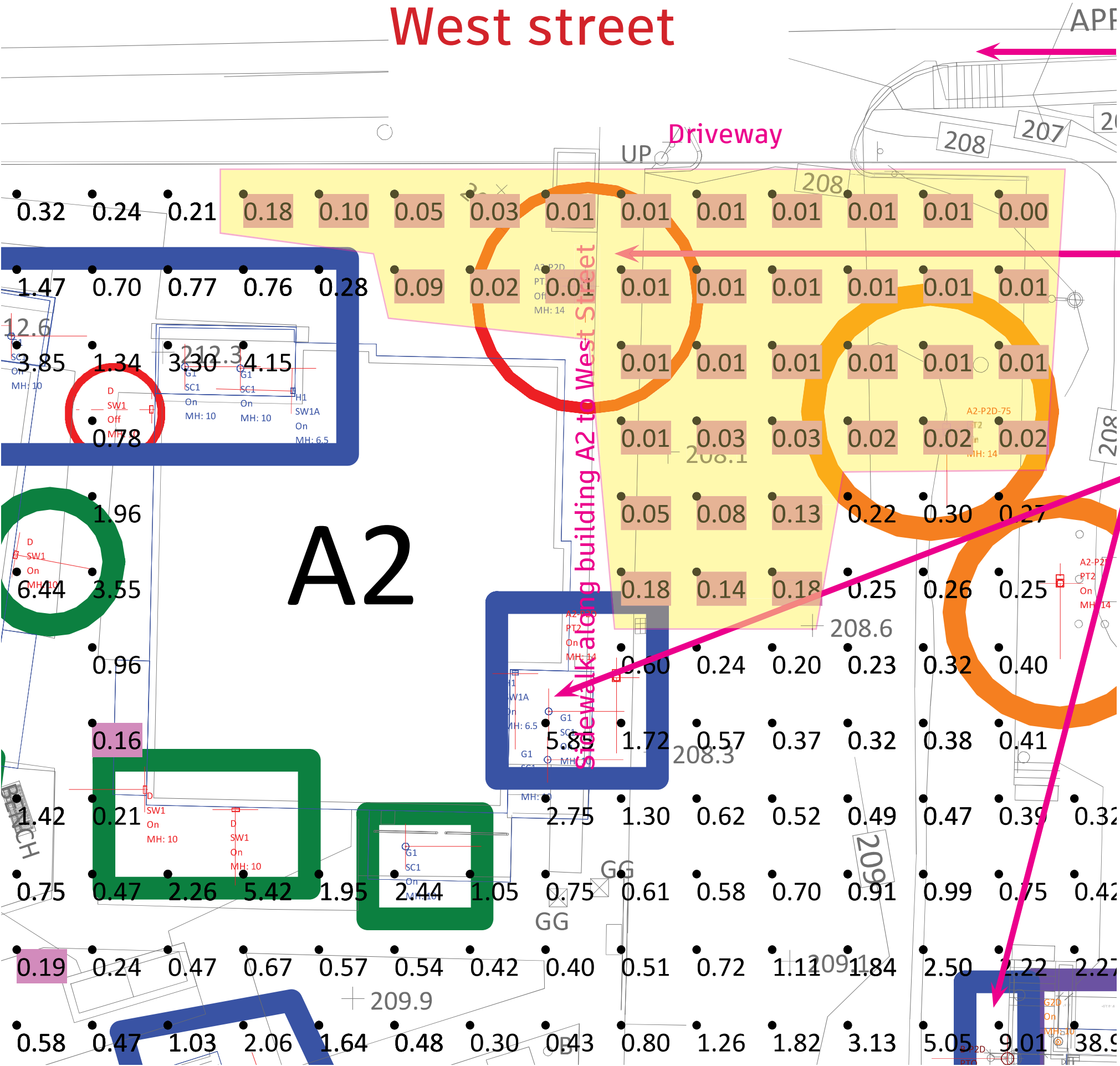
A photograph of a construction site at night. In the foreground, there is a large, uneven pile of snow. Beyond the snow, a dark, paved area, possibly a road or driveway, leads towards the background. On the left side, a portion of a modern building with large windows is visible, illuminated by an interior light. A concrete curb runs along the edge of the paved area. In the background, a tall wooden fence runs across the frame, separating the construction site from a residential area. Behind the fence, several trees are visible against the dark night sky. A street lamp on the right side of the fence casts a light on the scene. The overall atmosphere is dark and quiet.

Building Mounted Lights Required to be off

Egress lighting

Lighting levels at this exit from an emergency stair and the public path to public way are brighter because of the lights at the entry.

West street



Zooming in to interpret the Photometric data

Driveway and sidewalk is almost dark

Pole lights dimmed to 10%

In order to have compliant lighting we need to dim the Pole lights to 10% and the Pole near A2 is turned off. The Illuminating Engineering Society recommends .2 FC minimum in a curfew setting for average parking lot illumination. From the Photometric plans you can see the light at the sidewalk and at the driveway is below recommended levels highlighted in yellow.

Egress lighting

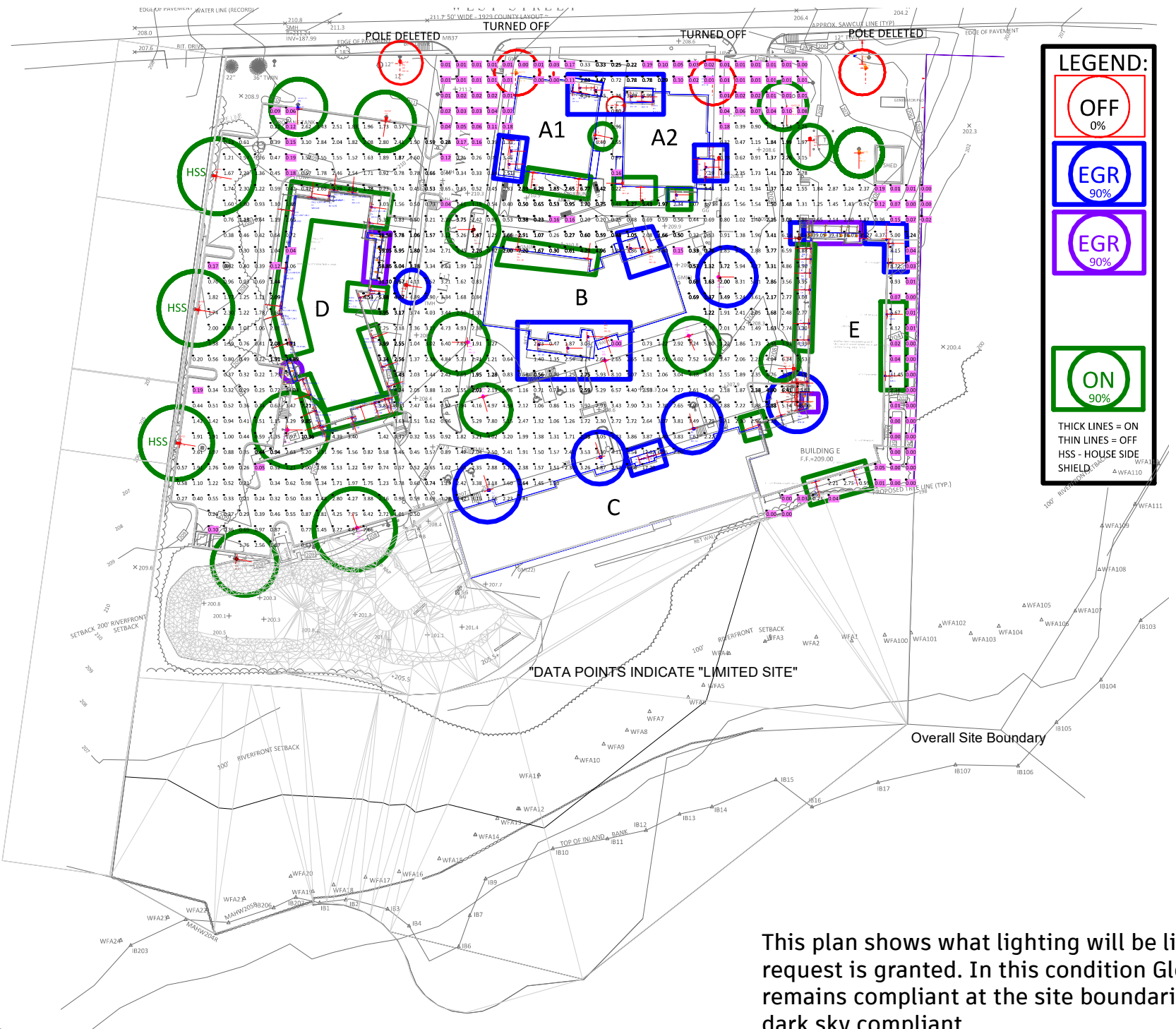
Lighting levels at the egress from the buildings are brighter to meet building code requirements



Photo above shows the driveway from West Street. Although the entrances to the buildings are bright, the sidewalk and driveway are very dim.

NORMAL (PRE-CURFEW) CONDITION: DUSK TO 11PM
ALL FIXTURES ON, BOTH NON-EGRESS AND EGRESS.
DATA POINTS HIGHLIGHTED IN PINK DO NOT CONFORM WITH
IES/ANSI RECOMMENDATIONS FOR MINIMUM FOOT-CANDLES (0.2 MINIMUM OR GREATER).
NON-CONFORMANCE NOT CONSIDERED SIGNIFICANT IN THE OPINION
OF RIPMAN LIGHTING CONSULTANTS, EXCEPT AT ENTRY POINTS TO GLEN BROOK WAY.

Compliant lighting at Site Boundaries with lighting NOT dimmed from dusk to 11 PM



This plan shows what lighting will be like if the waiver request is granted. In this condition Glen Brook Way remains compliant at the site boundaries. All lighting is dark sky compliant.



Photo from West Street looking South. At the property line to the lower right of the picture is very dark and there is no light spill to the adjacent property as shown on the photometric plan.



Photo from West Street looking North. Note how bright the street light. The snow illuminated in the foreground is from the street light not Glen Brook Way lighting

Photos showing light at the property line

We have made significant efforts to purchase lighting with tight cut-off and shielding. This means that the pole lights at the perimeter send light in one direction and do not spread light. The fence at the property line blocks light from cars parking from shining on our neighbors property.



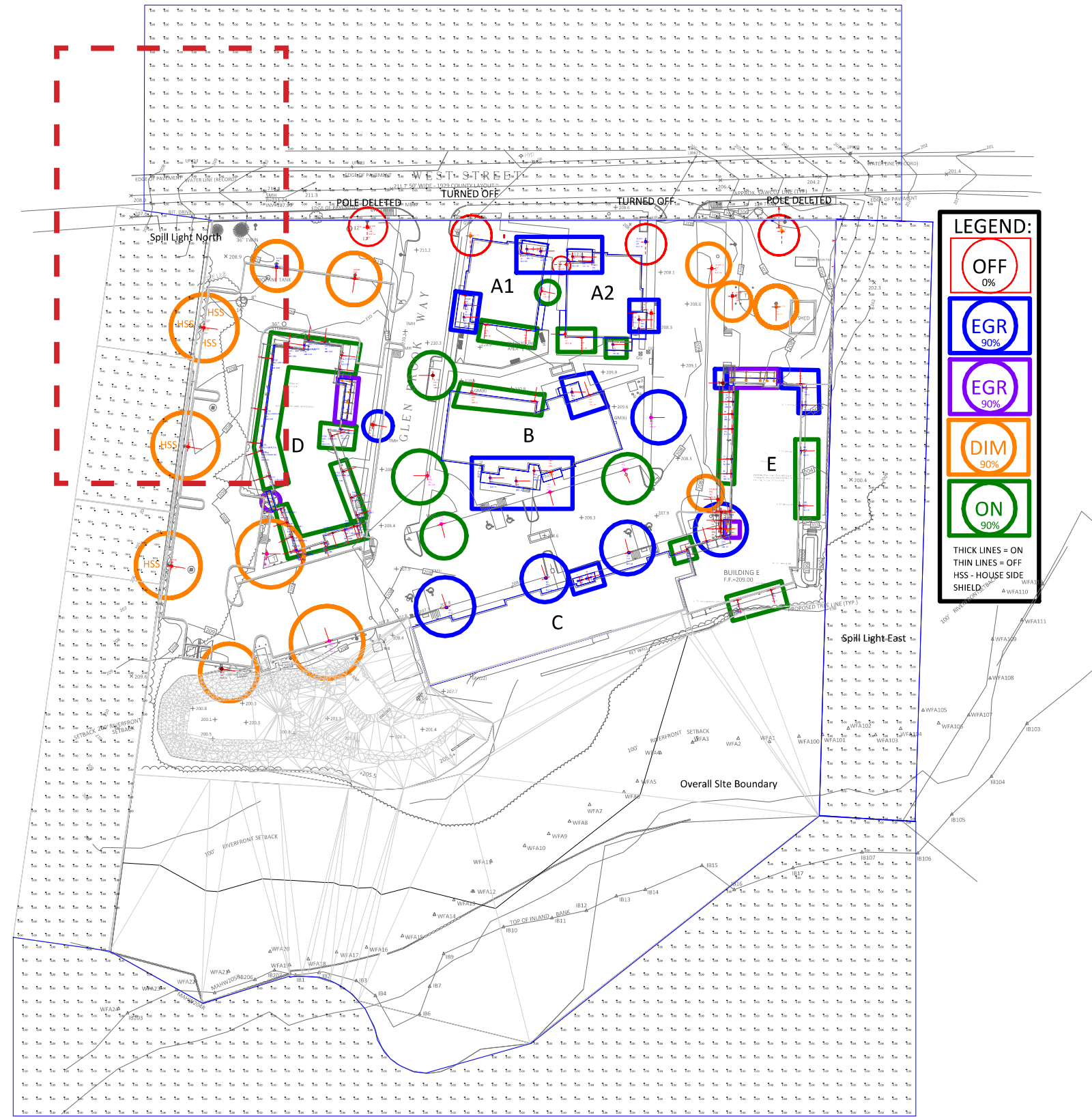
View from West Street of the property line. Indirect light from the street lights. The sidewalk and property line are dark.



View from the rear of the site looking at building D along the property line

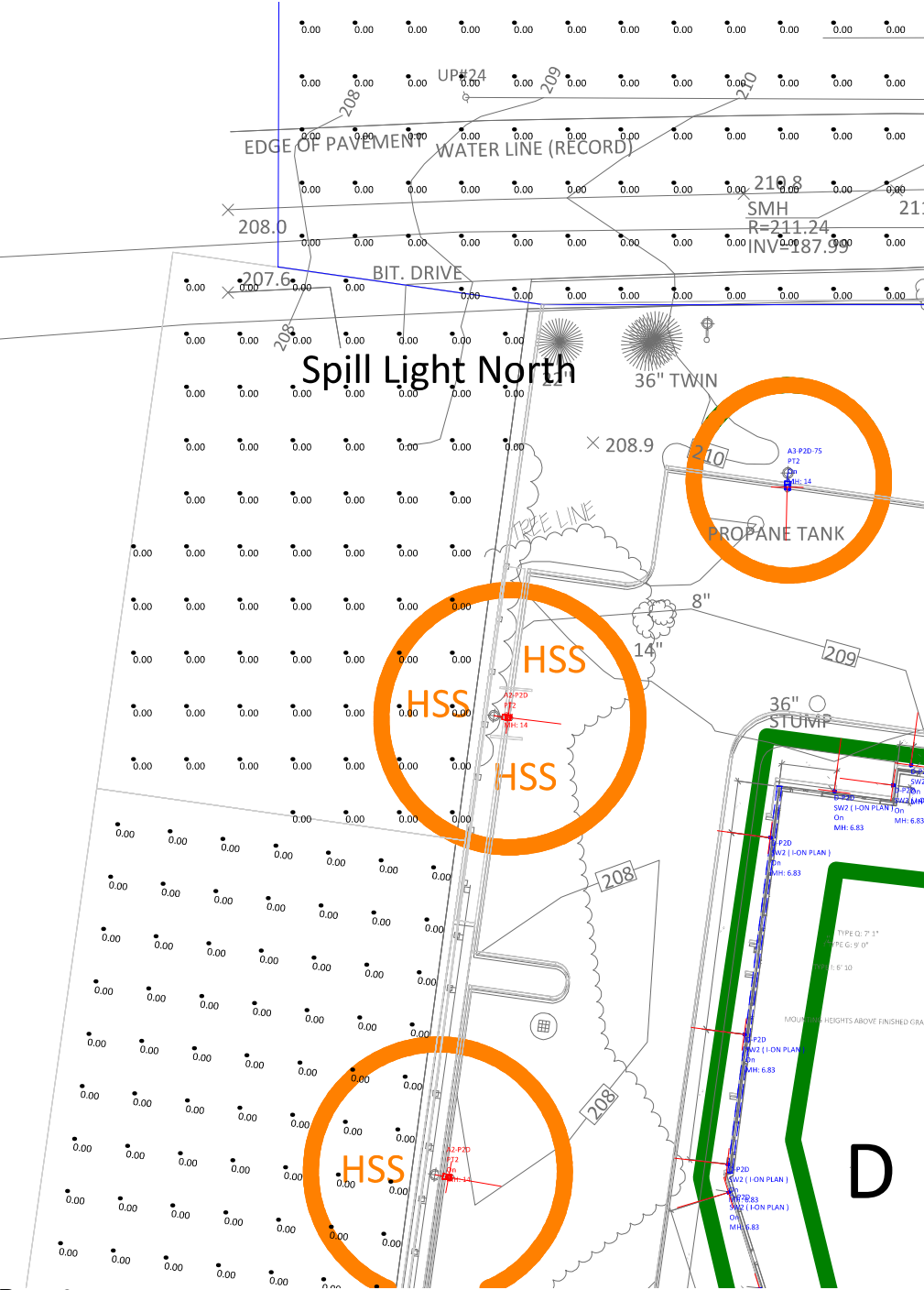
Please note, most cameras are designed to pick up light so bright spots look brighter, because the lens is “looking” for light sources. Photography allows us a sense of brigher spots and darker spots but cannot replicate what the human eye perceives.

NORMAL CONDITION : DUSK TO 11PM
ALL FIXTURES ON = 90%.
OFFSITE HORIZONTAL MAXIMUM FC ALLOWED AT GRADE = 0.00
OFFSITE HORIZONTAL MAXIMUM FC CALCULATED AT GRADE = 0.00



The following are the photometric data, showing various conditions and filtering out certain lights to demonstrate either compliance with the Medway Zoning Ordinances or the Building Code.

On the left is data showing light levels on adjacent properties listed 26.6A V5. Below is a detailed view.





VIEW 1 - PRE-CURFEW



VIEW 2 - PRE-CURFEW

VIEW 1 - DURING CURFEW (NORTH SIDEWALK AT D UNLIT)



VIEW 2 - DURING CURFEW (NORTH + WEST SIDEWALKS AT D UNLIT)





VIEW 3 - PRE-CURFEW



VIEW 4 - PRE-CURFEW

VIEW 3 - DURING CURFEW (SOUTH PARKING LOT, SIDEWALKS DARK)



VIEW 4 - DURING CURFEW (WEST SIDEWALK, PARKING DARK)





VIEW 5 - DURING CURFEW (SIDEWALK EAST OF D DARK)



VIEW 6 - DURING CURFEW (SOUTHWEST PARKING LOT DARK)



VIEW 7 - DURING CURFEW (SIDEWALK WEST OF D DARK)



VIEW 8 - DURING CURFEW (SHARP CUTOFF BELOW TOP OF FENCE)

MEDWAY GBW

RIPMAN LIGHTING CONSULTANTS DOCUMENTS

26 FEBRUARY 2024

THE FOLLOWING PHOTOMETRIC PLANS ARE SUBMITTED TO SUPPORT METRO WEST / GBW'S REQUEST FOR A WAIVER TO ALLOW CONTINUATION OF "NORMAL" (PRE-CURFEW, DUSK - 11PM) LIGHTING IN LIEU OF "CURFEW" LIGHTING REQUIRED FROM 11 - DAWN BY THE TOWN BYLAW.

MEDWAY GBW SITE LIGHTING PHOTOMETRICS SUMMARY

CALCULATIONS REQ'D

NON-EGRESS LIGHTING
EGRESS LIGHTING
TOTAL LIGHTING
EGRESS PATH LIGHTING
LIGHT TRESPASS
LIGHT OVERSPILL
IES CONFORMANCE

26.1A - NON-EGRESS LIGHTING
26.2A - EGRESS LIGHTING
26.3A - TOTAL LIGHTING
26.4A - EGRESS PATH LIGHTING
26.5A - LIGHT TRESPASS
26.6A - LIGHT OVERSPILL
26.7A - IES CONFORMANCE

MEDWAY "PRE-CURFEW" PHOTOMETRICS (DUSK TO 11PM)

VARIANCE REQUESTED IS TO OPERATE THE
SITE LIGHTING ALL NIGHT AT "PRE-CURFEW"
LEVELS

26.1 - NON-EGRESS LIGHTING
26.2 - EGRESS LIGHTING
26.3 - TOTAL LIGHTING
26.4 - EGRESS PATH LIGHTING
26.5 - LIGHT TRESPASS
26.6 - LIGHT OVERSPILL
26.7 - IES CONFORMANCE

MEDWAY "CURFEW" PHOTOMETRICS (DUSK TO 11PM)

MEETS "CURFEW" REQUIREMENTS,
BUT DOES NOT CONFORM WITH IES
RECOMMENDATIONS



VIEW 1 - PRE-CURFEW



VIEW 2 - PRE-CURFEW

VIEW 1 - DURING CURFEW (NORTH SIDEWALK AT D UNLIT)



VIEW 2 - DURING CURFEW (NORTH + WEST SIDEWALKS AT D UNLIT)





VIEW 3 - PRE-CURFEW



VIEW 4 - PRE-CURFEW

VIEW 3 - DURING CURFEW (SOUTH PARKING LOT, SIDEWALKS DARK)



VIEW 4 - DURING CURFEW (WEST SIDEWALK, PARKING DARK)





VIEW 5 - DURING CURFEW (SIDEWALK EAST OF D DARK)



VIEW 6 - DURING CURFEW (SOUTHWEST PARKING LOT DARK)



VIEW 7 - DURING CURFEW (SIDEWALK WEST OF D DARK)



VIEW 8 - DURING CURFEW (SHARP CUTOFF BELOW TOP OF FENCE)

TWO SETS OF CALCULATIONS FOLLOW.

THE FIRST SEVEN CALCULATIONS DOCUMENT "NORMAL" (PRE-CURFEW) LIGHTING.
THESE MEET IES / ANSI RECOMMENDATIONS FOR GOOD PRACTICE REGARDING MINIMUM
HORIZONTAL FOOTCANDLES REQUIRED FOR ROADWAYS, PARKING LOTS AND SIDEWALKS.

THEY DO NOT MEET THE TOWN BYLAW REQUIREMENTS FOR "CURFEW" LIGHTING.

THE SECOND SET OF SEVEN CALCULATIONS DOCUMENT "CURFEW" LIGHTING, CONFORMING
WITH THE REQUIREMENTS OF THE TOWN BYLAW.

THESE DO NOT MEET IES / ANSI RECOMMENDATIONS FOR GOOD PRACTICE REGARDING
MINIMUM HORIZONTAL FOOTCANDLES REQUIRED FOR ROADWAYS, PARKING LOTS AND
SIDEWALKS.

THEY DO MEET THE TOWN BYLAW REQUIREMENTS FOR "CURFEW" LIGHTING.

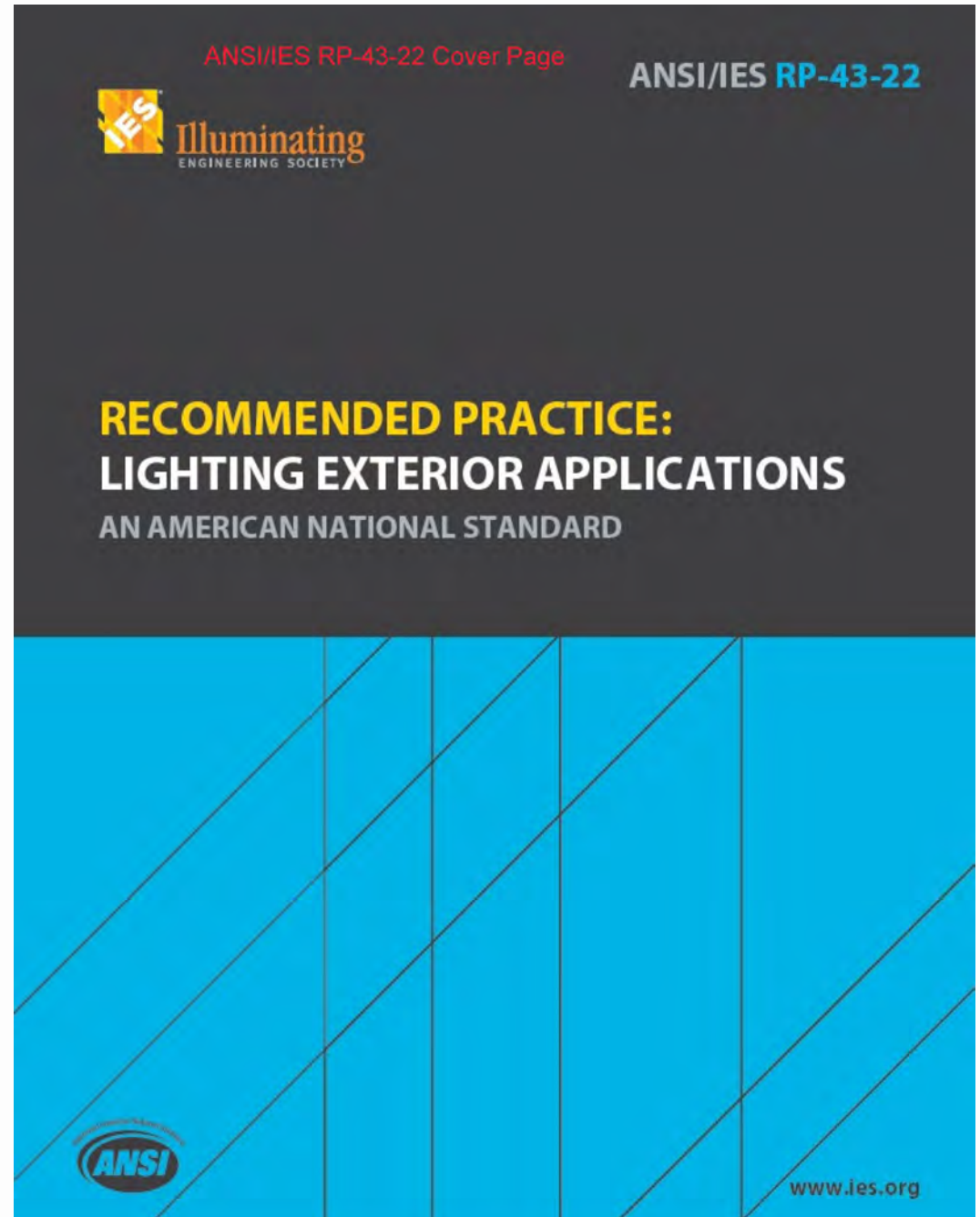
IES / ANSI RECOMMENDATIONS

STANDARDS FOR GOOD LIGHTING ARE PUBLISHED BY THE ILLUMINATING ENGINEERING SOCIETY (IES) AND THE AMERICAN NATIONAL STANDARDS INSTITUTE.

THESE STANDARDS ARE NOT REFERENCED IN THE BYLAW, BUT ARE GENERALLY RECOGNIZED AS ESTABLISHING PROFESSIONAL STANDARDS FOR GOOD PRACTICE, AND THE MINIMUM CONDITIONS FOR GOOD OUTDOOR LIGHTING.

CALCULATIONS PROVIDED BELOW FOR "NORMAL" PRE-CURFEW LIGHTING DO MEET IES / ANSI RECOMMENDATIONS FOR GOOD PRACTICE REGARDING MINIMUM HORIZONTAL FOOTCANDLES REQUIRED FOR ROADWAYS, PARKING LOTS AND SIDEWALKS, WITH A FEW EXCEPTIONS NOT CONSIDERED SIGNIFICANT BY RIPMAN LIGHTING CONSULTANTS.

CURFEW-CONFORMING LIGHTING BELOW DOES NOT MEET IES RECOMMENDATIONS FOR GOOD PRACTICE REGARDING MINIMUM HORIZONTAL FOOTCANDLES REQUIRED FOR ROADWAYS, PARKING LOTS AND SIDEWALKS (0.2 FOOTCANDLES HORIZONTAL AT GRADE PER IES / ANSI RECOMMENDED PRACTICE RP-43-22 (2022)).



ANSI/IES RP-43-22 Table A-3
 Pedestrian Safety on Walking Surfaces
 LZ1 Lower Limit = 0.2FC AVG, 10:1 AVG/MIN

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

Vexing Reflection Risk Light Level for Task or Area? 	
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Recommended Practice: Lighting Exterior Applications

THE FIRST SEVEN CALCULATIONS DOCUMENT “NORMAL” (PRE-CURFEW) LIGHTING.

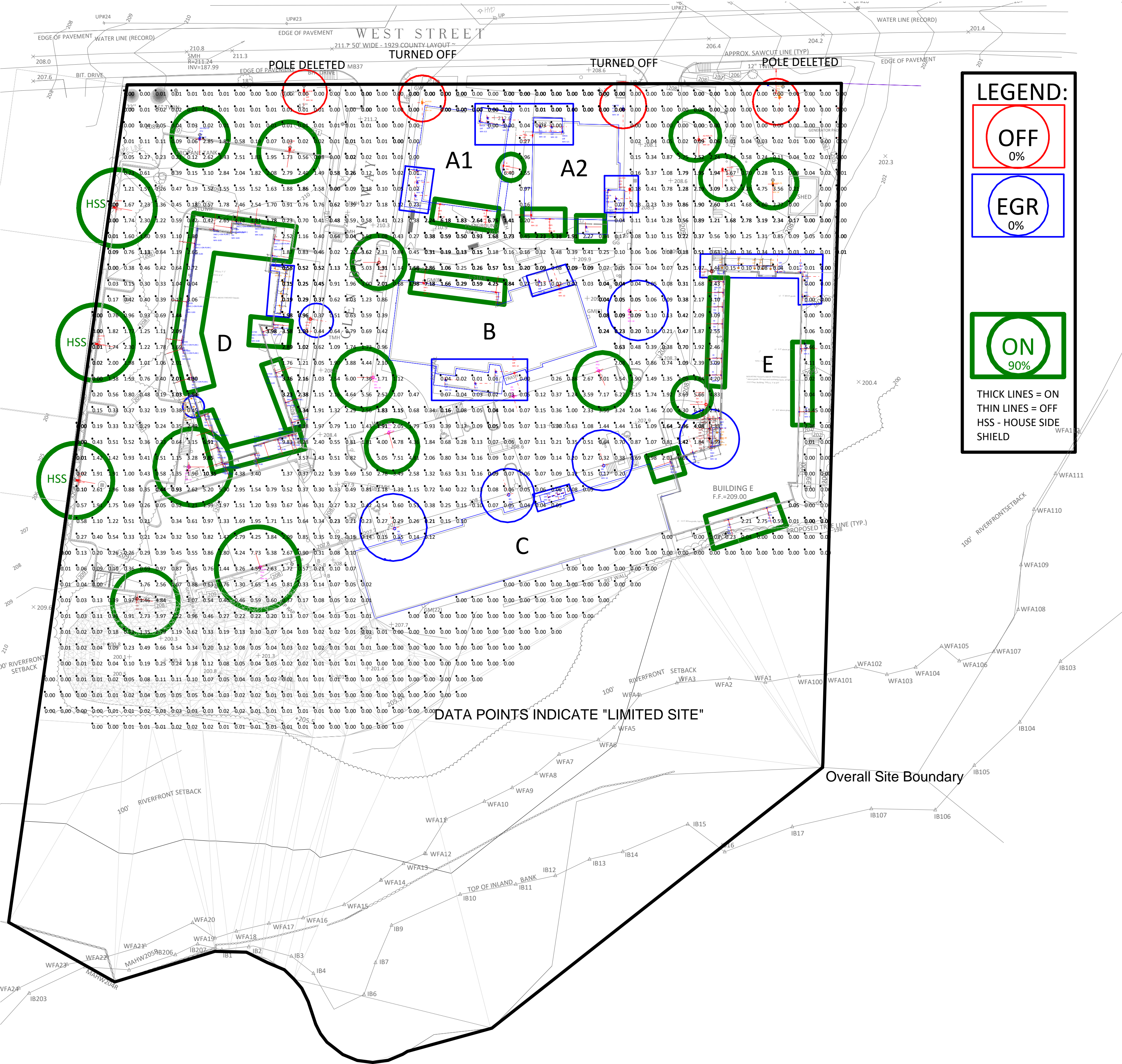
WITH A FEW DATA POINT EXCEPTIONS, NOT CONSIDERED SIGNIFICANT BY RIPMAN LIGHTING CONSULTANTS, THESE CALCULATIONS MEET IES / ANSI RECOMMENDATIONS FOR GOOD PRACTICE REGARDING MINIMUM HORIZONTAL FOOTCANDLES REQUIRED FOR ROADWAYS, PARKING LOTS AND SIDEWALKS.

THEY DO NOT MEET THE TOWN BYLAW REQUIREMENTS FOR “CURFEW” LIGHTING.

MEDWAY PHOTOMETRICS 26.1A-V5

- NORMAL (PRE-CURFEW) CONDITION: DUSK TO 11PM
- NON-EGRESS FIXTURES ONLY
- AVERAGE VALUE CALCULATED HORIZONTAL FOOTCANDLES FOR LIMITED SITE: 0.91 FC
- DOES NOT CONFORM TO MEDWAY ZONING ORDINANCE CURFEW REQUIREMENTS

NORMAL (PRE-CURFEW) CONDITION: DUSK TO 11PM
NON-EGRESS FIXTURES ONLY
AVERAGE VALUE CALCULATED HORIZONTAL FOOTCANDLES FOR LIMITED SITE: 0.91 FC
DOES NOT CONFORM TO MEDWAY ZONING ORDINANCE CURFEW REQUIREMENTS



Scale: 1 inch= 40 Ft.
GRIDS ARE 10'X10' TYP.
NO EGRESS LIGHTING INCLUDED

Notes on Calculations:

Reflectance : Walls - 0.5 (Unless Otherwise Noted)
Building E - Exterior Walls - 0.25
FIXTURE LLF As Noted Below on Page 2

Fixtures contributing to Egress Lighting shown as zero output (0%),
for purposes of calculation of limited site average horizontal foot-candles
for non-egress fixtures during normal hours.

Software used: Calculations run using AGI32, industry standard software (Version 21.1.77).

IES files: Industry standard IES files, provided by others, were downloaded and incorporated into the model, for all fixtures modelled, including where so specified, and available as an IES file, house side shielding provided by the fixture manufacturer where so noted "HSS".

Topography: Previous permit model treated the site and adjacent properties as flat. The current model treats the site and the areas to the north of the site (towards West Street) as flat, but incorporates estimated topography for the east and west properties adjacent. Estimated by visual observation on site.

Calculation data: Data is in horizontal footcandles (as if measured with a meter lying on the ground, aimed up), per the Zoning Ordinance.

Reflectances: Reflectances of buildings and ground surfaces included per industry standard reflectances.

Interflectances: Calculations include only direct illumination of the target grid points, cosine corrected for angle of incidence, and do not include interflected light from building surfaces.

Data Grids: 10' x 10' spacing.

Interstitial light levels: Note that measurements taken at other locations than the grid points shown may vary from those of the surrounding grid points.

Data rounding: Note that, as is common for all calculation programs, data rounding occurs. Thus, data calculated at 0.001 to 0.005 will round down to 0.00, while 0.006 to 0.009 will round up to 0.01. And 0.011 through 0.015 will round down to 0.01, while 0.016 through 0.019 will round up to 0.02.

All notes above apply to the current models.

Grid alignment: Note data grid points in this model do not exactly correspond to permit set grids due to orientation of grids, precluding data point to data point comparisons. But comparison of maximum, minimum and average values remains possible and appropriate.

Fixture status: Where noted, some fixtures have been turned off, and/or the aiming of fixtures may have changed, and/or custom shields may have been included in the model to minimize overspill.

Photometry: AGI32 uses "far field photometry" which means that it does not allow modelling of additional custom shielding added to the fixtures, where no IES file is available. We have modelled custom shields where called out using simulated shields at an appropriate distance from the fixture(s) to enable AGI32 to reasonably accurately calculate the impact of custom shielding.

Fixture output: All fixtures are, unless otherwise noted, calculated with an industry standard Light Loss Factor (LLF) of 90%. This means that initial installation values at data points will be 10% higher than the model reports. The same value for LLF was carried in the 5-16-22 Calculations submitted for permit. Where fixtures are dimmed in a specified rev of the model, a lower LLF is used to indicate the level dimmed to.

Site visit check measurements: If site visit check measurements are required, the installation must be complete and programmed for light output percentages as noted in the model, and there must be no snow on the ground, and ideally, no moon in the sky. Note that field measurements will include interflected components from building surfaces and will therefore be higher than calculated values.

The scope of services for this project for Ripman Lighting Consultants and Drafting & Photometric Consulting, LLC, our sub-contractor, is limited to running calculations of designs provided by others. We are providing data only. Neither Ripman Lighting Consultants nor Drafting & Photometric Consulting are making recommendations or approving or disapproving designs by others and we accept no liability for the implementation or modification of designs by others. For evaluation, these data calculations should be reviewed and commented on and the designs calculated, modified if required, by Tetra-Tech, the town's consultant, for conformance with the state building code and recognized standards of good practice.

SITE AVERAGE HFC = 0.91 FC
DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.1A-V5 | EGRESS LTG EXCLUDED
ALL NON-EGRESS FIXTURES TURNED "ON" = 90%
DOES NOT MEET 0.5 HORIZONTAL FC AVG OR LESS FOR LIMITED SITE

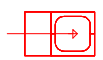
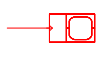
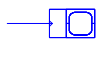
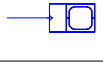






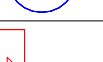
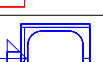







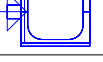


Drawn By: JS

Date:2/26/2024

Rev: 26.1A-V5

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LIGHTING PARAMETERS:

Luminaire Schedule									
Symbol	Qty	Label	Arrangement	LLF	Description	Arr. Watts	Arr. Lum. Lumens	Mounting Height	Manufacturer
	7	A2-P2D	Single	0.900	DSX0 LED P1 30K 70CRI BLC3 MVOLT	33.21	3343	14	Lithonia Lighting
	1	A2-P2D-75	Single	0.900	DSX0 LED P1 30K 70CRI BLC3 MVOLT	33.21	3343	14	Lithonia Lighting
	1	A3-P2D	Single	0.900	DSX0 LED P1 30K 70CRI RCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A3-P2D-75	Single	0.900	DSX0 LED P1 30K 70CRI RCCO MVOLT	33.21	3375	14	Lithonia Lighting
	2	A4-P2D	Single	0.900	DSX0 LED P1 30K 70CRI LCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A4-P2D-75	Single	0.900	DSX0 LED P1 30K 70CRI LCCO MVOLT	33.21	3375	14	Lithonia Lighting
	5	AD	Single	0.900	RADPT P4 30K ASY HS	85.678	9439	14	Lithonia Lighting
	2	AD-50	Single	0.900	RADPT P4 30K ASY HS	85.678	9439	14	Lithonia Lighting
	2	B-P2D	Single	0.900	RADPT P3 30K ASY HS	53.618	5939	14	Lithonia Lighting
	1	B-P2D-50	Single	0.900	RADPT P3 30K ASY HS	53.618	5939	14	Lithonia Lighting
	3	BD	Single	0.900	RADPT P4 30K PATH HS	85.678	7877	14	Lithonia Lighting
	10	D	Single	0.900	WDGE1 LED P2 30K 80CRI VW	15.018	1876	10, 12	Lithonia Lighting
	26	D-P2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	6.83	NLS Lighting
	1	E-P2D	Single	0.900	RADPT P4 30K SYM HS	85.678	9889	14	Lithonia Lighting
	1	E-P2D-50	Single	0.900	RADPT P4 30K SYM HS	85.678	9889	14	Lithonia Lighting
	13	G1	Single	0.900	7162-GY-C13-27K-BBI	13	1131	10	Brownlee Lighting Inc
	15	G2D	Single	0.900	HC850D010-HM82555827-81WDC	48	5828	10	COOPER LIGHTING SOLUTIONS - HALO COMMERCIAL (FORMERLY EATON)
	4	H1	Single	0.900	7325-BL-C17-27K	16.21	970	6.5	Brownlee Lighting
	6	H2	Single	0.900	S5077W.14	3.5	37	8, 10	Simes S.p.A.
	8	I2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	5, 10	NLS Lighting
	10	ID	Single	0.900	TWA-T4-16L-175-30K7	10	1212	10	NLS Lighting
	2	N	Single	0.900	CLX L48 4000LM SEF FDL MVOLT 40K 80CRI	25.543	3956	10	Lithonia Lighting

THIS SCHEDULE IS A PRODUCT OF AGI32 AND LISTS TECHNICAL DATA FOR ALL FIXTURES ON THE SITE, REGARDLESS OF WHETHER THEY ARE ON OR OFF. FOR STATUS "ON", "OFF", SEE PLANS (PART OF FIXTURE TAGS).

Calculation Summary									
Label	Units	Avg	Max	Min	Avg/Min	Max/Min	PtSpclr	PtSpTb	Grid Z
Other Site Horizontal	Fc	0.47	10.35	0.00	N.A.	N.A.	10	10	0
Parking Horizontal	Fc	1.17	10.35	0.00	N.A.	N.A.	10	10	0
Pedestrian Horizontal	Fc	1.15	10.35	0.00	N.A.	N.A.	10	10	0
Road Horizontal	Fc	1.02	11.45	0.00	N.A.	N.A.	10	10	0
Overall Site Average	Fc	0.91	11.5	0.0	N.A.	N.A.			

SITE AVERAGE HFC = 0.91 FC
DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.1A-V5 | EGRESS LTG EXCLUDED
ALL NON-EGRESS FIXTURES TURNED "ON" = 90%
DOES NOT MEET 0.5 HORIZONTAL FC AVG OR LESS FOR LIMITED SITE

Drawn By: JS

Date:2/26/2024

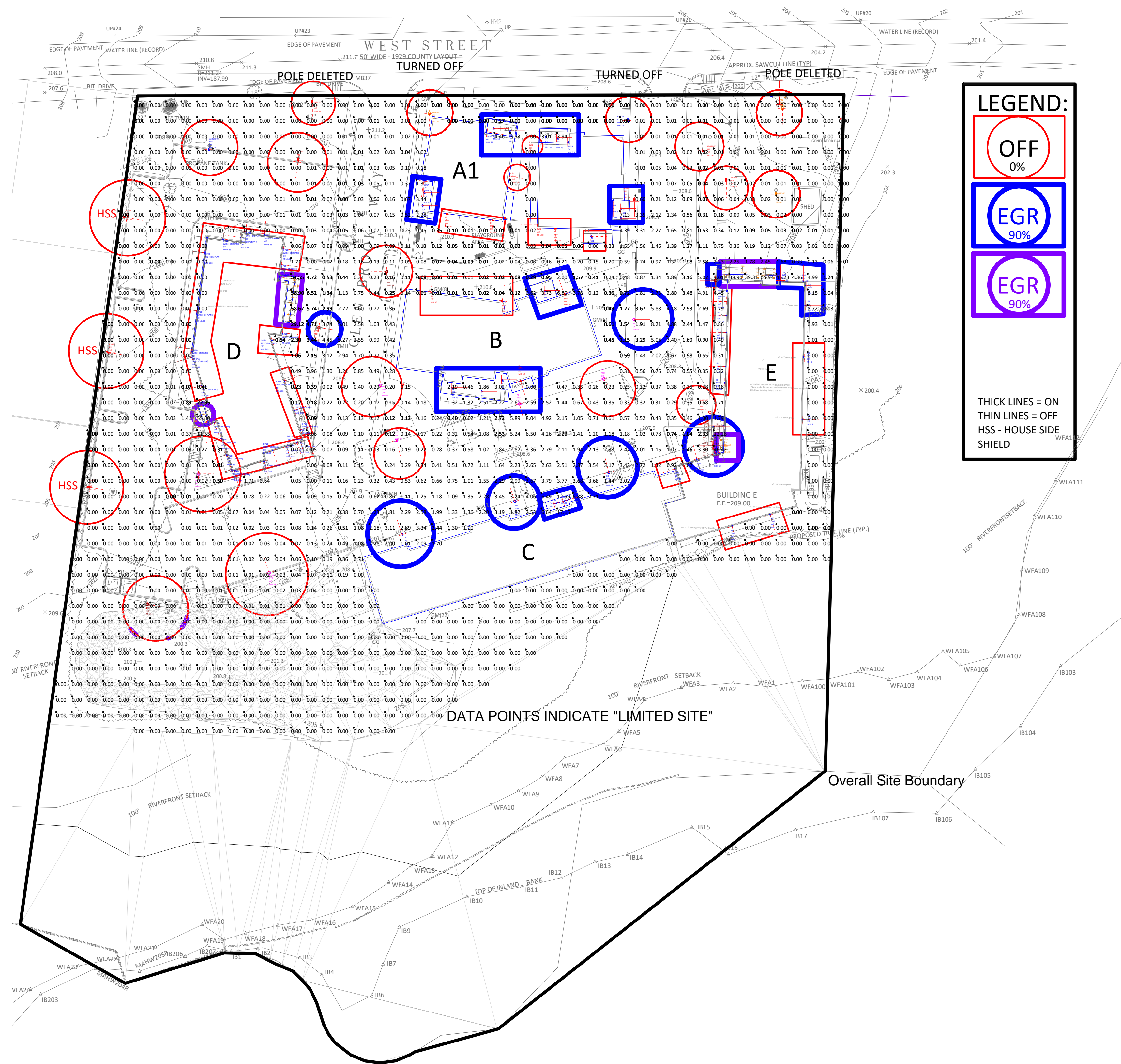
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MEDWAY PHOTOMETRICS 26.2A-V5

- CURFEW CONDITION: 11PM TO DAWN
- EGRESS FIXTURES ONLY (EXCLUDED FROM OVERALL SITE AVERAGE)
- FOR CONFORMANCE TO MASS. STATE BLDG CODE SEE DWG MEDWAY PHOTOMETRICS 26.4

CURFEW CONDITION: 11PM TO DAWN
EGRESS FIXTURES ONLY (EXCLUDED FROM OVERALL SITE AVERAGE)
FOR CONFORMANCE TO MASS. STATE BLDG CODE SEE DWG 26.4A



Scale: 1 inch= 40 Ft.
GRIDS ARE 10'X10' TYP.
ONLY EGRESS LIGHTING INCLUDED

Notes on Calculations:

Reflectance : Walls - 0.5 (Unless Otherwise Noted)
Building E - Exterior Walls - 0.25
FIXTURE LLF As Noted Below on Page 2

Fixtures in this calculation include only those contributing to Egress Lighting.

Software used: Calculations run using AGI32, industry standard software (Version 21.1.77).

IES files: Industry standard IES files, provided by others, were downloaded and incorporated into the model, for all fixtures modelled, including where so specified, and available as an IES file, house side shielding provided by the fixture manufacturer where so noted "HSS".

Topography: Previous permit model treated the site and adjacent properties as flat. The current model treats the site and the areas to the north of the site (towards West Street) as flat, but incorporates estimated topography for the east and west properties adjacent. Estimated by visual observation on site.

Calculation data: Data is in horizontal footcandles (as if measured with a meter lying on the ground, aimed up), per the Zoning Ordinance.

Reflectances: Reflectances of buildings and ground surfaces included per industry standard reflectances.

Interflectances: Calculations include only direct illumination of the target grid points, cosine corrected for angle of incidence, and do not include interreflected light from building surfaces.

Data Grids: 10' x 10' spacing.

Interstitial light levels: Note that measurements taken at other locations than the grid points shown may vary from those of the surrounding grid points.

Data rounding: Note that, as is common for all calculation programs, data rounding occurs. Thus, data calculated at 0.001 to 0.005 will round down to 0.00, while 0.006 to 0.009 will round up to 0.01. And 0.011 through 0.015 will round down to 0.01, while 0.016 through 0.019 will round up to 0.02.

All notes above apply to the current models.

Grid alignment: Note data grid points in this model do not exactly correspond to permit set grids due to orientation of grids, precluding data point to data point comparisons. But comparison of maximum, minimum and average values remains possible and appropriate.

Fixture status: Where noted, some fixtures have been turned off, and/or the aiming of fixtures may have changed, and/or custom shields may have been included in the model to minimize overspill.

Photometry: AGI32 uses "far field photometry" which means that it does not allow modelling of additional custom shielding added to the fixtures, where no IES file is available. We have modelled custom shields where called out using simulated shields at an appropriate distance from the fixture(s) to enable AGI32 to reasonably accurately calculate the impact of custom shielding.

Fixture output: All fixtures are, unless otherwise noted, calculated with an industry standard Light Loss Factor (LLF) of 90%. This means that initial installation values at data points will be 10% higher than the model reports. The same value for LLF was carried in the 5-16-22 Calculations submitted for permit. Where fixtures are dimmed in a specified rev of the model, a lower LLF is used to indicate the level dimmed to.

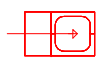
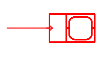
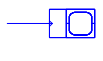
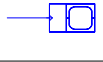






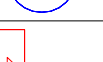
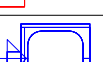







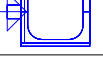


Site visit check measurements: If site visit check measurements are required, the installation must be complete and programmed for light output percentages as noted in the model, and there must be no snow on the ground, and ideally, no moon in the sky. Note that field measurements will include interreflected components from building surfaces and will therefore be higher than calculated values.

The scope of services for this project for Ripman Lighting Consultants and Drafting & Photometric Consulting, LLC, our sub-contractor, is limited to running calculations of designs provided by others. We are providing data only. Neither Ripman Lighting Consultants nor Drafting & Photometric Consulting are making recommendations or approving or disapproving designs by others and we accept no liability for the implementation or modification of designs by others. For evaluation, these data calculations should be reviewed and commented on and the designs calculated, modified if required, by Tetra-Tech, the town's consultant, for conformance with the state building code and recognized standards of good practice.

SITE AVERAGE HFC = 1.22 FC
DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.2A-V5
ALL EGRESS FIXTURES TURNED "ON" = 90%
ALL NON-EGRESS FIXTURES TURNED "OFF" = 0%

LIGHTING PARAMETERS:

Luminaire Schedule									
Symbol	Qty	Label	Arrangement	LLF	Description	Arr. Watts	Arr. Lum. Lumens	Mounting Height	Manufacturer
	7	A2-P2D	Single	0.900	DSX0 LED P1 30K 70CRI BLC3 MVOLT	33.21	3343	14	Lithonia Lighting
	1	A2-P2D-75	Single	0.900	DSX0 LED P1 30K 70CRI BLC3 MVOLT	33.21	3343	14	Lithonia Lighting
	1	A3-P2D	Single	0.900	DSX0 LED P1 30K 70CRI RCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A3-P2D-75	Single	0.900	DSX0 LED P1 30K 70CRI RCCO MVOLT	33.21	3375	14	Lithonia Lighting
	2	A4-P2D	Single	0.900	DSX0 LED P1 30K 70CRI LCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A4-P2D-75	Single	0.900	DSX0 LED P1 30K 70CRI LCCO MVOLT	33.21	3375	14	Lithonia Lighting
	5	AD	Single	0.900	RADPT P4 30K ASY HS	85.678	9439	14	Lithonia Lighting
	2	AD-50	Single	0.900	RADPT P4 30K ASY HS	85.678	9439	14	Lithonia Lighting
	2	B-P2D	Single	0.900	RADPT P3 30K ASY HS	53.618	5939	14	Lithonia Lighting
	1	B-P2D-50	Single	0.900	RADPT P3 30K ASY HS	53.618	5939	14	Lithonia Lighting
	3	BD	Single	0.900	RADPT P4 30K PATH HS	85.678	7877	14	Lithonia Lighting
	10	D	Single	0.900	WDGE1 LED P2 30K 80CRI VW	15.018	1876	10, 12	Lithonia Lighting
	26	D-P2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	6.83	NLS Lighting
	1	E-P2D	Single	0.900	RADPT P4 30K SYM HS	85.678	9889	14	Lithonia Lighting
	1	E-P2D-50	Single	0.900	RADPT P4 30K SYM HS	85.678	9889	14	Lithonia Lighting
	13	G1	Single	0.900	7162-GY-C13-27K-BBI	13	1131	10	Brownlee Lighting Inc
	15	G2D	Single	0.900	HC850D010-HM82555827-81WDC	48	5828	10	COOPER LIGHTING SOLUTIONS - HALO COMMERCIAL (FORMERLY EATON)
	4	H1	Single	0.900	7325-BL-C17-27K	16.21	970	6.5	Brownlee Lighting
	6	H2	Single	0.900	S5077W.14	3.5	37	8, 10	Simes S.p.A.
	8	I2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	5, 10	NLS Lighting
	10	ID	Single	0.900	TWA-T4-16L-175-30K7	10	1212	10	NLS Lighting
	2	N	Single	0.900	CLX L48 4000LM SEF FDL MVOLT 40K 80CRI	25.543	3956	10	Lithonia Lighting

THIS SCHEDULE IS A PRODUCT OF AGI32 AND LISTS TECHNICAL DATA FOR ALL FIXTURES ON THE SITE, REGARDLESS OF WHETHER THEY ARE ON OR OFF. FOR STATUS "ON", "OFF", SEE PLANS (PART OF FIXTURE TAGS).

Calculation Summary									
Label	Units	Avg	Max	Min	Avg/Min	Max/Min	PtSpclr	PtSpctb	Grid Z
Other Site Horizontal	Fc	0.50	58.90	0.00	N.A.	N.A.	10	10	0
Parking Horizontal	Fc	1.34	58.90	0.00	N.A.	N.A.	10	10	0
Pedestrian Horizontal	Fc	2.52	65.94	0.00	N.A.	N.A.	10	10	0
Road Horizontal	Fc	1.02	58.90	0.00	N.A.	N.A.	10	10	0
Overall Site Average	Fc	1.22	65.9	0.0	N.A.	N.A.			

SITE AVERAGE HFC = 1.22 FC
DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.2A-V5
ALL EGRESS FIXTURES TURNED "ON" = 90%
ALL NON-EGRESS FIXTURES TURNED "OFF" = 0%

Drawn By: JS

Date:2/26/2024

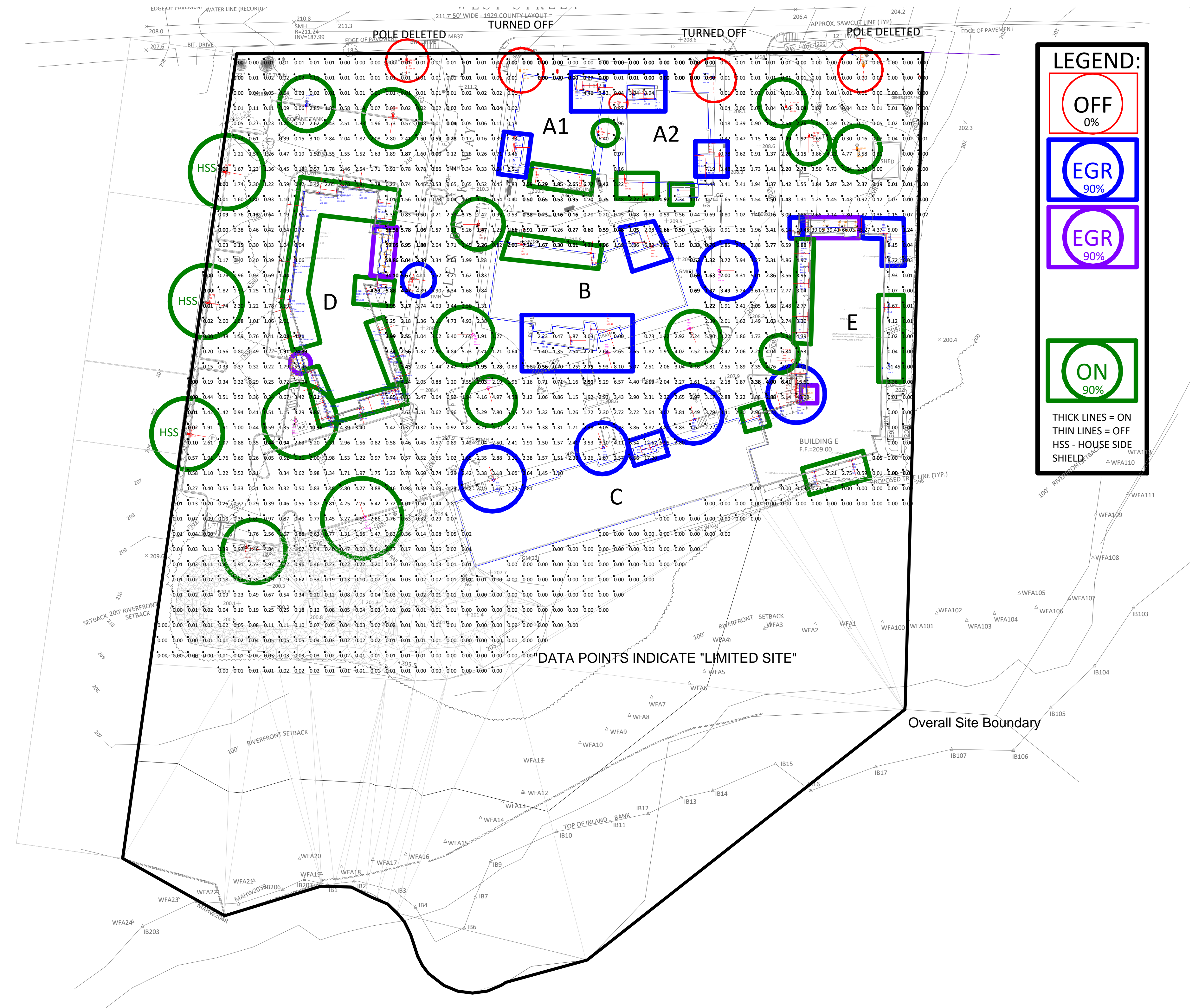
Rev: 26.2A-V5

Page 2 of 2

MEDWAY PHOTOMETRICS 26.3A-V5

- NORMAL (PRE-CURFEW) CONDITION: 11PM TO DAWN
- ALL FIXTURES ON, BOTH NON-EGRESS AND EGRESS.
- AVERAGE VALUE CALCULATED HORIZONTAL FOOTCANDLES FOR LIMITED SITE: 2.14 FC.

NORMAL (PRE-CURFEW) CONDITION: 11PM TO DAWN
ALL FIXTURES ON, BOTH NON-EGRESS AND EGRESS.
AVERAGE VALUE CALCULATED HORIZONTAL FOOTCANDLES FOR LIMITED SITE: 2.14 FC.



Scale: 1 inch= 40 Ft.
GRIDS ARE 10'X10' TYP.

Notes on Calculations:

Reflectance : Walls - 0.5 (Unless Otherwise Noted)
Building E - Exterior Walls - 0.25
FIXTURE LLF As Noted Below on Page 2

All site lighting fixtures including both non-egress (conforming to the zoning ordinance requirements for curfew lighting) and egress lighting fixtures (conforming to requirements of the State Building Code) included in this calculation for purposes of confirmation of overall lighting data points for proposed lighting.

Software used: Calculations run using AGI32, industry standard software (Version 21.1.77).

IES files: Industry standard IES files, provided by others, were downloaded and incorporated into the model, for all fixtures modelled, including where so specified, and available as an IES file, house side shielding provided by the fixture manufacturer where so noted "HSS".

Topography: Previous permit model treated the site and adjacent properties as flat. The current model treats the site and the areas to the north of the site (towards West Street) as flat, but incorporates estimated topography for the east and west properties adjacent. Estimated by visual observation on site.

Calculation data: Data is in horizontal footcandles (as if measured with a meter lying on the ground, aimed up), per the Zoning Ordinance.

Reflectances: Reflectances of buildings and ground surfaces included per industry standard reflectances.

Interflectances: Calculations include only direct illumination of the target grid points, cosine corrected for angle of incidence, and do not include interreflected light from building surfaces.

Data Grids: 10' x 10' spacing.

Interstitial light levels: Note that measurements taken at other locations than the grid points shown may vary from those of the surrounding grid points.

Data rounding: Note that, as is common for all calculation programs, data rounding occurs. Thus, data calculated at 0.001 to 0.005 will round down to 0.00, while 0.006 to 0.009 will round up to 0.01. And 0.011 through 0.015 will round down to 0.01, while 0.016 through 0.019 will round up to 0.02.

All notes above apply to the current models.

Grid alignment: Note data grid points in this model do not exactly correspond to permit set grids due to orientation of grids, precluding data point to data point comparisons. But comparison of maximum, minimum and average values remains possible and appropriate.

Fixture status: Where noted, some fixtures have been turned off, and/or the aiming of fixtures may have changed, and/or custom shields may have been included in the model to minimize overspill.

Photometry: AGI32 uses "far field photometry" which means that it does not allow modelling of additional custom shielding added to the fixtures, where no IES file is available. We have modelled custom shields where called out using simulated shields at an appropriate distance from the fixture(s) to enable AGI32 to reasonably accurately calculate the impact of custom shielding.

Fixture output: All fixtures are, unless otherwise noted, calculated with an industry standard Light Loss Factor (LLF) of 90%. This means that initial installation values at data points will be 10% higher than the model reports. The same value for LLF was carried in the 5-16-22 Calculations submitted for permit. Where fixtures are dimmed in a specified rev of the model, a lower LLF is used to indicate the level dimmed to.

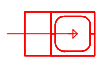
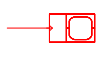
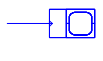
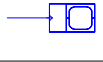






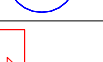
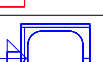







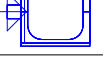


Site visit check measurements: If site visit check measurements are required, the installation must be complete and programmed for light output percentages as noted in the model, and there must be no snow on the ground, and ideally, no moon in the sky. Note that field measurements will include interreflected components from building surfaces and will therefore be higher than calculated values.

The scope of services for this project for Ripman Lighting Consultants and Drafting & Photometric Consulting, LLC, our sub-contractor, is limited to running calculations of designs provided by others. We are providing data only. Neither Ripman Lighting Consultants nor Drafting & Photometric Consulting are making recommendations or approving or disapproving designs by others and we accept no liability for the implementation or modification of designs by others. For evaluation, these data calculations should be reviewed and commented on and the designs calculated, modified if required, by Tetra-Tech, the town's consultant, for conformance with the state building code and recognized standards of good practice.

SITE AVERAGE HFC = 2.14 FC
DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.3A-V5
ALL FIXTURES TURNED "ON" = 90%

LIGHTING PARAMETERS:

Luminaire Schedule									
Symbol	Qty	Label	Arrangement	LLF	Description	Arr. Watts	Arr. Lum. Lumens	Mounting Height	Manufacturer
	7	A2-P2D	Single	0.900	DSX0 LED P1 30K 70CRI BLC3 MVOLT	33.21	3343	14	Lithonia Lighting
	1	A2-P2D-75	Single	0.900	DSX0 LED P1 30K 70CRI BLC3 MVOLT	33.21	3343	14	Lithonia Lighting
	1	A3-P2D	Single	0.900	DSX0 LED P1 30K 70CRI RCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A3-P2D-75	Single	0.900	DSX0 LED P1 30K 70CRI RCCO MVOLT	33.21	3375	14	Lithonia Lighting
	2	A4-P2D	Single	0.900	DSX0 LED P1 30K 70CRI LCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A4-P2D-75	Single	0.900	DSX0 LED P1 30K 70CRI LCCO MVOLT	33.21	3375	14	Lithonia Lighting
	5	AD	Single	0.900	RADPT P4 30K ASY HS	85.678	9439	14	Lithonia Lighting
	2	AD-50	Single	0.900	RADPT P4 30K ASY HS	85.678	9439	14	Lithonia Lighting
	2	B-P2D	Single	0.900	RADPT P3 30K ASY HS	53.618	5939	14	Lithonia Lighting
	1	B-P2D-50	Single	0.900	RADPT P3 30K ASY HS	53.618	5939	14	Lithonia Lighting
	3	BD	Single	0.900	RADPT P4 30K PATH HS	85.678	7877	14	Lithonia Lighting
	10	D	Single	0.900	WDGE1 LED P2 30K 80CRI VW	15.018	1876	10, 12	Lithonia Lighting
	26	D-P2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	6.83	NLS Lighting
	1	E-P2D	Single	0.900	RADPT P4 30K SYM HS	85.678	9889	14	Lithonia Lighting
	1	E-P2D-50	Single	0.900	RADPT P4 30K SYM HS	85.678	9889	14	Lithonia Lighting
	13	G1	Single	0.900	7162-GY-C13-27K-BBI	13	1131	10	Brownlee Lighting Inc
	15	G2D	Single	0.900	HC850D010-HM82555827-81WDC	48	5828	10	COOPER LIGHTING SOLUTIONS - HALO COMMERCIAL (FORMERLY EATON)
	4	H1	Single	0.900	7325-BL-C17-27K	16.21	970	6.5	Brownlee Lighting
	6	H2	Single	0.900	S5077W.14	3.5	37	8, 10	Simes S.p.A.
	8	I2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	5, 10	NLS Lighting
	10	ID	Single	0.900	TWA-T4-16L-175-30K7	10	1212	10	NLS Lighting
	2	N	Single	0.900	CLX L48 4000LM SEF FDL MVOLT 40K 80CRI	25.543	3956	10	Lithonia Lighting

THIS SCHEDULE IS A PRODUCT OF AGI32 AND LISTS TECHNICAL DATA FOR ALL FIXTURES ON THE SITE, REGARDLESS OF WHETHER THEY ARE ON OR OFF. FOR STATUS "ON", "OFF", SEE PLANS (PART OF FIXTURE TAGS).

Calculation Summary									
Label	Units	Avg	Max	Min	Avg/Min	Max/Min	PtSpclr	PtSpctb	Grid Z
Other Site Horizontal	Fc	0.97	59.05	0.00	N.A.	N.A.	10	10	0
Parking Horizontal	Fc	2.51	59.05	0.00	N.A.	N.A.	10	10	0
Pedestrian Horizontal	Fc	3.68	66.03	0.00	N.A.	N.A.	10	10	0
Road Horizontal	Fc	2.05	59.05	0.00	N.A.	N.A.	10	10	0
Overall Site Average	Fc	2.14	66.0	0.0	N.A.	N.A.			

SITE AVERAGE HFC = 2.14 FC
DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.3A-V5
ALL FIXTURES TURNED "ON" = 90%

Drawn By: JS

Date:2/26/2024

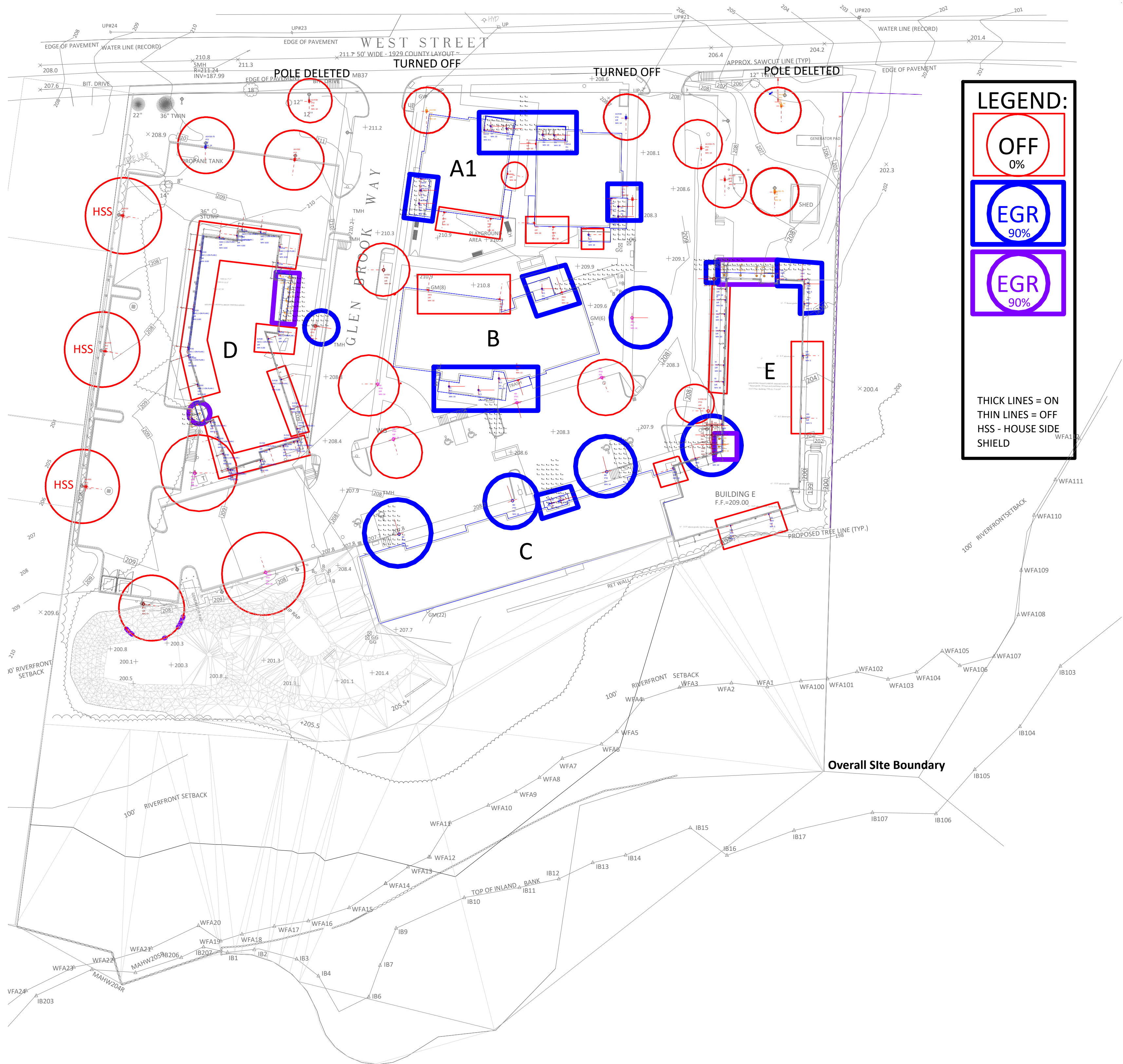
Rev: 26.3A-V5

Page 2 of 2

MEDWAY PHOTOMETRICS 26.4A-V5

- NORMAL (PRE-CURFEW) CONDITION - DUSK TO 11PM
- EGRESS FIXTURES ONLY
- REQUIRED BY MSBC: 1.0 FC HOR AVG, 0.1 FC HOR MIN, 40:1 MAX/MIN MAX
- CONFORMS TO MASS. STATE BLDG CODE 9TH EDITION AND NFPA101.

NORMAL (PRE-CURFEW) CONDITION - DUSK TO 11PM
EGRESS FIXTURES ONLY
REQUIRED BY MSBC: 1.0 FC HOR AVG, 0.1 FC HOR MIN, 40:1 MAX/MIN MAX
CONFORMS TO MASS. STATE BLDG CODE 9TH EDITION AND NFPA101.



Scale: 1 inch= 40 Ft.
GRIDS ARE 3'X3' TYP.
ONLY EGRESS LIGHTING INCLUDED

Notes on Calculations:

Reflectance : Walls - 0.5 (Unless Otherwise Noted)
Building E - Exterior Walls - 0.25
FIXTURE LLF As Noted Below on Page 2

Fixtures in this calculation include only those contributing to Egress Lighting.

Software used: Calculations run using AGI32, industry standard software (Version 21.1.77).

IES files: Industry standard IES files, provided by others, were downloaded and incorporated into the model, for all fixtures modelled, including where so specified, and available as an IES file, house side shielding provided by the fixture manufacturer where so noted "HSS".

Topography: Previous permit model treated the site and adjacent properties as flat. The current model treats the site and the areas to the north of the site (towards West Street) as flat, but incorporates estimated topography for the east and west properties adjacent. Estimated by visual observation on site.

Calculation data: Data is in horizontal footcandles (as if measured with a meter lying on the ground, aimed up), per the Zoning Ordinance.

Reflectances: Reflectances of buildings and ground surfaces included per industry standard reflectances.

Interflectances: Calculations include only direct illumination of the target grid points, cosine corrected for angle of incidence, and do not include interflected light from building surfaces.

Data Grids: 3' x 3' spacing.

Interstitial light levels: Note that measurements taken at other locations than the grid points shown may vary from those of the surrounding grid points.

Data rounding: Note that, as is common for all calculation programs, data rounding occurs. Thus, data calculated at 0.001 to 0.005 will round down to 0.00, while 0.006 to 0.009 will round up to 0.01. And 0.011 through 0.015 will round down to 0.01, while 0.016 through 0.019 will round up to 0.02.

All notes above apply to the current models.

Grid alignment: Note data grid points in this model do not exactly correspond to permit set grids due to orientation of grids, precluding data point to data point comparisons. But comparison of maximum, minimum and average values remains possible and appropriate.

Fixture status: Where noted, some fixtures have been turned off, and/or the aiming of fixtures may have changed, and/or custom shields may have been included in the model to minimize overspill.

Photometry: AGI32 uses "far field photometry" which means that it does not allow modelling of additional custom shielding added to the fixtures, where no IES file is available. We have modelled custom shields where called out using simulated shields at an appropriate distance from the fixture(s) to enable AGI32 to reasonably accurately calculate the impact of custom shielding.

Fixture output: All fixtures are, unless otherwise noted, calculated with an industry standard Light Loss Factor (LLF) of 90%. This means that initial installation values at data points will be 10% higher than the model reports. The same value for LLF was carried in the 5-16-22 Calculations submitted for permit. Where fixtures are dimmed in a specified rev of the model, a lower LLF is used to indicate the level dimmed to.

Site visit check measurements: If site visit check measurements are required, the installation must be complete and programmed for light output percentages as noted in the model, and there must be no snow on the ground, and ideally, no moon in the sky. Note that field measurements will include interflected components from building surfaces and will therefore be higher than calculated values.

The scope of services for this project for Ripman Lighting Consultants and Drafting & Photometric Consulting, LLC, our sub-contractor, is limited to running calculations of designs provided by others. We are providing data only. Neither Ripman Lighting Consultants nor Drafting & Photometric Consulting are making recommendations or approving or disapproving designs by others and we accept no liability for the implementation or modification of designs by others. For evaluation, these data calculations should be reviewed and commented on and the designs calculated, modified if required, by Tetra-Tech, the town's consultant, for conformance with the state building code and recognized standards of good practice.

DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.4A - V5
ALL EGRESS FIXTURES TURNED "ON" = 90%
ALL NON-EGRESS FIXTURES TURNED "OFF" = 0%























Drawn By: JS

Date:2/26/2024

Rev: 26.4A-V5

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LIGHTING PARAMETERS:

Luminaire Schedule									
Symbol	Qty	Label	Arrangement	LLF	Description	Arr. Watts	Arr. Lum. Lumens	Mounting Height	Manufacturer
	7	A2-P2D	Single	0.100	DSX0 LED P1 30K 70CRI BLC3 MVOLT (DIMMED TO 10%)	33.21	3343	14	Lithonia Lighting
	1	A2-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI BLC3 MVOLT (DIMMED TO 10%)	33.21	3343	14	Lithonia Lighting
	1	A3-P2D	Single	0.900	DSX0 LED P1 30K 70CRI RCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A3-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI RCCO MVOLT (DIMMED 10%)	33.21	3375	14	Lithonia Lighting
	2	A4-P2D	Single	0.900	DSX0 LED P1 30K 70CRI LCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A4-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI LCCO MVOLT (DIMMED TO 10%)	33.21	3375	14	Lithonia Lighting
	5	AD	Single	0.900	RADPT P4 30K ASY HS	85.678	9439	14	Lithonia Lighting
	2	AD-50	Single	0.100	RADPT P4 30K ASY HS (DIMMED TO 10%)	85.678	9439	14	Lithonia Lighting
	2	B-P2D	Single	0.900	RADPT P3 30K ASY HS	53.618	5939	14	Lithonia Lighting
	1	B-P2D-50	Single	0.100	RADPT P3 30K ASY HS (DIMMED TO 10%)	53.618	5939	14	Lithonia Lighting
	3	BD	Single	0.900	RADPT P4 30K PATH HS	85.678	7877	14	Lithonia Lighting
	10	D	Single	0.900	WDGE1 LED P2 30K 80CRI VW	15.018	1876	10, 12	Lithonia Lighting
	26	D-P2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	6.83	NLS Lighting
	1	E-P2D	Single	0.900	RADPT P4 30K SYM HS	85.678	9889	14	Lithonia Lighting
	1	E-P2D-50	Single	0.100	RADPT P4 30K SYM HS (DIMMED TO 10%)	85.678	9889	14	Lithonia Lighting
	13	G1	Single	0.900	7162-GY-C13-27K-BBI	13	1131	10	Brownlee Lighting Inc
	15	G2D	Single	0.900	HC850D010-HM82555827-81WDC	48	5828	10	COOPER LIGHTING SOLUTIONS - HALO COMMERCIAL (FORMERLY EATON)
	4	H1	Single	0.900	7325-BL-C17-27K	16.21	970	6.5	Brownlee Lighting
	6	H2	Single	0.900	S5077W.14	3.5	37	8, 10	Simes S.p.A.
	8	I2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	5, 10	NLS Lighting
	10	ID	Single	0.900	TWA-T4-16L-175-30K7	10	1212	10	NLS Lighting
	2	N	Single	0.900	CLX L48 4000LM SEF FDL MVOLT 40K 80CRI	25.543	3956	10	Lithonia Lighting

THIS SCHEDULE IS A PRODUCT OF AGI32 AND LISTS TECHNICAL DATA FOR ALL FIXTURES ON THE SITE, REGARDLESS OF WHETHER THEY ARE ON OR OFF. FOR STATUS "ON", "OFF", SEE PLANS (PART OF FIXTURE TAGS).

Calculation Summary									
Label	Units	Avg	Max	Min	Avg/Min	Max/Min	PtSpclr	PtSpctb	Grid Z
Building A1 & A2 North	Fc	3.04	5.13	0.24	12.67	21.38	3	3	0
Building A1 South	Fc	2.83	4.90	0.52	5.44	9.42	3	3	0
Building A2 South	Fc	2.70	5.84	0.53	5.09	11.02	3	3	0
Building B Northeast	Fc	1.94	7.62	0.23	8.43	33.13	3	3	0
Building B South	Fc	2.79	4.70	1.83	1.52	2.57	3	3	0
Building C North Center	Fc	8.46	23.44	2.46	3.44	9.53	3	3	0
Building C Northeast	Fc	2.71	3.47	1.81	1.50	1.92	3	3	0
Building C Northwest	Fc	2.37	3.35	0.99	2.39	3.38	3	3	0
Building D Northeast	Fc	22.28	73.82	1.91	11.66	38.65	3	3	0
Building D West	Fc	27.59	75.36	2.51	10.99	30.02	3	3	0
Building E North	Fc	12.54	53.27	1.74	7.21	30.61	3	3	0
Building E West	Fc	3.39	14.70	1.01	3.36	14.55	3	3	1

DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.4A - V5
ALL EGRESS FIXTURES TURNED "ON" = 90%
ALL NON-EGRESS FIXTURES TURNED "OFF" = 0%

Drawn By: JS

Date:2/26/2024

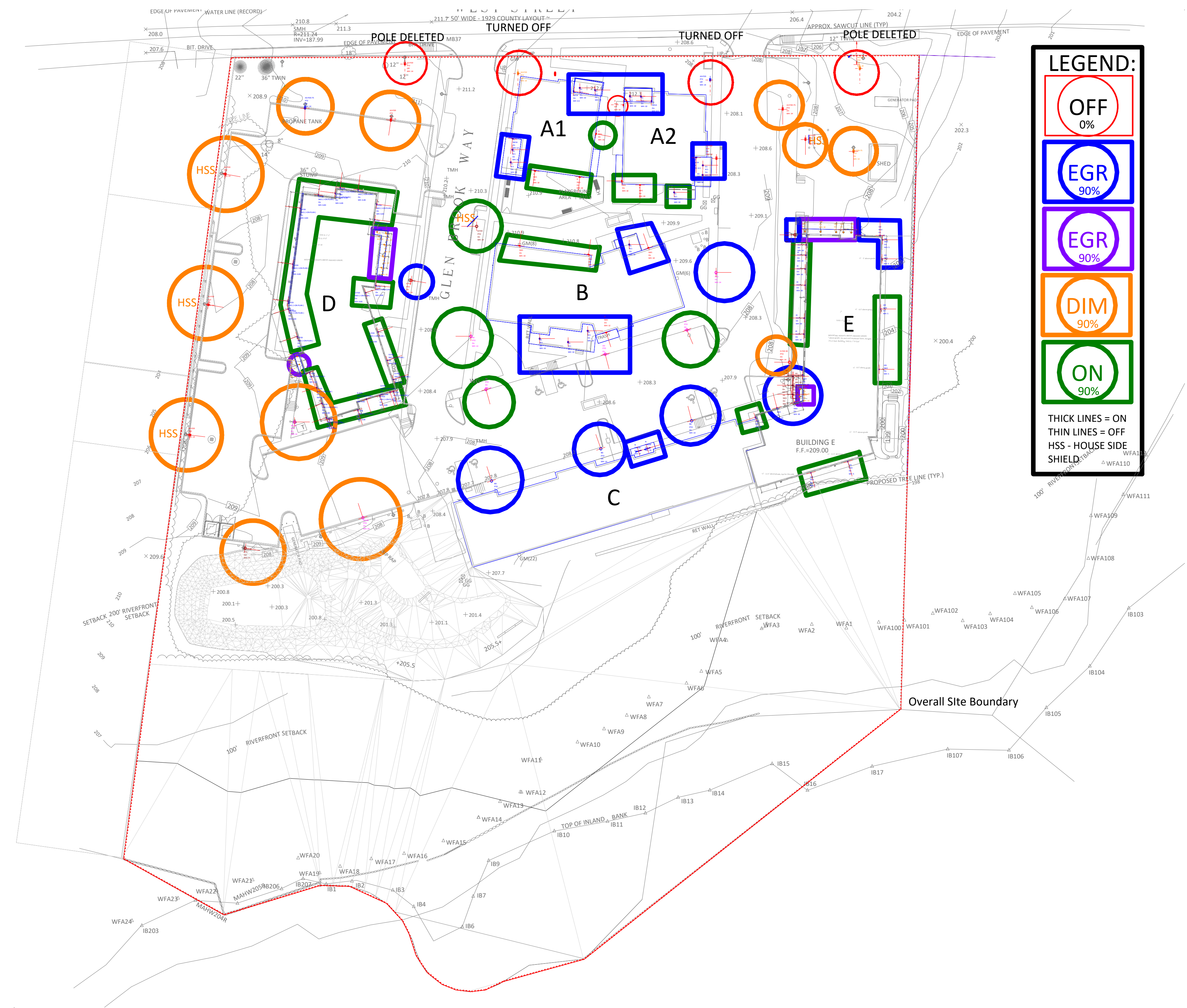
Rev: 26.4A-V5

Page 2 of 2

MEDWAY PHOTOMETRICS 26.5A-V5

- NORMAL (PRE-CURFEW) CONDITION: DUSK TO 11PM
- ALL FIXTURES ON = 90%.
- VERTICAL FC MAXIMUM ALLOWED AT SITE BOUNDARY (20' VERTICAL GRID) : 0.0
- VERTICAL FC MAXIMUM CALCULATED AT SITE BOUNDARY : 0.0

NORMAL (PRE-CURFEW) CONDITION: DUSK TO 11PM
ALL FIXTURES ON = 90%.
VERTICAL FC MAXIMUM ALLOWED AT SITE BOUNDARY (20' VERTICAL GRID) : 0.0
VERTICAL FC MAXIMUM CALCULATED AT SITE BOUNDARY : 0.0



Scale: 1 inch= 40 Ft.
VERTICAL GRIDS ARE 2'X2' TYP.

Notes on Calculations:

Reflectance : Walls - 0.5 (Unless Otherwise Noted)
Building E - Exterior Walls - 0.25
FIXTURE LLF As Noted Below on Page 2

All site lighting fixtures including both non-egress (conforming to the zoning ordinance requirements for curfew lighting) and egress lighting fixtures (conforming to requirements of the State Building Code) included in this calculation.

Software used: Calculations run using AGI32, industry standard software (Version 21.1.77).

IES files: Industry standard IES files, provided by others, were downloaded and incorporated into the model, for all fixtures modelled, including where so specified, and available as an IES file, house side shielding provided by the fixture manufacturer where so noted "HSS".

Topography: Previous permit model treated the site and adjacent properties as flat. The current model treats the site and the areas to the north of the site (towards West Street) as flat, but incorporates estimated topography for the east and west properties adjacent. Estimated by visual observation on site.

Calculation data: Data is in horizontal footcandles (as if measured with a meter lying on the ground, aimed up), per the Zoning Ordinance.

Reflectances: Reflectances of buildings and ground surfaces included per industry standard reflectances.

Interflectances: Calculations include only direct illumination of the target grid points, cosine corrected for angle of incidence, and do not include interreflected light from building surfaces.

Data Grids: 2' x 2' spacing.

Interstitial light levels: Note that measurements taken at other locations than the grid points shown may vary from those of the surrounding grid points.

Data rounding: Note that, as is common for all calculation programs, data rounding occurs. Thus, data calculated at 0.001 to 0.005 will round down to 0.00, while 0.006 to 0.009 will round up to 0.01. And 0.011 through 0.015 will round down to 0.01, while 0.016 through 0.019 will round up to 0.02.

All notes above apply to the current models.

Grid alignment: Note data grid points in this model do not exactly correspond to permit set grids due to orientation of grids, precluding data point to data point comparisons. But comparison of maximum, minimum and average values remains possible and appropriate.

Fixture status: Where noted, some fixtures have been turned off, and/or the aiming of fixtures may have changed, and/or custom shields may have been included in the model to minimize overspill.

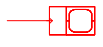
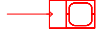
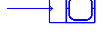




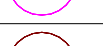










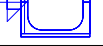
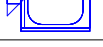


Photometry: AGI32 uses "far field photometry" which means that it does not allow modelling of additional custom shielding added to the fixtures, where no IES file is available. We have modelled custom shields where called out using simulated shields at an appropriate distance from the fixture(s) to enable AGI32 to reasonably accurately calculate the impact of custom shielding.

Fixture output: All fixtures are, unless otherwise noted, calculated with an industry standard Light Loss Factor (LLF) of 90%. This means that initial installation values at data points will be 10% higher than the model reports. The same value for LLF was carried in the 5-16-22 Calculations submitted for permit. Where fixtures are dimmed in a specified rev of the model, a lower LLF is used to indicate the level dimmed to.

Site visit check measurements: If site visit check measurements are required, the installation must be complete and programmed for light output percentages as noted in the model, and there must be no snow on the ground, and ideally, no moon in the sky. Note that field measurements will include interreflected components from building surfaces and will therefore be higher than calculated values.

The scope of services for this project for Ripman Lighting Consultants and Drafting & Photometric Consulting, LLC, our sub-contractor, is limited to running calculations of designs provided by others. We are providing data only. Neither Ripman Lighting Consultants nor Drafting & Photometric Consulting are making recommendations or approving or disapproving designs by others and we accept no liability for the implementation or modification of designs by others. For evaluation, these data calculations should be reviewed and commented on and the designs calculated, modified if required, by Tetra-Tech, the town's consultant, for conformance with the state building code and recognized standards of good practice.

LIGHTING PARAMETERS:

Luminaire Schedule									
Symbol	Qty	Label	Arrangement	LLF	Description	Arr. Watts	Arr. Lum. Lumens	Mounting Height	Manufacturer
	7	A2-P2D	Single	0.900	DSX0 LED P1 30K 70CRI BLC3 MVOLT	33.21	3343	14	Lithonia Lighting
	1	A2-P2D-75	Single	0.900	DSX0 LED P1 30K 70CRI BLC3 MVOLT	33.21	3343	14	Lithonia Lighting
	1	A3-P2D	Single	0.900	DSX0 LED P1 30K 70CRI RCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A3-P2D-75	Single	0.900	DSX0 LED P1 30K 70CRI RCCO MVOLT	33.21	3375	14	Lithonia Lighting
	2	A4-P2D	Single	0.900	DSX0 LED P1 30K 70CRI LCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A4-P2D-75	Single	0.900	DSX0 LED P1 30K 70CRI LCCO MVOLT	33.21	3375	14	Lithonia Lighting
	5	AD	Single	0.900	RADPT P4 30K ASY HS	85.678	9439	14	Lithonia Lighting
	2	AD-50	Single	0.900	RADPT P4 30K ASY HS	85.678	9439	14	Lithonia Lighting
	2	B-P2D	Single	0.900	RADPT P3 30K ASY HS	53.618	5939	14	Lithonia Lighting
	1	B-P2D-50	Single	0.900	RADPT P3 30K ASY HS	53.618	5939	14	Lithonia Lighting
	3	BD	Single	0.900	RADPT P4 30K PATH HS	85.678	7877	14	Lithonia Lighting
	10	D	Single	0.900	WDGE1 LED P2 30K 80CRI VW	15.018	1876	10, 12	Lithonia Lighting
	26	D-P2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	6.83	NLS Lighting
	1	E-P2D	Single	0.900	RADPT P4 30K SYM HS	85.678	9889	14	Lithonia Lighting
	1	E-P2D-50	Single	0.900	RADPT P4 30K SYM HS	85.678	9889	14	Lithonia Lighting
	13	G1	Single	0.900	7162-GY-C13-27K-BBI	13	1131	10	Brownlee Lighting Inc
	15	G2D	Single	0.900	HC850D010-HM82555827-81WDC	48	5828	10	COOPER LIGHTING SOLUTIONS - HALO COMMERCIAL (FORMERLY EATON)
	4	H1	Single	0.900	7325-BL-C17-27K	16.21	970	6.5	Brownlee Lighting
	6	H2	Single	0.900	S5077W.14	3.5	37	8, 10	Simes S.p.A.
	8	I2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	5, 10	NLS Lighting
	10	ID	Single	0.900	TWA-T4-16L-175-30K7	10	1212	10	NLS Lighting
	2	N	Single	0.900	CLX L48 4000LM SEF FDL MVOLT 40K 80CRI	25.543	3956	10	Lithonia Lighting

THIS SCHEDULE IS A PRODUCT OF AGI32 AND LISTS TECHNICAL DATA FOR ALL FIXTURES ON THE SITE, REGARDLESS OF WHETHER THEY ARE ON OR OFF. FOR STATUS "ON", "OFF", SEE PLANS (PART OF FIXTURE TAGS).

Calculation Summary									
Label	Units	Avg	Max	Min	Avg/Min	Max/Min	PtSpclR	PtSpcTb	Grid Z
Vertical - East_III_Seg1	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - North_III_Seg1	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg1	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg10	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg11	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg12	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg13	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg14	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg15	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg2	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg3	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg4	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg5	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg6	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg7	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg8	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg9	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - West_III_Seg1	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.

DIRECT ONLY

VERTICAL CALCULATIONS

NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.5A-V5

NORMAL CONDITIONS

VERTICAL FC CALCULATIONS AT PROPERTY BOUNDARY

ALL FIXTURES TURNED "ON" = 90%

Drawn By: JS

Date:2/26/2024

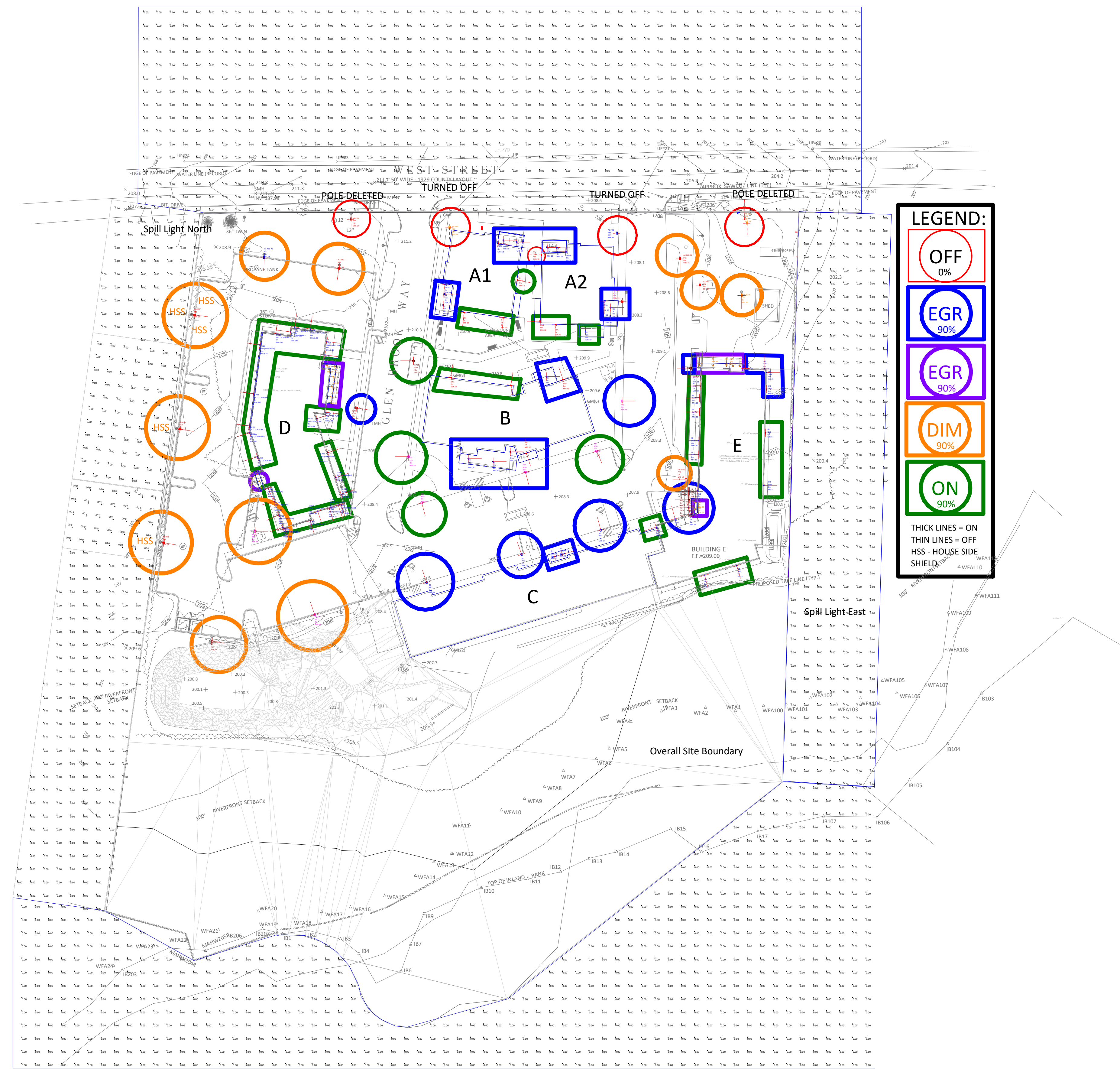
Rev: 26.5A-V5

Page 2 of 2

MEDWAY PHOTOMETRICS 26.6A-V5

- NORMAL CONDITION : DUSK TO 11PM
- ALL FIXTURES ON = 90%.
- OFFSITE HORIZONTAL MAXIMUM FC ALLOWED AT GRADE = 0.00
- OFFSITE HORIZONTAL MAXIMUM FC CALCULATED AT GRADE = 0.00

NORMAL CONDITION : DUSK TO 11PM
ALL FIXTURES ON = 90%.
OFFSITE HORIZONTAL MAXIMUM FC ALLOWED AT GRADE = 0.00
OFFSITE HORIZONTAL MAXIMUM FC CALCULATED AT GRADE = 0.00



Scale: 1 inch= 44 Ft.
VERTICAL GRIDS ARE 10'X10' TYP.

Notes on Calculations:

Reflectance : Walls - 0.5 (Unless Otherwise Noted)
Building E - Exterior Walls - 0.25
FIXTURE LLF As Noted Below on Page 2

All site lighting fixtures including both non-egress (conforming to the zoning ordinance requirements for curfew lighting) and egress lighting fixtures (conforming to requirements of the State Building Code) included in this calculation.

Software used: Calculations run using AGI32, industry standard software (Version 21.1.77).

IES files: Industry standard IES files, provided by others, were downloaded and incorporated into the model, for all fixtures modelled, including where so specified, and available as an IES file, house side shielding provided by the fixture manufacturer where so noted "HSS".

Topography: Previous permit model treated the site and adjacent properties as flat. The current model treats the site and the areas to the north of the site (towards West Street) as flat, but incorporates estimated topography for the east and west properties adjacent. Estimated by visual observation on site.

Calculation data: Data is in horizontal footcandles (as if measured with a meter lying on the ground, aimed up), per the Zoning Ordinance.

Reflectances: Reflectances of buildings and ground surfaces included per industry standard reflectances.

Interflectances: Calculations include only direct illumination of the target grid points, cosine corrected for angle of incidence, and do not include interreflected light from building surfaces.

Data Grids: 10' x 10' spacing.

Interstitial light levels: Note that measurements taken at other locations than the grid points shown may vary from those of the surrounding grid points.

Data rounding: Note that, as is common for all calculation programs, data rounding occurs. Thus, data calculated at 0.001 to 0.005 will round down to 0.00, while 0.006 to 0.009 will round up to 0.01. And 0.011 through 0.015 will round down to 0.01, while 0.016 through 0.019 will round up to 0.02.

All notes above apply to the current models.

Grid alignment: Note data grid points in this model do not exactly correspond to permit set grids due to orientation of grids, precluding data point to data point comparisons. But comparison of maximum, minimum and average values remains possible and appropriate.

Fixture status: Where noted, some fixtures have been turned off, and/or the aiming of fixtures may have changed, and/or custom shields may have been included in the model to minimize overspill.

Photometry: AGI32 uses "far field photometry" which means that it does not allow modelling of additional custom shielding added to the fixtures, where no IES file is available. We have modelled custom shields where called out using simulated shields at an appropriate distance from the fixture(s) to enable AGI32 to reasonably accurately calculate the impact of custom shielding.

Fixture output: All fixtures are, unless otherwise noted, calculated with an industry standard Light Loss Factor (LLF) of 90%. This means that initial installation values at data points will be 10% higher than the model reports. The same value for LLF was carried in the 5-16-22 Calculations submitted for permit. Where fixtures are dimmed in a specified rev of the model, a lower LLF is used to indicate the level dimmed to.

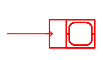
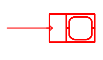
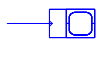
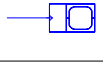







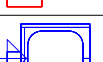




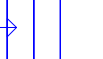

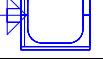
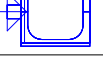


Site visit check measurements: If site visit check measurements are required, the installation must be complete and programmed for light output percentages as noted in the model, and there must be no snow on the ground, and ideally, no moon in the sky. Note that field measurements will include interreflected components from building surfaces and will therefore be higher than calculated values.

The scope of services for this project for Ripman Lighting Consultants and Drafting & Photometric Consulting, LLC, our sub-contractor, is limited to running calculations of designs provided by others. We are providing data only. Neither Ripman Lighting Consultants nor Drafting & Photometric Consulting are making recommendations or approving or disapproving designs by others and we accept no liability for the implementation or modification of designs by others. For evaluation, these data calculations should be reviewed and commented on and the designs calculated, modified if required, by Tetra-Tech, the town's consultant, for conformance with the state building code and recognized standards of good practice.

DIRECT ONLY
OFFSITE HOR FC CALCS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.6A-V5 NORMAL CONDITION
HORIZONTAL FC CALCULATIONS ABUTTING PROPERTIES
ALL FIXTURES TURNED "ON" = 90%

LIGHTING PARAMETERS:

Luminaire Schedule									
Symbol	Qty	Label	Arrangement	LLF	Description	Arr. Watts	Arr. Lum. Lumens	Mounting Height	Manufacturer
	7	A2-P2D	Single	0.900	DSX0 LED P1 30K 70CRI BLC3 MVOLT	33.21	3343	14	Lithonia Lighting
	1	A2-P2D-75	Single	0.900	DSX0 LED P1 30K 70CRI BLC3 MVOLT	33.21	3343	14	Lithonia Lighting
	1	A3-P2D	Single	0.900	DSX0 LED P1 30K 70CRI RCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A3-P2D-75	Single	0.900	DSX0 LED P1 30K 70CRI RCCO MVOLT	33.21	3375	14	Lithonia Lighting
	2	A4-P2D	Single	0.900	DSX0 LED P1 30K 70CRI LCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A4-P2D-75	Single	0.900	DSX0 LED P1 30K 70CRI LCCO MVOLT	33.21	3375	14	Lithonia Lighting
	5	AD	Single	0.900	RADPT P4 30K ASY HS	85.678	9439	14	Lithonia Lighting
	2	AD-50	Single	0.900	RADPT P4 30K ASY HS	85.678	9439	14	Lithonia Lighting
	2	B-P2D	Single	0.900	RADPT P3 30K ASY HS	53.618	5939	14	Lithonia Lighting
	1	B-P2D-50	Single	0.900	RADPT P3 30K ASY HS	53.618	5939	14	Lithonia Lighting
	3	BD	Single	0.900	RADPT P4 30K PATH HS	85.678	7877	14	Lithonia Lighting
	10	D	Single	0.900	WDGE1 LED P2 30K 80CRI VW	15.018	1876	10, 12	Lithonia Lighting
	26	D-P2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	6.83	NLS Lighting
	1	E-P2D	Single	0.900	RADPT P4 30K SYM HS	85.678	9889	14	Lithonia Lighting
	1	E-P2D-50	Single	0.900	RADPT P4 30K SYM HS	85.678	9889	14	Lithonia Lighting
	13	G1	Single	0.900	7162-GY-C13-27K-BBI	13	1131	10	Brownlee Lighting Inc
	15	G2D	Single	0.900	HC850D010-HM82555827-81WDC	48	5828	10	COOPER LIGHTING SOLUTIONS - HALO COMMERCIAL (FORMERLY EATON)
	4	H1	Single	0.900	7325-BL-C17-27K	16.21	970	6.5	Brownlee Lighting
	6	H2	Single	0.900	S5077W.14	3.5	37	8, 10	Simes S.p.A.
	8	I2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	5, 10	NLS Lighting
	10	ID	Single	0.900	TWA-T4-16L-175-30K7	10	1212	10	NLS Lighting
	2	N	Single	0.900	CLX L48 4000LM SEF FDL MVOLT 40K 80CRI	25.543	3956	10	Lithonia Lighting

THIS SCHEDULE IS A PRODUCT OF AGI32 AND LISTS TECHNICAL DATA FOR ALL FIXTURES ON THE SITE, REGARDLESS OF WHETHER THEY ARE ON OR OFF. FOR STATUS "ON", "OFF", SEE PLANS (PART OF FIXTURE TAGS).

Calculation Summary									
Label	Units	Avg	Max	Min	Avg/Min	Max/Min	PtSpcLr	PtSpcTb	Grid Z
Spill Light East	Fc	0.00	0.00	0.00	N.A.	N.A.	10	10	-19.979 to -0.001
Spill Light North	Fc	0.00	0.00	0.00	N.A.	N.A.	10	10	0
Spill Light South_Planar	Fc	0.00	0.00	0.00	N.A.	N.A.	10	10	-20
Spill Light West - Mid Section 1	Fc	0.00	0.00	0.00	N.A.	N.A.	10	10	-12.027 to 0
Spill Light West - Mid Section 2	Fc	0.00	0.00	0.00	N.A.	N.A.	10	10	-6 to 0
Spill Light West - North Section	Fc	0.00	0.00	0.00	N.A.	N.A.	10	10	0
Spill Light West - South Section	Fc	0.00	0.00	0.00	N.A.	N.A.	10	10	0

DIRECT ONLY
OFFSITE HOR FC CALCS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.6A-V5
NORMAL CONDITION
HORIZONTAL FC CALCULATIONS ABUTTING PROPERTIES
ALL FIXTURES TURNED "ON" = 90%

Drawn By: JS

Date:2/26/2024

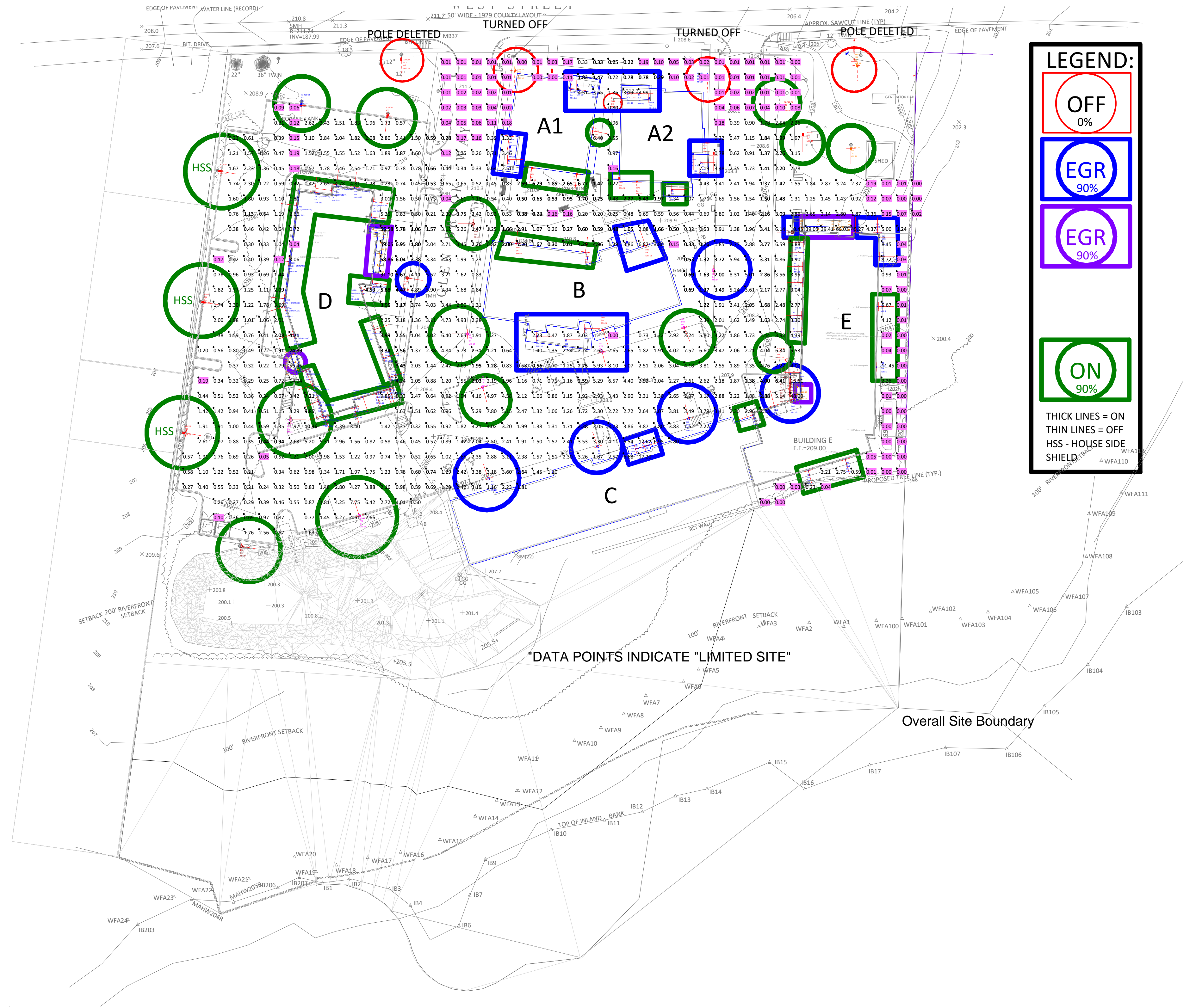
Rev: 26.6A-V5

Page 2 of 2

MEDWAY PHOTOMETRICS 26.7A-V5

- NORMAL (PRE-CURFEW) CONDITION: DUSK TO 11PM
- ALL FIXTURES ON, BOTH NON-EGRESS AND EGRESS.
- ONLY DATA POINTS HIGHLIGHTED IN PINK DO NOT CONFORM WITH IES/ANSI RECOMMENDATIONS FOR MINIMUM FOOT-CANDLES (0.2 MINIMUM OR GREATER).
- NON-CONFORMANCE NOT CONSIDERED SIGNIFICANT IN THE OPINION OF RIPMAN LIGHTING CONSULTANTS, EXCEPT AT ENTRY POINTS TO GLEN BROOK WAY.

NORMAL (PRE-CURFEW) CONDITION: DUSK TO 11PM
ALL FIXTURES ON, BOTH NON-EGRESS AND EGRESS.
DATA POINTS HIGHLIGHTED IN PINK DO NOT CONFORM WITH
IES/ANSI RECOMMENDATIONS FOR MINIMUM FOOT-CANDLES (0.2 MINIMUM OR GREATER).
NON-CONFORMANCE NOT CONSIDERED SIGNIFICANT IN THE OPINION
OF RIPMAN LIGHTING CONSULTANTS, EXCEPT AT ENTRY POINTS TO GLEN BROOK WAY.



Scale: 1 inch= 40 Ft.
GRIDS ARE 10'X10' TYP.

Notes on Calculations:

Reflectance : Walls - 0.5 (Unless Otherwise Noted)
Building E - Exterior Walls - 0.25
FIXTURE LLF As Noted Below on Page 2

All site lighting fixtures including both non-egress (conforming to the zoning ordinance requirements for curfew lighting) and egress lighting fixtures (conforming to requirements of the State Building Code) included in this calculation.

Software used: Calculations run using AGI32, industry standard software (Version 21.1.77).

IES files: Industry standard IES files, provided by others, were downloaded and incorporated into the model, for all fixtures modelled, including where so specified, and available as an IES file, house side shielding provided by the fixture manufacturer where so noted "HSS".

Topography: Previous permit model treated the site and adjacent properties as flat. The current model treats the site and the areas to the north of the site (towards West Street) as flat, but incorporates estimated topography for the east and west properties adjacent. Estimated by visual observation on site.

Calculation data: Data is in horizontal footcandles (as if measured with a meter lying on the ground, aimed up), per the Zoning Ordinance.

Reflectances: Reflectances of buildings and ground surfaces included per industry standard reflectances.

Interflectances: Calculations include only direct illumination of the target grid points, cosine corrected for angle of incidence, and do not include interreflected light from building surfaces.

Data Grids: 10' x 10' spacing.

Interstitial light levels: Note that measurements taken at other locations than the grid points shown may vary from those of the surrounding grid points.

Data rounding: Note that, as is common for all calculation programs, data rounding occurs. Thus, data calculated at 0.001 to 0.005 will round down to 0.00, while 0.006 to 0.009 will round up to 0.01. And 0.011 through 0.015 will round down to 0.01, while 0.016 through 0.019 will round up to 0.02.

All notes above apply to the current models.

Grid alignment: Note data grid points in this model do not exactly correspond to permit set grids due to orientation of grids, precluding data point to data point comparisons. But comparison of maximum, minimum and average values remains possible and appropriate.

Fixture status: Where noted, some fixtures have been turned off, and/or the aiming of fixtures may have changed, and/or custom shields may have been included in the model to minimize overspill.

Photometry: AGI32 uses "far field photometry" which means that it does not allow modelling of additional custom shielding added to the fixtures, where no IES file is available. We have modelled custom shields where called out using simulated shields at an appropriate distance from the fixture(s) to enable AGI32 to reasonably accurately calculate the impact of custom shielding.

Fixture output: All fixtures are, unless otherwise noted, calculated with an industry standard Light Loss Factor (LLF) of 90%. This means that initial installation values at data points will be 10% higher than the model reports. The same value for LLF was carried in the 5-16-22 Calculations submitted for permit. Where fixtures are dimmed in a specified rev of the model, a lower LLF is used to indicate the level dimmed to.























Site visit check measurements: If site visit check measurements are required, the installation must be complete and programmed for light output percentages as noted in the model, and there must be no snow on the ground, and ideally, no moon in the sky. Note that field measurements will include interreflected components from building surfaces and will therefore be higher than calculated values.

The scope of services for this project for Ripman Lighting Consultants and Drafting & Photometric Consulting, LLC, our sub-contractor, is limited to running calculations of designs provided by others. We are providing data only. Neither Ripman Lighting Consultants nor Drafting & Photometric Consulting are making recommendations or approving or disapproving designs by others and we accept no liability for the implementation or modification of designs by others. For evaluation, these data calculations should be reviewed and commented on and the designs calculated, modified if required, by Tetra-Tech, the town's consultant, for conformance with the state building code and recognized standards of good practice.

SITE AVERAGE HFC = 2.14 FC
DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.7A-V5
ALL FIXTURES TURNED "ON" = 90%

LIGHTING PARAMETERS:

Luminaire Schedule									
Symbol	Qty	Label	Arrangement	LLF	Description	Arr. Watts	Arr. Lum. Lumens	Mounting Height	Manufacturer
	7	A2-P2D	Single	0.900	DSX0 LED P1 30K 70CRI BLC3 MVOLT	33.21	3343	14	Lithonia Lighting
	1	A2-P2D-75	Single	0.900	DSX0 LED P1 30K 70CRI BLC3 MVOLT	33.21	3343	14	Lithonia Lighting
	1	A3-P2D	Single	0.900	DSX0 LED P1 30K 70CRI RCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A3-P2D-75	Single	0.900	DSX0 LED P1 30K 70CRI RCCO MVOLT	33.21	3375	14	Lithonia Lighting
	2	A4-P2D	Single	0.900	DSX0 LED P1 30K 70CRI LCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A4-P2D-75	Single	0.900	DSX0 LED P1 30K 70CRI LCCO MVOLT	33.21	3375	14	Lithonia Lighting
	5	AD	Single	0.900	RADPT P4 30K ASY HS	85.678	9439	14	Lithonia Lighting
	2	AD-50	Single	0.900	RADPT P4 30K ASY HS	85.678	9439	14	Lithonia Lighting
	2	B-P2D	Single	0.900	RADPT P3 30K ASY HS	53.618	5939	14	Lithonia Lighting
	1	B-P2D-50	Single	0.900	RADPT P3 30K ASY HS	53.618	5939	14	Lithonia Lighting
	3	BD	Single	0.900	RADPT P4 30K PATH HS	85.678	7877	14	Lithonia Lighting
	10	D	Single	0.900	WDGE1 LED P2 30K 80CRI VW	15.018	1876	10, 12	Lithonia Lighting
	26	D-P2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	6.83	NLS Lighting
	1	E-P2D	Single	0.900	RADPT P4 30K SYM HS	85.678	9889	14	Lithonia Lighting
	1	E-P2D-50	Single	0.900	RADPT P4 30K SYM HS	85.678	9889	14	Lithonia Lighting
	13	G1	Single	0.900	7162-GY-C13-27K-BBI	13	1131	10	Brownlee Lighting Inc
	15	G2D	Single	0.900	HC850D010-HM82555827-81WDC	48	5828	10	COOPER LIGHTING SOLUTIONS - HALO COMMERCIAL (FORMERLY EATON)
	4	H1	Single	0.900	7325-BL-C17-27K	16.21	970	6.5	Brownlee Lighting
	6	H2	Single	0.900	S5077W.14	3.5	37	8, 10	Simes S.p.A.
	8	I2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	5, 10	NLS Lighting
	10	ID	Single	0.900	TWA-T4-16L-175-30K7	10	1212	10	NLS Lighting
	2	N	Single	0.900	CLX L48 4000LM SEF FDL MVOLT 40K 80CRI	25.543	3956	10	Lithonia Lighting

THIS SCHEDULE IS A PRODUCT OF AGI32 AND LISTS TECHNICAL DATA FOR ALL FIXTURES ON THE SITE, REGARDLESS OF WHETHER THEY ARE ON OR OFF. FOR STATUS "ON", "OFF", SEE PLANS (PART OF FIXTURE TAGS).

Calculation Summary									
Label	Units	Avg	Max	Min	Avg/Min	Max/Min	PtSpcLr	PtSpcTb	Grid Z
Parking Horizontal	Fc	2.67	59.05	0.00	N.A.	N.A.	10	10	0
Pedestrian Horizontal	Fc	3.73	66.03	0.00	N.A.	N.A.	10	10	0
Road Horizontal	Fc	2.10	59.05	0.00	N.A.	N.A.	10	10	0

SITE AVERAGE HFC = 2.14 FC
DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.7A-V5
ALL FIXTURES TURNED "ON" = 90%

Drawn By: JS

Date:2/26/2024

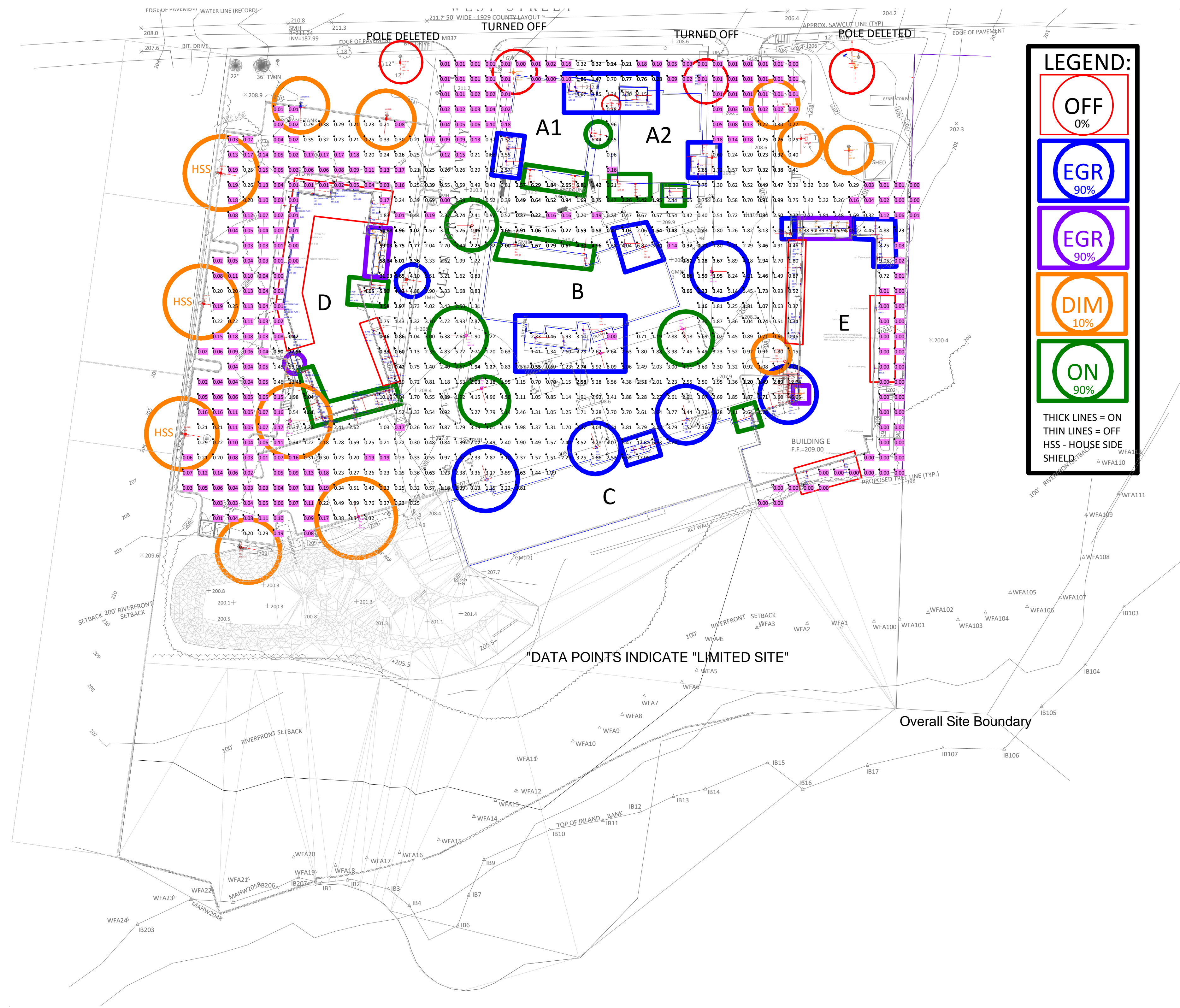
Rev: 26.7A-V5

Page 2 of 2

MEDWAY PHOTOMETRICS 26.7-V5

- CURFEW CONDITION: 11PM TO DAWN
- ALL FIXTURES ON, BOTH NON-EGRESS AND EGRESS, SOME DIMMED AS NOTED.
- DATA POINTS HIGHLIGHTED IN PINK DO NOT CONFORM WITH IES/ANSI RECOMMENDATIONS FOR MINIMUM FOOT-CANDLES (0.2 MINIMUM OR GREATER).
- NON-CONFORMANCE IS CONSIDERED SIGNIFICANT IN THE OPINION OF RIPMAN LIGHTING CONSULTANTS.

CURFEW CONDITION: 11PM TO DAWN
ALL FIXTURES ON, BOTH NON-EGRESS AND EGRESS, SOME DIMMED AS NOTED.
DATA POINTS HIGHLIGHTED IN PINK DO NOT CONFORM WITH
IES/ANSI RECOMMENDATIONS FOR MINIMUM FOOT-CANDLES (0.2 MINIMUM OR GREATER).
NON-CONFORMANCE IS CONSIDERED SIGNIFICANT IN THE OPINION
OF RIPMAN LIGHTING CONSULTANTS.



Scale: 1 inch= 40 Ft.
GRIDS ARE 10'X10' TYP.

Notes on Calculations:

Reflectance : Walls - 0.5 (Unless Otherwise Noted)
Building E - Exterior Walls - 0.25
FIXTURE LLF As Noted Below on Page 2

All site lighting fixtures including both non-egress (conforming to the zoning ordinance requirements for curfew lighting) and egress lighting fixtures (conforming to requirements of the State Building Code) included in this calculation.

Software used: Calculations run using AGI32, industry standard software (Version 21.1.77).

IES files: Industry standard IES files, provided by others, were downloaded and incorporated into the model, for all fixtures modelled, including where so specified, and available as an IES file, house side shielding provided by the fixture manufacturer where so noted "HSS".

Topography: Previous permit model treated the site and adjacent properties as flat. The current model treats the site and the areas to the north of the site (towards West Street) as flat, but incorporates estimated topography for the east and west properties adjacent. Estimated by visual observation on site.

Calculation data: Data is in horizontal footcandles (as if measured with a meter lying on the ground, aimed up), per the Zoning Ordinance.

Reflectances: Reflectances of buildings and ground surfaces included per industry standard reflectances.

Interflectances: Calculations include only direct illumination of the target grid points, cosine corrected for angle of incidence, and do not include interreflected light from building surfaces.

Data Grids: 10' x 10' spacing.

Interstitial light levels: Note that measurements taken at other locations than the grid points shown may vary from those of the surrounding grid points.

Data rounding: Note that, as is common for all calculation programs, data rounding occurs. Thus, data calculated at 0.001 to 0.005 will round down to 0.00, while 0.006 to 0.009 will round up to 0.01. And 0.011 through 0.015 will round down to 0.01, while 0.016 through 0.019 will round up to 0.02.

All notes above apply to the current models.

Grid alignment: Note data grid points in this model do not exactly correspond to permit set grids due to orientation of grids, precluding data point to data point comparisons. But comparison of maximum, minimum and average values remains possible and appropriate.

Fixture status: Where noted, some fixtures have been turned off, and/or the aiming of fixtures may have changed, and/or custom shields may have been included in the model to minimize overspill.

Photometry: AGI32 uses "far field photometry" which means that it does not allow modelling of additional custom shielding added to the fixtures, where no IES file is available. We have modelled custom shields where called out using simulated shields at an appropriate distance from the fixture(s) to enable AGI32 to reasonably accurately calculate the impact of custom shielding.

Fixture output: All fixtures are, unless otherwise noted, calculated with an industry standard Light Loss Factor (LLF) of 90%. This means that initial installation values at data points will be 10% higher than the model reports. The same value for LLF was carried in the 5-16-22 Calculations submitted for permit. Where fixtures are dimmed in a specified rev of the model, a lower LLF is used to indicate the level dimmed to.

Site visit check measurements: If site visit check measurements are required, the installation must be complete and programmed for light output percentages as noted in the model, and there must be no snow on the ground, and ideally, no moon in the sky. Note that field measurements will include interreflected components from building surfaces and will therefore be higher than calculated values.

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SITE AVERAGE HFC = 1.67 FC
DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.7-V5
ALL FIXTURES TURNED "ON" = 90%, OR DIMMED TO 10%, AS NOTED

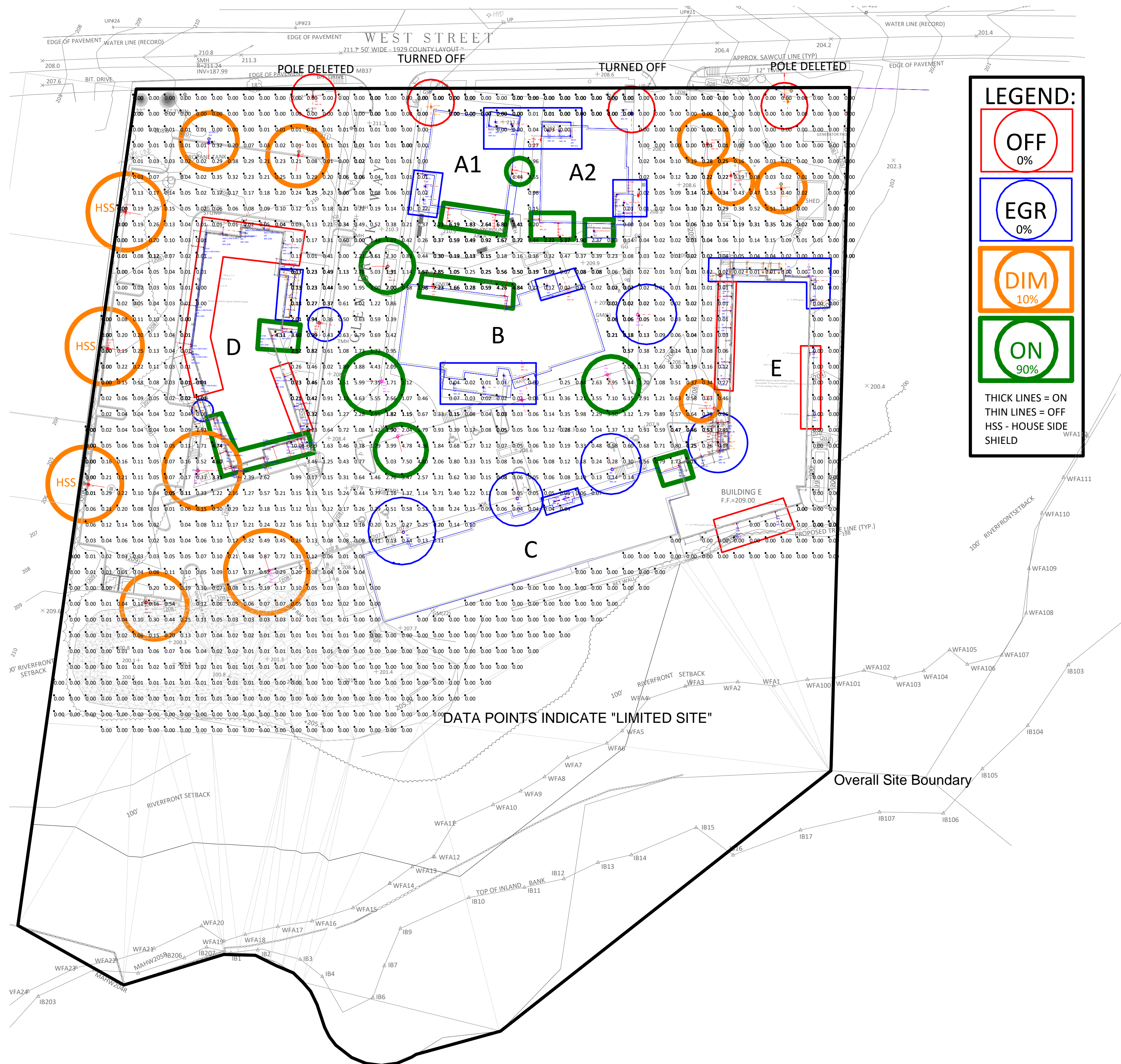
THE SECOND SET OF SEVEN CALCULATIONS
DOCUMENT "CURFEW" LIGHTING, CONFORMING
WITH THE REQUIREMENTS OF THE TOWN BYLAW.

THESE DO NOT MEET IES / ANSI RECOMMENDATIONS FOR GOOD PRACTICE REGARDING MINIMUM
HORIZONTAL FOOTCANDLES REQUIRED FOR ROADWAYS, PARKING LOTS AND SIDEWALKS.

MEDWAY PHOTOMETRICS 26.1-V5

- CURFEW CONDITION: 11PM TO DAWN
- NON-EGRESS FIXTURES ONLY
- AVERAGE VALUE CALCULATED HORIZONTAL FOOTCANDLES FOR LIMITED SITE: 0.46 FC
- CONFORMS TO MEDWAY ZONING ORDINANCE CURFEW REQUIREMENTS

CURFEW CONDITION: 11PM TO DAWN
NON-EGRESS FIXTURES ONLY
AVERAGE VALUE CALCULATED HORIZONTAL FOOTCANDLES FOR LIMITED SITE: 0.46 FC
CONFORMS TO MEDWAY ZONING ORDINANCE CURFEW REQUIREMENTS



Scale: 1 inch= 40 Ft.
GRIDS ARE 10'X10' TYP.
NO EGRESS LIGHTING INCLUDED

Notes on Calculations:

Reflectance : Walls - 0.5 (Unless Otherwise Noted)
Building E - Exterior Walls - 0.25
FIXTURE LLF As Noted Below on Page 2

Fixtures contributing to Egress Lighting shown as zero output (0%), for purposes of calculation of limited site average horizontal foot-candles for non-egress fixtures during curfew hours, not to exceed 0.50 horizontal FC average per Town Zoning Ordinance.

Software used: Calculations run using AGI32, industry standard software (Version 21.1.77).

IES files: Industry standard IES files, provided by others, were downloaded and incorporated into the model, for all fixtures modelled, including where so specified, and available as an IES file, house side shielding provided by the fixture manufacturer where so noted "HSS".

Topography: Previous permit model treated the site and adjacent properties as flat. The current model treats the site and the areas to the north of the site (towards West Street) as flat, but incorporates estimated topography for the east and west properties adjacent. Estimated by visual observation on site.

Calculation data: Data is in horizontal footcandles (as if measured with a meter lying on the ground, aimed up), per the Zoning Ordinance.

Reflectances: Reflectances of buildings and ground surfaces included per industry standard reflectances.

Interflectances: Calculations include only direct illumination of the target grid points, cosine corrected for angle of incidence, and do not include interreflected light from building surfaces.

Data Grids: 10' x 10' spacing.

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All notes above apply to the current models.

Grid alignment: Note data grid points in this model do not exactly correspond to permit set grids due to orientation of grids, precluding data point to data point comparisons. But comparison of maximum, minimum and average values remains possible and appropriate.

Fixture status: Where noted, some fixtures have been turned off, and/or the aiming of fixtures may have changed, and/or custom shields may have been included in the model to minimize overspill.

Photometry: AGI32 uses "far field photometry" which means that it does not allow modelling of additional custom shielding added to the fixtures, where no IES file is available. We have modelled custom shields where called out using simulated shields at an appropriate distance from the fixture(s) to enable AGI32 to reasonably accurately calculate the impact of custom shielding.

Fixture output: All fixtures are, unless otherwise noted, calculated with an industry standard Light Loss Factor (LLF) of 90%. This means that initial installation values at data points will be 10% higher than the model reports. The same value for LLF was carried in the 5-16-22 Calculations submitted for permit. Where fixtures are dimmed in a specified rev of the model, a lower LLF is used to indicate the level dimmed to.

Site visit check measurements: If site visit check measurements are required, the installation must be complete and programmed for light output percentages as noted in the model, and there must be no snow on the ground, and ideally, no moon in the sky. Note that field measurements will include interreflected components from building surfaces and will therefore be higher than calculated values.

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SITE AVERAGE HFC = 0.46 FC
DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

SEES 1 + 2 - PHOTOMETRIC SITE PLAN 26.1-V5 | EGRESS LTG EXCLUDED
R FIXTURES TURNED "ON" = 90%, OR DIMMED TO 10%, AS NOTED
MEETS 0.5 HORIZONTAL FC AVG OR LESS FOR LIMITED SITE























Drawn By: JS

Date:2/26/2024

Rev: 26.1-V5

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LIGHTING PARAMETERS:

Luminaire Schedule									
Symbol	Qty	Label	Arrangement	LLF	Description	Arr. Watts	Arr. Lum. Lumens	Mounting Height	Manufacturer
	7	A2-P2D	Single	0.100	DSX0 LED P1 30K 70CRI BLC3 MVOLT (DIMMED TO 10%)	33.21	3343	14	Lithonia Lighting
	1	A2-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI BLC3 MVOLT (DIMMED TO 10%)	33.21	3343	14	Lithonia Lighting
	1	A3-P2D	Single	0.900	DSX0 LED P1 30K 70CRI RCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A3-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI RCCO MVOLT (DIMMED 10%)	33.21	3375	14	Lithonia Lighting
	2	A4-P2D	Single	0.900	DSX0 LED P1 30K 70CRI LCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A4-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI LCCO MVOLT (DIMMED TO 10%)	33.21	3375	14	Lithonia Lighting
	5	AD	Single	0.900	RADPT P4 30K ASY HS	85.678	9439	14	Lithonia Lighting
	2	AD-50	Single	0.100	RADPT P4 30K ASY HS (DIMMED TO 10%)	85.678	9439	14	Lithonia Lighting
	2	B-P2D	Single	0.900	RADPT P3 30K ASY HS	53.618	5939	14	Lithonia Lighting
	1	B-P2D-50	Single	0.100	RADPT P3 30K ASY HS (DIMMED TO 10%)	53.618	5939	14	Lithonia Lighting
	3	BD	Single	0.900	RADPT P4 30K PATH HS	85.678	7877	14	Lithonia Lighting
	10	D	Single	0.900	WDGE1 LED P2 30K 80CRI VW	15.018	1876	10, 12	Lithonia Lighting
	26	D-P2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	6.83	NLS Lighting
	1	E-P2D	Single	0.900	RADPT P4 30K SYM HS	85.678	9889	14	Lithonia Lighting
	1	E-P2D-50	Single	0.100	RADPT P4 30K SYM HS (DIMMED TO 10%)	85.678	9889	14	Lithonia Lighting
	13	G1	Single	0.900	7162-GY-C13-27K-BBI	13	1131	10	Brownlee Lighting Inc
	15	G2D	Single	0.900	HC850D010-HM82555827-81WDC	48	5828	10	COOPER LIGHTING SOLUTIONS - HALO COMMERCIAL (FORMERLY EATON)
	4	H1	Single	0.900	7325-BL-C17-27K	16.21	970	6.5	Brownlee Lighting
	6	H2	Single	0.900	S5077W.14	3.5	37	8, 10	Simes S.p.A.
	8	I2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	5, 10	NLS Lighting
	10	ID	Single	0.900	TWA-T4-16L-175-30K7	10	1212	10	NLS Lighting
	2	N	Single	0.900	CLX L48 4000LM SEF FDL MVOLT 40K 80CRI	25.543	3956	10	Lithonia Lighting

THIS SCHEDULE IS A PRODUCT OF AGI32 AND LISTS TECHNICAL DATA FOR ALL FIXTURES ON THE SITE, REGARDLESS OF WHETHER THEY ARE ON OR OFF. FOR STATUS "ON", "OFF", SEE PLANS (PART OF FIXTURE TAGS).

Calculation Summary									
Label	Units	Avg	Max	Min	Avg/Min	Max/Min	PtSpcLr	PtSpcTb	Grid Z
Other Site Horizontal	Fc	0.21	7.23	0.00	N.A.	N.A.	10	10	0
Parking Horizontal	Fc	0.60	7.50	0.00	N.A.	N.A.	10	10	0
Pedestrian Horizontal	Fc	0.64	10.08	0.00	N.A.	N.A.	10	10	0
Road Horizontal	Fc	0.53	7.23	0.00	N.A.	N.A.	10	10	0
Overall Site Average	Fc	0.46	10.1	0.0	N.A.	N.A.			

SITE AVERAGE HFC = 0.46 FC
DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.1-V5 | EGRESS LTG EXCLUDED
ALL OTHER FIXTURES TURNED "ON" = 90%, OR DIMMED TO 10%, AS NOTED
MEETS 0.5 HORIZONTAL FC AVG OR LESS FOR LIMITED SITE

Drawn By: JS

Date:2/26/2024

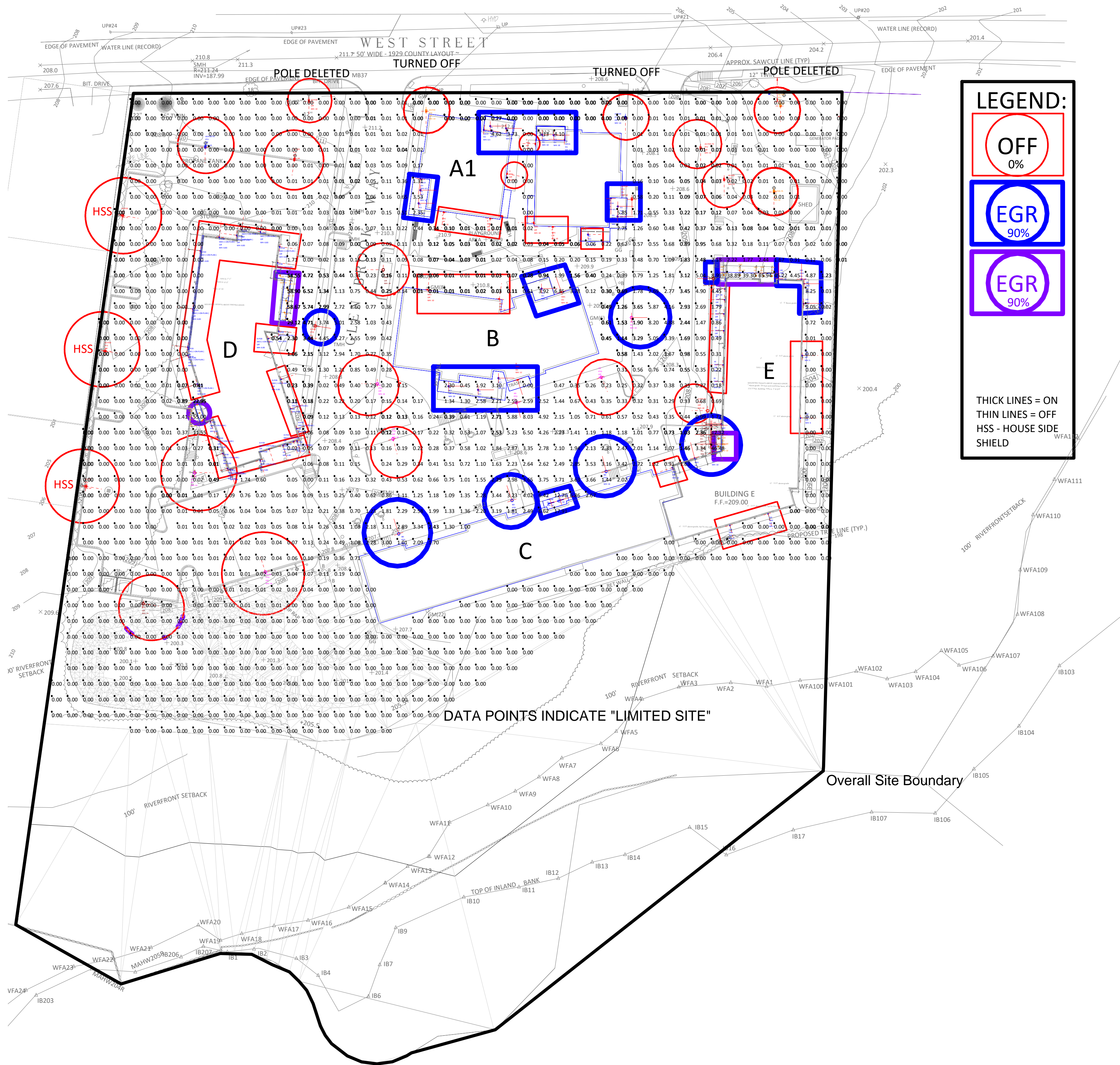
Rev: 26.1-V5

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MEDWAY PHOTOMETRICS 26.2-V5

- CURFEW CONDITION: 11PM TO DAWN
- EGRESS FIXTURES ONLY
- FOR CONFORMANCE TO MASS. STATE BLDG CODE SEE DWG MEDWAY PHOTOMETRICS 26.4

CURFEW CONDITION: 11PM TO DAWN
EGRESS FIXTURES ONLY
FOR CONFORMANCE TO MASS. STATE BLDG CODE SEE DWG 26.4



Scale: 1 inch= 40 Ft.
GRIDS ARE 10'X10' TYP.
ONLY EGRESS LIGHTING INCLUDED

Notes on Calculations:

Reflectance : Walls - 0.5 (Unless Otherwise Noted)
Building E - Exterior Walls - 0.25
FIXTURE LLF As Noted Below on Page 2

Fixtures in this calculation include only those contributing to Egress Lighting.

Software used: Calculations run using AGI32, industry standard software (Version 21.1.77).

IES files: Industry standard IES files, provided by others, were downloaded and incorporated into the model, for all fixtures modelled, including where so specified, and available as an IES file, house side shielding provided by the fixture manufacturer where so noted "HSS".

Topography: Previous permit model treated the site and adjacent properties as flat. The current model treats the site and the areas to the north of the site (towards West Street) as flat, but incorporates estimated topography for the east and west properties adjacent. Estimated by visual observation on site.

Calculation data: Data is in horizontal footcandles (as if measured with a meter lying on the ground, aimed up), per the Zoning Ordinance.

Reflectances: Reflectances of buildings and ground surfaces included per industry standard reflectances.

Interflectances: Calculations include only direct illumination of the target grid points, cosine corrected for angle of incidence, and do not include interflected light from building surfaces.

Data Grids: 10' x 10' spacing.

Interstitial light levels: Note that measurements taken at other locations than the grid points shown may vary from those of the surrounding grid points.

Data rounding: Note that, as is common for all calculation programs, data rounding occurs. Thus, data calculated at 0.001 to 0.005 will round down to 0.00, while 0.006 to 0.009 will round up to 0.01. And 0.011 through 0.015 will round down to 0.01, while 0.016 through 0.019 will round up to 0.02.

All notes above apply to the current models.

Grid alignment: Note data grid points in this model do not exactly correspond to permit set grids due to orientation of grids, precluding data point to data point comparisons. But comparison of maximum, minimum and average values remains possible and appropriate.

Fixture status: Where noted, some fixtures have been turned off, and/or the aiming of fixtures may have changed, and/or custom shields may have been included in the model to minimize overspill.

Photometry: AGI32 uses "far field photometry" which means that it does not allow modelling of additional custom shielding added to the fixtures, where no IES file is available. We have modelled custom shields where called out using simulated shields at an appropriate distance from the fixture(s) to enable AGI32 to reasonably accurately calculate the impact of custom shielding.

Fixture output: All fixtures are, unless otherwise noted, calculated with an industry standard Light Loss Factor (LLF) of 90%. This means that initial installation values at data points will be 10% higher than the model reports. The same value for LLF was carried in the 5-16-22 Calculations submitted for permit. Where fixtures are dimmed in a specified rev of the model, a lower LLF is used to indicate the level dimmed to.























Site visit check measurements: If site visit check measurements are required, the installation must be complete and programmed for light output percentages as noted in the model, and there must be no snow on the ground, and ideally, no moon in the sky. Note that field measurements will include interflected components from building surfaces and will therefore be higher than calculated values.

The scope of services for this project for Ripman Lighting Consultants and Drafting & Photometric Consulting, LLC, our sub-contractor, is limited to running calculations of designs provided by others. We are providing data only. Neither Ripman Lighting Consultants nor Drafting & Photometric Consulting are making recommendations or approving or disapproving designs by others and we accept no liability for the implementation or modification of designs by others. For evaluation, these data calculations should be reviewed and commented on and the designs calculated, modified if required, by Tetra-Tech, the town's consultant, for conformance with the state building code and recognized standards of good practice.

SITE AVERAGE HFC = 1.21 FC
DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.2 - V5
ALL EGRESS FIXTURES TURNED "ON" = 90%
ALL NON-EGRESS FIXTURES TURNED "OFF" = 0%

LIGHTING PARAMETERS:

Luminaire Schedule									
Symbol	Qty	Label	Arrangement	LLF	Description	Arr. Watts	Arr. Lum. Lumens	Mounting Height	Manufacturer
	7	A2-P2D	Single	0.100	DSX0 LED P1 30K 70CRI BLC3 MVOLT (DIMMED TO 10%)	33.21	3343	14	Lithonia Lighting
	1	A2-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI BLC3 MVOLT (DIMMED TO 10%)	33.21	3343	14	Lithonia Lighting
	1	A3-P2D	Single	0.900	DSX0 LED P1 30K 70CRI RCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A3-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI RCCO MVOLT (DIMMED 10%)	33.21	3375	14	Lithonia Lighting
	2	A4-P2D	Single	0.900	DSX0 LED P1 30K 70CRI LCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A4-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI LCCO MVOLT (DIMMED TO 10%)	33.21	3375	14	Lithonia Lighting
	5	AD	Single	0.900	RADPT P4 30K ASY HS	85.678	9439	14	Lithonia Lighting
	2	AD-50	Single	0.100	RADPT P4 30K ASY HS (DIMMED TO 10%)	85.678	9439	14	Lithonia Lighting
	2	B-P2D	Single	0.900	RADPT P3 30K ASY HS	53.618	5939	14	Lithonia Lighting
	1	B-P2D-50	Single	0.100	RADPT P3 30K ASY HS (DIMMED TO 10%)	53.618	5939	14	Lithonia Lighting
	3	BD	Single	0.900	RADPT P4 30K PATH HS	85.678	7877	14	Lithonia Lighting
	10	D	Single	0.900	WDGE1 LED P2 30K 80CRI VW	15.018	1876	10, 12	Lithonia Lighting
	26	D-P2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	6.83	NLS Lighting
	1	E-P2D	Single	0.900	RADPT P4 30K SYM HS	85.678	9889	14	Lithonia Lighting
	1	E-P2D-50	Single	0.100	RADPT P4 30K SYM HS (DIMMED TO 10%)	85.678	9889	14	Lithonia Lighting
	13	G1	Single	0.900	7162-GY-C13-27K-BBI	13	1131	10	Brownlee Lighting Inc
	15	G2D	Single	0.900	HC850D010-HM82555827-81WDC	48	5828	10	COOPER LIGHTING SOLUTIONS - HALO COMMERCIAL (FORMERLY EATON)
	4	H1	Single	0.900	7325-BL-C17-27K	16.21	970	6.5	Brownlee Lighting
	6	H2	Single	0.900	S5077W.14	3.5	37	8, 10	Simes S.p.A.
	8	I2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	5, 10	NLS Lighting
	10	ID	Single	0.900	TWA-T4-16L-175-30K7	10	1212	10	NLS Lighting
	2	N	Single	0.900	CLX L48 4000LM SEF FDL MVOLT 40K 80CRI	25.543	3956	10	Lithonia Lighting

THIS SCHEDULE IS A PRODUCT OF AGI32 AND LISTS TECHNICAL DATA FOR ALL FIXTURES ON THE SITE, REGARDLESS OF WHETHER THEY ARE ON OR OFF. FOR STATUS "ON", "OFF", SEE PLANS (PART OF FIXTURE TAGS).

Calculation Summary									
Label	Units	Avg	Max	Min	Avg/Min	Max/Min	PtSpclr	PtSpTb	Grid Z
Other Site Horizontal	Fc	0.50	58.90	0.00	N.A.	N.A.	10	10	0
Parking Horizontal	Fc	1.32	58.90	0.00	N.A.	N.A.	10	10	0
Pedestrian Horizontal	Fc	2.50	65.94	0.00	N.A.	N.A.	10	10	0
Road Horizontal	Fc	1.01	58.90	0.00	N.A.	N.A.	10	10	0
Overall Site Average	Fc	1.21	65.9	0.0	N.A.	N.A.			

SITE AVERAGE HFC = 1.21 FC
DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.2 - V5
ALL EGRESS FIXTURES TURNED "ON" = 90%
ALL NON-EGRESS FIXTURES TURNED "OFF" = 0%

Drawn By: JS

Date:2/26/2024

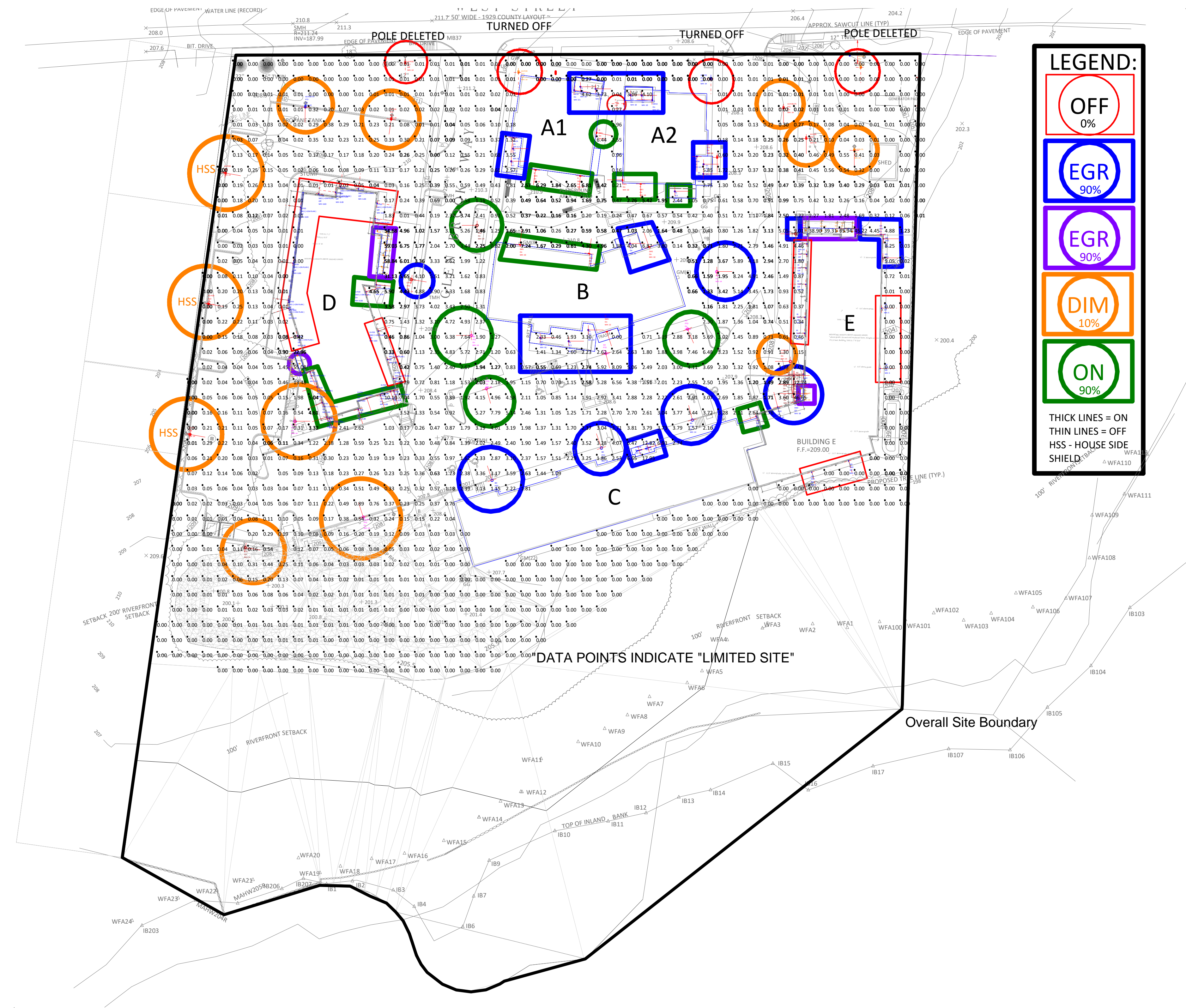
Rev: 26.2-V5

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MEDWAY PHOTOMETRICS 26.3-V5

- CURFEW CONDITION: 11PM TO DAWN
- ALL FIXTURES ON, BOTH NON-EGRESS AND EGRESS, SOME DIMMED AS NOTED.
- AVERAGE VALUE CALCULATED HORIZONTAL FOOTCANDLES FOR LIMITED SITE: 1.67 FC.

CURFEW CONDITION: 11PM TO DAWN
ALL FIXTURES ON, BOTH NON-EGRESS AND EGRESS, SOME DIMMED AS NOTED.
AVERAGE VALUE CALCULATED HORIZONTAL FOOTCANDLES FOR LIMITED SITE: 1.67 FC.



Scale: 1 inch= 40 Ft.
GRIDS ARE 10'X10' TYP.

Notes on Calculations:

Reflectance : Walls - 0.5 (Unless Otherwise Noted)
Building E - Exterior Walls - 0.25
FIXTURE LLF As Noted Below on Page 2

All site lighting fixtures including both non-egress (conforming to the zoning ordinance requirements for curfew lighting) and egress lighting fixtures (conforming to requirements of the State Building Code) included in this calculation for purposes of confirmation of overall lighting data points for proposed lighting.

Software used: Calculations run using AGI32, industry standard software (Version 21.1.77).

IES files: Industry standard IES files, provided by others, were downloaded and incorporated into the model, for all fixtures modelled, including where so specified, and available as an IES file, house side shielding provided by the fixture manufacturer where so noted "HSS".

Topography: Previous permit model treated the site and adjacent properties as flat. The current model treats the site and the areas to the north of the site (towards West Street) as flat, but incorporates estimated topography for the east and west properties adjacent. Estimated by visual observation on site.

Calculation data: Data is in horizontal footcandles (as if measured with a meter lying on the ground, aimed up), per the Zoning Ordinance.

Reflectances: Reflectances of buildings and ground surfaces included per industry standard reflectances.

Interflectances: Calculations include only direct illumination of the target grid points, cosine corrected for angle of incidence, and do not include interreflected light from building surfaces.

Data Grids: 10' x 10' spacing.

Interstitial light levels: Note that measurements taken at other locations than the grid points shown may vary from those of the surrounding grid points.

Data rounding: Note that, as is common for all calculation programs, data rounding occurs. Thus, data calculated at 0.001 to 0.005 will round down to 0.00, while 0.006 to 0.009 will round up to 0.01. And 0.011 through 0.015 will round down to 0.01, while 0.016 through 0.019 will round up to 0.02.

All notes above apply to the current models.

Grid alignment: Note data grid points in this model do not exactly correspond to permit set grids due to orientation of grids, precluding data point to data point comparisons. But comparison of maximum, minimum and average values remains possible and appropriate.

Fixture status: Where noted, some fixtures have been turned off, and/or the aiming of fixtures may have changed, and/or custom shields may have been included in the model to minimize overspill.

Photometry: AGI32 uses "far field photometry" which means that it does not allow modelling of additional custom shielding added to the fixtures, where no IES file is available. We have modelled custom shields where called out using simulated shields at an appropriate distance from the fixture(s) to enable AGI32 to reasonably accurately calculate the impact of custom shielding.

Fixture output: All fixtures are, unless otherwise noted, calculated with an industry standard Light Loss Factor (LLF) of 90%. This means that initial installation values at data points will be 10% higher than the model reports. The same value for LLF was carried in the 5-16-22 Calculations submitted for permit. Where fixtures are dimmed in a specified rev of the model, a lower LLF is used to indicate the level dimmed to.























Site visit check measurements: If site visit check measurements are required, the installation must be complete and programmed for light output percentages as noted in the model, and there must be no snow on the ground, and ideally, no moon in the sky. Note that field measurements will include interreflected components from building surfaces and will therefore be higher than calculated values.

The scope of services for this project for Ripman Lighting Consultants and Drafting & Photometric Consulting, LLC, our sub-contractor, is limited to running calculations of designs provided by others. We are providing data only. Neither Ripman Lighting Consultants nor Drafting & Photometric Consulting are making recommendations or approving or disapproving designs by others and we accept no liability for the implementation or modification of designs by others. For evaluation, these data calculations should be reviewed and commented on and the designs calculated, modified if required, by Tetra-Tech, the town's consultant, for conformance with the state building code and recognized standards of good practice.

SITE AVERAGE HFC = 1.67 FC
DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.3-V5
ALL FIXTURES TURNED "ON" = 90%, OR DIMMED TO 10%, AS NOTED

LIGHTING PARAMETERS:

Luminaire Schedule									
Symbol	Qty	Label	Arrangement	LLF	Description	Arr. Watts	Arr. Lum. Lumens	Mounting Height	Manufacturer
	7	A2-P2D	Single	0.100	DSX0 LED P1 30K 70CRI BLC3 MVOLT (DIMMED TO 10%)	33.21	3343	14	Lithonia Lighting
	1	A2-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI BLC3 MVOLT (DIMMED TO 10%)	33.21	3343	14	Lithonia Lighting
	1	A3-P2D	Single	0.900	DSX0 LED P1 30K 70CRI RCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A3-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI RCCO MVOLT (DIMMED TO 10%)	33.21	3375	14	Lithonia Lighting
	2	A4-P2D	Single	0.900	DSX0 LED P1 30K 70CRI LCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A4-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI LCCO MVOLT (DIMMED TO 10%)	33.21	3375	14	Lithonia Lighting
	5	AD	Single	0.900	RADPT P4 30K ASY HS	85.678	9439	14	Lithonia Lighting
	2	AD-50	Single	0.100	RADPT P4 30K ASY HS (DIMMED TO 10%)	85.678	9439	14	Lithonia Lighting
	2	B-P2D	Single	0.900	RADPT P3 30K ASY HS	53.618	5939	14	Lithonia Lighting
	1	B-P2D-50	Single	0.100	RADPT P3 30K ASY HS (DIMMED TO 10%)	53.618	5939	14	Lithonia Lighting
	3	BD	Single	0.900	RADPT P4 30K PATH HS	85.678	7877	14	Lithonia Lighting
	10	D	Single	0.900	WDGE1 LED P2 30K 80CRI VW	15.018	1876	10, 12	Lithonia Lighting
	26	D-P2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	6.83	NLS Lighting
	1	E-P2D	Single	0.900	RADPT P4 30K SYM HS	85.678	9889	14	Lithonia Lighting
	1	E-P2D-50	Single	0.100	RADPT P4 30K SYM HS (DIMMED TO 10%)	85.678	9889	14	Lithonia Lighting
	13	G1	Single	0.900	7162-GY-C13-27K-BBI	13	1131	10	Brownlee Lighting Inc
	15	G2D	Single	0.900	HC850D010-HM82555827-81WDC	48	5828	10	COOPER LIGHTING SOLUTIONS - HALO COMMERCIAL (FORMERLY EATON)
	4	H1	Single	0.900	7325-BL-C17-27K	16.21	970	6.5	Brownlee Lighting
	6	H2	Single	0.900	S5077W.14	3.5	37	8, 10	Simes S.p.A.
	8	I2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	5, 10	NLS Lighting
	10	ID	Single	0.900	TWA-T4-16L-175-30K7	10	1212	10	NLS Lighting
	2	N	Single	0.900	CLX L48 4000LM SEF FDL MVOLT 40K 80CRI	25.543	3956	10	Lithonia Lighting

THIS SCHEDULE IS A PRODUCT OF AGI32 AND LISTS TECHNICAL DATA FOR ALL FIXTURES ON THE SITE, REGARDLESS OF WHETHER THEY ARE ON OR OFF. FOR STATUS "ON", "OFF", SEE PLANS (PART OF FIXTURE TAGS).

Calculation Summary									
Label	Units	Avg	Max	Min	Avg/Min	Max/Min	PtSpclr	PtSpctb	Grid Z
Other Site Horizontal	Fc	0.70	59.03	0.00	N.A.	N.A.	10	10	0
Parking Horizontal	Fc	1.92	59.03	0.00	N.A.	N.A.	10	10	0
Pedestrian Horizontal	Fc	3.13	65.94	0.00	N.A.	N.A.	10	10	0
Road Horizontal	Fc	1.53	59.03	0.00	N.A.	N.A.	10	10	0
Overall Site Average	Fc	1.67	65.9	0.0	N.A.	N.A.			

SITE AVERAGE HFC = 1.67 FC
DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.3-V5
ALL FIXTURES TURNED "ON" = 90%, OR DIMMED TO 10%, AS NOTED

Drawn By: JS

Date:2/26/2024

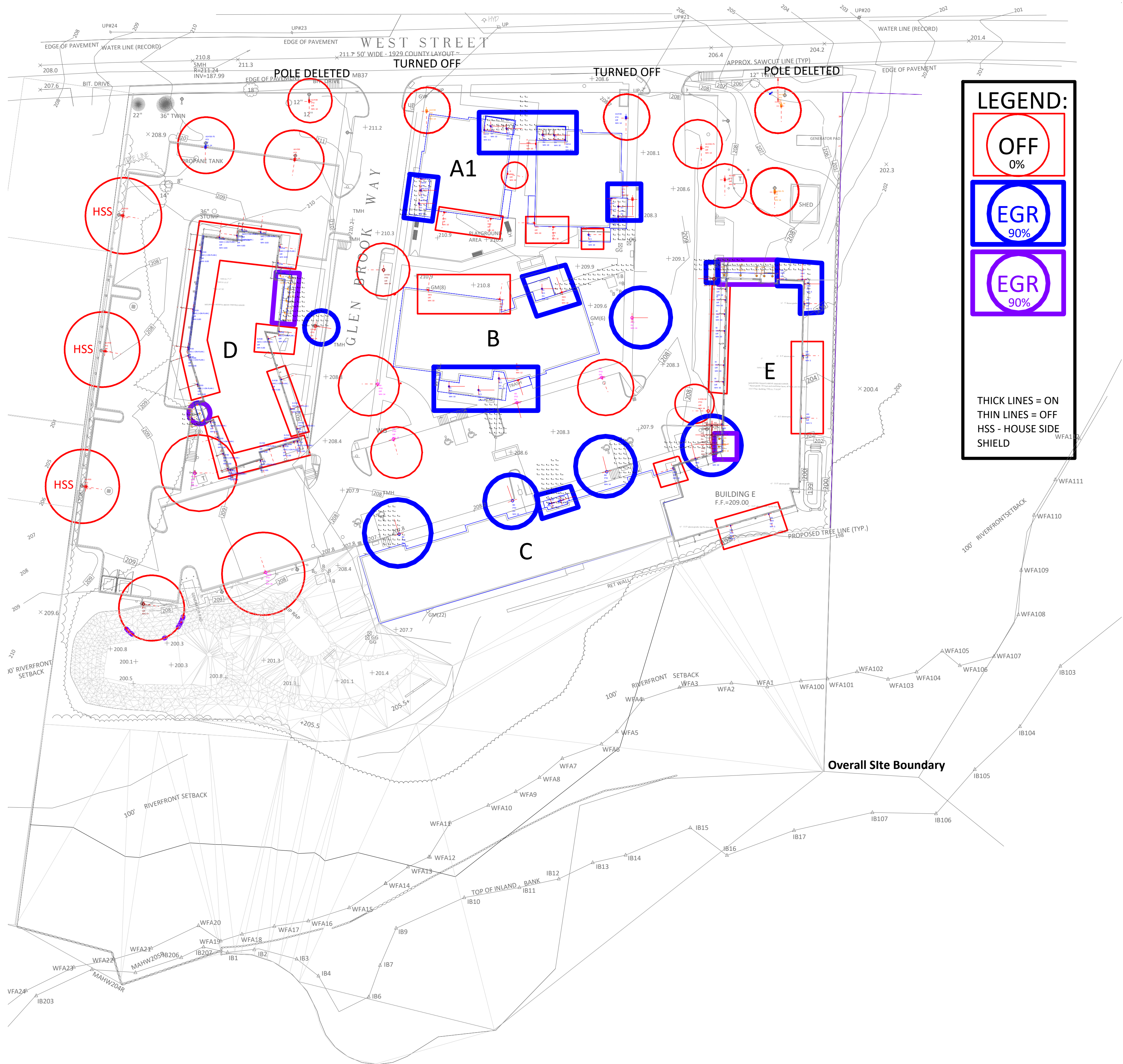
Rev: 26.3-V5

Page 2 of 2

MEDWAY PHOTOMETRICS 26.4-V5

- CURFEW CONDITION - DUSK TO 11PM
- EGRESS FIXTURES ONLY
- REQUIRED BY MSBC: 1.0 FC HOR AVG, 0.1 FC HOR MIN, 40:1 MAX/MIN MAX
- CONFORMS TO MASS. STATE BLDG CODE 9TH EDITION AND NFPA 101.

CURFEW CONDITION - DUSK TO 11PM
EGRESS FIXTURES ONLY
REQUIRED BY MSBC: 1.0 FC HOR AVG, 0.1 FC HOR MIN, 40:1 MAX/MIN MAX
CONFORMS TO MASS. STATE BLDG CODE 9TH EDITION AND NFPA101.



Scale: 1 inch= 40 Ft.
GRIDS ARE 3'X3' TYP.
ONLY EGRESS LIGHTING INCLUDED

Notes on Calculations:

Reflectance : Walls - 0.5 (Unless Otherwise Noted)
Building E - Exterior Walls - 0.25
FIXTURE LLF As Noted Below on Page 2

Fixtures in this calculation include only those contributing to Egress Lighting.

Software used: Calculations run using AGI32, industry standard software (Version 21.1.77).

IES files: Industry standard IES files, provided by others, were downloaded and incorporated into the model, for all fixtures modelled, including where so specified, and available as an IES file, house side shielding provided by the fixture manufacturer where so noted "HSS".

Topography: Previous permit model treated the site and adjacent properties as flat. The current model treats the site and the areas to the north of the site (towards West Street) as flat, but incorporates estimated topography for the east and west properties adjacent. Estimated by visual observation on site.

Calculation data: Data is in horizontal footcandles (as if measured with a meter lying on the ground, aimed up), per the Zoning Ordinance.

Reflectances: Reflectances of buildings and ground surfaces included per industry standard reflectances.

Interflectances: Calculations include only direct illumination of the target grid points, cosine corrected for angle of incidence, and do not include interflected light from building surfaces.

Data Grids: 3' x 3' spacing.

Interstitial light levels: Note that measurements taken at other locations than the grid points shown may vary from those of the surrounding grid points.

Data rounding: Note that, as is common for all calculation programs, data rounding occurs. Thus, data calculated at 0.001 to 0.005 will round down to 0.00, while 0.006 to 0.009 will round up to 0.01. And 0.011 through 0.015 will round down to 0.01, while 0.016 through 0.019 will round up to 0.02.

All notes above apply to the current models.

Grid alignment: Note data grid points in this model do not exactly correspond to permit set grids due to orientation of grids, precluding data point to data point comparisons. But comparison of maximum, minimum and average values remains possible and appropriate.

Fixture status: Where noted, some fixtures have been turned off, and/or the aiming of fixtures may have changed, and/or custom shields may have been included in the model to minimize overspill.

Photometry: AGI32 uses "far field photometry" which means that it does not allow modelling of additional custom shielding added to the fixtures, where no IES file is available. We have modelled custom shields where called out using simulated shields at an appropriate distance from the fixture(s) to enable AGI32 to reasonably accurately calculate the impact of custom shielding.

Fixture output: All fixtures are, unless otherwise noted, calculated with an industry standard Light Loss Factor (LLF) of 90%. This means that initial installation values at data points will be 10% higher than the model reports. The same value for LLF was carried in the 5-16-22 Calculations submitted for permit. Where fixtures are dimmed in a specified rev of the model, a lower LLF is used to indicate the level dimmed to.

Site visit check measurements: If site visit check measurements are required, the installation must be complete and programmed for light output percentages as noted in the model, and there must be no snow on the ground, and ideally, no moon in the sky. Note that field measurements will include interflected components from building surfaces and will therefore be higher than calculated values.

The scope of services for this project for Ripman Lighting Consultants and Drafting & Photometric Consulting, LLC, our sub-contractor, is limited to running calculations of designs provided by others. We are providing data only. Neither Ripman Lighting Consultants nor Drafting & Photometric Consulting are making recommendations or approving or disapproving designs by others and we accept no liability for the implementation or modification of designs by others. For evaluation, these data calculations should be reviewed and commented on and the designs calculated, modified if required, by Tetra-Tech, the town's consultant, for conformance with the state building code and recognized standards of good practice.

DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.4 - V5
ALL EGRESS FIXTURES TURNED "ON" = 90%
ALL NON-EGRESS FIXTURES TURNED "OFF" = 0%

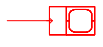
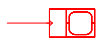
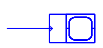
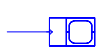




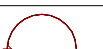
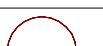





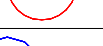




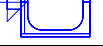
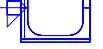
Drawn By: JS

Date:2/26/2024

Rev: 26.4-V5

Page 1 of 2

LIGHTING PARAMETERS:

Luminaire Schedule									
Symbol	Qty	Label	Arrangement	LLF	Description	Arr. Watts	Arr. Lum. Lumens	Mounting Height	Manufacturer
	7	A2-P2D	Single	0.100	DSX0 LED P1 30K 70CRI BLC3 MVOLT (DIMMED TO 10%)	33.21	3343	14	Lithonia Lighting
	1	A2-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI BLC3 MVOLT (DIMMED TO 10%)	33.21	3343	14	Lithonia Lighting
	1	A3-P2D	Single	0.900	DSX0 LED P1 30K 70CRI RCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A3-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI RCCO MVOLT (DIMMED 10%)	33.21	3375	14	Lithonia Lighting
	2	A4-P2D	Single	0.900	DSX0 LED P1 30K 70CRI LCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A4-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI LCCO MVOLT (DIMMED TO 10%)	33.21	3375	14	Lithonia Lighting
	5	AD	Single	0.900	RADPT P4 30K ASY HS	85.678	9439	14	Lithonia Lighting
	2	AD-50	Single	0.100	RADPT P4 30K ASY HS (DIMMED TO 10%)	85.678	9439	14	Lithonia Lighting
	2	B-P2D	Single	0.900	RADPT P3 30K ASY HS	53.618	5939	14	Lithonia Lighting
	1	B-P2D-50	Single	0.100	RADPT P3 30K ASY HS (DIMMED TO 10%)	53.618	5939	14	Lithonia Lighting
	3	BD	Single	0.900	RADPT P4 30K PATH HS	85.678	7877	14	Lithonia Lighting
	10	D	Single	0.900	WDGE1 LED P2 30K 80CRI VW	15.018	1876	10, 12	Lithonia Lighting
	26	D-P2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	6.83	NLS Lighting
	1	E-P2D	Single	0.900	RADPT P4 30K SYM HS	85.678	9889	14	Lithonia Lighting
	1	E-P2D-50	Single	0.100	RADPT P4 30K SYM HS (DIMMED TO 10%)	85.678	9889	14	Lithonia Lighting
	13	G1	Single	0.900	7162-GY-C13-27K-BBI	13	1131	10	Brownlee Lighting Inc
	15	G2D	Single	0.900	HC850D010-HM82555827-81WDC	48	5828	10	COOPER LIGHTING SOLUTIONS - HALO COMMERCIAL (FORMERLY EATON)
	4	H1	Single	0.900	7325-BL-C17-27K	16.21	970	6.5	Brownlee Lighting
	6	H2	Single	0.900	S5077W.14	3.5	37	8, 10	Simes S.p.A.
	8	I2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	5, 10	NLS Lighting
	10	ID	Single	0.900	TWA-T4-16L-175-30K7	10	1212	10	NLS Lighting
	2	N	Single	0.900	CLX L48 4000LM SEF FDL MVOLT 40K 80CRI	25.543	3956	10	Lithonia Lighting

THIS SCHEDULE IS A PRODUCT OF AGI32 AND LISTS TECHNICAL DATA FOR ALL FIXTURES ON THE SITE, REGARDLESS OF WHETHER THEY ARE ON OR OFF. FOR STATUS "ON", "OFF", SEE PLANS (PART OF FIXTURE TAGS).

Calculation Summary									
Label	Units	Avg	Max	Min	Avg/Min	Max/Min	PtSpclr	PtSpctb	Grid Z
Building A1 & A2 North	Fc	3.04	5.13	0.24	12.67	21.38	3	3	0
Building A1 South	Fc	2.83	4.90	0.52	5.44	9.42	3	3	0
Building A2 South	Fc	2.70	5.84	0.53	5.09	11.02	3	3	0
Building B Northeast	Fc	1.94	7.62	0.23	8.43	33.13	3	3	0
Building B South	Fc	2.79	4.70	1.83	1.52	2.57	3	3	0
Building C North Center	Fc	8.46	23.44	2.46	3.44	9.53	3	3	0
Building C Northeast	Fc	2.71	3.47	1.81	1.50	1.92	3	3	0
Building C Northwest	Fc	2.37	3.35	0.99	2.39	3.38	3	3	0
Building D Northeast	Fc	22.28	73.82	1.91	11.66	38.65	3	3	0
Building D West	Fc	27.59	75.36	2.51	10.99	30.02	3	3	0
Building E North	Fc	12.54	53.27	1.74	7.21	30.61	3	3	0
Building E West	Fc	3.39	14.70	1.01	3.36	14.55	3	3	1

DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.4 - V5
ALL EGRESS FIXTURES TURNED "ON" = 90%
ALL NON-EGRESS FIXTURES TURNED "OFF" = 0%

Drawn By: JS

Date:2/26/2024

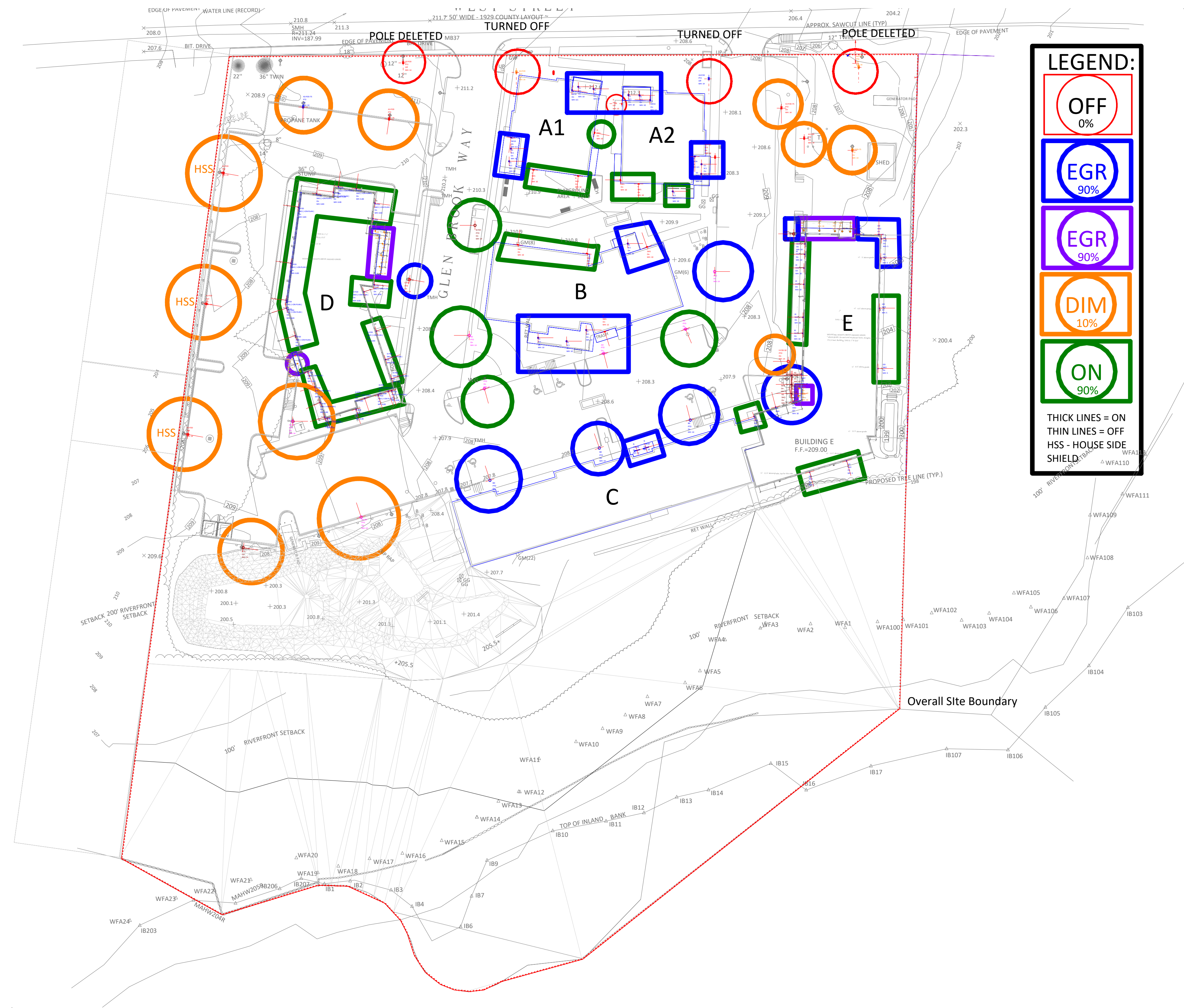
Rev: 26.4-V5

Page 2 of 2

MEDWAY PHOTOMETRICS 26.5-V5

- CURFEW CONDITION - 11PM TO DAWN
- ALL FIXTURES ON, SOME DIMMED AS NOTED.
- VERTICAL FC PERMITTED AT SITE BOUNDARY (20' VERTICAL GRID) 0.0 MAXIMUM.
- CALCULATED VERTICAL FC MAXIMUM AT SITE BOUNDARY: 0.0

CURFEW CONDITION - 11PM TO DAWN
ALL FIXTURES ON, SOME DIMMED AS NOTED.
VERTICAL FC PERMITTED AT SITE BOUNDARY (20' VERTICAL GRID) 0.0 MAXIMUM.
CALCULATED VERTICAL FC MAXIMUM AT SITE BOUNDARY: 0.0



Scale: 1 inch= 40 Ft.
VERTICAL GRIDS ARE 2'X2' TYP.

Notes on Calculations:

Reflectance : Walls - 0.5 (Unless Otherwise Noted)
Building E - Exterior Walls - 0.25
FIXTURE LLF As Noted Below on Page 2

All site lighting fixtures including both non-egress (conforming to the zoning ordinance requirements for curfew lighting) and egress lighting fixtures (conforming to requirements of the State Building Code) included in this calculation.

Software used: Calculations run using AGI32, industry standard software (Version 21.1.77).

IES files: Industry standard IES files, provided by others, were downloaded and incorporated into the model, for all fixtures modelled, including where so specified, and available as an IES file, house side shielding provided by the fixture manufacturer where so noted "HSS".

Topography: Previous permit model treated the site and adjacent properties as flat. The current model treats the site and the areas to the north of the site (towards West Street) as flat, but incorporates estimated topography for the east and west properties adjacent. Estimated by visual observation on site.

Calculation data: Data is in horizontal footcandles (as if measured with a meter lying on the ground, aimed up), per the Zoning Ordinance.

Reflectances: Reflectances of buildings and ground surfaces included per industry standard reflectances.

Interflectances: Calculations include only direct illumination of the target grid points, cosine corrected for angle of incidence, and do not include interreflected light from building surfaces.

Data Grids: 2' x 2' spacing.

Interstitial light levels: Note that measurements taken at other locations than the grid points shown may vary from those of the surrounding grid points.

Data rounding: Note that, as is common for all calculation programs, data rounding occurs. Thus, data calculated at 0.001 to 0.005 will round down to 0.00, while 0.006 to 0.009 will round up to 0.01. And 0.011 through 0.015 will round down to 0.01, while 0.016 through 0.019 will round up to 0.02.

All notes above apply to the current models.

Grid alignment: Note data grid points in this model do not exactly correspond to permit set grids due to orientation of grids, precluding data point to data point comparisons. But comparison of maximum, minimum and average values remains possible and appropriate.

Fixture status: Where noted, some fixtures have been turned off, and/or the aiming of fixtures may have changed, and/or custom shields may have been included in the model to minimize overspill.

Photometry: AGI32 uses "far field photometry" which means that it does not allow modelling of additional custom shielding added to the fixtures, where no IES file is available. We have modelled custom shields where called out using simulated shields at an appropriate distance from the fixture(s) to enable AGI32 to reasonably accurately calculate the impact of custom shielding.























Fixture output: All fixtures are, unless otherwise noted, calculated with an industry standard Light Loss Factor (LLF) of 90%. This means that initial installation values at data points will be 10% higher than the model reports. The same value for LLF was carried in the 5-16-22 Calculations submitted for permit. Where fixtures are dimmed in a specified rev of the model, a lower LLF is used to indicate the level dimmed to.

Site visit check measurements: If site visit check measurements are required, the installation must be complete and programmed for light output percentages as noted in the model, and there must be no snow on the ground, and ideally, no moon in the sky. Note that field measurements will include interreflected components from building surfaces and will therefore be higher than calculated values.

The scope of services for this project for Ripman Lighting Consultants and Drafting & Photometric Consulting, LLC, our sub-contractor, is limited to running calculations of designs provided by others. We are providing data only. Neither Ripman Lighting Consultants nor Drafting & Photometric Consulting are making recommendations or approving or disapproving designs by others and we accept no liability for the implementation or modification of designs by others. For evaluation, these data calculations should be reviewed and commented on and the designs calculated, modified if required, by Tetra-Tech, the town's consultant, for conformance with the state building code and recognized standards of good practice.

DIRECT ONLY
VERTICAL CALCULATIONS
NO INTERFLECTIONS
GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.5-V5
VERTICAL FC CALCULATIONS AT PROPERTY BOUNDARY
ALL FIXTURES TURNED "ON" = 90%, OR DIMMED, AS NOTED

LIGHTING PARAMETERS:

Luminaire Schedule									
Symbol	Qty	Label	Arrangement	LLF	Description	Arr. Watts	Arr. Lum. Lumens	Mounting Height	Manufacturer
	7	A2-P2D	Single	0.100	DSX0 LED P1 30K 70CRI BLC3 MVOLT (DIMMED TO 10%)	33.21	3343	14	Lithonia Lighting
	1	A2-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI BLC3 MVOLT (DIMMED TO 10%)	33.21	3343	14	Lithonia Lighting
	1	A3-P2D	Single	0.900	DSX0 LED P1 30K 70CRI RCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A3-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI RCCO MVOLT (DIMMED TO 10%)	33.21	3375	14	Lithonia Lighting
	2	A4-P2D	Single	0.900	DSX0 LED P1 30K 70CRI LCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A4-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI LCCO MVOLT (DIMMED TO 10%)	33.21	3375	14	Lithonia Lighting
	5	AD	Single	0.900	RADPT P4 30K ASY HS	85.678	9439	14	Lithonia Lighting
	2	AD-50	Single	0.100	RADPT P4 30K ASY HS (DIMMED TO 10%)	85.678	9439	14	Lithonia Lighting
	2	B-P2D	Single	0.900	RADPT P3 30K ASY HS	53.618	5939	14	Lithonia Lighting
	1	B-P2D-50	Single	0.100	RADPT P3 30K ASY HS (DIMMED TO 10%)	53.618	5939	14	Lithonia Lighting
	3	BD	Single	0.900	RADPT P4 30K PATH HS	85.678	7877	14	Lithonia Lighting
	10	D	Single	0.900	WDGE1 LED P2 30K 80CRI VW	15.018	1876	10, 12	Lithonia Lighting
	26	D-P2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	6.83	NLS Lighting
	1	E-P2D	Single	0.900	RADPT P4 30K SYM HS	85.678	9889	14	Lithonia Lighting
	1	E-P2D-50	Single	0.100	RADPT P4 30K SYM HS (DIMMED TO 10%)	85.678	9889	14	Lithonia Lighting
	13	G1	Single	0.900	7162-GY-C13-27K-BBI	13	1131	10	Brownlee Lighting Inc
	15	G2D	Single	0.900	HC850D010-HM82555827-81WDC	48	5828	10	COOPER LIGHTING SOLUTIONS - HALO COMMERCIAL (FORMERLY EATON)
	4	H1	Single	0.900	7325-BL-C17-27K	16.21	970	6.5	Brownlee Lighting
	6	H2	Single	0.900	S5077W.14	3.5	37	8, 10	Simes S.p.A.
	8	I2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	5, 10	NLS Lighting
	10	ID	Single	0.900	TWA-T4-16L-175-30K7	10	1212	10	NLS Lighting
	2	N	Single	0.900	CLX L48 4000LM SEF FDL MVOLT 40K 80CRI	25.543	3956	10	Lithonia Lighting

THIS SCHEDULE IS A PRODUCT OF AGI32 AND LISTS TECHNICAL DATA FOR ALL FIXTURES ON THE SITE, REGARDLESS OF WHETHER THEY ARE ON OR OFF. FOR STATUS "ON", "OFF", SEE PLANS (PART OF FIXTURE TAGS).

Calculation Summary									
Label	Units	Avg	Max	Min	Avg/Min	Max/Min	PtSpclR	PtSpcTb	Grid Z
Vertical - East_III_Seg1	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - North_III_Seg1	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg1	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg10	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg11	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg12	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg13	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg14	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg15	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg2	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg3	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg4	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg5	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg6	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg7	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg8	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - South_III_Seg9	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.
Vertical - West_III_Seg1	Fc	0.00	0.0	0.0	N.A.	N.A.	2	2	N.A.

DIRECT ONLY
VERTICAL CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.5-V5
VERTICAL FC CALCULATIONS AT PROPERTY BOUNDARY
ALL FIXTURES TURNED "ON" = 90%, OR DIMMED, AS NOTED

Drawn By: JS

Date:2/26/2024

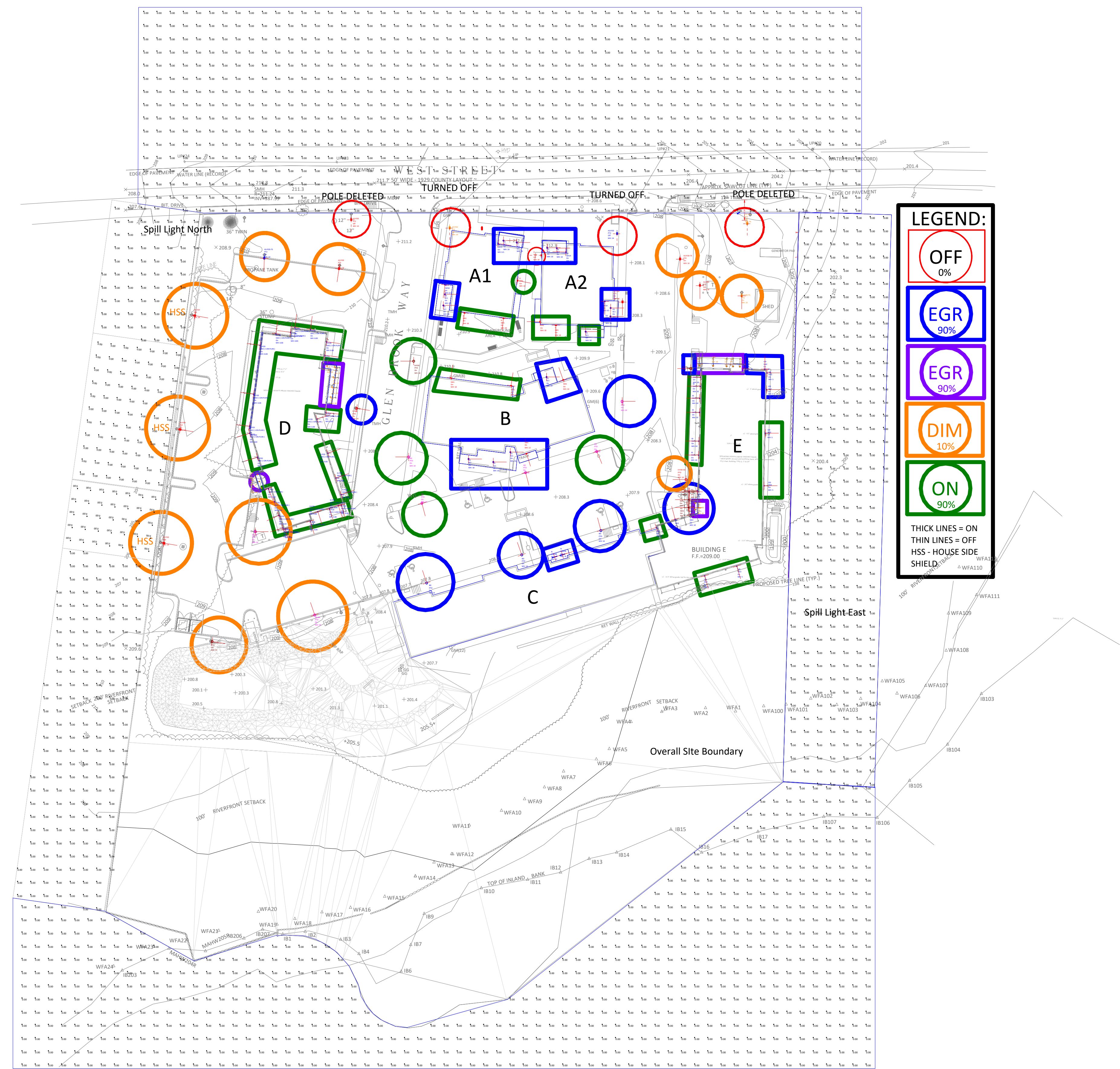
Rev: 26.5-V5

Page 2 of 2

MEDWAY PHOTOMETRICS 26.6-V5

- CURFEW CONDITION - 11PM TO DAWN
- ALL FIXTURES ON, SOME DIMMED AS NOTED.
- OFFSITE HORIZONTAL FC ALLOWED AT GRADE = 0.00 MAXIMUM.
- OFFSITE HORIZONTAL FC MAXIMUM CALCULATED AT GRADE: 0.00

CURFEW CONDITION - 11PM TO DAWN
ALL FIXTURES ON, SOME DIMMED AS NOTED.
OFFSITE HORIZONTAL FC ALLOWED AT GRADE = 0.00 MAXIMUM.
OFFSITE HORIZONTAL FC MAXIMUM CALCULATED AT GRADE: 0.00



Scale: 1 inch= 44 Ft.
VERTICAL GRIDS ARE 10'X10' TYP.

Notes on Calculations:

Reflectance : Walls - 0.5 (Unless Otherwise Noted)
Building E - Exterior Walls - 0.25
FIXTURE LLF As Noted Below on Page 2

All site lighting fixtures including both non-egress (conforming to the zoning ordinance requirements for curfew lighting) and egress lighting fixtures (conforming to requirements of the State Building Code) included in this calculation.

Software used: Calculations run using AGI32, industry standard software (Version 21.1.77).

IES files: Industry standard IES files, provided by others, were downloaded and incorporated into the model, for all fixtures modelled, including where so specified, and available as an IES file, house side shielding provided by the fixture manufacturer where so noted "HSS".

Topography: Previous permit model treated the site and adjacent properties as flat. The current model treats the site and the areas to the north of the site (towards West Street) as flat, but incorporates estimated topography for the east and west properties adjacent. Estimated by visual observation on site.

Calculation data: Data is in horizontal footcandles (as if measured with a meter lying on the ground, aimed up), per the Zoning Ordinance.

Reflectances: Reflectances of buildings and ground surfaces included per industry standard reflectances.

Interflectances: Calculations include only direct illumination of the target grid points, cosine corrected for angle of incidence, and do not include interreflected light from building surfaces.

Data Grids: 10' x 10' spacing.

Interstitial light levels: Note that measurements taken at other locations than the grid points shown may vary from those of the surrounding grid points.

Data rounding: Note that, as is common for all calculation programs, data rounding occurs. Thus, data calculated at 0.001 to 0.005 will round down to 0.00, while 0.006 to 0.009 will round up to 0.01. And 0.011 through 0.015 will round down to 0.01, while 0.016 through 0.019 will round up to 0.02.

All notes above apply to the current models.

Grid alignment: Note data grid points in this model do not exactly correspond to permit set grids due to orientation of grids, precluding data point to data point comparisons. But comparison of maximum, minimum and average values remains possible and appropriate.

Fixture status: Where noted, some fixtures have been turned off, and/or the aiming of fixtures may have changed, and/or custom shields may have been included in the model to minimize overspill.

Photometry: AGI32 uses "far field photometry" which means that it does not allow modelling of additional custom shielding added to the fixtures, where no IES file is available. We have modelled custom shields where called out using simulated shields at an appropriate distance from the fixture(s) to enable AGI32 to reasonably accurately calculate the impact of custom shielding.

Fixture output: All fixtures are, unless otherwise noted, calculated with an industry standard Light Loss Factor (LLF) of 90%. This means that initial installation values at data points will be 10% higher than the model reports. The same value for LLF was carried in the 5-16-22 Calculations submitted for permit. Where fixtures are dimmed in a specified rev of the model, a lower LLF is used to indicate the level dimmed to.























Site visit check measurements: If site visit check measurements are required, the installation must be complete and programmed for light output percentages as noted in the model, and there must be no snow on the ground, and ideally, no moon in the sky. Note that field measurements will include interreflected components from building surfaces and will therefore be higher than calculated values.

The scope of services for this project for Ripman Lighting Consultants and Drafting & Photometric Consulting, LLC, our sub-contractor, is limited to running calculations of designs provided by others. We are providing data only. Neither Ripman Lighting Consultants nor Drafting & Photometric Consulting are making recommendations or approving or disapproving designs by others and we accept no liability for the implementation or modification of designs by others. For evaluation, these data calculations should be reviewed and commented on and the designs calculated, modified if required, by Tetra-Tech, the town's consultant, for conformance with the state building code and recognized standards of good practice.

DIRECT ONLY
OFFSITE HOR FC CALCS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.6-V5
HORIZONTAL FC CALCULATIONS ABUTTING PROPERTIES
ALL FIXTURES TURNED "ON" = 90%, OR DIMMED, AS NOTED

LIGHTING PARAMETERS:

Luminaire Schedule									
Symbol	Qty	Label	Arrangement	LLF	Description	Arr. Watts	Arr. Lum. Lumens	Mounting Height	Manufacturer
	7	A2-P2D	Single	0.100	DSX0 LED P1 30K 70CRI BLC3 MVOLT (DIMMED TO 10%)	33.21	3343	14	Lithonia Lighting
	1	A2-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI BLC3 MVOLT (DIMMED TO 10%)	33.21	3343	14	Lithonia Lighting
	1	A3-P2D	Single	0.900	DSX0 LED P1 30K 70CRI RCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A3-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI RCCO MVOLT (DIMMED TO 10%)	33.21	3375	14	Lithonia Lighting
	2	A4-P2D	Single	0.900	DSX0 LED P1 30K 70CRI LCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A4-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI LCCO MVOLT (DIMMED TO 10%)	33.21	3375	14	Lithonia Lighting
	5	AD	Single	0.900	RADPT P4 30K ASY HS	85.678	9439	14	Lithonia Lighting
	2	AD-50	Single	0.100	RADPT P4 30K ASY HS (DIMMED TO 10%)	85.678	9439	14	Lithonia Lighting
	2	B-P2D	Single	0.900	RADPT P3 30K ASY HS	53.618	5939	14	Lithonia Lighting
	1	B-P2D-50	Single	0.100	RADPT P3 30K ASY HS (DIMMED TO 10%)	53.618	5939	14	Lithonia Lighting
	3	BD	Single	0.900	RADPT P4 30K PATH HS	85.678	7877	14	Lithonia Lighting
	10	D	Single	0.900	WDGE1 LED P2 30K 80CRI VW	15.018	1876	10, 12	Lithonia Lighting
	26	D-P2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	6.83	NLS Lighting
	1	E-P2D	Single	0.900	RADPT P4 30K SYM HS	85.678	9889	14	Lithonia Lighting
	1	E-P2D-50	Single	0.100	RADPT P4 30K SYM HS (DIMMED TO 10%)	85.678	9889	14	Lithonia Lighting
	13	G1	Single	0.900	7162-GY-C13-27K-BBI	13	1131	10	Brownlee Lighting Inc
	15	G2D	Single	0.900	HC850D010-HM82555827-81WDC	48	5828	10	COOPER LIGHTING SOLUTIONS - HALO COMMERCIAL (FORMERLY EATON)
	4	H1	Single	0.900	7325-BL-C17-27K	16.21	970	6.5	Brownlee Lighting
	6	H2	Single	0.900	S5077W.14	3.5	37	8, 10	Simes S.p.A.
	8	I2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	5, 10	NLS Lighting
	10	ID	Single	0.900	TWA-T4-16L-175-30K7	10	1212	10	NLS Lighting
	2	N	Single	0.900	CLX L48 4000LM SEF FDL MVOLT 40K 80CRI	25.543	3956	10	Lithonia Lighting

THIS SCHEDULE IS A PRODUCT OF AGI32 AND LISTS TECHNICAL DATA FOR ALL FIXTURES ON THE SITE, REGARDLESS OF WHETHER THEY ARE ON OR OFF. FOR STATUS "ON", "OFF", SEE PLANS (PART OF FIXTURE TAGS).

Calculation Summary									
Label	Units	Avg	Max	Min	Avg/Min	Max/Min	PtSpcLr	PtSpcTb	Grid Z
Spill Light East	Fc	0.00	0.00	0.00	N.A.	N.A.	10	10	-19.979 to -0.001
Spill Light North	Fc	0.00	0.00	0.00	N.A.	N.A.	10	10	0
Spill Light South_Planar	Fc	0.00	0.00	0.00	N.A.	N.A.	10	10	-20
Spill Light West - Mid Section 1	Fc	0.00	0.00	0.00	N.A.	N.A.	10	10	-12.027 to 0
Spill Light West - Mid Section 2	Fc	0.00	0.00	0.00	N.A.	N.A.	10	10	-6 to 0
Spill Light West - North Section	Fc	0.00	0.00	0.00	N.A.	N.A.	10	10	0
Spill Light West - South Section	Fc	0.00	0.00	0.00	N.A.	N.A.	10	10	0

DIRECT ONLY
OFFSITE HOR FC CALCS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.6-V5
HORIZONTAL FC CALCULATIONS ABUTTING PROPERTIES
ALL FIXTURES TURNED "ON" = 90%, OR DIMMED, AS NOTED

Drawn By: JS

Date:2/26/2024

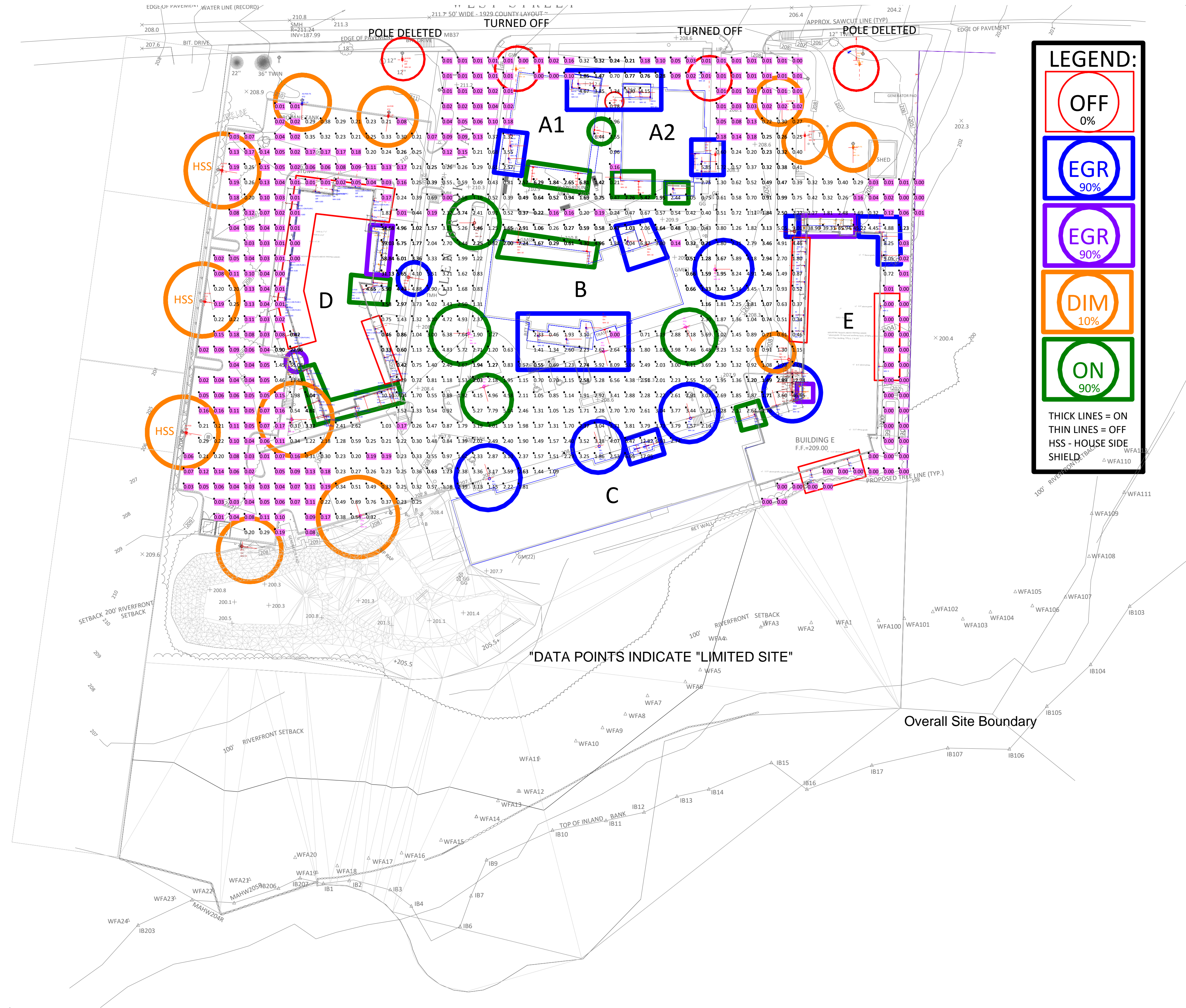
Rev: 26.6-V5

Page 2 of 2

MEDWAY PHOTOMETRICS 26.7-V5

- CURFEW CONDITION: 11PM TO DAWN
- ALL FIXTURES ON, BOTH NON-EGRESS AND EGRESS, SOME DIMMED AS NOTED.
- DATA POINTS HIGHLIGHTED IN PINK DO NOT CONFORM WITH IES/ANSI RECOMMENDATIONS FOR MINIMUM FOOT-CANDLES (0.2 MINIMUM OR GREATER).
- NON-CONFORMANCE IS CONSIDERED SIGNIFICANT IN THE OPINION OF RIPMAN LIGHTING CONSULTANTS.

CURFEW CONDITION: 11PM TO DAWN
ALL FIXTURES ON, BOTH NON-EGRESS AND EGRESS, SOME DIMMED AS NOTED.
DATA POINTS HIGHLIGHTED IN PINK DO NOT CONFORM WITH
IES/ANSI RECOMMENDATIONS FOR MINIMUM FOOT-CANDLES (0.2 MINIMUM OR GREATER).
NON-CONFORMANCE IS CONSIDERED SIGNIFICANT IN THE OPINION
OF RIPMAN LIGHTING CONSULTANTS.



Scale: 1 inch= 40 Ft.
GRIDS ARE 10'X10' TYP.

Notes on Calculations:

Reflectance : Walls - 0.5 (Unless Otherwise Noted)
Building E - Exterior Walls - 0.25
FIXTURE LLF As Noted Below on Page 2

All site lighting fixtures including both non-egress (conforming to the zoning ordinance requirements for curfew lighting) and egress lighting fixtures (conforming to requirements of the State Building Code) included in this calculation.

Software used: Calculations run using AGI32, industry standard software (Version 21.1.77).

IES files: Industry standard IES files, provided by others, were downloaded and incorporated into the model, for all fixtures modelled, including where so specified, and available as an IES file, house side shielding provided by the fixture manufacturer where so noted "HSS".

Topography: Previous permit model treated the site and adjacent properties as flat. The current model treats the site and the areas to the north of the site (towards West Street) as flat, but incorporates estimated topography for the east and west properties adjacent. Estimated by visual observation on site.

Calculation data: Data is in horizontal footcandles (as if measured with a meter lying on the ground, aimed up), per the Zoning Ordinance.

Reflectances: Reflectances of buildings and ground surfaces included per industry standard reflectances.

Interflectances: Calculations include only direct illumination of the target grid points, cosine corrected for angle of incidence, and do not include interreflected light from building surfaces.

Data Grids: 10' x 10' spacing.

Interstitial light levels: Note that measurements taken at other locations than the grid points shown may vary from those of the surrounding grid points.

Data rounding: Note that, as is common for all calculation programs, data rounding occurs. Thus, data calculated at 0.001 to 0.005 will round down to 0.00, while 0.006 to 0.009 will round up to 0.01. And 0.011 through 0.015 will round down to 0.01, while 0.016 through 0.019 will round up to 0.02.

All notes above apply to the current models.

Grid alignment: Note data grid points in this model do not exactly correspond to permit set grids due to orientation of grids, precluding data point to data point comparisons. But comparison of maximum, minimum and average values remains possible and appropriate.

Fixture status: Where noted, some fixtures have been turned off, and/or the aiming of fixtures may have changed, and/or custom shields may have been included in the model to minimize overspill.

Photometry: AGI32 uses "far field photometry" which means that it does not allow modelling of additional custom shielding added to the fixtures, where no IES file is available. We have modelled custom shields where called out using simulated shields at an appropriate distance from the fixture(s) to enable AGI32 to reasonably accurately calculate the impact of custom shielding.

Fixture output: All fixtures are, unless otherwise noted, calculated with an industry standard Light Loss Factor (LLF) of 90%. This means that initial installation values at data points will be 10% higher than the model reports. The same value for LLF was carried in the 5-16-22 Calculations submitted for permit. Where fixtures are dimmed in a specified rev of the model, a lower LLF is used to indicate the level dimmed to.























Site visit check measurements: If site visit check measurements are required, the installation must be complete and programmed for light output percentages as noted in the model, and there must be no snow on the ground, and ideally, no moon in the sky. Note that field measurements will include interreflected components from building surfaces and will therefore be higher than calculated values.

The scope of services for this project for Ripman Lighting Consultants and Drafting & Photometric Consulting, LLC, our sub-contractor, is limited to running calculations of designs provided by others. We are providing data only. Neither Ripman Lighting Consultants nor Drafting & Photometric Consulting are making recommendations or approving or disapproving designs by others and we accept no liability for the implementation or modification of designs by others. For evaluation, these data calculations should be reviewed and commented on and the designs calculated, modified if required, by Tetra-Tech, the town's consultant, for conformance with the state building code and recognized standards of good practice.

SITE AVERAGE HFC = 1.67 FC
DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.7-V5
ALL FIXTURES TURNED "ON" = 90%, OR DIMMED TO 10%, AS NOTED

LIGHTING PARAMETERS:

Luminaire Schedule									
Symbol	Qty	Label	Arrangement	LLF	Description	Arr. Watts	Arr. Lum. Lumens	Mounting Height	Manufacturer
	7	A2-P2D	Single	0.100	DSX0 LED P1 30K 70CRI BLC3 MVOLT (DIMMED TO 10%)	33.21	3343	14	Lithonia Lighting
	1	A2-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI BLC3 MVOLT (DIMMED TO 10%)	33.21	3343	14	Lithonia Lighting
	1	A3-P2D	Single	0.900	DSX0 LED P1 30K 70CRI RCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A3-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI RCCO MVOLT (DIMMED TO 10%)	33.21	3375	14	Lithonia Lighting
	2	A4-P2D	Single	0.900	DSX0 LED P1 30K 70CRI LCCO MVOLT	33.21	3375	14	Lithonia Lighting
	1	A4-P2D-75	Single	0.100	DSX0 LED P1 30K 70CRI LCCO MVOLT (DIMMED TO 10%)	33.21	3375	14	Lithonia Lighting
	5	AD	Single	0.900	RADPT P4 30K ASY HS	85.678	9439	14	Lithonia Lighting
	2	AD-50	Single	0.100	RADPT P4 30K ASY HS (DIMMED TO 10%)	85.678	9439	14	Lithonia Lighting
	2	B-P2D	Single	0.900	RADPT P3 30K ASY HS	53.618	5939	14	Lithonia Lighting
	1	B-P2D-50	Single	0.100	RADPT P3 30K ASY HS (DIMMED TO 10%)	53.618	5939	14	Lithonia Lighting
	3	BD	Single	0.900	RADPT P4 30K PATH HS	85.678	7877	14	Lithonia Lighting
	10	D	Single	0.900	WDGE1 LED P2 30K 80CRI VW	15.018	1876	10, 12	Lithonia Lighting
	26	D-P2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	6.83	NLS Lighting
	1	E-P2D	Single	0.900	RADPT P4 30K SYM HS	85.678	9889	14	Lithonia Lighting
	1	E-P2D-50	Single	0.100	RADPT P4 30K SYM HS (DIMMED TO 10%)	85.678	9889	14	Lithonia Lighting
	13	G1	Single	0.900	7162-GY-C13-27K-BBI	13	1131	10	Brownlee Lighting Inc
	15	G2D	Single	0.900	HC850D010-HM82555827-81WDC	48	5828	10	COOPER LIGHTING SOLUTIONS - HALO COMMERCIAL (FORMERLY EATON)
	4	H1	Single	0.900	7325-BL-C17-27K	16.21	970	6.5	Brownlee Lighting
	6	H2	Single	0.900	S5077W.14	3.5	37	8, 10	Simes S.p.A.
	8	I2D	Single	0.900	TWA-T4-16L-175-30K7	10	1212	5, 10	NLS Lighting
	10	ID	Single	0.900	TWA-T4-16L-175-30K7	10	1212	10	NLS Lighting
	2	N	Single	0.900	CLX L48 4000LM SEF FDL MVOLT 40K 80CRI	25.543	3956	10	Lithonia Lighting

THIS SCHEDULE IS A PRODUCT OF AGI32 AND LISTS TECHNICAL DATA FOR ALL FIXTURES ON THE SITE, REGARDLESS OF WHETHER THEY ARE ON OR OFF. FOR STATUS "ON", "OFF", SEE PLANS (PART OF FIXTURE TAGS).

Calculation Summary									
Label	Units	Avg	Max	Min	Avg/Min	Max/Min	PtSpcLr	PtSpcTb	Grid Z
Parking Horizontal	Fc	2.05	59.03	0.00	N.A.	N.A.	10	10	0
Pedestrian Horizontal	Fc	3.18	65.94	0.00	N.A.	N.A.	10	10	0
Road Horizontal	Fc	1.58	59.03	0.00	N.A.	N.A.	10	10	0

SITE AVERAGE HFC = 1.67 FC
DIRECT ONLY CALCULATIONS
NO INTERFLECTIONS

GBW - PHASES 1 + 2 - PHOTOMETRIC SITE PLAN 26.7-V5
ALL FIXTURES TURNED "ON" = 90%, OR DIMMED TO 10%, AS NOTED

Drawn By: JS

Date:2/26/2024

Rev: 26.7-V5

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