Inlet Grate Capacity Calculations

Inlet Grate Capacity Calculations

Job: SM-5369 Calculated by: JTM
Project: 429 Great Road Date: 4/19/2016

LeBARON FOUNDRY, INC. LF246 inlet grate pass area A = 225 sq. in.
1.56 sq. ft.

Q = (C*A* SQRT(2*g*h))*f

C = orifice coefficient
C = 0.6 square edges
A = inlet area
A = 1.56 sq. ft.
g = gravitational constant
g = 32.2 ft/sec^2
h = head on inlet
h = 0.33 ft. (low points)
0.17 ft. (on slope)
f = clogging factor
f = 0.66

Single Grate
Q (MAX)= 2.85 cfs (LP) low points LF246
Q (MAX)= 2.04 cfs (OS) on slope LF246
Double Grate
Q (MAX)= 5.70 cfs (LP) low points LF246
Q (MAX)= 4.09 cfs (OS) on slope LF246

	TRIBUTARY AREA (AC)	TIME OF CONC.	100 YR INTENSITY	C	Q=CiA Q100	POSITION	Q (MAX)	single grate	double grate
CB1	0.17	10	7.6	0.57	0.74	OS	2.04	yes	
CB2	0.08	10	7.6	0.9	0.55	OS	2.04	yes	
CB3	0.12	10	7.6	0.78	0.71	LP	2.85	yes	

Infiltration Trench Sizing Calculations

Infiltration Trench Calculation

Project: 429 Great Rd by: JTM Date: 4/13/2016

Location: Acton, MA checked: Date:

P11-Lot 2 Turnout

Area of Driveway:	1667	S.F.	0.04 AC
Direct runoff 100 yr Storm Event:	6.26	inches	From Figure 2.1 210 VI-TR55 based on 6.4 inches of rainfall

Turnout runoff volume to be infiltrated

1667 S.F. x 6.26 IN = 870 FT^3

Infiltration trench sizing

Length:	72	ft
Width:	5	ft
Depth:	1	ft

40% voids with gravel

Volume provided: L' x W' x D' X 40%

72 x 5 x 1 x 40 % = 144 FT^3

Infiltration

(Total area +Infiltration) (1.02 in/hr (Rawls # for Loam)) x 24 hours*(1ft/12in)

360 + 144 * 8.27*24 = 8336 ft^3 per 24 hours

144 FT^3 + 8336 FT^3 = 8480 FT^3

8480	FT^3 >	870	FT^3 O.K.

TSS Removal Calculations

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: Pretreatment for Subsurface Inf. Area 1

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Deep Sump Catch Basin W/ Hood	25%	1.00	0.25	0.75
CDS 2015-4	89.2%	0.75	0.67	0.08

Total TSS Removal = 92%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: 5369
Prepared By: JTM
Date: 4/19/16

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: Pretreatment for Subsurface Inf. Area 2

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Deep Sump Catch Basin W/ Hood	25%	1.00	0.25	0.75
Vortsentry HS36	91.5%	0.75	0.69	0.06

Total TSS Removal = 94%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: 5369
Prepared By: JTM
Date: 4/19/16

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: Pretreatment Infiltration Trench

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Grass and gravel filter strip	25%	1.00	0.25	0.75
Stone and filter fabric layer	25%	0.75	0.19	0.56

Total TSS Removal = 44%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: 5369
Prepared By: JTM
Date: 4/19/16

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

Mass. Dept. of Environmental Protection

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: Subsirface Infiltration Area 1

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
CDS 2015-4	89.2%	1.00	0.89	0.11
Stormtech subsurface Structure	80%	0.11	0.09	0.02

Total TSS Removal = 98%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: 5369
Prepared By: JTM
Date: 4/19/16

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Non-automated: Mar. 4, 2008

Location: Subsirface Infiltration Area 2

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Vortsentry HS36	91.5%	1.00	0.92	0.08
Stormtech subsurface Structure	80%	0.08	0.06	0.02

Total TSS Removal = 98%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: 5369
Prepared By: JTM
Date: 4/19/16

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

Mass. Dept. of Environmental Protection

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: Infiltration Trench

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Infiltration Trench with pretreament	80%	1.00	0..8	0.20

Total TSS Removal = 80%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: 5369
Prepared By: JTM
Date: 4/19/16

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

Mass. Dept. of Environmental Protection

CDS ESTIMATED NET ANNUAL TSS REDUCTION BASED ON THE RATIONAL RAINFALL METHOD

CONTECH ENGINEERED SOLUTIONS

429 GREAT ROAD
ACTON, MA
for SYSTEM: DMH4

Area	0.17	acres	CDS Model		
Weighted C	0.90		2015-4		
Tc	6	minutes	CDS Treatment Capacity		
			1.4	cfs	

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Removal Efficiency (%)	Incremental Removal (%)
0.02	10.2%	10.2%	0.00	0.00	97.1	9.9
0.04	9.6%	19.8%	0.01	0.01	96.9	9.4
0.06	9.4%	29.3%	0.01	0.01	96.8	9.1
0.08	7.7%	37.0%	0.01	0.01	96.6	7.5
0.10	8.6%	45.6%	0.02	0.02	96.5	8.3
0.12	6.3%	51.9%	0.02	0.02	96.3	6.1
0.14	4.7%	56.5%	0.02	0.02	96.2	4.5
0.16	4.6%	61.2%	0.02	0.02	96.0	4.5
0.18	3.5%	64.7%	0.03	0.03	95.9	3.4
0.20	4.3%	69.1%	0.03	0.03	95.7	4.2
0.25	8.0%	77.1%	0.04	0.04	95.4	7.6
0.30	5.6%	82.7%	0.05	0.05	95.0	5.3
0.35	4.4%	87.0%	0.05	0.05	94.6	4.1
0.40	2.5%	89.5%	0.06	0.06	94.2	2.4
0.45	2.5%	92.1%	0.07	0.07	93.9	2.4
0.50	1.4%	93.5%	0.08	0.08	93.5	1.3
0.75	5.0%	98.5%	0.11	0.11	91.6	4.6
1.00	1.0%	99.5%	0.15	0.15	89.8	0.9
1.50	0.0%	99.5%	0.23	0.23	86.1	0.0
2.00	0.0%	99.5%	0.31	0.31	82.3	0.0
3.00	0.5%	100.0%	0.46	0.46	74.9	0.4
						95.7

Removal Efficiency Adjustment[2] =	6.5%
Predicted % Annual Rainfall Treated =	93.5%
Predicted Net Annual Load Removal Efficiency =	**89.2%**

1 - Based on 10 years of hourly precipitation data from NCDC Station 770, Boston WSFO AP, Suffolk County, MA
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

VortSentry® HS Estimated Net Annual TSS Reduction

CONTECH® ENGINEERED SOLUTIONS

429 GREAT ROAD
ACTON, MA
Model VSHS36
System DMH5

Design Ratio[1] = $\frac{\text{0.1 acres x 0.9}}{\text{27 ft3}}$ **= 0.003**

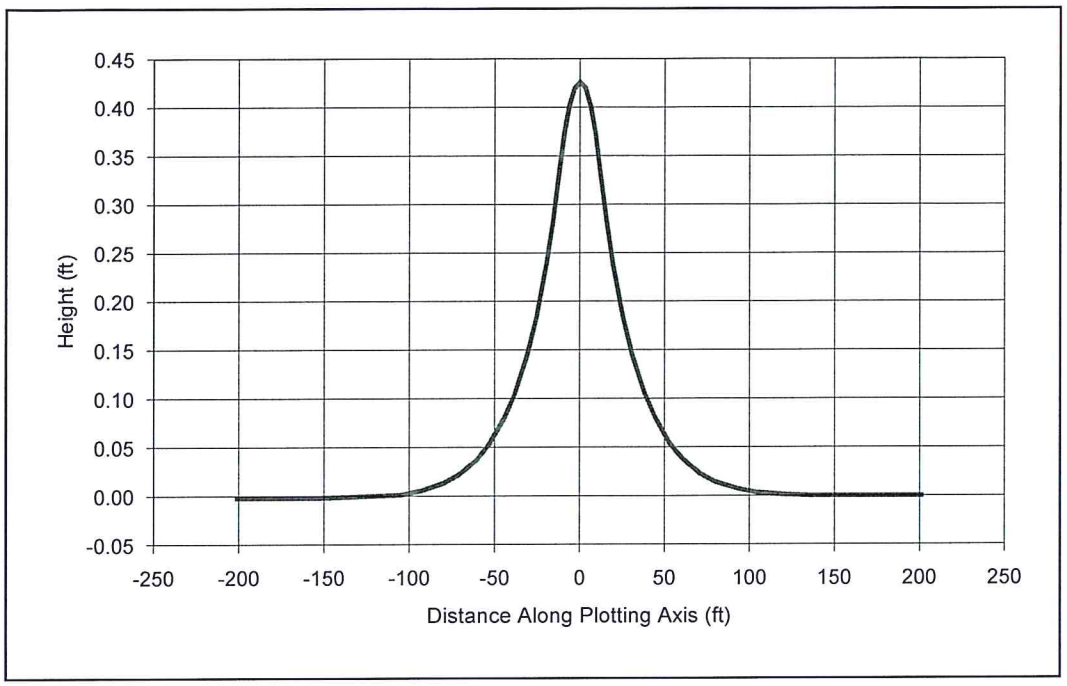
Rainfall Intensity "/hr	Flow Rate cfs	Operating Rate[2] cfs/ft^3	% Total Rainfall Depth[3]	Rmvl. Effcy[4] (%)	Rel. Effcy (%)
0.02	0.00	0.00007	10.2%	98.0%	10.0%
0.04	0.00	0.00014	9.6%	98.0%	9.5%
0.06	0.01	0.00020	9.4%	98.0%	9.3%
0.08	0.01	0.00027	7.7%	98.0%	7.6%
0.10	0.01	0.00034	8.6%	98.0%	8.4%
0.12	0.01	0.00041	6.3%	98.0%	6.2%
0.14	0.01	0.00048	4.7%	98.0%	4.6%
0.16	0.01	0.00054	4.6%	98.0%	4.5%
0.18	0.02	0.00061	3.5%	98.0%	3.5%
0.20	0.02	0.00068	4.3%	98.0%	4.3%
0.25	0.02	0.00085	8.0%	98.0%	7.8%
0.30	0.03	0.00102	5.6%	98.0%	5.5%
0.35	0.03	0.00119	4.4%	98.0%	4.3%
0.40	0.04	0.00136	2.5%	98.0%	2.5%
0.45	0.04	0.00153	2.5%	98.0%	2.5%
0.50	0.05	0.00170	1.4%	98.0%	1.4%
0.75	0.07	0.00255	5.0%	98.0%	4.9%
1.00	0.09	0.00340	1.0%	98.0%	1.0%
1.50	0.14	0.00509	0.0%	98.0%	0.0%
2.00	0.18	0.00679	0.0%	98.0%	0.0%
3.00	0.27	0.01019	0.5%	95.7%	0.5%
					98.0%
				% rain falling at >3"/hr =	0.0%
				Removal Efficiency Adjustment[4] =	6.5%
				Predicted Net Annual Load Removal Efficiency =	**91.5%**

1 - Design Ratio = (Total Drainage Area x Runoff Coefficient) / VortSentry HS Treatment Volume
= The Total Drainage Area and Runoff Coefficient are specified by the site engineer.
2 - Operating Rate (cfs/ft^3) = Rainfall Intensity ("/hr) x Design Ratio
3 - Based on 10 years of hourly precipitation data from NCDC Station 770, Boston WSFO AP, Suffolk County, MA
4 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

Calculated by: CJA	Date: 04/20/16	Checked by:	Date:

Groundwater Mounding Calculations

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: Stamski and McNary, Inc.

PROJECT: 5369 Inf Area 1

ANALYST: James Melvin

DATE: 4/21/2016 TIME: 9:48:03 AM

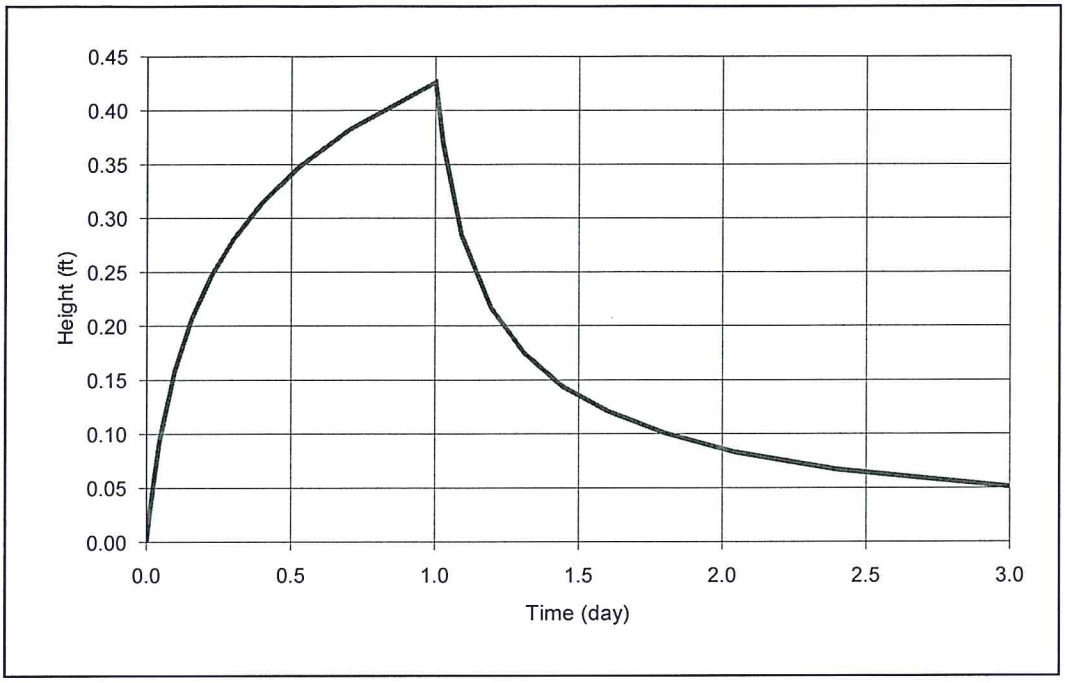
INPUT PARAMETERS

Application rate: 0.85 c.ft/day/sq. ft
Duration of application: 1 days
Fillable porosity: 0.35
Hydraulic conductivity: 39 ft/day
Initial saturated thickness: 10 ft
Length of application area: 23.36 ft
Width of application area: 31.47 ft
Constant head boundary used at: 201 ft
Plotting axis from Y-Axis: 0 degrees
Edge of recharge area:
positive X: 0 ft
positive Y: 11.7 ft
Total volume applied: 624.8683 c.ft

MODEL RESULTS

X (ft)	Y (ft)	Plot Axis (ft)	Mound Height (ft)
0	-201	-201	0
0	-169	-169	0
0	-137.1	-137	0
0	-105.1	-105	0
0	-80	-80	0.01
0	-60.5	-61	0.04
0	-44.6	-45	0.08
0	-31.1	-31	0.14
0	-19.5	-19	0.24
0	-11.7	-12	0.34
0	-6.3	-6	0.4
0	0	0	0.43
0	6.3	6	0.4
0	11.7	12	0.34
0	19.5	19	0.24
0	31.1	31	0.14
0	44.6	45	0.08
0	60.5	61	0.04
0	80	80	0.01
0	105.1	105	0
0	137.1	137	0
0	169	169	0
0	201	201	0

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: Stamski and McNary, Inc.

PROJECT: 5369 Inf Area 1

ANALYST: James Melvin

DATE: 4/21/2016 TIME: 9:48:15 AM

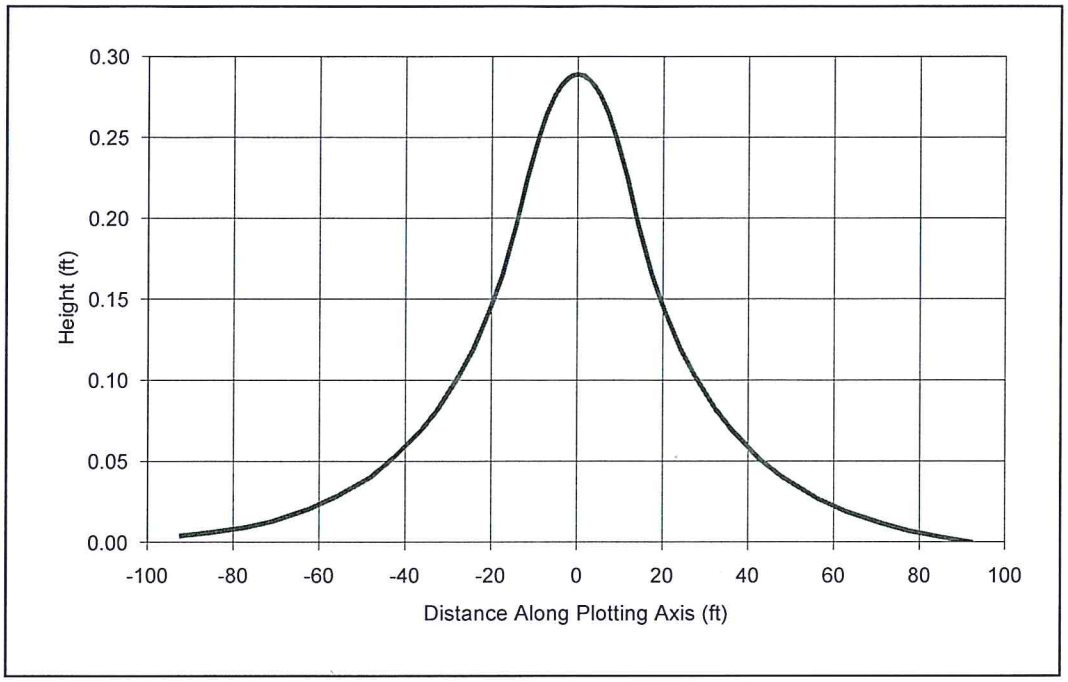
INPUT PARAMETERS

Application rate: 0.85 c.ft/day/sq. ft
Duration of application: 1 day
Total simulation time: 3 day
Fillable porosity: 0.35
Hydraulic conductivity: 39 ft/day
Initial saturated thickness: 10 ft
Length of application area: 23.36 ft
Width of application area: 31.47 ft
Constant head boundary used at: 201 ft
Groundwater mounding @
X coordinate: 0 ft
Y coordinate: 0 ft
Total volume applied: 624.8683 cft

MODEL RESULTS

Time (day)	Mound Height (ft)
0	0
0	0.03
0	0.09
0.1	0.16
0.2	0.21
0.2	0.25
0.3	0.28
0.4	0.31
0.5	0.35
0.7	0.38
1	0.43
1	0.37
1.1	0.28
1.2	0.22
1.3	0.18
1.4	0.14
1.6	0.12
1.8	0.1
2	0.08
2.4	0.07
3	0.05

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: Stamski and McNary, Inc.

PROJECT: 5369 Inf Area 2

ANALYST: James Melvin

DATE: 4/21/2016 TIME: 9:54:17 AM

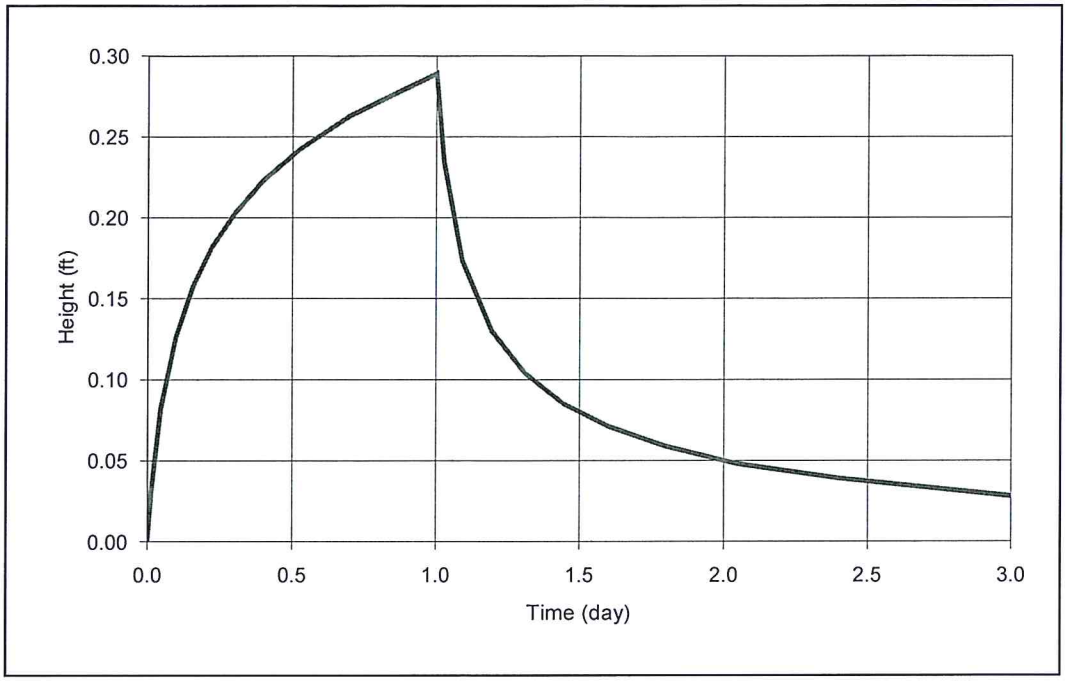
INPUT PARAMETERS

Application rate: 0.86 c.ft/day/sq. ft
Duration of application: 1 days
Fillable porosity: 0.35
Hydraulic conductivity: 39 ft/day
Initial saturated thickness: 10 ft
Length of application area: 23.36 ft
Width of application area: 18.16 ft
Constant head boundary used at: 92 ft
Plotting axis from Y-Axis: 30 degrees
Edge of recharge area:
positive X: 6.7 ft
positive Y: 11.7 ft
Total volume applied: 364.8271 c.ft

MODEL RESULTS

X (ft)	Y (ft)	Plot Axis (ft)	Mound Height (ft)
-46	-79.7	-92	0
-38.7	-67	-77	0.01
-31.4	-54.3	-63	0.02
-24.1	-41.7	-48	0.04
-18.3	-31.7	-37	0.07
-13.8	-24	-28	0.1
-10.2	-17.7	-20	0.14
-7.1	-12.3	-14	0.2
-4.5	-7.7	-9	0.25
-2.7	-4.6	-5	0.28
-1.4	-2.5	-3	0.28
0	0	0	0.29
1.4	2.5	3	0.28
2.7	4.6	5	0.28
4.5	7.7	9	0.25
7.1	12.3	14	0.2
10.2	17.7	20	0.14
13.8	24	28	0.1
18.3	31.7	37	0.07
24.1	41.7	48	0.04
31.4	54.3	63	0.02
38.7	67	77	0.01
46	79.7	92	0

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: Stamski and McNary, Inc.

PROJECT: 5369 Inf Area 2

ANALYST: James Melvin

DATE: 4/21/2016 TIME: 9:54:26 AM

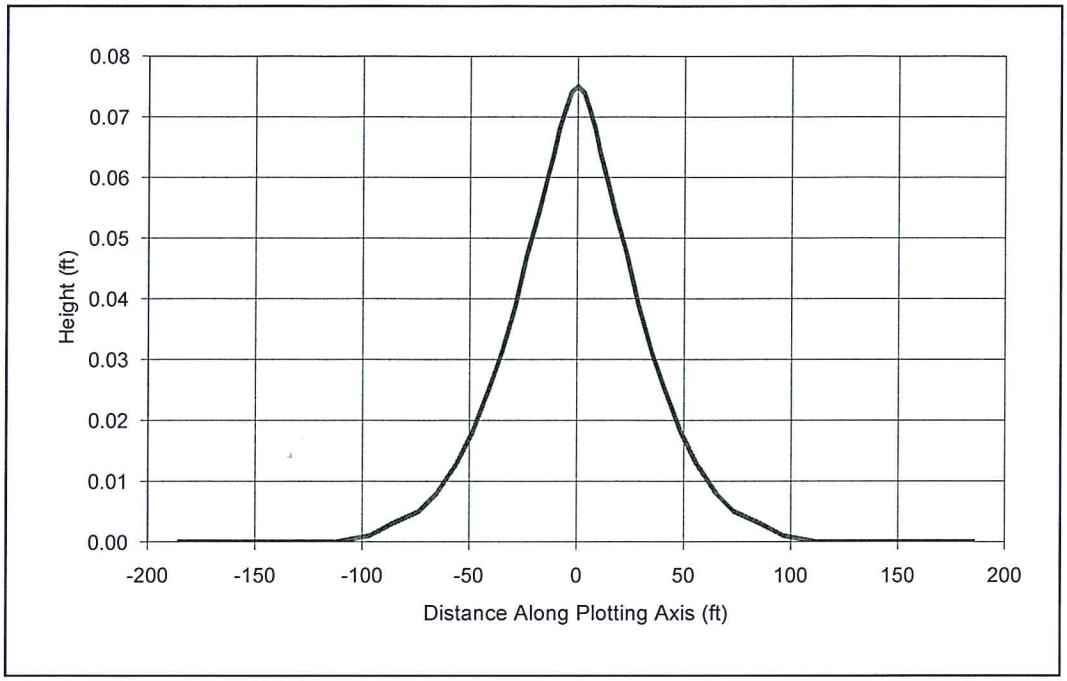
INPUT PARAMETERS

Application rate: 0.86 c.ft/day/sq. ft
Duration of application: 1 day
Total simulation time: 3 day
Fillable porosity: 0.35
Hydraulic conductivity: 39 ft/day
Initial saturated thickness: 10 ft
Length of application area: 23.36 ft
Width of application area: 18.16 ft
Constant head boundary used at: 92 ft
Groundwater mounding @
X coordinate: 0 ft
Y coordinate: 0 ft
Total volume applied: 364.8271 cft

MODEL RESULTS

Time (day)	Mound Height (ft)
0	0
0	0.03
0	0.08
0.1	0.13
0.2	0.16
0.2	0.18
0.3	0.2
0.4	0.22
0.5	0.24
0.7	0.26
1	0.29
1	0.24
1.1	0.17
1.2	0.13
1.3	0.1
1.4	0.08
1.6	0.07
1.8	0.06
2	0.05
2.4	0.04
3	0.03

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: Stamski and McNary, Inc.

PROJECT: 5369 Inf Trench

ANALYST: James Melvin

DATE: 4/21/2016 TIME: 9:59:23 AM

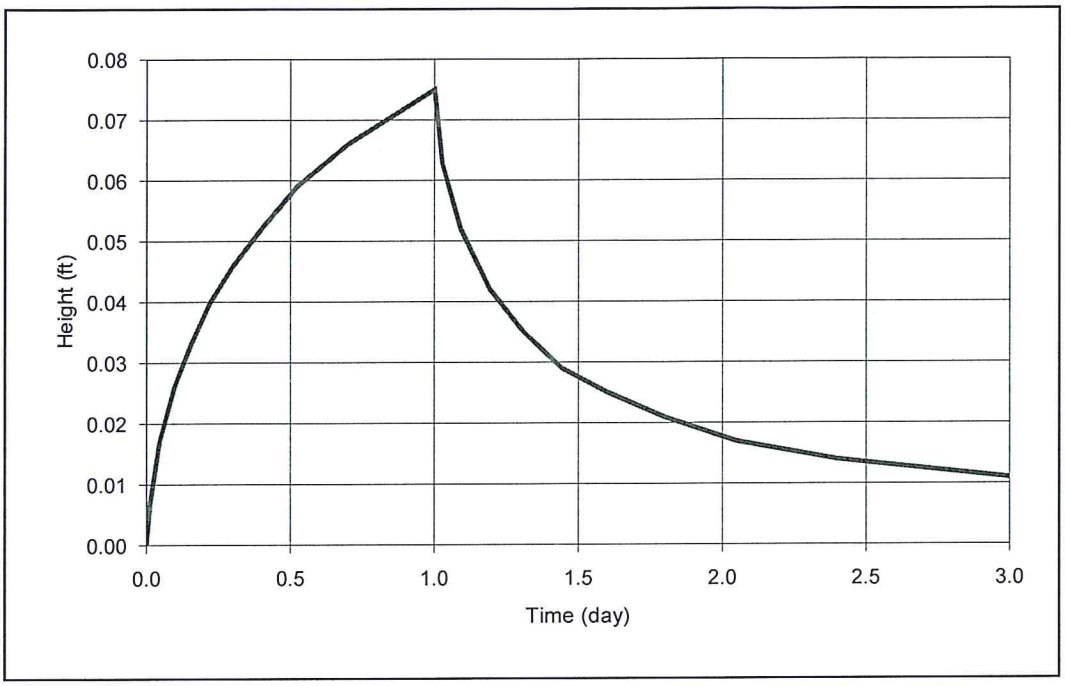
INPUT PARAMETERS

Application rate: 0.39 c.ft/day/sq. ft
Duration of application: 1 days
Fillable porosity: 0.35
Hydraulic conductivity: 39 ft/day
Initial saturated thickness: 10 ft
Length of application area: 72 ft
Width of application area: 5 ft
Constant head boundary used at: 185 ft
Plotting axis from Y-Axis: 30 degrees
Edge of recharge area:
positive X: 2.5 ft
positive Y: 4.3 ft
Total volume applied: 140.4 c.ft

MODEL RESULTS

X (ft)	Y (ft)	Plot Axis (ft)	Mound Height (ft)
-92.5	-160.2	-185	0
-77.8	-134.7	-156	0
-63.1	-109.3	-126	0
-48.4	-83.8	-97	0
-36.8	-63.7	-74	0
-27.8	-48.2	-56	0.01
-20.5	-35.5	-41	0.02
-14.3	-24.8	-29	0.04
-9	-15.5	-18	0.05
-5.4	-9.3	-11	0.06
-2.9	-5	-6	0.07
0	0	0	0.08
2.9	5	6	0.07
5.4	9.3	11	0.06
9	15.5	18	0.05
14.3	24.8	29	0.04
20.5	35.5	41	0.02
27.8	48.2	56	0.01
36.8	63.7	74	0
48.4	83.8	97	0
63.1	109.3	126	0
77.8	134.7	156	0
92.5	160.2	185	0

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: Stamski and McNary, Inc.

PROJECT: 5369 Inf Trench

ANALYST: James Melvin

DATE: 4/21/2016 TIME: 9:59:35 AM

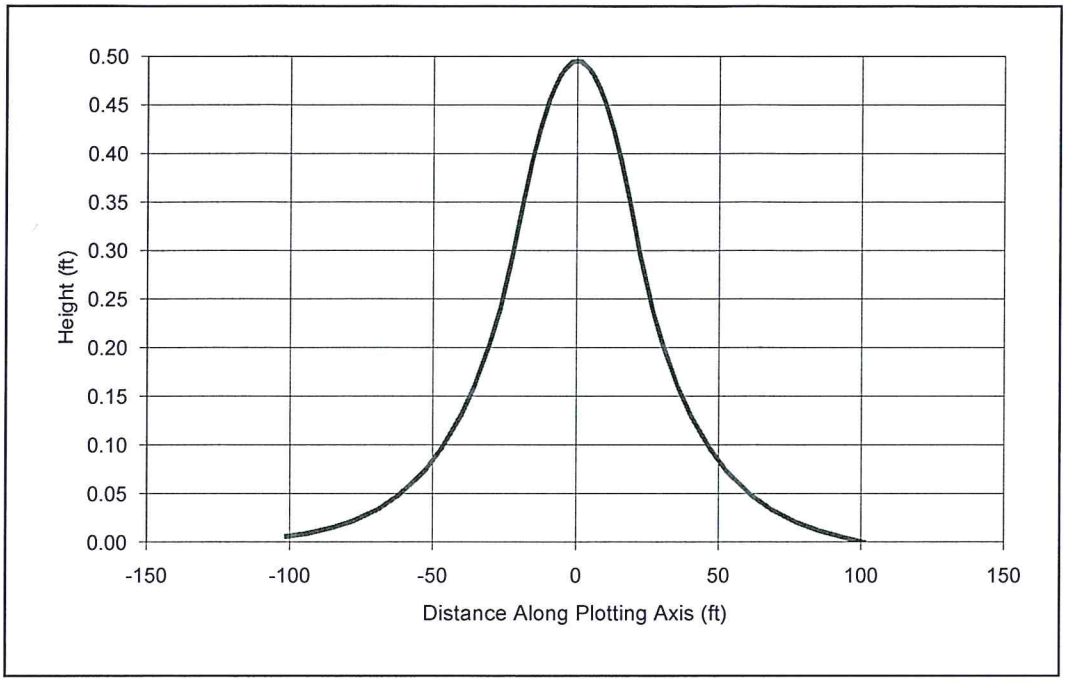
INPUT PARAMETERS

Application rate: 0.39 c.ft/day/sq. ft
Duration of application: 1 day
Total simulation time: 3 day
Fillable porosity: 0.35
Hydraulic conductivity: 39 ft/day
Initial saturated thickness: 10 ft
Length of application area: 72 ft
Width of application area: 5 ft
Constant head boundary used at: 185 ft
Groundwater mounding @
X coordinate: 0 ft
Y coordinate: 0 ft
Total volume applied: 140.4 cft

MODEL RESULTS

Time (day)	Mound Height (ft)
0	0
0	0.01
0	0.02
0.1	0.03
0.2	0.03
0.2	0.04
0.3	0.05
0.4	0.05
0.5	0.06
0.7	0.07
1	0.08
1	0.06
1.1	0.05
1.2	0.04
1.3	0.04
1.4	0.03
1.6	0.02
1.8	0.02
2	0.02
2.4	0.01
3	0.01

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: Stamski and McNary, Inc.

PROJECT: 5369 Roof Drywell

ANALYST: James Melvin

DATE: 4/21/2016 TIME: 10:04:28 AM

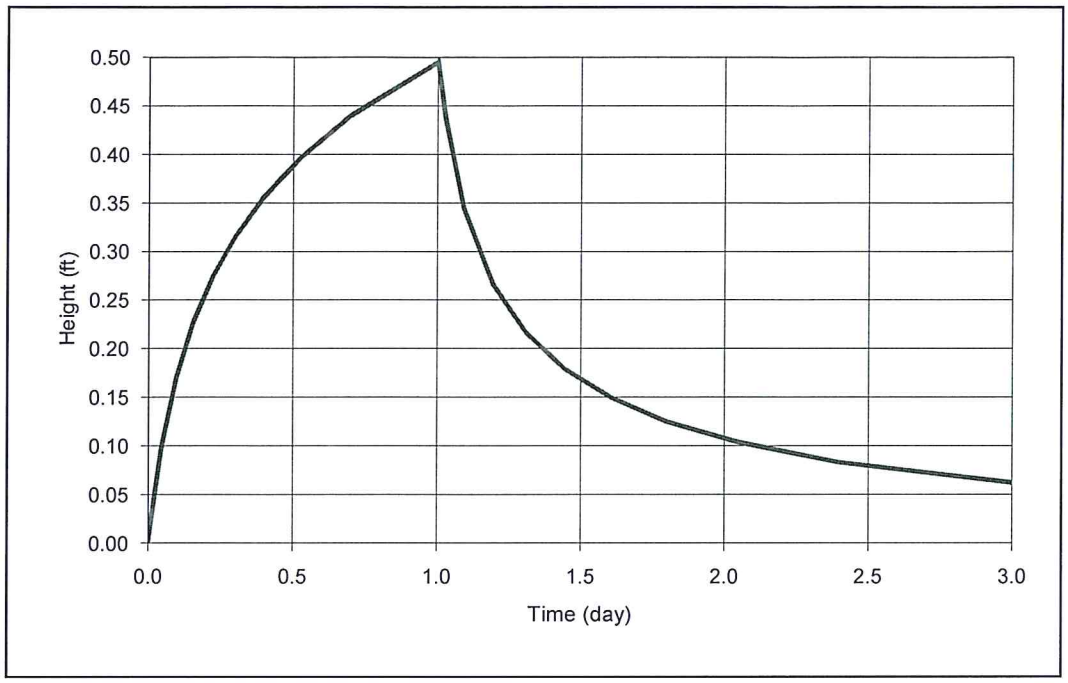
INPUT PARAMETERS

Application rate: 0.84 c.ft/day/sq. ft
Duration of application: 1 days
Fillable porosity: 0.35
Hydraulic conductivity: 39 ft/day
Initial saturated thickness: 10 ft
Length of application area: 37.6 ft
Width of application area: 24.81 ft
Constant head boundary used at: 101 ft
Plotting axis from Y-Axis: 30 degrees
Edge of recharge area:
positive X: 10.9 ft
positive Y: 18.8 ft
Total volume applied: 783.599 c.ft

MODEL RESULTS

X (ft)	Y (ft)	Plot Axis (ft)	Mound Height (ft)
-50.5	-87.5	-101	0.01
-42.5	-73.6	-85	0.02
-34.4	-59.6	-69	0.03
-26.4	-45.7	-53	0.07
-20.1	-34.8	-40	0.13
-15.2	-26.3	-30	0.2
-11.2	-19.4	-22	0.29
-7.8	-13.5	-16	0.39
-4.9	-8.5	-10	0.45
-2.9	-5.1	-6	0.48
-1.6	-2.8	-3	0.49
0	0	0	0.5
1.6	2.8	3	0.49
2.9	5.1	6	0.48
4.9	8.5	10	0.45
7.8	13.5	16	0.39
11.2	19.4	22	0.29
15.2	26.3	30	0.2
20.1	34.8	40	0.13
26.4	45.7	53	0.07
34.4	59.6	69	0.03
42.5	73.6	85	0.01
50.5	87.5	101	0

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: Stamski and McNary, Inc.

PROJECT: 5369 Roof Drywell

ANALYST: James Melvin

DATE: 4/21/2016 TIME: 10:04:33 AM

INPUT PARAMETERS

Application rate: 0.84 c.ft/day/sq. ft
Duration of application: 1 day
Total simulation time: 3 day
Fillable porosity: 0.35
Hydraulic conductivity: 39 ft/day
Initial saturated thickness: 10 ft
Length of application area: 37.6 ft
Width of application area: 24.81 ft
Constant head boundary used at: 101 ft
Groundwater mounding @
X coordinate: 0 ft
Y coordinate: 0 ft
Total volume applied: 783.5991 cft

MODEL RESULTS

Time (day)	Mound Height (ft)
0	0
0	0.03
0	0.1
0.1	0.17
0.2	0.23
0.2	0.27
0.3	0.32
0.4	0.36
0.5	0.4
0.7	0.44
1	0.5
1	0.44
1.1	0.34
1.2	0.27
1.3	0.22
1.4	0.18
1.6	0.15
1.8	0.12
2	0.1
2.4	0.08
3	0.06

STAMSKI AND McNARY, INC.
1000 MAIN STREET
ACTON, MASSACHUSETTS 01720
TEL (978) 263-8585
FAX (978) 263-9883

JOB 5369 429 GREAT Rd
SHEET NO. _____ OF _____
CALCULATED BY JTM DATE 4/19/16
CHECKED BY _____ DATE _____
SCALE _____

RATE OF APPLICATION

INF AREA 1

WATER QUALITY VOLUME
$7496 \times \frac{1}{12} = 625$ C.F.

APPLICATION RATE $= \frac{625 \text{ C.F.}}{23.36 \times 31.47} = \frac{625}{735} = 0.85$

INF AREA 2

WATER QUALITY VOLUME
$4388 \times \frac{1}{12} = 366$

APPLICATION RATE $= \frac{366}{23.36 \times 18.16} = \frac{366}{424} = 0.86$

INF TRENCH

WATER QUALITY VOLUME
$1667 \times \frac{1}{12} = 139$ C.F.

APPLICATION RATE $= \frac{139}{72 \times 5} = \frac{139}{360} = 0.39$

ROOF DRYWELL

WATER QUALITY VOLUME
$10563 \times \frac{1}{12} = 880$ C.F.

APPLICATION RATE $= \frac{880}{37.6 \times 24.81} = \frac{880}{1046} = 0.84$

Storm Sewer Design

DESIGN STORM: 100 YEAR
DATE: 4/19/2016
DONE BY: JTM
FILE: 5369 RATIONAL METHOD.wb3

STORM SEWER DESIGN

(ADS N-12)"n"= 0.010 4"-10"
(ADS N-12)"n"= 0.012 12"-36"
(ADS N-12)"n"= 0.013 42"-60"
(Cast Iron)"n"= 0.011
(RCP)"n"=0.013

PROJECT: SM-5369
LOCATION: Acton, MA

FROM	TO	LENGTH (FT)	TRIBUTARY AREA INCR. (ACRES)	TRIBUTARY AREA TOTAL (ACRES)	TIME OF FLOW TO UPPER END (MIN)	TIME OF FLOW TIME IN SECTION (MIN)	RUNOFF COEFF. "C"	RAINFALL INTENSITY (IN/HR)	"Q" TOTAL RUNOFF (CFS)	SLOPE of PIPE (FT/FT)	DIAM (IN)	MANN. "n"	CAPACITY FULL (CFS)	VELOCITY FULL (FPS)	DESIGN FLOW VELOCITY (FPS)	DESIGN FLOW VELOCITY HEAD (FT)	DESIGN FLOW DEPTH OF FLOW (FT)	DESIGN FLOW TOTAL ENERGY HEAD (FT)	MANHOLE INVERT DROP (FT)	FALL IN PIPE (FT)	DRAIN INV. ELEVATION UPPER END	DRAIN INV. ELEVATION LOWER END	GROUND SURFACE UPPER END	GROUND SURFACE LOWER END	
CB-1	DMH-1	46		0.17	10	0.26	0.57	7.6	0.74	0.005	12	0.012	2.72	3.47	2.95	0.13	0.36	0.49		0.23	202.30	202.07	206.80	205.00	CB-1
DMH-1	DMH-2	54		0.17	10	0.31	0.57	7.6	0.74	0.005	12	0.012	2.72	3.47	2.95	0.13	0.36	0.49		0.27	201.97	201.70	205.00	207.33	DMH-1
DMH-2	DMH-3	64		0.17	10	0.36	0.57	7.6	0.74	0.005	12	0.012	2.72	3.47	2.95	0.13	0.36	0.49		0.32	201.60	201.28	207.33	208.20	DMH-2
CB-2	DMH-3	7		0.08	10	0.03	0.90	7.6	0.55	0.014	12	0.012	4.60	5.87	3.92	0.24	0.23	0.47		0.10	201.38	201.28	207.00	206.33	CB-2
DMH-3	INF	4		0.25	10	0.01	0.68	7.6	1.28	0.050	12	0.012	8.61	10.97	7.87	0.96	0.26	1.22		0.20	201.28	201.08	206.33	203.83	DMH-3
CB-3	DMH-4	17		0.12	10	0.10	0.78	7.6	0.71	0.005	12	0.012	2.80	3.57	2.96	0.14	0.34	0.48		0.09	198.87	198.78	201.75	202.20	CB-3
DMH-4	INF	4		0.12	10	0.01	0.78	7.6	0.71	0.050	12	0.012	8.61	10.97	6.55	0.67	0.19	0.86		0.20	198.78	198.58	202.20	201.33	DMH-4

CB - CATCH BASIN
DI - DROP INLET
DMH- DRAIN MANHOLE
INF - INFILTRATION AREA

Project: 429 Great Road By JTM Date 4/19/2016

Location: Acton, MA Checked Date

Rational Method

Q = peak flow rate, (cfs)

i = rainfall intensity inches/hour

C = runoff coefficient,
C = 0.90 impervious
C = 0.20 landscaped / grass
C = 0.15 woods

A = area (ac)

CB-1

Surface Cover	A (ac)	C	Product A x C
impervious	0.09	0.9	0.081
lands/grass	0.08	0.2	0.016
woods	0	0.15	0
sum =	0.17	sum =	0.097

C = **0.57** = total product / total area

DMH-2

Surface Cover	A (ac)	C	Product A x C
CB 1	0.17	0.57	0.097
			0.000
sum =	0.17	sum =	0.097

C = **0.57** = total product / total area

Project: 429 Great Road By JTM Date 4/19/2016

Location: Acton, MA Checked _____ Date _____

Rational Method

Q = peak flow rate, (cfs)

i = rainfall intensity inches/hour

C = runoff coefficient,

A = area (ac)

C = 0.90 impervious
C = 0.20 landscaped / grass
C = 0.15 woods

CB-2

Surface Cover	A (ac)	C	Product A x C
impervious	0.08	0.9	0.072
lands/grass	0.00	0.2	0
woods	0.00	0.15	0
sum =	0.08	sum =	0.072

C = **0.90** = total product / total area

DMH-3

Surface Cover	A (ac)	C	Product A x C
CB-2	0.08	0.90	0.072
DMH-2	0.17	0.57	0.097
sum =	0.25	sum =	0.169

C = **0.68** = total product / total area

Project: **429 Great Road** By JTM Date 4/19/2016

Location: **Acton, MA** Checked Date

Rational Method

Q = peak flow rate, (cfs)

i = rainfall intensity inches/hour

C = runoff coefficient,
C = 0.90 impervious
C = 0.20 landscaped / grass
C = 0.15 woods

A = area (ac)

CB-3

Surface Cover	A (ac)	C	Product A x C
impervious	0.10	0.9	0.09
lands/grass	0.02	0.2	0.004
woods	0	0.15	0
sum =	0.12	sum =	0.094

C = **0.78** = total product / total area

DMH-4

Surface Cover	A (ac)	C	Product A x C
CB-3	0.12	0.78	0.094
sum =	0.12	sum =	0.094

C = **0.78** = total product / total area

Soil Evaluation

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

COUNTRY PROPERTIES, LLC
Owner Name

429 GREAT ROAD
Street Address

Map/Lot #

ACTON
City

MA
State

01720
Zip Code

B. Site Information

1. (Check one) ☑ New Construction ☐ Upgrade ☐ Repair

2. Soil Survey Available? ☑ Yes ☐ No If yes: NRCS (Source) 626B 631C (Soil Map Unit)

MERRIMAC URBAN LAND COMPLEX
CHARLTON URBAN LAND HOLLIS COMPLEX
Soil Name

Soil Limitations

SAND AND GRAVEL GLACIOFLUVIAL DEPOSITS
Geologic/Parent Material

OUTWASH TERRACE, OUTWASH PLAIN
Landform

3. Surficial Geological Report Available? ☑ Yes ☐ No If yes: OLIVER (Year Published/Source) _____ (Publication Scale) TILL or BEDROCK (Map Unit)

4. Flood Rate Insurance Map

Above the 500-year flood boundary? ☑ Yes ☐ No Within the 100-year flood boundary? ☐ Yes ☑ No
If Yes, continue to #5.

5. Within a velocity zone? ☐ Yes ☑ No

6. Within a Mapped Wetland Area? ☐ Yes ☑ No MassGIS Wetland Data Layer: — (Wetland Type)

7. Current Water Resource Conditions (USGS): 2/16 (Month/Year) Range: ☐ Above Normal ☐ Normal ☑ Below Normal

8. Other references reviewed:

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 1 | 2/23/16 (Date) | 9:00 A.M. (Time) | Sunny (Weather)

1. Location

Ground Elevation at Surface of Hole: _____ feet Latitude/Longitude: /

Description of Location: LAWN

2. Land Use: LAWN (e.g., woodland, agricultural field, vacant lot, etc.) None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) Slope (%)

Vegetation: LAWN Landform: _____ Position on Landscape (SU, SH, BS, FS, TS): _____

3. Distances from:

Open Water Body	– feet	Drainage Way	– feet	Wetlands	>100' feet
Property Line	>10' feet	Drinking Water Well	– feet	Other	_____ feet

4. Parent Material: SAND AND GRAVEL GLACIOFLUVIAL Unsuitable Materials Present: ☐ Yes ☑ No

If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☑ Yes ☐ No If yes: 62" Depth Weeping from Pit; 95" Depth Standing Water in Hole

Estimated Depth to High Groundwater: 60" inches _____ elevation

Deep Observation Hole Number: 1

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
14	A	10YR 3/2	–	–	–	SL	–	–	M	F	–
14	B	10YR 4/6	–	–	–	LS	–	–	M	F	–
65	C_1	2.5Y 5/3	60"	High/Low	–	COARSE SAND	20	5	S.G.	Loose	–
120	C_2	2.5Y 5/3	–	–	–	MED SAND	20	5	S.G.	Loose	–

Additional Notes:

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area*)

Deep Observation Hole Number: 2 | 2/23/16 (Date) | 9:00 A.M (Time) | SUNNY (Weather)

1. Location

Ground Elevation at Surface of Hole: _____ feet Latitude/Longitude: /

Description of Location: LAWN

2. Land Use: LAWN (e.g., woodland, agricultural field, vacant lot, etc.) Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)

Vegetation: LAWN Landform: _____ Position on Landscape (SU, SH, BS, FS, TS): _____

3. Distances from:

Open Water Body	– feet	Drainage Way	– feet	Wetlands	>100 feet
Property Line	>10' feet	Drinking Water Well	_____ feet	Other	_____ feet

4. Parent Material: SAND AND GRAVEL GLACIOFLUVIAL Unsuitable Materials Present: ☐ Yes ☑ No

If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☑ Yes ☐ No If yes: 62" Depth Weeping from Pit 100" Depth Standing Water in Hole

Estimated Depth to High Groundwater: 60" inches _____ elevation

Deep Observation Hole Number: 2

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
14	A	10YR 3/2	–	–	–	SL	–	–	M	F	–
19	B	10YR 4/6	–	–	–	LS	–	–	M	F	–
65	C1	2.5Y 5/3	60	High/low	–	COARSE SAND	20	5	S.G.	LOOSE	–
114	C2	2.5Y 5/3	–	–	–	MED. SAND	20	5	S.G.	LOOSE	–

Additional Notes:

Commonwealth of Massachusetts
City/Town of
Percolation Test
Form 12

Percolation test results must be submitted with the Soil Suitability Assessment for On-site Sewage Disposal. DEP has provided this form for use by local Boards of Health. Other forms may be used, but the information must be substantially the same as that provided here. Before using this form, check with the local Board of Health to determine the form they use.

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A. Site Information

COUNTRY PROPERTIES, LLC
Owner Name

429 GREAT ROAD
Street Address or Lot #

ACTON — City/Town
MA — State
01720 — Zip Code

Contact Person (if different from Owner)
Telephone Number

B. Test Results

	2/23/16 (Date)	9:30 AM (Time)	Date	Time
Observation Hole #	PT-A			
Depth of Perc	48"			
Start Pre-Soak				
End Pre-Soak	24 GALLONS			
Time at 12"	UNABLE TO			
Time at 9"	SATURATE			
Time at 6"				
Time (9"-6")				
Rate (Min./Inch)				
	Test Passed: ☑ Test Failed: ☐		Test Passed: ☐ Test Failed: ☐	

JAMES MELVAN - STAMSITZ AND McNARY, INC
Test Performed By:

EVAN CARLONI - ACTON BOH
Witnessed By:

Comments:

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole # _____	Obs. Hole # _____
☐ Depth observed standing water in observation hole	_____ inches	_____ inches
☐ Depth weeping from side of observation hole	_____ inches	_____ inches
☑ Depth to soil redoximorphic features (mottles)	SEE SOIL LOGS inches	_____ inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

_____ Index Well Number _____ Reading Date

$S_h = S_c - [S_r \times (OW_c - OW_{max})/OW_r]$

Obs. Hole # _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

Obs. Hole # _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☑ Yes ☐ No

SEE SOIL LOGS

b. If yes, at what depth was it observed? Upper boundary: _____ inches Lower boundary: _____ inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

[signature]	2/23/16
Signature of Soil Evaluator	Date
JAMES MELVIN SE 13716	7/1/18
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License
EVAN CARLONI - ACTON	ACTON
Name of Board of Health Witness	Board of Health

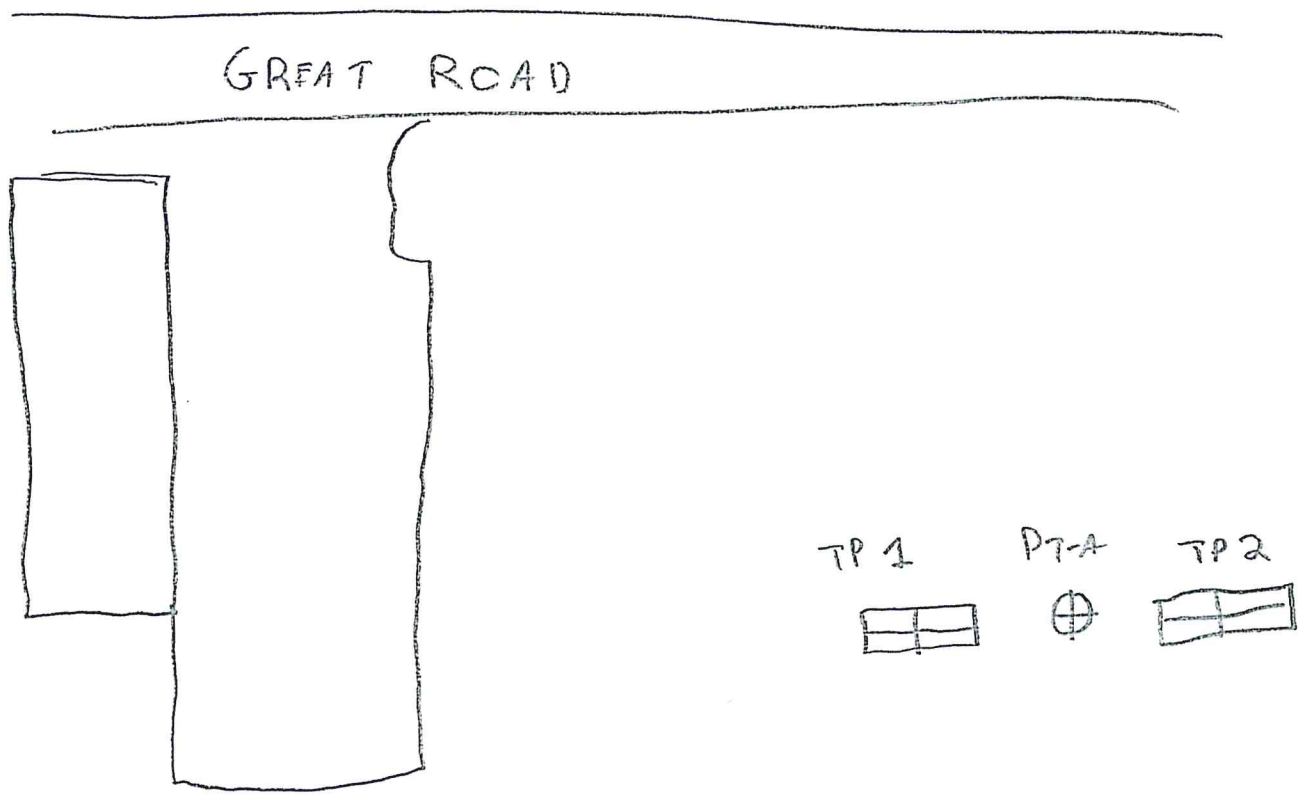
Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Field Diagrams

Use this sheet for field diagrams:



Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area*)

Deep Observation Hole Number: D-1 | 2/23/16 (Date) | 10:00 AM (Time) | SUNNY (Weather)

1. Location

Ground Elevation at Surface of Hole: _____ feet Latitude/Longitude: /

Description of Location: LAWN

2. Land Use: LAWN (e.g., woodland, agricultural field, vacant lot, etc.) Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)

Vegetation: LAWN Landform Position on Landscape (SU, SH, BS, FS, TS)

3. Distances from:

Open Water Body	– feet	Drainage Way	– feet	Wetlands	710' feet
Property Line	710' feet	Drinking Water Well	– feet	Other	– feet

4. Parent Material: _____ Unsuitable Materials Present: ☐ Yes ☐ No

If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☑ Yes ☐ No If yes: 41" Depth Weeping from Pit 57" Depth Standing Water in Hole

Estimated Depth to High Groundwater: 38" inches elevation

Deep Observation Hole Number: D-1

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
14	A	10YR 3/2				SL			M	F	
22	B	10YR 5/4				SL			M	F	
62	C	2.5Y 5/3	38	High/low		COARSE SAND	10	–	S.G.	LOOSE	

Additional Notes:

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: D-2 | 2/23/16 (Date) | 10:00 A.M (Time) | SUNNY (Weather)

1. Location

Ground Elevation at Surface of Hole: _____ feet Latitude/Longitude: /

Description of Location: LAWN

2. Land Use: LAWN (e.g., woodland, agricultural field, vacant lot, etc.) Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)

Vegetation: LAWN Landform: Position on Landscape (SU, SH, BS, FS, TS)

3. Distances from:

Open Water Body	– feet	Drainage Way	– feet	Wetlands	>100' feet
Property Line	>10' feet	Drinking Water Well	– feet	Other	– feet

4. Parent Material: _____ Unsuitable Materials Present: ☐ Yes ☐ No

If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☑ Yes ☐ No If yes: 59 (Depth Weeping from Pit) 83 (Depth Standing Water in Hole)

Estimated Depth to High Groundwater: 48" inches elevation

Deep Observation Hole Number: D-2

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
22	A	10YR 3/2				SL	–	–	M	F	–
40	B	10YR 5/4				SL	–	–	M	F	–
93	C	2.5Y 5/3	48	High/low		COARSE SAND	10	–	S.G.	LOOSE	–

Additional Notes:

Operation and Maintenance Manual

Schedule for Inspection and Maintenance:

Contech Proprietary BMP: (DMH-4 and 5)
Inspection and maintenance of the unit can be performed form the surface, without entry into the unit. Perform maintenance a minimum of twice per year. The unit should be cleaned once the sediment has reached a depth of 75% of the sump in the chamber.

Perform frequent inspections during the first year of installation to accurately establish the maintenance schedule.

Remove oil and sediment through the manhole cover with the use of a vacuum truck.

Disposal from the unit is similar to that of any other best management practice (BMP). Consult local guidelines or your Contech area marketing manager prior to disposing the separator contents.

Deep Sump and Hooded Catch Basins: (CB 1-3)
During construction, catch basin grates shall be wrapped with filter fabric. Catch basins shall be cleaned upon the completion of construction. After construction, the deep sumps for all catch basins and drain manholes shall be inspected four times a year and cleaned four times a year. Sediment removed shall be disposed of in accordance with applicable local, state, and federal guidelines and regulations. The depth of the sediment in a basin shall not exceed a depth of 18 inches as determined by probing with a stick. If the stick hits the bottom within 30 inches of the water level, more than 18 inches of sediment has accumulated and must be removed. Licensed persons should remove and dispose of the contents of the sump in accordance with applicable regulations.

Drain Manholes: (DMH 1, 2, and 3)
The drain manholes shall be inspected four times a year. Any cause of or potential for clogging shall be addressed.

Subsurface Structures:
Inspect the chambers after every major storm for the first few months to ensure proper stabilization and function. Thereafter, inspect and clean at least twice per year. Any debris that may clog the system shall be removed. Water levels should be recorded over several days to check the drywell drainage. If chambers cannot be cleaned they may have to be re-installed.

Infiltration Trench
The Infiltration trench shall be inspected annually. The filter fabric shall be inspected for excessive sediment build up. If appreciable amounts of sediment are observed the top layer of stone shall be moved aside and the filter fabric cleaned or replaced. The top layer of stone shall then be washed and placed over the filter fabric.

Emergency Contacts:
In the event of a hazardous materials spill on the site the following parties shall be contacted:
Fire Department: ph: 978-264-9645

Records:
The responsible parties shall maintain an inspection log of all elements of the storm water management plan. The responsible parties shall maintain a maintenance log documenting the inspection and maintenance of the drainage structures under his control. A copy of the erosion control and storm water maintenance plan and inspection logs shall be kept onsite at all times.

Responsibility Party:
The current Owner shall be responsible for all inspection and maintenance of the items.

Name: _____

Signature: _____

Date: _____

429 Great Road

Operation and Maintenance Inspection Log

Year: _____

Catch Basins	**Four times per year**
Subsurface Drainage Structu	**Once per year**
Contech Units	**Two times per year**
Infiltration Trenches	**Two time per year**

Contech Units (DMH 4 and 5)

Previous Inspection Date: _____
Inspection Date: _____
Inspector Name: _____
Comments:

Action Required:

Catch Basins: CB1-3 **CB** _____

Previous Inspection Date: _____
Inspection Date: _____
Inspector Name: _____
Sediment Depth: _____ (Remove if depth greater than 18")
Comments:

Action Required:

Subsurface Drainage Structure

Previous Inspection Date: _____
Inspection Date: _____
Inspector Name: _____
Comments:

Action Required:

Infiltration Trench:

Previous Inspection Date: _____

Inspection Date: _____

Inspector Name: _____

Comments:

Action Required:

Drainage Maps

3.7 WATER BALANCE CALCULATIONS
for
429 Great Road
Acton, MA

PREPARED FOR:

Country Properties, LLC
6 ProctorStreet
Acton, MA 01720

PREPARED BY:

Stamski and McNary, Inc.
1000 Main Street
Acton, MA 01720

Engineering-Planning-Surveying

Water Balance Calculations

SM-5369

Project: 429 Great Road | By: JTM | Date: 4/19/2016

Location: Acton MA | Checked: | Date:

Pre-Development Recharge

CN=	47.1	
From Figure 1, infiltration=	19.5	in/year
Drainage Area=	50,747	s.f.

Recharge= 50,747 x 19.5 /12 in/ft 82,464 c.f./year

Pre-Development Sewage Flow

Leaching Area=	216	gpd
Total Design Flow=	216	gpd

216 gpd x 365 days/year x 0.134 s.f./gal = 10,539 c.f./year

Average(50%)= 5,269 c.f./year

Post-Development Recharge

CN=	66.7	
From Figure 1, infiltration=	18	in/year
Drainage area=	50,747	s.f.

Recharge= 50,747 x 18 /12 in/ft 76,121 c.f./year

Post-Development Sewage Flow

Leaching Area=	630	gpd
Total Design Flow=	630	gpd

630 gpd x 365 days/year x 0.134 s.f./gal = 30,738 c.f./year

Average(50%)= 15,369 c.f./year

Post-Development Subsurface Infiltration

CN=	85.5	
From Figure 1, runoff=	13	in/year (directed to drywells)
Impervious Area	27,818	s.f.

Recharge= 27,818 x 13 /12 in/ft 30,136 c.f./year

Post-Development	Vs.	Pre-Development
121,626	>	87,733
c.f./year		c.f./year

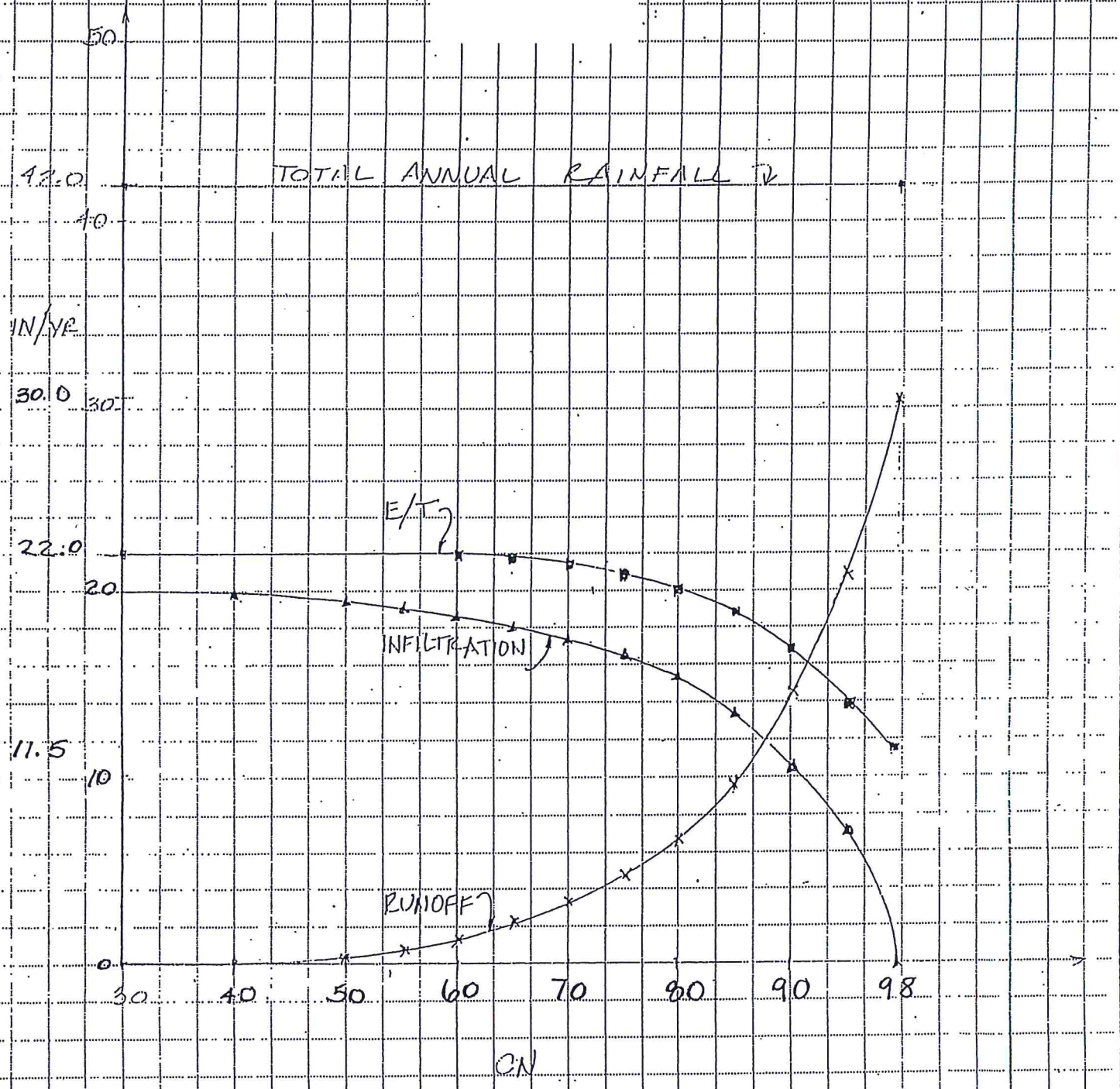
Total CN

PRE				Post			
Subcatchment	Area	CN	Sum		Area	CN	Sum
1	1.18	47.1	55.58	A	0.53	38.6	20.46
			0.00	B	0.25	79.2	19.80
			0.00	C	0.10	96.2	9.62
			0.00	D	0.04	98	3.92
				ROOF	0.24	98.0	23.52
Total	1.18		55.58				
	Average	47.1					
				Total	1.16		77.32
					Average	66.7	
				B	0.25	79.2	19.80
				C	0.10	96.2	9.62
				D	0.04	98.0	3.92
				ROOFS	0.24	98.0	23.52
				Total	0.39		33.34
					Average	85.5	

STAMSKI AND McNARY, INC.
80 Harris Street
ACTON, MASSACHUSETTS 01720
TEL (978) 263-8585
FAX (978) 263-9883

JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

Figure 1



NOTE: GRAPH COMPILED FROM DATA PUBLISHED BY NOAA (1984-1988)
(SEE REPORT FROM STAMSKI & MCNARY INC. SUBMITTED W/ TOWN OF ACTON ENG. DEPT.)

3.8 EARTH REMOVAL CALCULATIONS
for
429 Great Road
Acton, MA

PREPARED FOR:

Country Properties, LLC
6 ProctorStreet
Acton, MA 01720

PREPARED BY:

Stamski and McNary, Inc.
1000 Main Street
Acton, MA 01720

Engineering-Planning-Surveying

Cut/Fill Report

Generated: 2016-04-21 11:40:53

By user: James.melvin

Drawing: Z:\5300-5399\5369\CAD DRAWINGS\CIVIL 3D\Z:\5300-5399\5369\CAD DRAWINGS\CIVIL 3D\5369-SITE PLAN-4.dwg

Volume Summary

Name	Type	Cut Factor	Fill Factor	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
cut fill surface	full	1.000	1.000	48704.36	51.79	4090.04	4038.24<Fill>

Totals

	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Total	48704.36	51.79	4090.04	4038.24<Fill>

* Value adjusted by cut or fill factor other than 1.0

STAMSKI AND McNARY, INC.
1000 MAIN STREET
ACTON, MASSACHUSETTS 01720
TEL (978) 263-8585
FAX (978) 263-9883

JOB 5369 429 GREAT ROAD
SHEET NO. _____ OF _____
CALCULATED BY JTM DATE 4/21/16
CHECKED BY _____ DATE _____
SCALE _____

8318 S.F. AREA OF BUILDING

2.5 Ft OF CUT AVERAGE

8318 S.F. × 2.5 Ft = 20795 C.F.

$20795 \text{ C.F.} \times \frac{1 \text{ Cy}}{27 \text{ CF}} = 770 \text{ Cy}$

4090 Cy FILL − 770 Cy OF CUT = 3320 CY FILL

PRODUCT 204-1 (Single Sheets) 205-1 (Padded)

3.9 PLANS

Attached plans include: Title Sheet, Existing Conditions Plan, Layout Plan, Grading plan, Drainage & Utilities Plan, Detail Sheet - By: Stamski & McNary, Inc.

Landscape Plan – By: Randell Clemence Landscape Architecture

Architectural Plans- By E.J. Rempelakis Associates

REDUCED PLANS

FULL SIZE
PLANS

FLOOR PLANS

3.10
Traffic Study

Traffic Study

The proposed development will produce a maximum of 25.64 trips during a peak hour and 295 trips during a weekday. Since the proposed development will produce less than 30 trips in a peak hour and less than 400 trips on a weekday, this project is not subject to a traffic impact study. The calculations were made based on Automobile Sales listed in the ITE Trip Generation Manual, 9th Edition, Volume 3.

STAMSKI AND McNARY, INC.
1000 MAIN STREET
ACTON, MASSACHUSETTS 01720
TEL (978) 263-8585
FAX (978) 263-9883

JOB 5369 429 GREAT Rd
SHEET NO. _____ OF _____
CALCULATED BY JTM DATE 4/21/16
CHECKED BY _____ DATE _____
SCALE _____

TRAFFIC STUDY CALCULATIONS

GROSS FLOOR AREA OF BUILDING = 9,159 S.F.

AUTOMOBILE SALES
32.30 TRIP PER DAY PER 1,000 S.F. OF GFA

$$9159 \times \frac{32.3}{1000} = 296 \text{ TRIPS/DAY}$$

296 TRIPS < 400 TRIPS

2.8 TRIPS PER 1000 S.F. OF GFA PEAK HOUR

$$9159 \times \frac{2.8}{1000} = 25.6 \text{ TRIPS PEAK HOUR}$$

25.6 TRIPS < 30 TRIPS

☆ NUMBERS BASED ON ITE TRIP GENERATION MANUAL. 9TH EDITION, VOLUME 3

3.9.10
Lighting Plan

Lighting Plan

The Photometric plan is being developed and will be submitted once it is completed.

OSQ Series

OSQ™ LED Area/Flood Luminaire – Medium

Product Description

The OSQ™ Area/Flood luminaire blends extreme optical control, advanced thermal management and modern, clean aesthetics. Built to last, the housing is rugged cast aluminum with an integral, weathertight LED driver compartment. Versatile mounting configurations offer simple installation. Its slim, low-profile design minimizes wind load requirements and blends seamlessly into the site providing even, quality illumination. 'A' Input power designator is a suitable upgrade for HID applications up to 250 Watt. 'J' Input power designator is a suitable upgrade for HID applications up to 400 Watt.

Applications: Parking lots, walkways, campuses, car dealerships, office complexes, and internal roadways

Performance Summary

NanoOptic® Precision Delivery Grid™ optic

Made in the U.S.A. of U.S. and imported parts

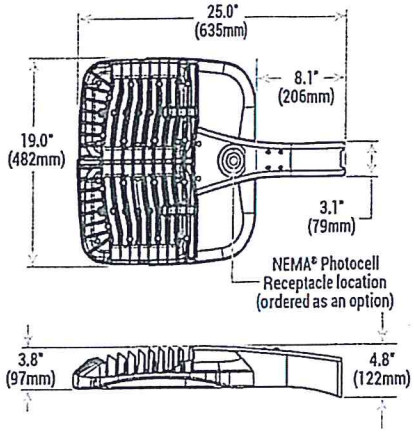
CRI: Minimum 70 CRI (4000K & 5700K); 80 CRI (3000K)

CCT: 3000K (+/- 300K), 4000K (+/- 300K), 5700K (+/- 500K)

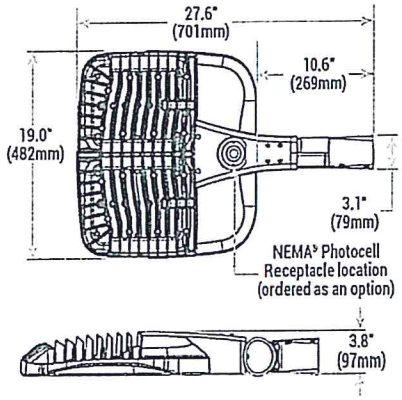
Limited Warranty†: 10 years on luminaire/10 years on Colorfast DeltaGuard® finish

† See www.cree.com/lighting/products/warranty for warranty terms

DA Mount



AA Mount



Accessories

Field-Installed	
Backlight Shield OSQ-BLSMF – Front facing optics	OSQ-BLSMR – Rotated optics

Ordering Information

Fully assembled luminaire is composed of two components that must be ordered separately:
Example: Mount: OSQ-AA-SV + Luminaire: OSQ-A-NM-2ME-A-40K-UL-SV

Mount (Luminaire must be ordered separately)			
OSQ-			
OSQ-AA Adjustable Arm OSQ-DA Direct Arm	Color Options:	SV Silver BK Black	BZ Bronze WH White

Weight
26.5 lbs. (12kg)

Luminaire (Mount must be ordered separately)

OSQ	A	NM							
Product	**Version**	**Mounting**	**Optic**		**Input Power Designator**	**CCT**	**Voltage**	**Color Options**	**Options**
OSQ	A	NM No Mount	2ME* Type II Medium 3ME* Type III Medium 4ME* Type IV Medium 5ME Type V Medium 5SH Type V Short	WSN Wide Sign 15D 15° Flood 25D 25° Flood 40D 40° Flood 60D 60° Flood	A 112W J 168W	30K 3000K 40K 4000K 57K 5700K	UL Universal 120-277V UH Universal 347-480V	BK Black BZ Bronze SV Silver WH White	DIM 0-10V Dimming - Control by others - Refer to Dimming spec sheet for details - Can't exceed wattage of specified input power designator F Fuse - When code dictates fusing, use time delay fuse ML Multi-Level - Refer to ML spec sheet for details - High: 100%, Low: 30% - Intended for downlight applications at 0° tilt PML Programmable Multi-Level, 20-40' Mounting Height - Refer to PML spec sheet for details - Intended for downlight applications at 0° tilt PML2 Programmable Multi-Level, 10-30' Mounting Height - Refer to PML spec sheet for details - Intended for downlight applications at 0° tilt Q9 Field Adjustable Output - Refer to Field Adjustable Output spec sheet for details R NEMA® Photocell Receptacle - Intended for downlight applications with maximum 45° tilt - Photocell by others RL Rotate Left - LED and optic are rotated to the left RR Rotate Right - LED and optic are rotated to the right

* Available with Backlight Shield when ordered with field-installed accessory (see table above)

Product Specifications

CONSTRUCTION & MATERIALS

- Slim, low profile design minimizes wind load requirements
- Luminaire housing is rugged die cast aluminum with an integral, weathertight LED driver compartment and high performance heat sink
- Convenient interlocking mounting method on direct arm mount. Mounting adaptor is rugged die cast aluminum and mounts to 3-6" (76-152mm) square or round pole, secured by two 5/16-18 UNC bolts spaced on 2" (51mm) centers
- Mounting for the adjustable arm mount adaptor is rugged die cast aluminum and mounts to 2" (51mm) IP, 2.375" (60mm) O.D. tenon
- Adjustable arm mount can be adjusted 180° in 2.5° increments
- Designed for uplight and downlight applications
- Exclusive Colorfast DeltaGuard® finish features an E-Coat epoxy primer with an ultra-durable powder topcoat, providing excellent resistance to corrosion, ultraviolet degradation and abrasion. Silver, bronze, black, and white are available
- Weight: 26.5 lbs. (12kg)

ELECTRICAL SYSTEM

- Input Voltage: 120-277V or 347-480V, 50/60Hz, Class 1 drivers
- Power Factor: > 0.9 at full load
- Total Harmonic Distortion: < 20% at full load
- Integral 10kV surge suppression protection standard
- To address inrush current, slow blow fuse or type C/D breaker should be used
- 10V Source Current: 0.15mA

REGULATORY & VOLUNTARY QUALIFICATIONS

- cULus Listed
- Suitable for wet locations
- Enclosure rated IP66 per IEC 60529 when ordered without R option
- Consult factory for CE Certified products
- Certified to ANSI C136.31-2001, 3G bridge and overpass vibration standards
- 10kV surge suppression protection tested in accordance with IEEE/ANSI C62.41.2
- Meets FCC Part 15 standards for conducted and radiated emissions
- Luminaire and finish endurance tested to withstand 5,000 hours of elevated ambient salt fog conditions as defined in ASTM Standard B 117
- Meets Buy American requirements within ARRA
- DLC qualified when ordered with 30K (5ME, 5SH optics), or 40K and 57K (2ME, 3ME, 4ME, 5ME, 5SH, 15D, 25D, 40D, 60D optics). Please refer to www.designlights.org/QPL for most current information
- Dark Sky Friendly, IDA approved. Please refer to www.darksky.org/ for most current information
- RoHS compliant. Consult factory for additional details

Electrical Data*

Input Power Designator	System Watts 120-480V	Total Current					
		120V	208V	240V	277V	347V	480V
A	112	0.97	0.56	0.49	0.43	0.34	0.25
J	168	1.47	0.85	0.74	0.64	0.50	0.36

* Electrical data at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%

Recommended OSQ Series Lumen Maintenance Factors (LMF)[1]

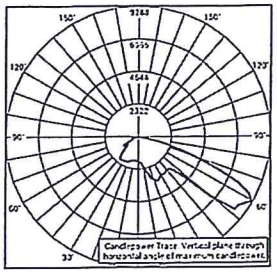
Ambient	Optic	Initial LMF	25K hr Projected[2] LMF	50K hr Projected[2] LMF	75K hr Projected/ Calcu-lated[2,3] LMF	100K hr Calculated[3] LMF
5°C (41°F)	2ME, 3ME, 4ME	1.04	0.99	0.93	0.89	0.84
	5ME, 5SH, 15D, 25D, 40D, 60D, WSN	1.05	0.94	0.86	0.80	0.74
10°C (50°F)	2ME, 3ME, 4ME	1.03	0.98	0.93	0.88	0.83
	5ME, 5SH, 15D, 25D, 40D, 60D, WSN	1.04	0.93	0.86	0.79	0.73
15°C (59°F)	2ME, 3ME, 4ME	1.02	0.97	0.92	0.87	0.82
	5ME, 5SH, 15D, 25D, 40D, 60D, WSN	1.03	0.92	0.85	0.78	0.72
20°C (68°F)	2ME, 3ME, 4ME	1.01	0.96	0.91	0.86	0.82
	5ME, 5SH, 15D, 25D, 40D, 60D, WSN	1.01	0.90	0.83	0.77	0.71
25°C (77°F)	2ME, 3ME, 4ME	1.00	0.95	0.90	0.85	0.81
	5ME, 5SH, 15D, 25D, 40D, 60D, WSN	1.00	0.89	0.82	0.76	0.70

[1] Lumen maintenance values at 25°C (77°F) are calculated per TM-21 based on LM-80 data and in-situ luminaire testing
[2] In accordance with IESNA TM-21-11, Projected Values represent interpolated value based on time durations that are within six times (6X) the IESNA LM-80-08 total test duration (in hours) for the device under testing ((DUT) i.e. the packaged LED chip)
[3] In accordance with IESNA TM-21-11, Calculated Values represent time durations that exceed six times (6X) the IESNA LM-80-08 total test duration (in hours) for the device under testing ((DUT) i.e. the packaged LED chip)

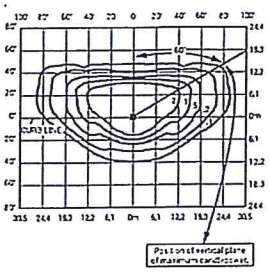
Photometry

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: www.cree.com/Lighting/Products/Outdoor/Area/OSQ-Series

2ME



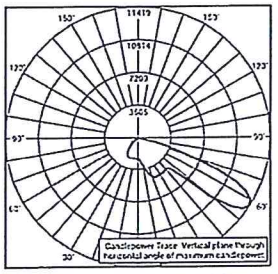
RESTL Test Report #: PL03347-001
OSQ-A-**-2ME-A-40K-UL
Initial Delivered Lumens: 10,988



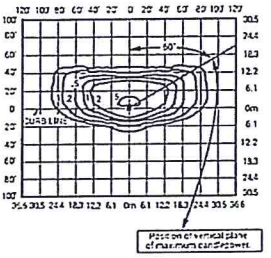
OSQ-A-**-2ME-J-40K-UL
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 16,356
Initial FC at grade

Type II Medium Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
A	9,136	B2 U0 G1	10,904	B2 U0 G2	11,649	B2 U0 G2
J	13,703	B2 U0 G2	16,356	B3 U0 G2	17,474	B3 U0 G2

* Initial delivered lumens at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt



RESTL Test Report #: PL03642-003
OSQ-A-**-2ME-J-40K-UL w/OSQ-BLSMF
Initial Delivered Lumens: 14,643

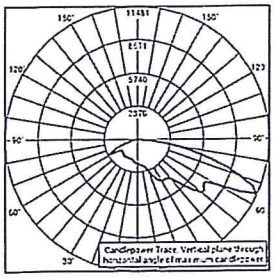


OSQ-A-**-2ME-J-40K-UL w/OSQ-BLSMF
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 14,020
Initial FC at grade

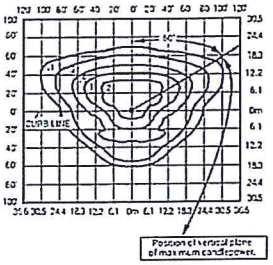
Type II Medium w/BLS Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11
A	7,831	B1 U0 G1	9,346	B2 U0 G2	9,985	B2 U0 G2
J	11,746	B2 U0 G2	14,020	B2 U0 G2	14,978	B2 U0 G2

* Initial delivered lumens at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt

3ME



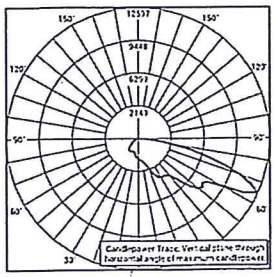
RESTL Test Report #: PL03478-001
OSQ-A-**-3ME-J-40K-UL
Initial Delivered Lumens: 16,257



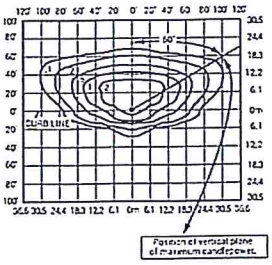
OSQ-A-**-3ME-J-40K-UL
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 16,189
Initial FC at grade

Type III Medium Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11
A	9,042	B2 U0 G2	10,793	B2 U0 G2	11,530	B2 U0 G2
J	13,564	B3 U0 G3	16,189	B3 U0 G3	17,296	B3 U0 G3

* Initial delivered lumens at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt



RESTL Test Report #: PL03642-001
OSQ-A-**-3ME-J-40K-UL w/OSQ-BLSMF
Initial Delivered Lumens: 14,229



OSQ-A-**-3ME-J-40K-UL w/OSQ-BLSMF
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 13,853
Initial FC at grade

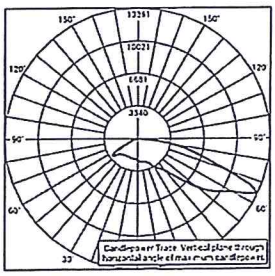
Type III Medium w/BLS Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
A	7,737	B1 U0 G2	9,235	B1 U0 G2	9,866	B1 U0 G2
J	11,606	B1 U0 G2	13,853	B2 U0 G3	14,799	B2 U0 G3

* Initial delivered lumens at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt

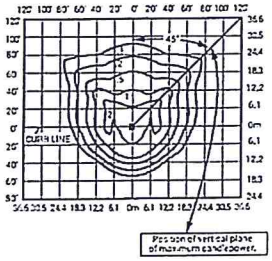
Photometry

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: www.cree.com/Lighting/Products/Outdoor/Area/OSQ-Series

4ME



RESTL Test Report #: PL03496-001
OSQ-A-**-4ME-J-40K-UL
Initial Delivered Lumens: 16,293

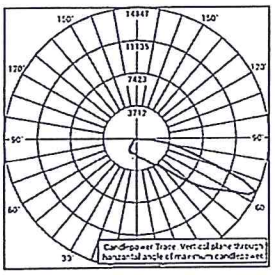


OSQ-A-**-4ME-J-40K-UL
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 16,022
Initial FC at grade

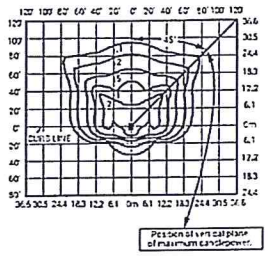
Type IV Medium Distribution

Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
A	8,949	B2 U0 G2	10,682	B2 U0 G2	11,412	B2 U0 G3
J	13,424	B3 U0 G3	16,022	B3 U0 G3	17,117	B3 U0 G3

* Initial delivered lumens at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt



RESTL Test Report #: PL03642-002
OSQ-A-**-4ME-J-40K-UL w/OSQ-BLSMF
Initial Delivered Lumens: 13,647



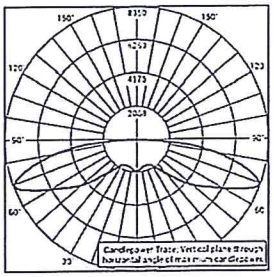
OSQ-A-**-4ME-J-40K-UL w/OSQ-BLSMF
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 13,686
Initial FC at grade

Type IV Medium w/BLS Distribution

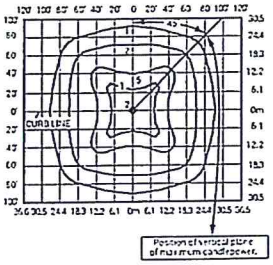
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11
A	7,644	B1 U0 G2	9,124	B1 U0 G2	9,747	B1 U0 G2
J	11,466	B2 U0 G3	13,686	B2 U0 G3	14,621	B2 U0 G3

* Initial delivered lumens at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt

5ME



RESTL Test Report #: PL03466-001
OSQ-A-**-5ME-S-40K-UL
Initial Delivered Lumens: 20,709



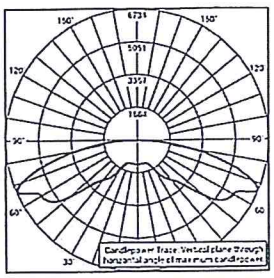
OSQ-A-**-5ME-A-40K-UL
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 13,686
Initial FC at grade

Type V Medium Distribution

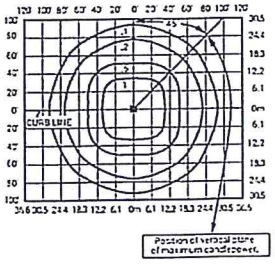
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
A	8,716	B3 U0 G3	10,320	B4 U0 G3	10,473	B4 U0 G3
J	13,075	B4 U0 G4	15,480	B4 U0 G4	15,710	B4 U0 G4

* Initial delivered lumens at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt

5SH



RESTL Test Report #: PL03501-001
OSQ-A-**-5SH-S-40K-UL
Initial Delivered Lumens: 21,066



OSQ-A-**-5SH-A-40K-UL
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 15,817
Initial FC at grade

Type V Short Distribution

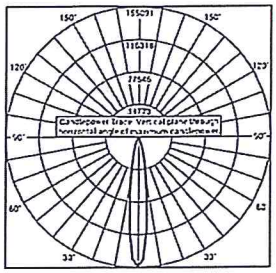
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11
A	8,906	B3 U0 G3	10,544	B4 U0 G3	10,701	B4 U0 G3
J	13,359	B4 U0 G3	15,817	B4 U0 G4	16,052	B4 U0 G4

* Initial delivered lumens at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt

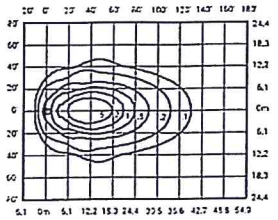
Photometry

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: www.cree.com/Lighting/Products/Outdoor/Area/OSQ-Series

15D



RESTL Test Report #: PL03903-001
OSQ-A-**-15D-S-40K-UL
Initial Delivered Lumens: 22,600

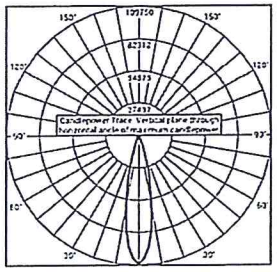


OSQ-A-**-15D-J-40K-UL
Mounting Height: 25' (7.6m) A.F.G., 60° Tilt
Initial Delivered Lumens: 16,153
Initial FC at grade

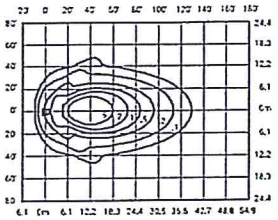
15° Flood Distribution			
Input Power Designator	3000K	4000K	5700K
	Initial Delivered Lumens*	Initial Delivered Lumens*	Initial Delivered Lumens*
A	9,095	10,769	10,929
J	13,643	16,153	16,393

* Initial delivered lumens at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%

25D



RESTL Test Report #: PL03903-002
OSQ-A-**-25D-S-40K-UL
Initial Delivered Lumens: 22,633

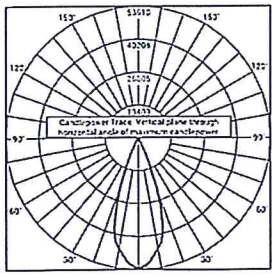


OSQ-A-**-25D-J-40K-UL
Mounting Height: 25' (7.6m) A.F.G., 60° Tilt
Initial Delivered Lumens: 16,153
Initial FC at grade

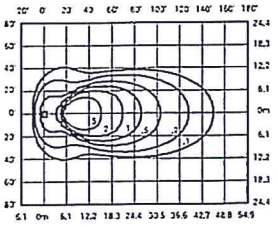
25° Flood Distribution			
Input Power Designator	3000K	4000K	5700K
	Initial Delivered Lumens*	Initial Delivered Lumens*	Initial Delivered Lumens*
A	9,095	10,769	10,929
J	13,643	16,153	16,393

* Initial delivered lumens at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%

40D



RESTL Test Report #: PL03903-003
OSQ-A-**-40D-S-40K-UL
Initial Delivered Lumens: 22,404



OSQ-A-**-40D-J-40K-UL
Mounting Height: 25' (7.6m) A.F.G., 60° Tilt
Initial Delivered Lumens: 15,985
Initial FC at grade

40° Flood Distribution			
Input Power Designator	3000K	4000K	5700K
	Initial Delivered Lumens*	Initial Delivered Lumens*	Initial Delivered Lumens*
A	9,001	10,657	10,815
J	13,501	15,985	16,222

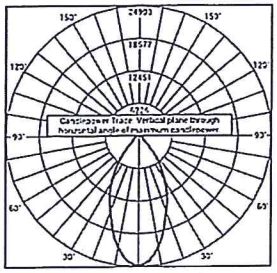
* Initial delivered lumens at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%

OSQ™ LED Area/Flood Luminaire – Medium

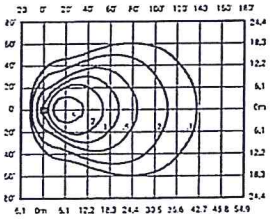
Photometry

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: www.cree.com/Lighting/Products/Outdoor/Area/OSQ-Series

60D



RESTL Test Report #: PL03903-004
OSQ-A-**-60D-S-40K-UL
Initial Delivered Lumens: 22,301

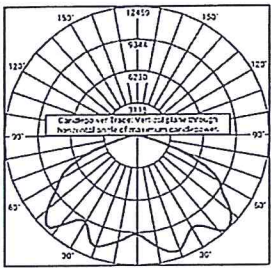


OSQ-A-**-60D-J-40K-UL
Mounting Height: 25' (7.6m) A.F.G., 60° Tilt
Initial Delivered Lumens: 16,153
Initial FC at grade

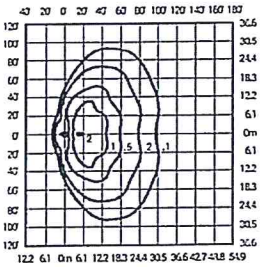
60° Flood Distribution			
Input Power Designator	3000K	4000K	5700K
	Initial Delivered Lumens*	Initial Delivered Lumens*	Initial Delivered Lumens*
A	9,095	10,769	10,929
J	13,643	16,153	16,393

* Initial delivered lumens at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%

WSN



RESTL Test Report #: PL04597-001
OSQ-A-**-WSN-S-30K-UL
Initial Delivered Lumens: 19,087



OSQ-A-**-WSN-A-40K-UL
Mounting Height: 25' (7.6m) A.F.G., 60° Tilt
Initial Delivered Lumens: 10,555
Initial FC at grade

Wide Sign Distribution			
Input Power Designator	3000K	4000K	5700K
	Initial Delivered Lumens*	Initial Delivered Lumens*	Initial Delivered Lumens*
A	8,914	10,555	10,711
J	13,372	15,832	16,067

* Initial delivered lumens at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%

Luminaire EPA

Fixed Arm Mount – OSQ-DA Weight: 26.5 lbs. (12kg)					
Single	2 @ 180°	2 @ 90°	3 @ 90°	3 @ 120°	4 @ 90°
0.74	1.48	1.19	1.93	1.63	2.38

Adjustable Arm Mount – OSQ-AA Weight: 26.5 lbs. (12kg)							
Single	2 @ 180°	2 @ 90°	3 @ 90°	3 @ 120°	3 @ 180°	4 @ 180°	4 @ 90°
Tenon Configuration (0°-80° Tilt); If used with Cree tenons, please add tenon EPA with Luminaire EPA							
PB-1A*; PT-1; PW-1A3**	PB-2A*; PB-2R2.375; PD-2A4(180); PT-2(180); PW-2A3**	PB-2A*; PD-2A4(90); PT-2(90)	PB-3A*; PD-3A4(90); PT-3(90)	PB-3A*; PT-3(120)	PB-3A*; PB-3R2.375	PB-4A*(180)	PB-4A*(90); PB-4R2.375; PD-4A4(90); PT-4(90)
0° Tilt							
0.74	1.48	1.19	1.93	1.63	3.33	4.65	2.38
10° Tilt							
0.75	1.48	1.49	2.23	2.15	4.22	5.84	2.98
20° Tilt							
1.12	1.48	1.86	2.60	2.85	5.31	7.32	3.72
30° Tilt							
1.46	1.48	2.20	2.94	3.56	6.34	8.68	4.40
45° Tilt							
1.96	1.96	2.69	3.43	4.54	7.83	10.68	5.38
60° Tilt							
2.33	2.33	3.07	3.81	5.11	8.94	12.16	6.14
70° Tilt							
2.49	2.49	3.23	3.97	5.11	9.43	12.80	6.46
80° Tilt							
2.58	2.58	3.32	4.06	5.11	9.71	13.16	6.64
Tenon Configuration (90° Tilt); If used with Cree tenons, please add tenon EPA with Luminaire EPA							
PB-1A*; PT-1; PW-1A3**	PB-2A*; PB-2R2.375; PD-2A4(180); PT-2(180); PW-2A3**	PB-2A*	PB-3A*	PB-3A*; PT-3(120)	PB-3A*; PB-3R2.375	PB-4A*(180)	PB-4A*(90); PB-4R2.375
90° Tilt							
2.61	2.61	4.44	6.05	5.11	9.79	13.28	10.39

* Specify pole size: 3 (3"), 4 (4"), 5 (5"), or 6 (6") for single, double or triple luminaire orientation or 4 (4"), 5 (5"), or 6 (6") for quad luminaire orientation
** These EPA values must be multiplied by the following ratio: Fixture Mounting Height/Total Pole Height. Specify pole size: 3 (3"), 4 (4"), 5 (5"), or 6 (6")

Tenon EPA

Part Number	EPA
PB-1A*	None
PB-2A*	0.82
PB-3A*	1.52
PB-4A*(180)	2.22
PB-4A*(90)	1.11
PB-2R2.375	0.92
PB-3R2.375	1.62
PB-4R2.375	2.32
PD Series Tenons	0.09
PT Series Tenons	0.10
PW-1A3**	0.47
PW-2A3**	0.94
WM-2	0.08
WM-4	0.25
WM-DM	None

* Specify pole size: 3 (3"), 4 (4"), 5 (5"), or 6 (6") for single, double or triple luminaire orientation or 4 (4"), 5 (5"), or 6 (6") for quad luminaire orientation

** These EPA values must be multiplied by the following ratio: Fixture Mounting Height/Total Pole Height. Specify pole size: 3 (3"), 4 (4"), 5 (5"), or 6 (6")

Tenons and Brackets[1] (must specify color)

Square Internal Mount Vertical Tenons (Steel)
- Mounts to 3-6" (76-152mm) square aluminum or steel poles

PB-1A* – Single
PB-2A* – 180° Twin
PB-3A* – 180° Triple
PB-4A*(90) – 90° Quad
PB-4A*(180) – 180° Quad

Square Internal Mount Horizontal Tenons (Aluminum)
- Mounts to 4" (102mm) square aluminum or steel poles

PD-2A4(90) – 90° Twin
PD-2A4(180) – 180° Twin
PD-3A4(90) – 90° Triple
PD-4A4(90) – 90° Quad

Wall Mount Brackets
- Mounts to wall or roof

WM-2 – Horizontal for OSQ-AA mount
WM-4 – L-Shape for OSQ-AA mount
WM-DM – Plate for OSQ-DA mount

Round External Mount Vertical Tenons (Steel)
- Mounts to 2.375" (60mm) O.D. round aluminum or steel poles or tenons

PB-2R2.375 – Twin
PB-3R2.375 – Triple
PB-4R2.375 – Quad

Round External Mount Horizontal Tenons (Aluminum)
- Mounts to 2.375" (60mm) O.D. round aluminum or steel poles or tenons
- Mounts to square pole with PB-1A* tenon

PT-1 – Single (Vertical)
PT-2(90) – 90° Twin
PT-2(180) – 180° Twin
PT-3(90) – 90° Triple
PT-4(90) – 90° Quad

Mid-Pole Bracket
- Mounts to square pole

PW-1A3** – Single
PW-2A3** – Double

[1] Refer to the Bracket and Tenons spec sheet for more details

Direct Mount Configurations

Compatibility with OSQ-DA Direct Mount Bracket					
Input Power Designator	2 @ 90°	2 @ 180°	3 @ 90°	3 @ 120°	4 @ 90°
3" Square					
A & J	N/A	✓	N/A	N/A	N/A
3" Round					
A & J	N/A	✓	N/A	N/A	N/A
4" Square					
A & J	✓	✓	✓	N/A	✓
4" Round					
A & J	✓	✓	✓	✓	✓
5" Square					
A & J	✓	✓	✓	N/A	✓
5" Round					
A & J	✓	✓	✓	✓	✓
6" Square					
A & J	✓	✓	✓	N/A	✓
6" Round					
A & J	✓	✓	✓	✓	✓

© 2015 Cree, Inc. and/or one of its subsidiaries. All rights reserved. For informational purposes only. Content is subject to change. Patent www.cree.com/patents. Cree®, NanoOptic®, and Colorfast DeltaGuard® are registered trademarks, and the Cree logo, Precision Delivery Grid™ and OSQ™ are trademarks of Cree, Inc. The UL logo is a registered trademark of UL LLC. NEMA® is a registered trademark of the National Electrical Manufacturers Association. The DLC QPL logo is a registered trademark of Northeast Energy Efficiency Partnerships, Inc.

US: www.cree.com/lighting T (800) 236-6800 F (262) 504-5415

Canada: www.cree.com/canada T (800) 473-1234 F (800) 890-7507

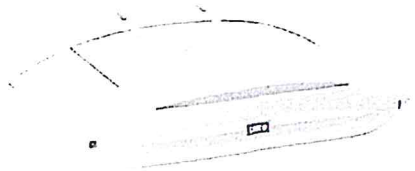
Cree Edge™ Series

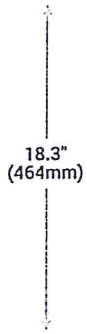
LED Security Wall Pack Luminaire

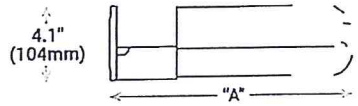
Product Description

The Cree Edge™ wall mount luminaire has a slim, low profile design. The luminaire end caps are made from rugged die cast aluminum with integral, weathertight LED driver compartments and high performance aluminum heat sinks specifically designed for LED applications. Housing is rugged aluminum. Includes a lightweight mounting box for installation over standard and mud ring single gang J-Boxes. Secures to wall with four 3/16" (5mm) screws (by others). Conduit entry from top, bottom, sides and rear. Allows mounting for uplight or downlight. Designed and approved for easy through-wiring. Includes leaf/debris guard.

Applications: General area and security lighting







Performance Summary

Patented NanoOptic® Product Technology

Made in the U.S.A. of U.S. and imported parts

CRI: Minimum 70 CRI

CCT: 4000K (+/- 300K), 5700K (+/- 500K) standard

Limited Warranty[1]: 10 years on luminaire/10 years on Colorfast DeltaGuard® finish

[1] See www.cree.com/lighting/products/warranty for warranty terms

Accessories

Field-Installed	
Bird Spikes XA-BRDSPK	Hand-Held Remote XA-SENSREM - For successful implementation of the programmable multi-level option, a minimum of one hand-held remote is required

LED Count (x10)	Dim. "A"	Weight
02	9.9" (251mm)	20 lbs. (9.1kg)
04	11.9" (303mm)	22 lbs. (10.0kg)
06	13.9" (353mm)	25 lbs. (11.3kg)
08	15.9" (404mm)	27 lbs. (12.2kg)
10	17.9" (455mm)	31 lbs. (14.1kg)
12	19.9" (505mm)	32 lbs. (14.5kg)

Ordering Information

Example: SEC-EDG-2M-WM-06-E-UL-SV-700

SEC-EDG		WM		E				
Product	**Optic**	**Mounting**	**LED Count (x10)**	**Series**	**Voltage**	**Color Options**	**Drive Current**	**Options**
SEC-EDG	2M Type II Medium 2MB Type II Medium w/BLS 2S Type II Short 2SB Type II Short w/BLS 3M Type III Medium 3MB Type III Medium w/BLS 4M Type IV Medium 4MB Type IV Medium w/BLS	WM Wall Mount	02 04 06 08 10 12	E	UL Universal 120-277V UH Universal 347-480V 34 347V	BK Black BZ Bronze SV Silver WH White	350 350mA 525 525mA -Available with 20-80 LEDs 700 700mA -Available with 20-60 LEDs	DIM 0-10V Dimming - Control by others - Refer to Dimming spec sheet for details - Can't exceed specified drive current F Fuse - Refer to ML spec sheet for availability with ML options - Available with UL voltage only - When code dictates fusing, use time delay fuse ML Multi-Level - Refer to ML spec sheet for details - Intended for downlight applications of 0° tilt P Photocell - Refer to ML spec sheet for availability with ML options - Must specify UL or 34 voltage PML Programmable Multi-Level - Refer to PML spec sheet for details - Intended for downlight applications of 0° tilt 40K 4000K Color Temperature - Minimum 70 CRI - Color temperature per luminaire

Product Specifications

CONSTRUCTION & MATERIALS

- Slim, low profile design
- Luminaire sides are rugged die cast aluminum with integral, weathertight LED driver compartment and high performance aluminum heat sinks specifically designed for LED applications
- Housing is rugged aluminum
- Furnished with low copper, light weight mounting box designed for installation over standard and mud ring single gang J-Boxes
- Luminaire can also be direct mounted to a wall and surface wired
- Secures to wall with four 3/16" (5mm) screws (by others)
- Conduit entry from top, bottom, sides, and rear
- Allows mounting for uplight or downlight
- Designed and approved for easy through-wiring
- Includes leaf/debris guard
- Exclusive Colorfast DeltaGuard® finish features an E-Coat epoxy primer with an ultradurable powder topcoat, providing excellent resistance to corrosion, ultraviolet degradation and abrasion. Black, bronze, silver and white are available
- Weight: See Dimensions and Weight Chart on page 1

ELECTRICAL SYSTEM

- Input Voltage: 120–277V or 347–480V, 50/60Hz, Class 1 drivers
- Power Factor: > 0.9 at full load
- Total Harmonic Distortion: < 20% at full load
- Integral weathertight J-Box with leads (wire nuts) for easy power hook up
- Integral 10kV surge suppression protection standard
- To address inrush current, slow blow fuse or type C/D breaker should be used
- Maximum 10V Source Current: 20 LED (350mA): 10mA; 20LED (525 & 700 mA) and 40-120 LED: 0.15mA

REGULATORY & VOLUNTARY QUALIFICATIONS

- cULus Listed
- Suitable for wet locations
- Meets FCC Part 15 standards for conducted and radiated emissions
- Enclosure rated IP66 per IEC 60529 when ordered without P, PML or ML options
- 10kV surge suppression protection tested in accordance with IEEE/ANSI C62.41.2
- Luminaire and finish endurance tested to withstand 5,000 hours of elevated ambient salt fog conditions as defined in ASTM Standard B 117
- DLC qualified. Exceptions apply when ordered with full backlight control. Please refer to www.designlights.org/QPL for most current information
- Dark Sky Friendly; IDA Approved. Please refer to www.darksky.org/ for most current information
- Meets Buy American requirements within ARRA

Electrical Data*

LED Count (x10)	System Watts 120-480V	Total Current 120V	208V	240V	277V	347V	480V
350mA							
02	25	0.21	0.13	0.11	0.10	0.08	0.07
04	46	0.36	0.23	0.21	0.20	0.15	0.12
06	66	0.52	0.31	0.28	0.26	0.20	0.15
08	90	0.75	0.44	0.38	0.34	0.26	0.20
10	110	0.92	0.53	0.47	0.41	0.32	0.24
12	130	1.10	0.63	0.55	0.48	0.36	0.28
525mA							
02	37	0.30	0.19	0.17	0.16	0.12	0.10
04	70	0.58	0.34	0.31	0.28	0.21	0.16
06	101	0.84	0.49	0.43	0.38	0.30	0.22
08	133	1.13	0.66	0.58	0.51	0.39	0.28
700mA							
02	50	0.41	0.25	0.22	0.20	0.15	0.12
04	93	0.78	0.46	0.40	0.36	0.27	0.20
06	134	1.14	0.65	0.57	0.50	0.39	0.29

* Electrical data at 25°C (77°F)

Recommended Cree Edge™ Series Lumen Maintenance Factors (LMF)[1]

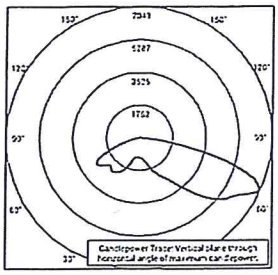
Ambient	Initial LMF	25K hr Projected[2] LMF	50K hr Projected[2] LMF	75K hr Calculated[3] LMF	100K hr Calculated[3] LMF
5°C (41°F)	1.04	0.99	0.97	0.95	0.93
10°C (50°F)	1.03	0.98	0.96	0.94	0.92
15°C (59°F)	1.02	0.97	0.95	0.93	0.91
20°C (68°F)	1.01	0.96	0.94	0.92	0.90
25°C (77°F)	1.00	0.95	0.93	0.91	0.89

[1] Lumen maintenance values at 25°C are calculated per TM-21 based on LM-80 data and in-situ luminaire testing
[2] In accordance with IESNA TM-21-11, Projected Values represent interpolated value based on time durations that are within six times (6X) the IESNA LM-80-08 total test duration (in hours) for the device under testing ((DUT) i.e. the packaged LED chip)
[3] In accordance with IESNA TM-21-11, Calculated Values represent time durations that exceed six times (6X) the IESNA LM-80-08 total test duration (in hours) for the device under testing ((DUT) i.e. the packaged LED chip)

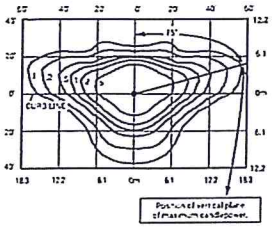
Photometry

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: www.cree.com/Lighting/Tools-and-Support/Exterior-IES-Configuration-Tool

2M



ITL Test Report #: 79174
SEC-EDG-2M-**-06-E-UL-700-40K
Initial Delivered Lumens: 11,128

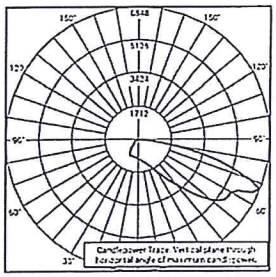


SEC-EDG-2M-**-08-E-UL-525-40K
Mounting Height: 10' (3.0m) A.F.G.
Initial Delivered Lumens: 11,835
Initial FC at grade

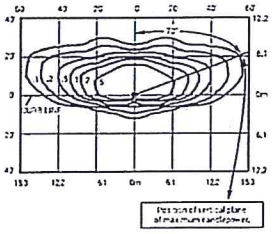
Type II Medium Distribution				
LED Count (x10)	4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
350mA				
02	2,138	B1 U0 G1	2,220	B1 U0 G1
04	4,276	B1 U0 G1	4,440	B1 U0 G1
06	6,340	B2 U0 G2	6,584	B2 U0 G2
08	8,454	B2 U0 G2	8,779	B2 U0 G2
10	10,542	B3 U0 G3	10,947	B3 U0 G3
12	12,650	B3 U0 G3	13,137	B3 U0 G3
525mA				
02	2,993	B1 U0 G1	3,108	B1 U0 G1
04	5,986	B2 U0 G2	6,216	B2 U0 G2
06	8,876	B2 U0 G2	9,218	B2 U0 G2
08	11,835	B3 U0 G3	12,290	B3 U0 G3
700mA				
02	3,656	B1 U0 G1	3,796	B1 U0 G1
04	7,311	B2 U0 G2	7,593	B2 U0 G2
06	10,842	B3 U0 G3	11,259	B3 U0 G3

* Initial delivered lumens at 25°C (77°F).
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf

2MB



CSA Test Report #: 6447
ARE-EDG-2MB-**-06-E-UL-700-40K
Initial Delivered Lumens: 7,953



SEC-EDG-2MB-**-08-E-UL-525-40K
Mounting Height: 10' (3.0m) A.F.G.
Initial Delivered Lumens: 8,915
Initial FC at grade

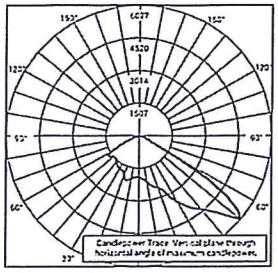
Type II Medium Distribution w/BLS				
LED Count (x10)	4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
350mA				
02	1,610	B0 U0 G1	1,672	B0 U0 G1
04	3,221	B0 U0 G1	3,345	B0 U0 G1
06	4,776	B1 U0 G1	4,959	B1 U0 G1
08	6,368	B1 U0 G1	6,613	B1 U0 G2
10	7,941	B1 U0 G2	8,246	B1 U0 G2
12	9,529	B1 U0 G2	9,895	B1 U0 G2
525mA				
02	2,254	B0 U0 G1	2,341	B0 U0 G1
04	4,509	B1 U0 G1	4,682	B1 U0 G1
06	6,686	B1 U0 G2	6,943	B1 U0 G2
08	8,915	B1 U0 G2	9,258	B1 U0 G2
700mA				
02	2,754	B0 U0 G1	2,860	B0 U0 G1
04	5,507	B1 U0 G1	5,719	B1 U0 G1
06	8,167	B1 U0 G2	8,481	B1 U0 G2

* Initial delivered lumens at 25°C (77°F).
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf

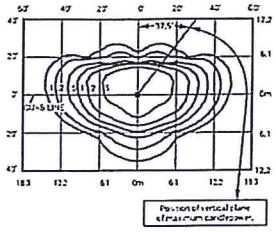
Photometry

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: www.cree.com/Lighting/Tools-and-Support/Exterior-IES-Configuration-Tool

2S



ITL Test Report #: 79175
SEC-EDG-2S-**-06-E-UL-700-40K
Initial Delivered Lumens: 11,704



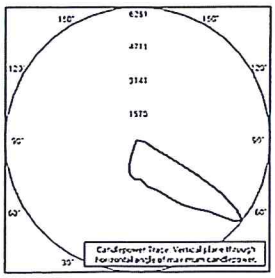
SEC-EDG-2S-**-08-E-UL-525-40K
Mounting Height: 10' (3.0m) A.F.G.
Initial Delivered Lumens: 12,604
Initial FC at grade

Type II Short Distribution

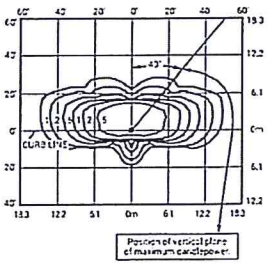
LED Count (x10)	4000K Initial Delivered Lumens*	4000K BUG Ratings** Per TM-15-11	5700K Initial Delivered Lumens*	5700K BUG Ratings** Per TM-15-11
350mA				
02	2,277	B1 U0 G1	2,364	B1 U0 G1
04	4,553	B1 U0 G1	4,728	B1 U0 G1
06	6,752	B2 U0 G2	7,012	B2 U0 G2
08	9,003	B2 U0 G2	9,349	B2 U0 G2
10	11,226	B3 U0 G3	11,658	B3 U0 G3
12	13,472	B3 U0 G3	13,990	B3 U0 G3
525mA				
02	3,187	B1 U0 G1	3,310	B1 U0 G1
04	6,375	B2 U0 G2	6,620	B2 U0 G2
06	9,453	B2 U0 G2	9,816	B3 U0 G3
08	12,604	B3 U0 G3	13,088	B3 U0 G3
700mA				
02	3,893	B1 U0 G1	4,043	B1 U0 G1
04	7,786	B2 U0 G2	8,086	B2 U0 G2
06	11,546	B3 U0 G3	11,990	B3 U0 G3

* Initial delivered lumens at 25°C (77°F).
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf

2SB



CSA Test Report #: 6454
ARE-EDG-2SB-**-06-E-UL-700-40K
Initial Delivered Lumens: 9,202



SEC-EDG-2SB-**-08-E-UL-525-40K
Mounting Height: 10' (3.0m) A.F.G.
Initial Delivered Lumens: 9,683
Initial FC at grade

Type II Short Distribution w/BLS

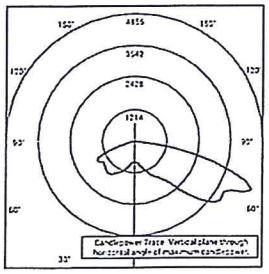
LED Count (x10)	4000K Initial Delivered Lumens*	4000K BUG Ratings** Per TM-15-11	5700K Initial Delivered Lumens*	5700K BUG Ratings** Per TM-15-11
350mA				
02	1,749	B0 U0 G1	1,816	B0 U0 G1
04	3,498	B1 U0 G1	3,633	B1 U0 G1
06	5,188	B1 U0 G1	5,387	B1 U0 G1
08	6,917	B1 U0 G1	7,183	B1 U0 G1
10	8,625	B2 U0 G1	8,957	B2 U0 G1
12	10,350	B2 U0 G2	10,748	B2 U0 G2
525mA				
02	2,449	B1 U0 G1	2,543	B1 U0 G1
04	4,898	B1 U0 G1	5,086	B1 U0 G1
06	7,263	B1 U0 G1	7,542	B1 U0 G1
08	9,683	B2 U0 G2	10,056	B2 U0 G2
700mA				
02	2,991	B1 U0 G1	3,106	B1 U0 G1
04	5,982	B1 U0 G1	6,212	B1 U0 G1
06	8,871	B2 U0 G1	9,212	B2 U0 G2

* Initial delivered lumens at 25°C (77°F).
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf

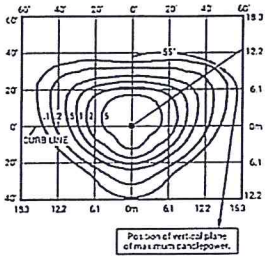
Photometry

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: www.cree.com/Lighting/Tools-and-Support/Exterior-IES-Configuration-Tool

3M



ITLTest Report #: 79173
SEC-EDG-3M-**-06-E-UL-700-40K
Initial Delivered Lumens: 10,343

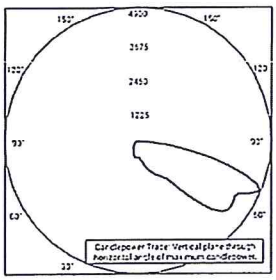


SEC-EDG-3M-**-08-E-UL-525-40K
Mounting Height: 10' (3.0m) A.F.G.
Initial Delivered Lumens: 11,220
Initial FC at grade

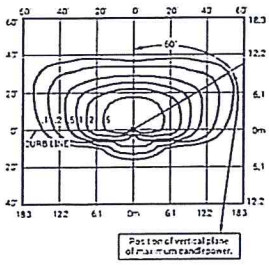
Type III Medium Distribution				
LED Count (x10)	4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
350mA				
02	2,027	B1 U0 G1	2,105	B1 U0 G1
04	4,054	B1 U0 G1	4,209	B1 U0 G1
06	6,011	B2 U0 G2	6,242	B2 U0 G2
08	8,015	B2 U0 G2	8,323	B2 U0 G2
10	9,994	B3 U0 G3	10,379	B3 U0 G3
12	11,993	B3 U0 G3	12,454	B3 U0 G3
525mA				
02	2,837	B1 U0 G1	2,947	B1 U0 G1
04	5,675	B2 U0 G2	5,893	B2 U0 G2
06	8,415	B2 U0 G2	8,739	B2 U0 G2
08	11,220	B3 U0 G3	11,652	B3 U0 G3
700mA				
02	3,466	B1 U0 G1	3,599	B1 U0 G1
04	6,932	B2 U0 G2	7,198	B2 U0 G2
06	10,279	B3 U0 G3	10,674	B3 U0 G3

* Initial delivered lumens at 25°C (77°F).
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf

3MB



CSA Test Report #: 6448
ARE-EDG-3MB-**-06-E-UL-700
Initial Delivered Lumens: 7,740



SEC-EDG-3MB-**-08-E-UL-525-40K
Mounting Height: 10' (3.0m) A.F.G.
Initial Delivered Lumens: 8,300
Initial FC at grade

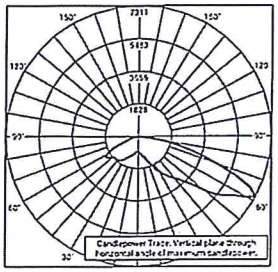
Type III Medium Distribution w/BLS				
LED Count (x10)	4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
350mA				
02	1,499	B1 U0 G1	1,557	B1 U0 G1
04	2,999	B1 U0 G1	3,114	B1 U0 G1
06	4,446	B1 U0 G1	4,617	B1 U0 G1
08	5,929	B1 U0 G2	6,157	B1 U0 G2
10	7,393	B1 U0 G2	7,677	B1 U0 G2
12	8,872	B1 U0 G2	9,213	B1 U0 G2
525mA				
02	2,099	B1 U0 G1	2,180	B1 U0 G1
04	4,198	B1 U0 G1	4,359	B1 U0 G1
06	6,225	B1 U0 G2	6,464	B1 U0 G2
08	8,300	B1 U0 G2	8,619	B1 U0 G2
700mA				
02	2,564	B1 U0 G1	2,662	B1 U0 G1
04	5,127	B1 U0 G2	5,325	B1 U0 G2
06	7,603	B1 U0 G2	7,896	B1 U0 G2

* Initial delivered lumens at 25°C (77°F).
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf

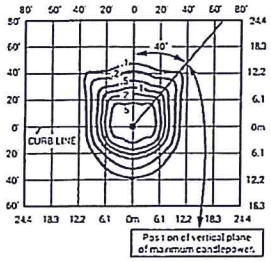
Photometry

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: www.cree.com/Lighting/Tools-and-Support/Exterior-IES-Configuration-Tool

4M



ITL Test Report #: 78793
SEC-EDG-4M-**-06-E-UL-700-40K
Initial Delivered Lumens: 11,607

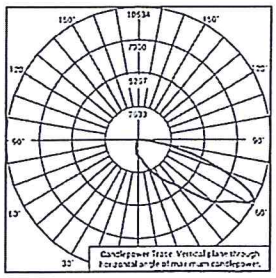


SEC-EDG-4M-**-08-E-UL-525-40K
Mounting Height: 10' (3.0m) A.F.G.
Initial Delivered Lumens: 11,835
Initial FC at grade

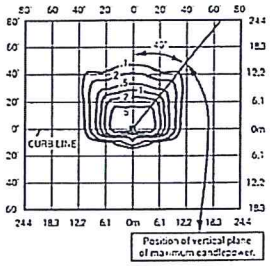
Type IV Medium Distribution				
LED Count (x10)	4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
350mA				
02	2,138	B1 U0 G1	2,220	B1 U0 G1
04	4,276	B1 U0 G1	4,440	B1 U0 G1
06	6,340	B2 U0 G2	6,584	B2 U0 G2
08	8,454	B2 U0 G2	8,779	B2 U0 G2
10	10,542	B2 U0 G2	10,947	B3 U0 G3
12	12,650	B3 U0 G3	13,137	B3 U0 G3
525mA				
02	2,993	B1 U0 G1	3,108	B1 U0 G1
04	5,986	B2 U0 G2	6,216	B2 U0 G2
06	8,876	B2 U0 G2	9,218	B2 U0 G2
08	11,835	B3 U0 G3	12,290	B3 U0 G3
700mA				
02	3,656	B1 U0 G1	3,796	B1 U0 G1
04	7,311	B2 U0 G2	7,593	B2 U0 G2
06	10,842	B3 U0 G3	11,259	B3 U0 G3

* Initial delivered lumens at 25°C (77°F).
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf

4MB



CSA Test Report #: 6449
ARE-EDG-4MB-**-12-E-UL-525-40K
Initial Delivered Lumens: 13,155

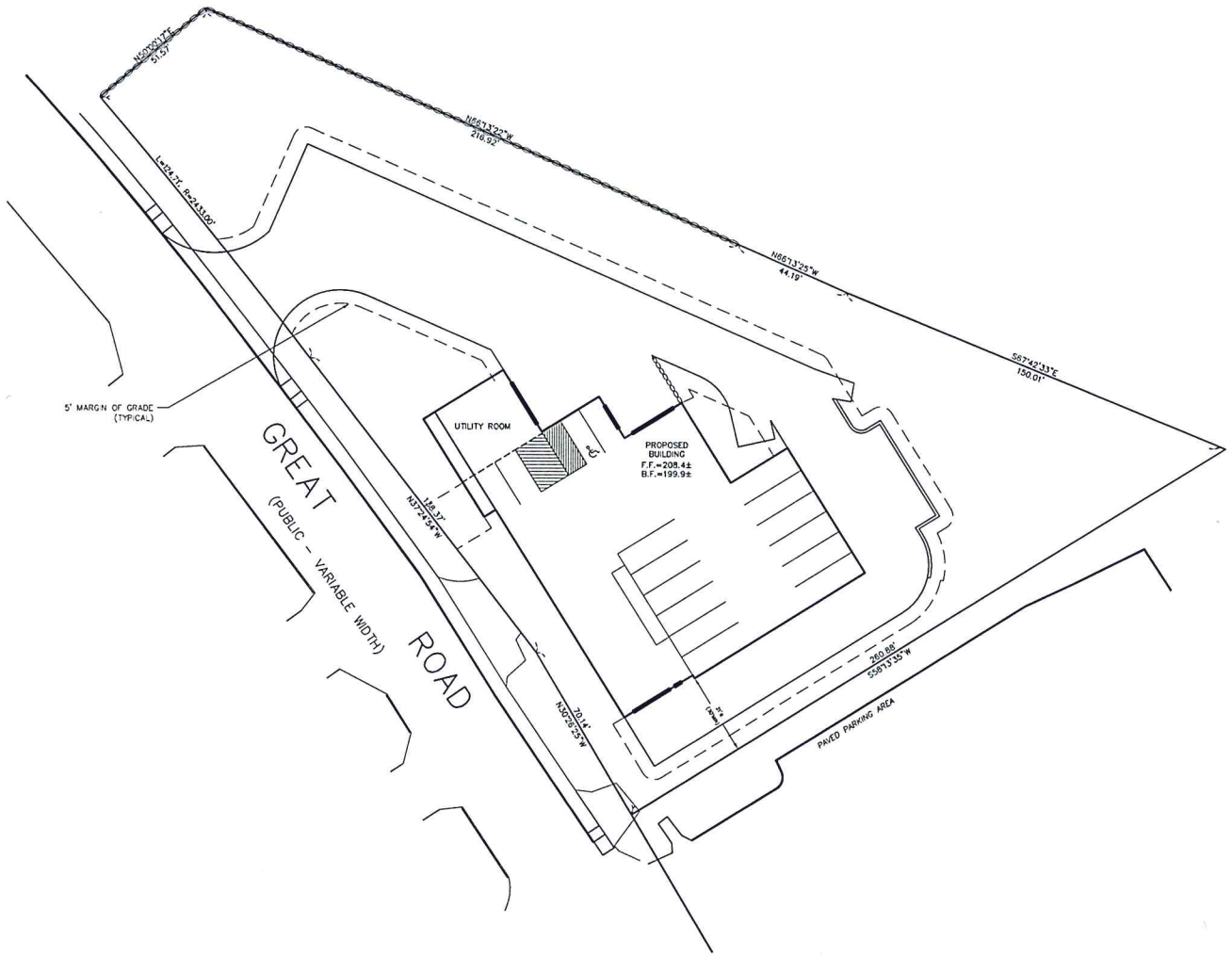


SEC-EDG-4MB-**-08-E-UL-525-40K
Mounting Height: 10' (3.0m) A.F.G.
Initial Delivered Lumens: 8,915
Initial FC at grade

Type IV Medium Distribution w/BLS				
LED Count (x10)	4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
350mA				
02	1,610	B0 U0 G1	1,672	B0 U0 G1
04	3,221	B1 U0 G1	3,345	B1 U0 G1
06	4,776	B1 U0 G1	4,959	B1 U0 G1
08	6,368	B1 U0 G2	6,613	B1 U0 G2
10	7,941	B1 U0 G2	8,246	B1 U0 G2
12	9,529	B1 U0 G2	9,895	B1 U0 G2
525mA				
02	2,254	B0 U0 G1	2,341	B0 U0 G1
04	4,509	B1 U0 G1	4,682	B1 U0 G1
06	6,686	B1 U0 G2	6,943	B1 U0 G2
08	8,915	B1 U0 G2	9,258	B1 U0 G2
700mA				
02	2,754	B0 U0 G1	2,860	B0 U0 G1
04	5,507	B1 U0 G1	5,719	B1 U0 G2
06	8,167	B1 U0 G2	8,481	B1 U0 G2

* Initial delivered lumens at 25°C (77°F).
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf

© 2015 Cree, Inc. and/or one of its subsidiaries. All rights reserved. For informational purposes only. Content is subject to change. Patent www.cree.com/patents. Cree®, NanoOptic®, and Colorfast DeltaGuard® are registered trademarks, and the Cree logo and Cree Edge™ are trademarks of Cree, Inc. The UL logo is a registered trademark of UL LLC. The DLC QPL logo is a registered trademarks of Northeast Energy Efficiency Partnerships, Inc.



LEGEND:

- N/F — NOW OR FORMERLY
- OVERHEAD WIRES
- TREE
- TREE LINE
- UP — UTILITY POLE
- GG — GAS GATE
- G — GAS SERVICE (BURIED)
- WG — WATER GATE
- W — WATER SERVICE (BURIED)
- DMH — DRAIN MANHOLE
- D — SUB-SURFACE DRAIN LINE
- 88 — EXISTING CONTOUR
- 85 — EXISTING CONTOUR
- LIGHTPOLE
- WETLAND FLAG
- 99X9 — SPOT ELEVATION
- STONE WALL
- EDGE OF PAVEMENT

10.6.3.2 a) 17,576 SF x 0.1 = 1,758 WATTS
10.6.3.2 b) 64± LINEAR FEET OF DOORWAYS
40 TOTAL DOORS = (64+6x6)x13 = 1,300 WATTS
TOTAL WATTAGE ALLOWED ON SITE = 3,058 WATTS
TOTAL WATTAGE PROPOSED ON SITE =

SITE PLAN
IN
ACTON, MA.

SITE POWER PLAN
FOR: COUNTRY PROPERTIES, LLC
SCALE: 1"=20' APRIL 22, 2016

STAMSKI AND McNARY, INC.
1000 MAIN STREET ACTON, MASS.
ENGINEERING – PLANNING – SURVEYING
0 10 20 40 60 80

SM-5369 (5369 SITE 4.dwg) SHEET 6 OF 7