დამკვეთი: LLC “Excellent Team”
ობიექტი: *რაგბის მოედანი - ქ.თბილისი*

პროექტის ავტორი: *შ.პ.ს. „ჯი თი ჯი“*
პროექტის დიზაინერი: *კახაბერ ბუცხრიკიძე*
პროექტზე პასუხისმგებელი: *გიორგი ჩილაჩავა, მიხეილ ხუბულური*

საშუალო ჰორიზონტალური განათება: *422 ლუქსი*

GR index, დამაბრმავებელი კოეფ: *38,8*

გამოყენებული პროჟექტორები: *MVF403/2000W* *40 ცალი*
რაოდენობა:

Table of Contents

1. Project Description 3

1.1 3-D Project Overview 3
1.2 Top Project Overview 4
1.3 Left Project Overview 5
1.4 Right Project Overview 6
1.5 Front Project Overview 7
1.6 Back Project Overview 8

2. Summary 9

2.1 General Information 9
2.2 Obstacle Information 9
2.3 Project Luminaires 9
2.4 Calculation Results 9

3. Calculation Results 11

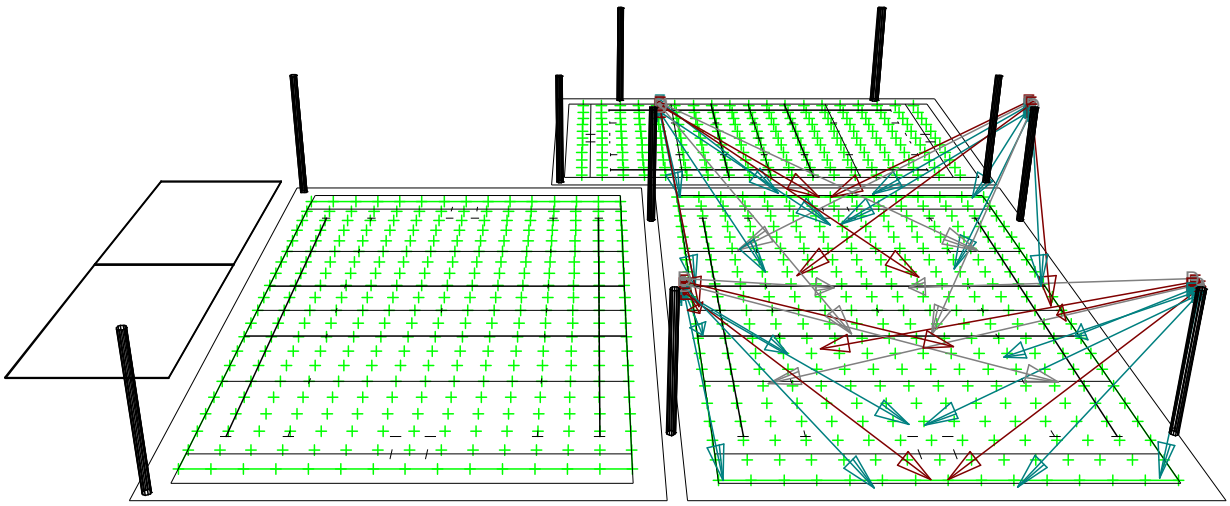
3.1 RUGBY - 1 Eh: Textual Table 11
3.2 RUGBY - 1 Eh: Graphical Table 13
3.3 RUGBY - 1 Eh: Iso Contour 14
3.4 RUGBY - 1 Eh: Filled Iso Contour 15
3.5 RUGBY - 1 Eh: Mountain Plot 16
3.6 GR RUGBY - 1: Textual Table 17
3.7 GR RUGBY - 1: Graphical Table 22

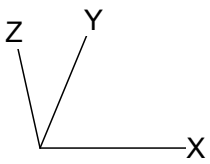
4. Luminaire Details 23

4.1 Project Luminaires 23

1. Project Description

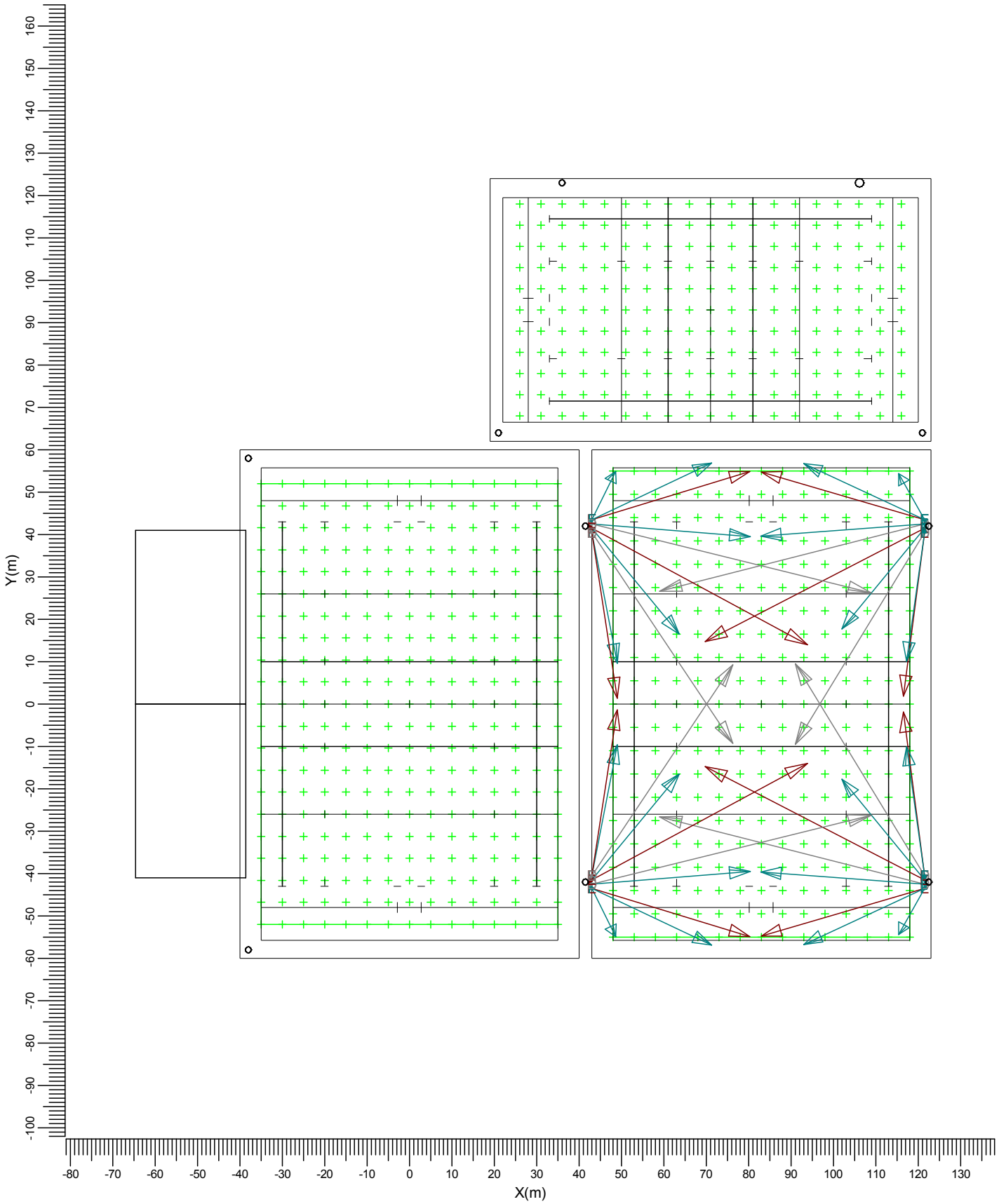
1.1 3-D Project Overview





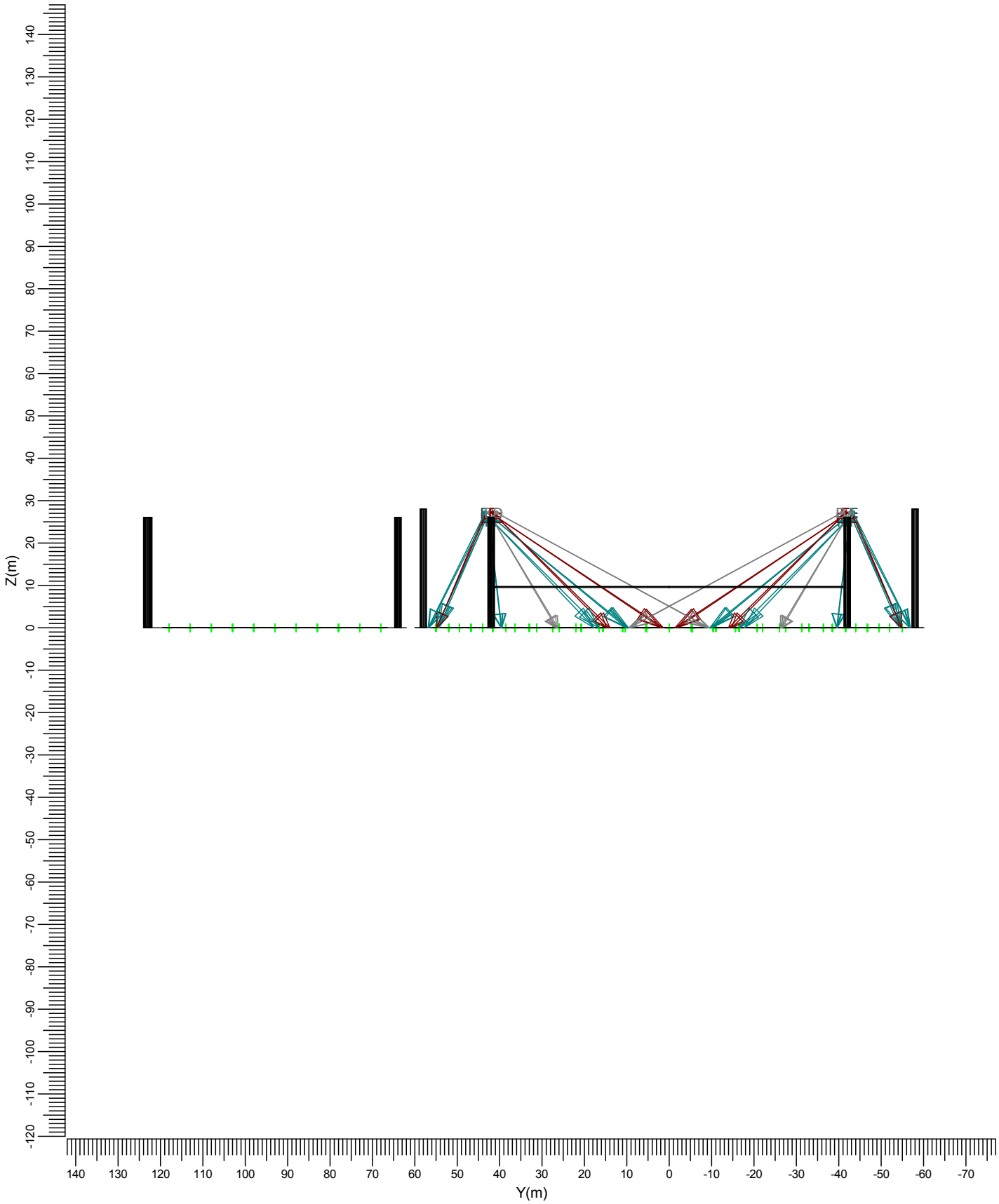
B MVF403 A3
C MVF403 A4
D MVF403 A5
E MVF403 A6
F MVF403 A7

1.2 Top Project Overview



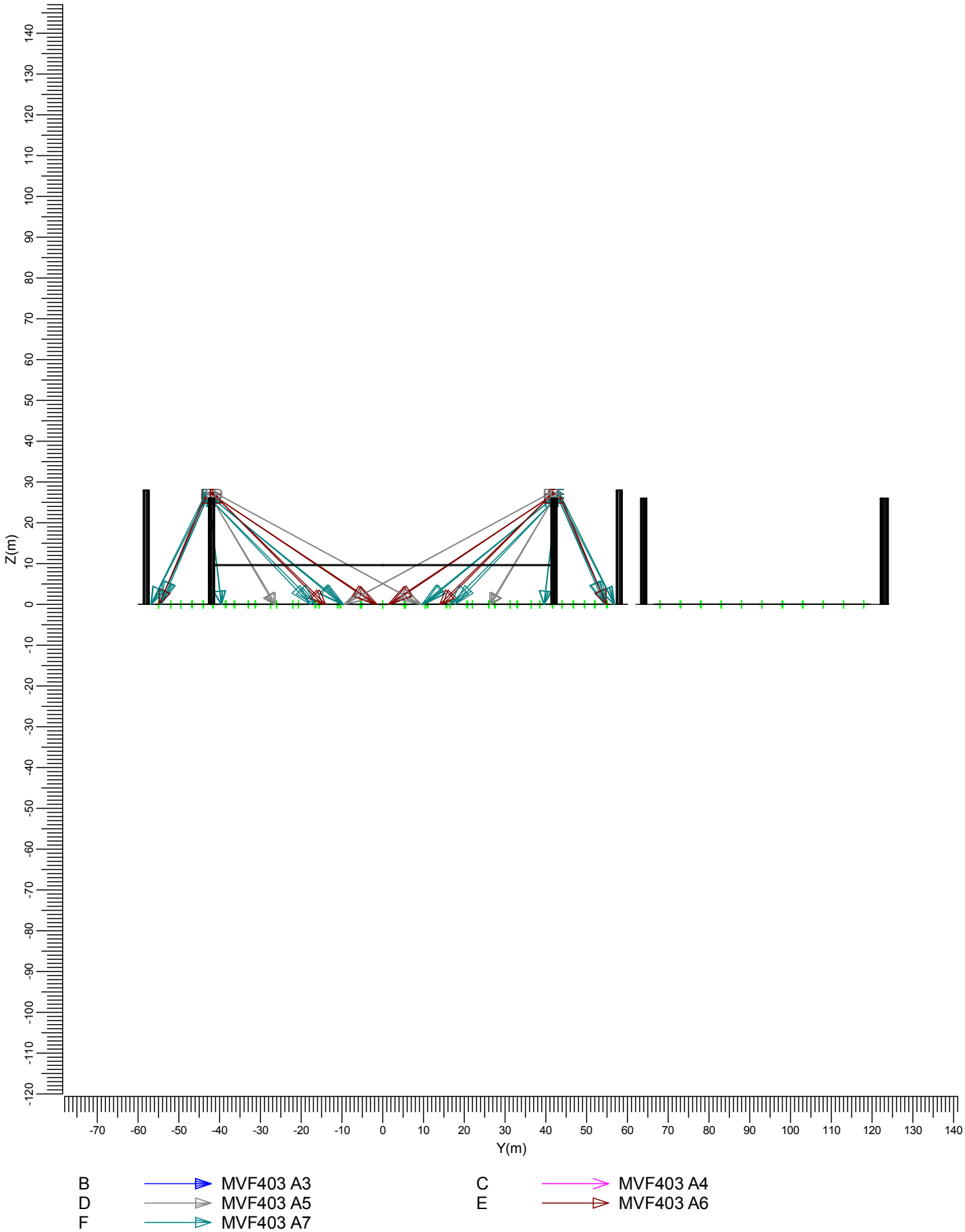
Scale
1:1250

1.3 Left Project Overview



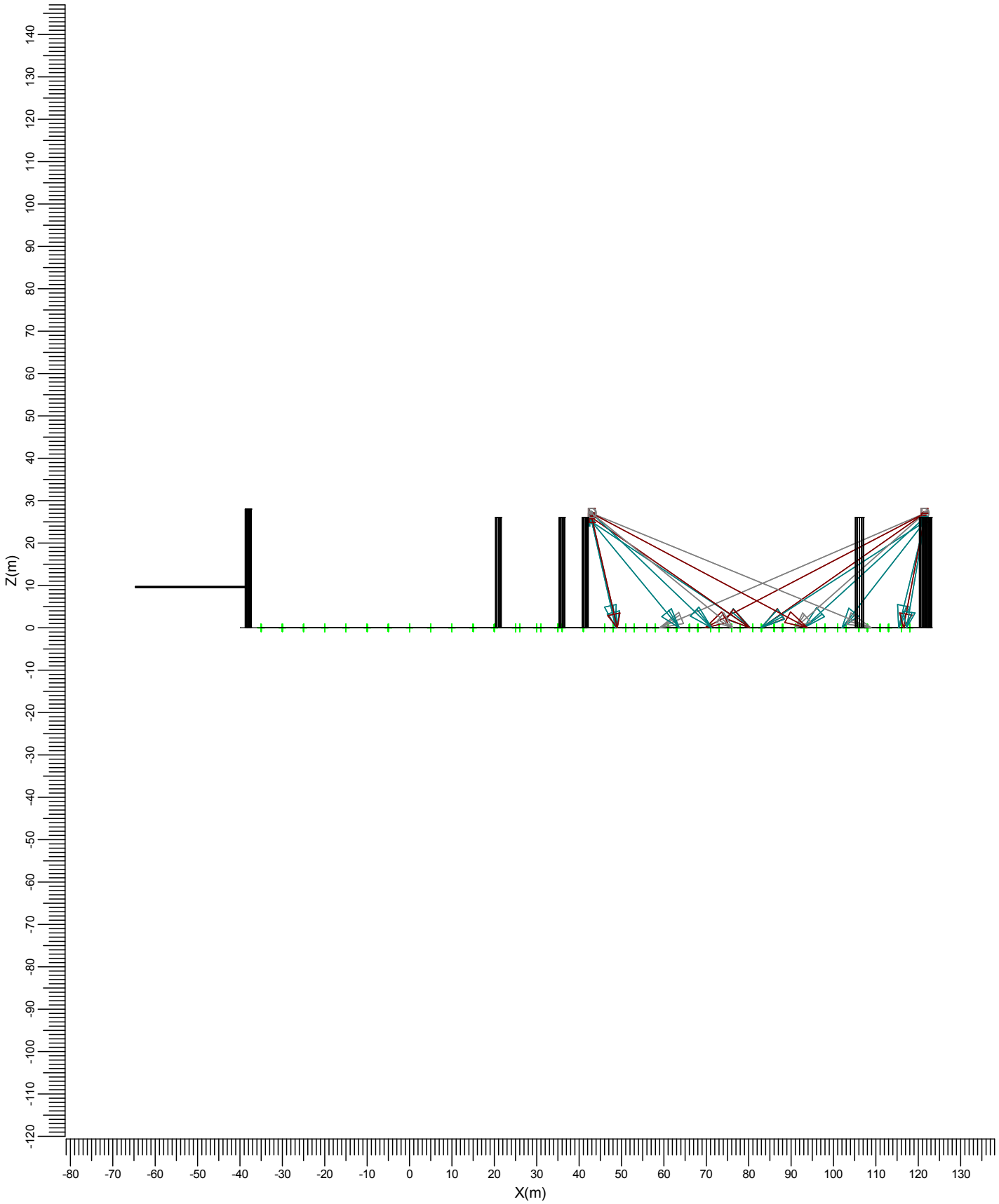
Scale
1:1250

1.4 Right Project Overview



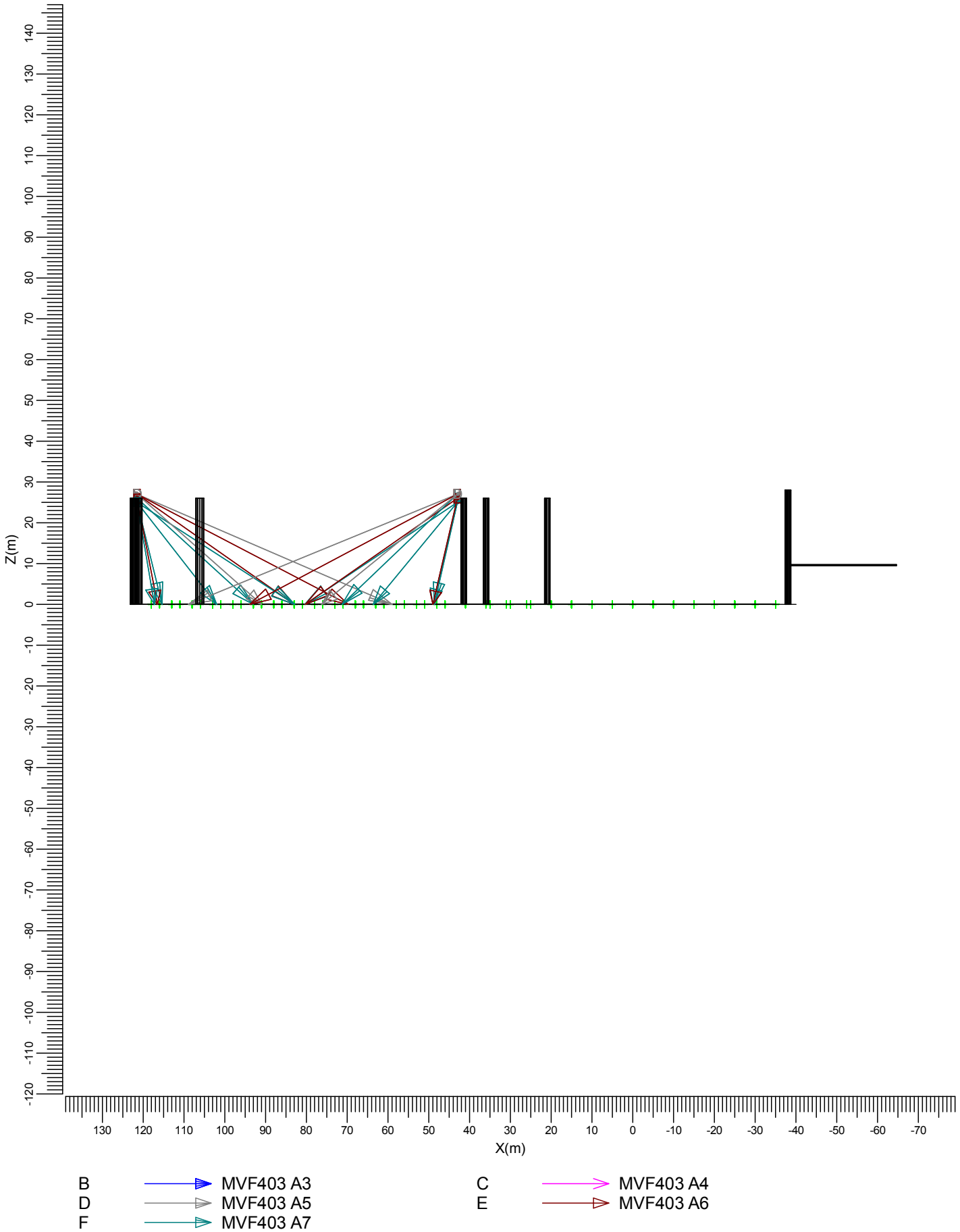
Scale
1:1250

1.5 Front Project Overview



Scale
1:1250

1.6 Back Project Overview



Scale
1:1250

2. Summary

2.1 General Information

The overall maintenance factor used for this project is 0.75.

2.2 Obstacle Information

Obstacle	Transparency (%)	Position		
		X (m)	Y (m)	Z (m)
bloc	0	-64.60	0.00	9.50
		-64.60	0.00	9.50
R	100	-38.00	-58.00	0.00
		-38.00	58.00	0.00
RR1	100	41.50	42.00	0.00
		41.50	-42.00	0.00
R1	100	122.50	42.00	0.00
		122.50	-42.00	0.00
R2 m1	100	21.00	64.00	0.00
R2m2	100	36.00	123.00	0.00
R2m3	0	106.20	123.00	0.00
R2m4	100	121.00	64.00	0.00

2.3 Project Luminaires

Code	Qty	Luminaire Type	Lamp Type	Power (W)	Flux (lm)
D	8	MVF403 A5	1 * MHN-SAH2000W/400V/956	2175.0	1 * 226000
E	12	MVF403 A6	1 * MHN-SAH2000W/400V/956	2175.0	1 * 226000
F	20	MVF403 A7	1 * MHN-SAH2000W/400V/956	2175.0	1 * 226000

The total installed power: 87.00 (kWatt)

Number of Luminaires Per Arrangement:

Arrangement	Luminaire Code			Power (kWatt)
	D	E	F	
R	0	0	0	0.00
R - 2 (3)	0	0	0	0.00
R - 1	4	6	10	43.50
R - 1 (1)	4	6	10	43.50
R - 2 (1)	0	0	0	0.00
R - 2 (2)	0	0	0	0.00
R - 2 (4)	0	0	0	0.00
RR	0	0	0	0.00

2.4 Calculation Results

(Il)luminance Calculations:

Calculation	Type	Unit	Ave	Min	Max	Min/Ave	Min/Max
RUGBY - Eh	Surface Illuminance	lux	26.7	1.2	212.0	0.04	0.01
RUGBY - 1 Eh	Surface Illuminance	lux	422	330	491	0.78	0.67
RUGBY - 2	Surface Illuminance	lux	28.2	1.2	182.2	0.04	0.01

Glare Rating for Grid of Observers:

Calculation	Observer Grid	Reference Grid	Reflectance	GR-Max
GR RUGBY	RUGBY	RUGBY	0.25	57.6
GR RUGBY - 1	RUGBI-1	RUGBI-1	0.25	38.8
GR RUGBY - 2	RUGBY - 2	RUGBY - 2	0.25	54.8

Obtrusive Light Calculations:

The upward light ratio (ULR) is 0.02.

3. Calculation Results

3.1 RUGBY - 1 Eh: Textual Table

Grid : RUGBI-1 at Z = -0.00 m
Calculation : Surface Illuminance (lux)

X (m) / Y (m)	48.00	53.00	58.00	63.00	68.00	73.00	78.00	83.00	88.00	93.00	98.00	103.00	108.00
55.00	429	397	350	333	398	384	382	366	371	384	376	330<	363
49.50	393	410	440	420	415	451	442	428	429	433	407	420	437
44.00	362	410	390	447	418	451	461	459	450	413	422	425	382
38.50	362	415	415	476	438	435	447	440	438	405	456	442	417
33.00	365	418	461	479	437	428	447	437	426	415	440	471	464
27.50	351	476	489	459	424	429	423	421	413	411	435	462	491>
22.00	429	454	430	457	433	417	417	413	405	407	434	462	438
16.50	378	428	448	436	423	413	410	402	406	405	420	436	450
11.00	430	457	442	428	410	422	425	419	423	420	412	427	437
5.50	396	430	423	431	439	446	437	426	432	451	446	435	426
0.00	382	402	416	436	464	462	441	436	437	467	472	446	421
-5.50	396	430	423	431	439	446	437	426	432	451	446	435	426
-11.00	430	457	442	428	410	422	425	419	423	420	412	427	437
-16.50	378	428	448	436	423	413	410	402	406	405	420	436	450
-22.00	429	454	430	457	433	417	417	413	405	407	434	462	438
-27.50	351	476	489	459	424	429	423	421	413	411	435	462	491>
-33.00	365	418	461	479	437	428	447	437	426	415	440	471	464
-38.50	362	415	415	476	438	435	447	440	438	405	456	442	417
-44.00	362	410	390	447	418	451	461	459	450	413	422	425	382
-49.50	393	410	440	420	415	451	442	428	429	433	407	420	437
-55.00	429	397	350	333	398	384	382	366	371	384	376	330<	363

Continue >

Average	Minimum	Maximum	Min/Ave	Min/Max	Project maintenance factor
422	330	491	0.78	0.67	0.75

< Continue

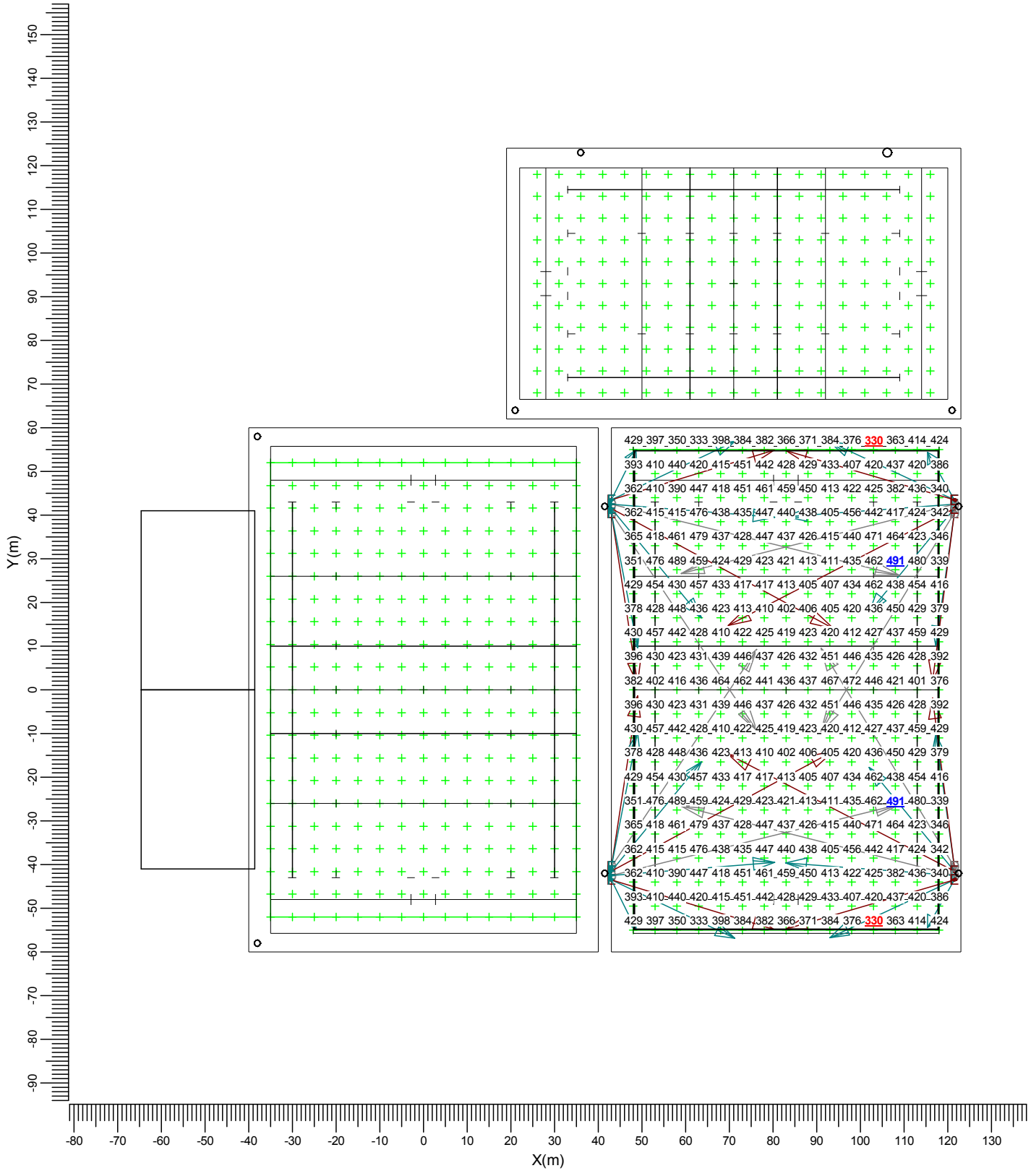
Grid : RUGBI-1 at Z = -0.00 m
Calculation : Surface Illuminance (lux)

X (m) / Y (m)	113.00	118.00
55.00	414	424
49.50	420	386
44.00	436	340
38.50	424	342
33.00	423	346
27.50	480	339
22.00	454	416
16.50	429	379
11.00	459	429
5.50	428	392
0.00	401	376
-5.50	428	392
-11.00	459	429
-16.50	429	379
-22.00	454	416
-27.50	480	339
-33.00	423	346
-38.50	424	342
-44.00	436	340
-49.50	420	386
-55.00	414	424

Average	Minimum	Maximum	Min/Ave	Min/Max	Project maintenance factor
422	330	491	0.78	0.67	0.75

3.2 RUGBY - 1 Eh: Graphical Table

Grid : RUGBI-1 at Z = -0.00 m
Calculation : Surface Illuminance (lux)

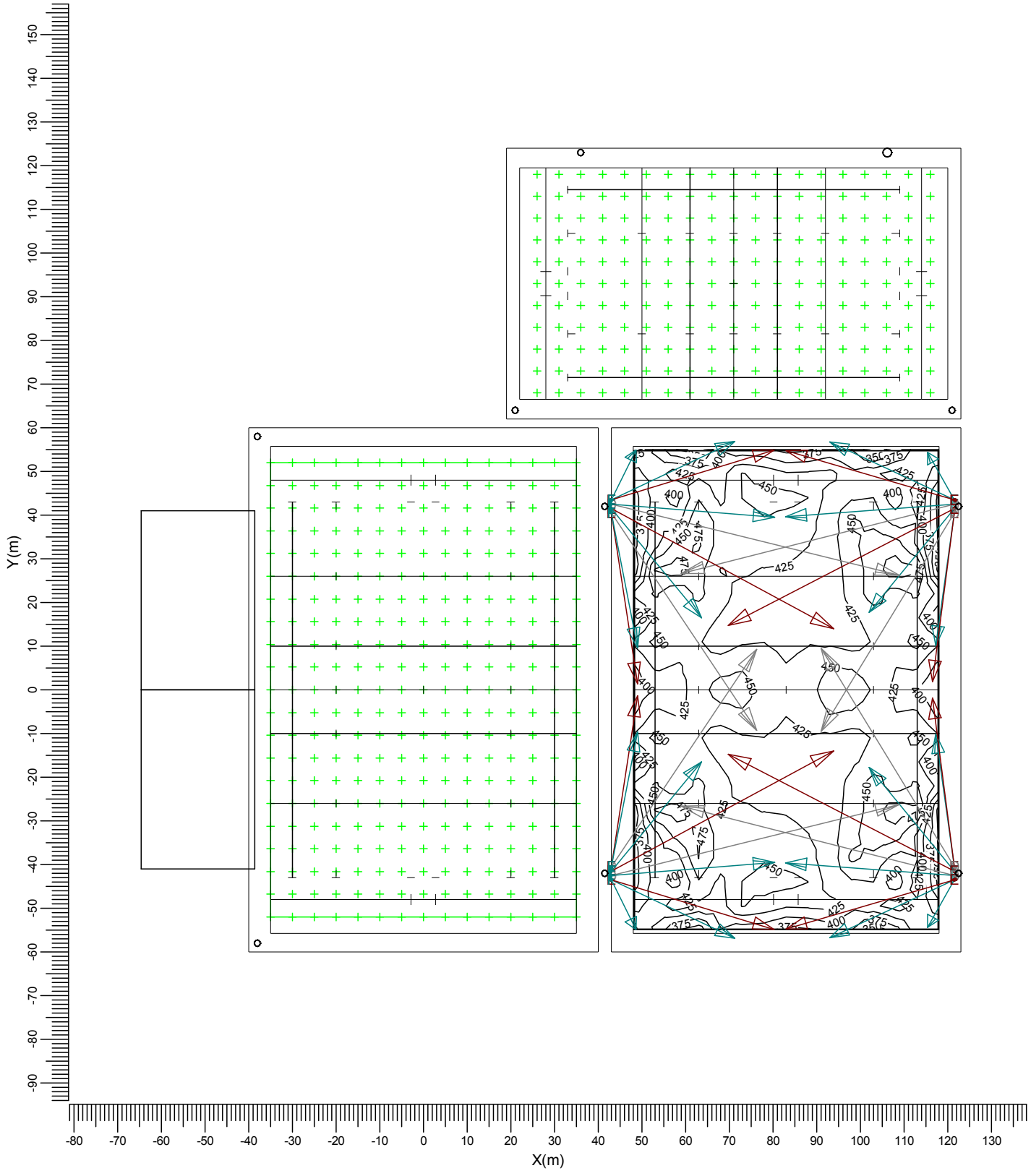


B MVF403 A3
C MVF403 A4
D MVF403 A5
E MVF403 A6
F MVF403 A7

Average	Minimum	Maximum	Min/Ave	Min/Max	Project maintenance factor	Scale
422	330	491	0.78	0.67	0.75	1:1250

3.3 RUGBY - 1 Eh: Iso Contour

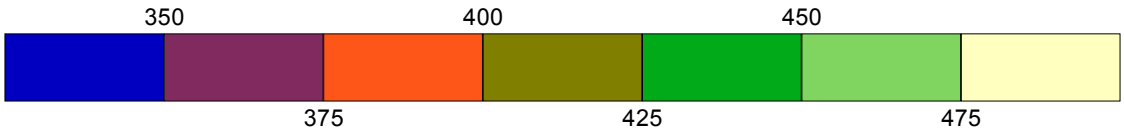
Grid : RUGBI-1 at Z = -0.00 m
Calculation : Surface Illuminance (lux)

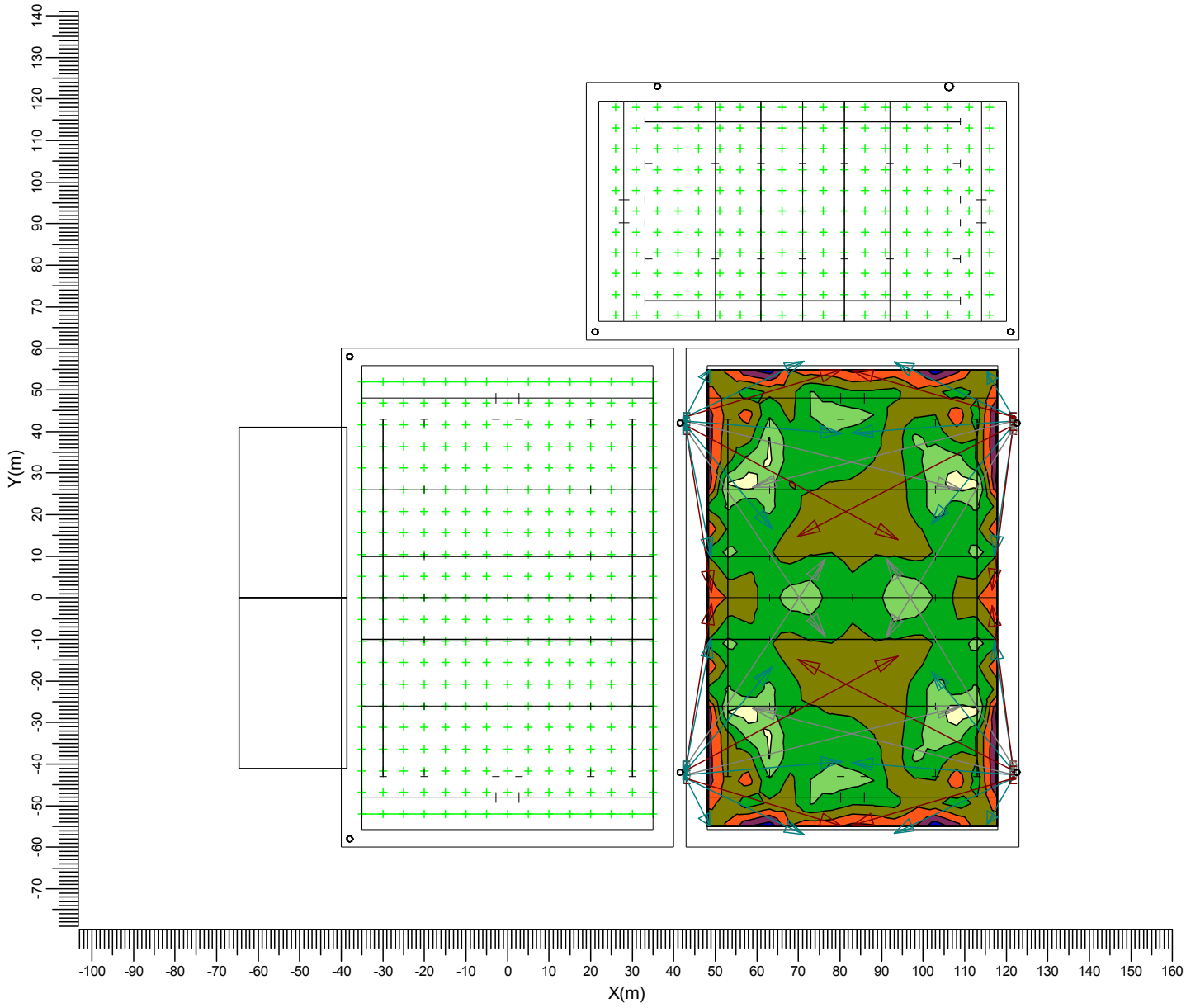


Average	Minimum	Maximum	Min/Ave	Min/Max	Project maintenance factor	Scale
422	330	491	0.78	0.67	0.75	1:1250

3.4 RUGBY - 1 Eh: Filled Iso Contour

Grid : RUGBI-1 at Z = -0.00 m
Calculation : Surface Illuminance (lux)



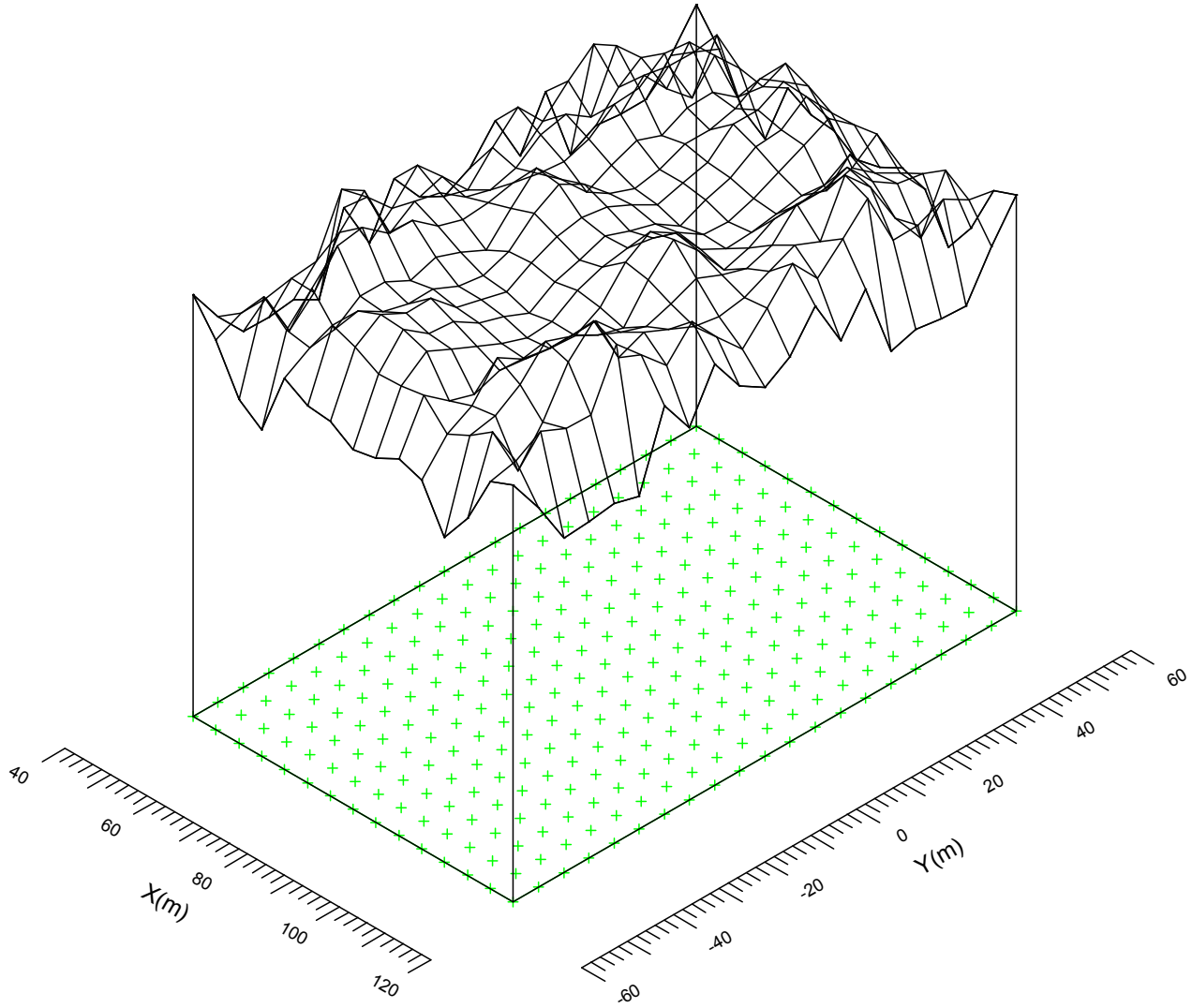


B MVF403 A3
C MVF403 A4
D MVF403 A5
E MVF403 A6
F MVF403 A7

Average	Minimum	Maximum	Min/Ave	Min/Max	Project maintenance factor	Scale
422	330	491	0.78	0.67	0.75	1:1500

3.5 RUGBY - 1 Eh: Mountain Plot

Grid : RUGBI-1 at Z = -0.00 m
Calculation : Surface Illuminance (lux)



Average	Minimum	Maximum	Min/Ave	Min/Max	Project maintenance factor
422	330	491	0.78	0.67	0.75

3.6 GR RUGBY - 1: Textual Table

Grid of Observers : RUGBI-1
Calculation : Glare Rating
Grid for Background Luminance : RUGBI-1 (Reflectance: 0.25)
Vertical Viewing Angle : -2.0 deg

X	Y	Z	Angle	GR-Max	X	Y	Z	Angle	GR-Max
48.00	-55.00	0.00	0	26	78.00	-44.00	0.00	0	36
53.00	-55.00	0.00	0	27	83.00	-44.00	0.00	180	35
58.00	-55.00	0.00	0	28	88.00	-44.00	0.00	180	35
63.00	-55.00	0.00	0	28	93.00	-44.00	0.00	180	35
68.00	-55.00	0.00	0	29	98.00	-44.00	0.00	180	35
73.00	-55.00	0.00	0	30	103.00	-44.00	0.00	180	35
78.00	-55.00	0.00	180	32	108.00	-44.00	0.00	180	34
83.00	-55.00	0.00	0	32	113.00	-44.00	0.00	180	34
88.00	-55.00	0.00	0	31	118.00	-44.00	0.00	180	33
93.00	-55.00	0.00	45	30	48.00	-38.50	0.00	0	35
98.00	-55.00	0.00	180	29	53.00	-38.50	0.00	0	36
103.00	-55.00	0.00	180	28	58.00	-38.50	0.00	0	37
108.00	-55.00	0.00	180	27	63.00	-38.50	0.00	0	37
113.00	-55.00	0.00	180	26	68.00	-38.50	0.00	0	37
118.00	-55.00	0.00	180	25	73.00	-38.50	0.00	0	37
48.00	-49.50	0.00	0	30	78.00	-38.50	0.00	0	36
53.00	-49.50	0.00	0	31	83.00	-38.50	0.00	180	35
58.00	-49.50	0.00	0	32	88.00	-38.50	0.00	180	35
63.00	-49.50	0.00	0	32	93.00	-38.50	0.00	180	36
68.00	-49.50	0.00	0	33	98.00	-38.50	0.00	180	37
73.00	-49.50	0.00	0	33	103.00	-38.50	0.00	180	37
78.00	-49.50	0.00	180	34	108.00	-38.50	0.00	180	37
83.00	-49.50	0.00	0	34	113.00	-38.50	0.00	180	36
88.00	-49.50	0.00	180	33	118.00	-38.50	0.00	180	35
93.00	-49.50	0.00	180	33	48.00	-33.00	0.00	0	36
98.00	-49.50	0.00	180	32	53.00	-33.00	0.00	0	37
103.00	-49.50	0.00	180	32	58.00	-33.00	0.00	0	38
108.00	-49.50	0.00	180	31	63.00	-33.00	0.00	0	39
113.00	-49.50	0.00	180	30	68.00	-33.00	0.00	0	38
118.00	-49.50	0.00	180	29	73.00	-33.00	0.00	0	37
48.00	-44.00	0.00	0	33	78.00	-33.00	0.00	0	35
53.00	-44.00	0.00	0	34	83.00	-33.00	0.00	180	34
58.00	-44.00	0.00	0	35	88.00	-33.00	0.00	180	35
63.00	-44.00	0.00	0	35	93.00	-33.00	0.00	180	37
68.00	-44.00	0.00	0	36	98.00	-33.00	0.00	180	38
73.00	-44.00	0.00	0	36	103.00	-33.00	0.00	180	38

Continue >

Maximum
38.8

Project maintenance factor
0.75

< Continue
Continue >

Grid of Observers : RUGBI-1
Calculation : Glare Rating
Grid for Background Luminance : RUGBI-1 (Reflectance: 0.25)
Vertical Viewing Angle : -2.0 deg

X	Y	Z	Angle	GR-Max	X	Y	Z	Angle	GR-Max
108.00	-33.00	0.00	180	38	68.00	-16.50	0.00	315	33
113.00	-33.00	0.00	180	37	73.00	-16.50	0.00	315	34
118.00	-33.00	0.00	180	36	78.00	-16.50	0.00	135	34
48.00	-27.50	0.00	0	35	83.00	-16.50	0.00	135	35
53.00	-27.50	0.00	0	37	88.00	-16.50	0.00	135	34
58.00	-27.50	0.00	0	38	93.00	-16.50	0.00	135	34
63.00	-27.50	0.00	0	38	98.00	-16.50	0.00	225	33
68.00	-27.50	0.00	0	38	103.00	-16.50	0.00	180	32
73.00	-27.50	0.00	0	36	108.00	-16.50	0.00	180	32
78.00	-27.50	0.00	0	33	113.00	-16.50	0.00	180	32
83.00	-27.50	0.00	180	31	118.00	-16.50	0.00	180	31
88.00	-27.50	0.00	180	34	48.00	-11.00	0.00	270	32
93.00	-27.50	0.00	180	36	53.00	-11.00	0.00	270	32
98.00	-27.50	0.00	180	37	58.00	-11.00	0.00	225	32
103.00	-27.50	0.00	180	38	63.00	-11.00	0.00	225	33
108.00	-27.50	0.00	180	38	68.00	-11.00	0.00	225	34
113.00	-27.50	0.00	180	37	73.00	-11.00	0.00	135	36
118.00	-27.50	0.00	180	36	78.00	-11.00	0.00	135	37
48.00	-22.00	0.00	0	33	83.00	-11.00	0.00	135	37
53.00	-22.00	0.00	0	35	88.00	-11.00	0.00	45	36
58.00	-22.00	0.00	0	36	93.00	-11.00	0.00	45	35
63.00	-22.00	0.00	0	36	98.00	-11.00	0.00	135	33
68.00	-22.00	0.00	0	35	103.00	-11.00	0.00	315	32
73.00	-22.00	0.00	0	34	108.00	-11.00	0.00	90	32
78.00	-22.00	0.00	315	33	113.00	-11.00	0.00	270	32
83.00	-22.00	0.00	315	32	118.00	-11.00	0.00	270	32
88.00	-22.00	0.00	225	32	48.00	-5.50	0.00	270	34
93.00	-22.00	0.00	180	34	53.00	-5.50	0.00	270	34
98.00	-22.00	0.00	180	35	58.00	-5.50	0.00	90	33
103.00	-22.00	0.00	180	35	63.00	-5.50	0.00	225	33
108.00	-22.00	0.00	180	36	68.00	-5.50	0.00	135	35
113.00	-22.00	0.00	180	35	73.00	-5.50	0.00	135	38
118.00	-22.00	0.00	180	34	78.00	-5.50	0.00	135	39
48.00	-16.50	0.00	0	31	83.00	-5.50	0.00	135	38
53.00	-16.50	0.00	0	32	88.00	-5.50	0.00	45	38
58.00	-16.50	0.00	0	32	93.00	-5.50	0.00	45	37
63.00	-16.50	0.00	315	32	98.00	-5.50	0.00	45	35

Maximum
38.8

Project maintenance factor
0.75

< Continue
Continue >

Grid of Observers : RUGBI-1
Calculation : Glare Rating
Grid for Background Luminance : RUGBI-1 (Reflectance: 0.25)
Vertical Viewing Angle : -2.0 deg

X	Y	Z	Angle	GR-Max	X	Y	Z	Angle	GR-Max
103.00	-5.50	0.00	90	33	63.00	11.00	0.00	135	33
108.00	-5.50	0.00	90	33	68.00	11.00	0.00	135	34
113.00	-5.50	0.00	270	34	73.00	11.00	0.00	225	36
118.00	-5.50	0.00	270	34	78.00	11.00	0.00	225	37
48.00	0.00	0.00	90	34	83.00	11.00	0.00	225	37
53.00	0.00	0.00	90	33	88.00	11.00	0.00	315	36
58.00	0.00	0.00	90	33	93.00	11.00	0.00	315	35
63.00	0.00	0.00	135	33	98.00	11.00	0.00	225	33
68.00	0.00	0.00	135	36	103.00	11.00	0.00	45	32
73.00	0.00	0.00	135	38	108.00	11.00	0.00	270	32
78.00	0.00	0.00	135	38	113.00	11.00	0.00	90	32
83.00	0.00	0.00	135	38	118.00	11.00	0.00	90	32
88.00	0.00	0.00	45	37	48.00	16.50	0.00	0	31
93.00	0.00	0.00	45	37	53.00	16.50	0.00	0	32
98.00	0.00	0.00	45	36	58.00	16.50	0.00	0	32
103.00	0.00	0.00	45	33	63.00	16.50	0.00	45	32
108.00	0.00	0.00	90	33	68.00	16.50	0.00	45	33
113.00	0.00	0.00	90	33	73.00	16.50	0.00	45	34
118.00	0.00	0.00	90	33	78.00	16.50	0.00	225	34
48.00	5.50	0.00	90	34	83.00	16.50	0.00	225	35
53.00	5.50	0.00	90	34	88.00	16.50	0.00	225	34
58.00	5.50	0.00	270	33	93.00	16.50	0.00	225	34
63.00	5.50	0.00	135	33	98.00	16.50	0.00	135	33
68.00	5.50	0.00	225	35	103.00	16.50	0.00	180	32
73.00	5.50	0.00	225	38	108.00	16.50	0.00	180	32
78.00	5.50	0.00	225	39	113.00	16.50	0.00	180	32
83.00	5.50	0.00	225	38	118.00	16.50	0.00	180	31
88.00	5.50	0.00	315	38	48.00	22.00	0.00	0	33
93.00	5.50	0.00	315	37	53.00	22.00	0.00	0	35
98.00	5.50	0.00	315	35	58.00	22.00	0.00	0	36
103.00	5.50	0.00	270	33	63.00	22.00	0.00	0	36
108.00	5.50	0.00	270	33	68.00	22.00	0.00	0	35
113.00	5.50	0.00	90	34	73.00	22.00	0.00	0	34
118.00	5.50	0.00	90	34	78.00	22.00	0.00	45	33
48.00	11.00	0.00	90	32	83.00	22.00	0.00	45	32
53.00	11.00	0.00	90	32	88.00	22.00	0.00	135	32
58.00	11.00	0.00	135	32	93.00	22.00	0.00	180	34

Maximum
38.8

Project maintenance factor
0.75

< Continue
Continue >

Grid of Observers : RUGBI-1
Calculation : Glare Rating
Grid for Background Luminance : RUGBI-1 (Reflectance: 0.25)
Vertical Viewing Angle : -2.0 deg

X	Y	Z	Angle	GR-Max	X	Y	Z	Angle	GR-Max
98.00	22.00	0.00	180	35	58.00	38.50	0.00	0	37
103.00	22.00	0.00	180	35	63.00	38.50	0.00	0	37
108.00	22.00	0.00	180	36	68.00	38.50	0.00	0	37
113.00	22.00	0.00	180	35	73.00	38.50	0.00	0	37
118.00	22.00	0.00	180	34	78.00	38.50	0.00	0	36
48.00	27.50	0.00	0	35	83.00	38.50	0.00	180	35
53.00	27.50	0.00	0	37	88.00	38.50	0.00	180	35
58.00	27.50	0.00	0	38	93.00	38.50	0.00	180	36
63.00	27.50	0.00	0	38	98.00	38.50	0.00	180	37
68.00	27.50	0.00	0	38	103.00	38.50	0.00	180	37
73.00	27.50	0.00	0	36	108.00	38.50	0.00	180	37
78.00	27.50	0.00	0	33	113.00	38.50	0.00	180	36
83.00	27.50	0.00	180	31	118.00	38.50	0.00	180	35
88.00	27.50	0.00	180	34	48.00	44.00	0.00	0	33
93.00	27.50	0.00	180	36	53.00	44.00	0.00	0	34
98.00	27.50	0.00	180	37	58.00	44.00	0.00	0	35
103.00	27.50	0.00	180	38	63.00	44.00	0.00	0	35
108.00	27.50	0.00	180	38	68.00	44.00	0.00	0	36
113.00	27.50	0.00	180	37	73.00	44.00	0.00	0	36
118.00	27.50	0.00	180	36	78.00	44.00	0.00	0	36
48.00	33.00	0.00	0	36	83.00	44.00	0.00	180	35
53.00	33.00	0.00	0	37	88.00	44.00	0.00	180	35
58.00	33.00	0.00	0	38	93.00	44.00	0.00	180	35
63.00	33.00	0.00	0	39	98.00	44.00	0.00	180	35
68.00	33.00	0.00	0	38	103.00	44.00	0.00	180	35
73.00	33.00	0.00	0	37	108.00	44.00	0.00	180	34
78.00	33.00	0.00	0	35	113.00	44.00	0.00	180	34
83.00	33.00	0.00	180	34	118.00	44.00	0.00	180	33
88.00	33.00	0.00	180	35	48.00	49.50	0.00	0	30
93.00	33.00	0.00	180	37	53.00	49.50	0.00	0	31
98.00	33.00	0.00	180	38	58.00	49.50	0.00	0	32
103.00	33.00	0.00	180	38	63.00	49.50	0.00	0	32
108.00	33.00	0.00	180	38	68.00	49.50	0.00	0	33
113.00	33.00	0.00	180	37	73.00	49.50	0.00	0	33
118.00	33.00	0.00	180	36	78.00	49.50	0.00	180	34
48.00	38.50	0.00	0	35	83.00	49.50	0.00	0	34
53.00	38.50	0.00	0	36	88.00	49.50	0.00	180	33

Maximum
38.8

Project maintenance factor
0.75

< Continue

Grid of Observers : RUGBI-1
Calculation : Glare Rating
Grid for Background Luminance : RUGBI-1 (Reflectance: 0.25)
Vertical Viewing Angle : -2.0 deg

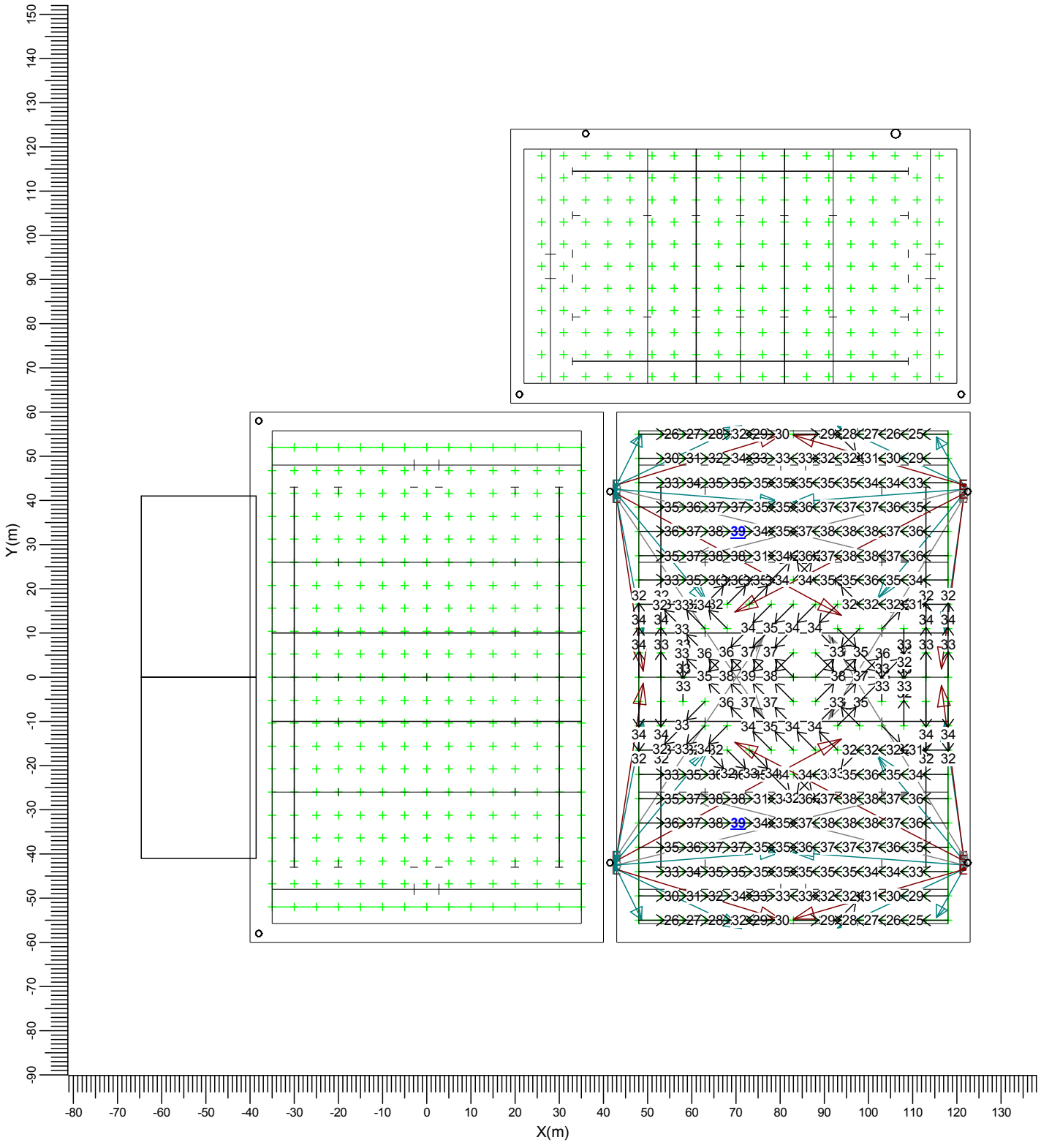
X	Y	Z	Angle	GR-Max	X	Y	Z	Angle	GR-Max
93.00	49.50	0.00	180	33					
98.00	49.50	0.00	180	32					
103.00	49.50	0.00	180	32					
108.00	49.50	0.00	180	31					
113.00	49.50	0.00	180	30					
118.00	49.50	0.00	180	29					
48.00	55.00	0.00	0	26					
53.00	55.00	0.00	0	27					
58.00	55.00	0.00	0	28					
63.00	55.00	0.00	0	28					
68.00	55.00	0.00	0	29					
73.00	55.00	0.00	0	30					
78.00	55.00	0.00	180	32					
83.00	55.00	0.00	0	32					
88.00	55.00	0.00	0	31					
93.00	55.00	0.00	315	30					
98.00	55.00	0.00	180	29					
103.00	55.00	0.00	180	28					
108.00	55.00	0.00	180	27					
113.00	55.00	0.00	180	26					
118.00	55.00	0.00	180	25					

Maximum
38.8

Project maintenance factor
0.75

3.7 GR RUGBY - 1: Graphical Table

Grid of Observers : RUGBI-1
Calculation : Glare Rating
Grid for Background Luminance : RUGBI-1 (Reflectance: 0.25)
Vertical Viewing Angle : -2.0 deg



Maximum
38.8

Project maintenance factor
0.75

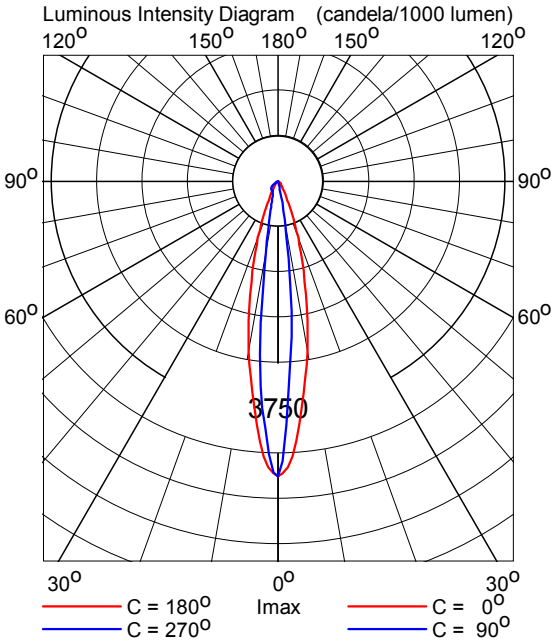
Scale
1:1250

4. Luminaire Details

4.1 Project Luminaires

MVF403
MVF403 1xMHN-SAH2000W/400V/956 A5



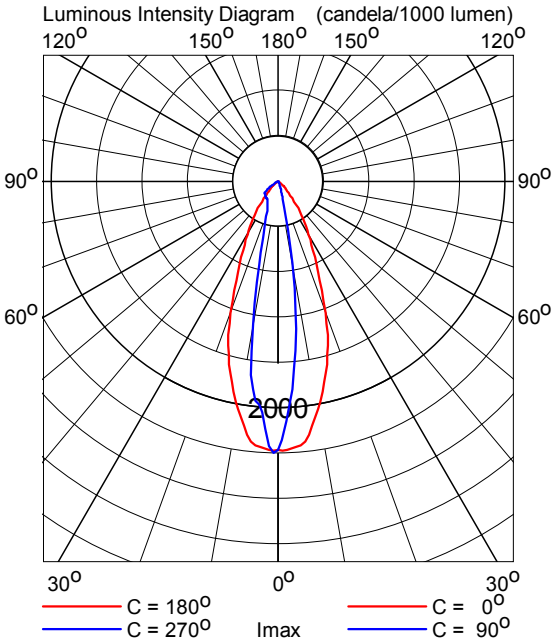


Light output ratios
DLOR : 0.80
ULOR : 0.01
TLOR : 0.81
Ballast : Conventional
Lamp flux : 226000 lm
Luminaire wattage : 2175.0 W
Measurement code : LVM1246200

Note: This luminaire is a special version of the mentioned measurement code.

MVF403
MVF403 1xMHN-SAH2000W/400V/956 A6



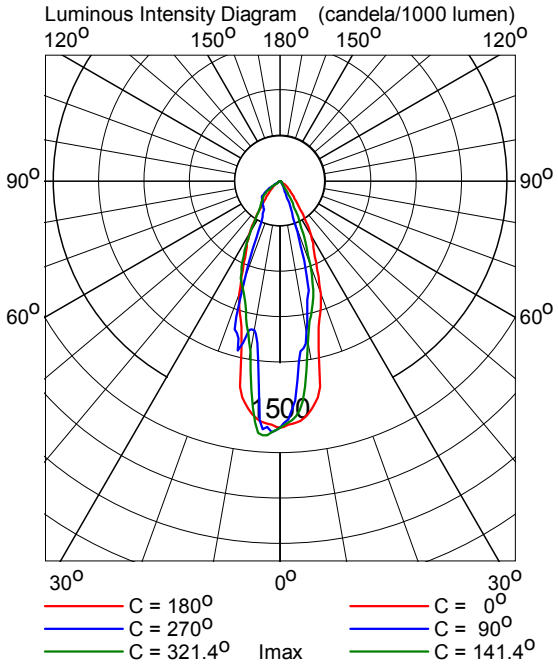


Light output ratios
DLOR : 0.80
ULOR : 0.00
TLOR : 0.80
Ballast : Conventional
Lamp flux : 226000 lm
Luminaire wattage : 2175.0 W
Measurement code : LVM1246300

Note: This luminaire is a special version of the mentioned measurement code.

MVF403
MVF403 1xMHN-SAH2000W/400V/956 A7





Light output ratios
- DLOR : 0.80
- ULOR : 0.00
- TLOR : 0.80

Ballast : Conventional
Lamp flux : 226000 lm
Luminaire wattage : 2175.0 W
Measurement code : LVM1246400

Note: This luminaire is a special version of the mentioned measurement code.