

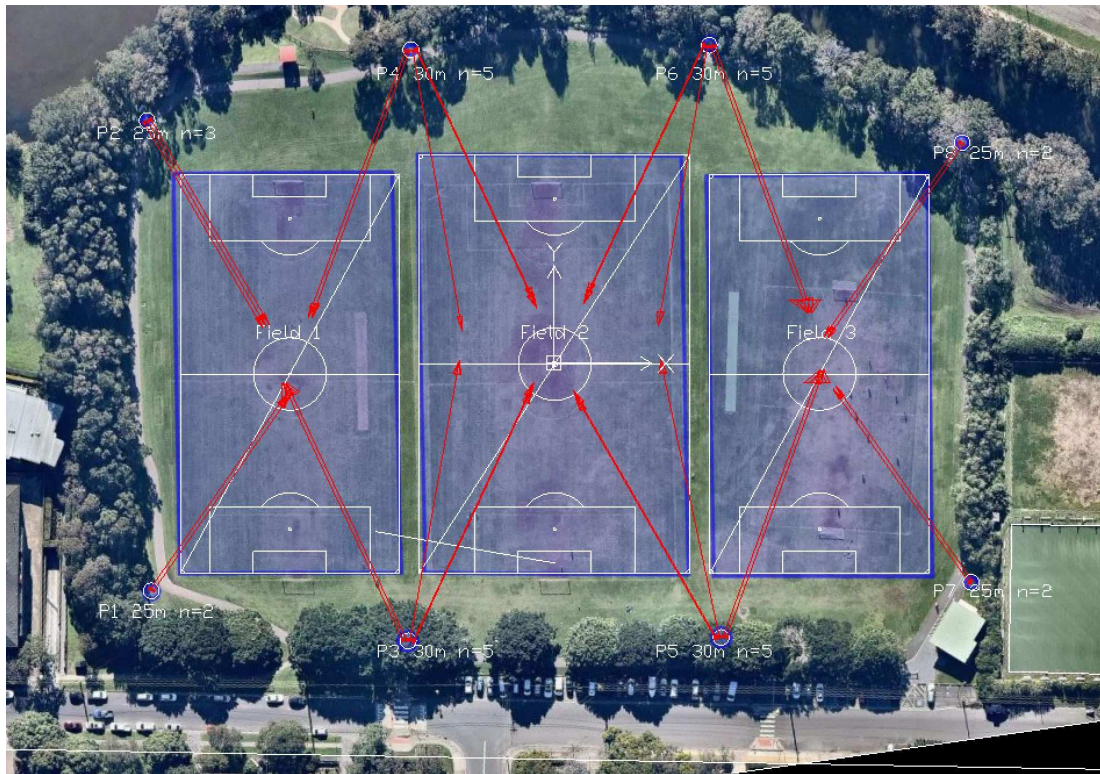
Passmore Reserve

100 lux - LED

Project code: 18076-02-A

Date: 10-09-2018

Description: Rev A - Original - Concept for review



The nominal values shown in this report are the result of precision calculations, based upon precisely positioned luminaires in a fixed relationship to each other and to the area under examination. In practice the values may vary due to tolerances on luminaires, luminaire positioning, reflection properties and electrical supply.

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CalcuLuX Area 7.9.0.0

1. Project Description

1.1 Description

Dimensions have been taken from a pdf/satellite image, subject to confirmation prior to installation/commissioning.
MH = 25/30 metres; the height above the playing surface to a single crossarm.

Glare Ratings (GR) are based on a diffuse playing surface reflectance of 25%.
GR_{max} ≤ 50 for observers per Figure 6 AS 2560.2.3-2007 Football.

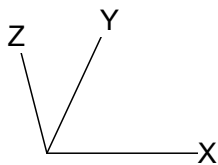
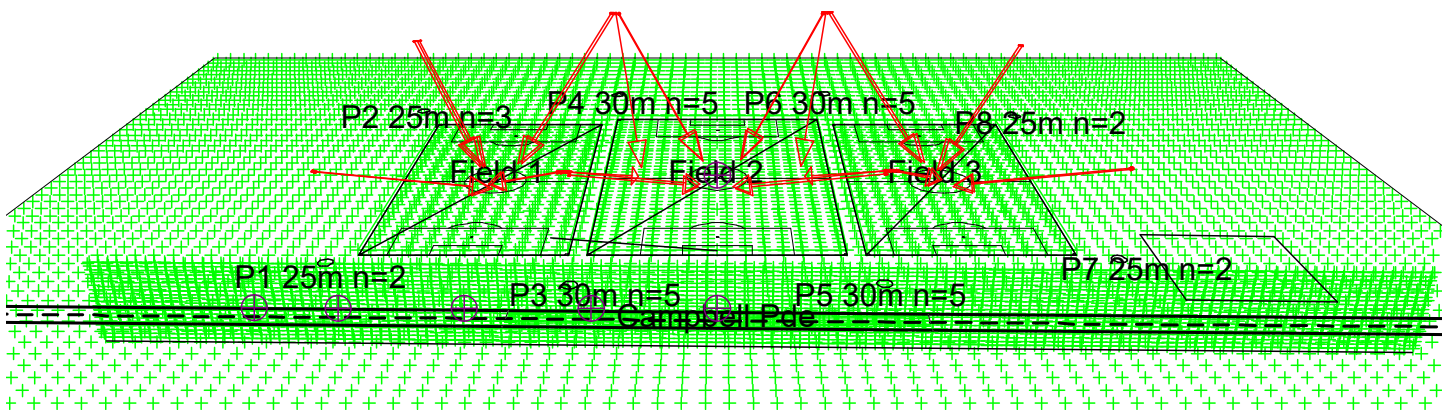
A maintenance factor of 0.86 has been allowed to apply to all luminaires.
A maintenance policy should be adopted to support the maintenance factor.
MF=1.0 is used to show obtrusive light initial values.

AS4282-1997 Obtrusive light assesment:
All luminaires on, direct flux only, no obstructions such as trees are included.
Maximum luminous intensity per luminaire = Level 1 control (pre-curfew, medium/large area per Table 2.2),
E_v ≤ 10 lux (measured at z = 1 to 20 m),

Philips OptiVision LED gen2 BVP525 50K 757 T30 IP66 3 module.
Weight=28 kg(remote driver 6 kg), SC_x=0.31 (at 40° tilt).
Note trunnion depth is 30mm, longer bolts may required.
LT and LO versions use integral shields to mitigate obtrusive light.
Floodlight reference tilt (∠I_{max}) is noted as "TILT90".
Subtract 30° from TILT90 to get the tilt of the visor.
All luminaires are tilted with visor at ≤ 37°.
Floodlights should be spaced at least 95cm apart.
Driver rating: 230-400V +/-10% 50Hz.
Input Power = 1392 W, Run current: 415V=3.6A, 240V=6.2A
Refer to Mounting instructions for inrush current details.
Cable from driver to floodlight 6C+E 1000V (by others):
Length < 25m use 1.5mm², Length ≤ 50m use 2.5mm².
Tolerances on light flux: +/- 7%
Can be mounted over/under without modification/accessories, (single cross-arm only, if two or more cross-arms are required, then provision must be made for sufficient offset to avoid the luminaires on the lower arm/s shadowing those on the upper arm).

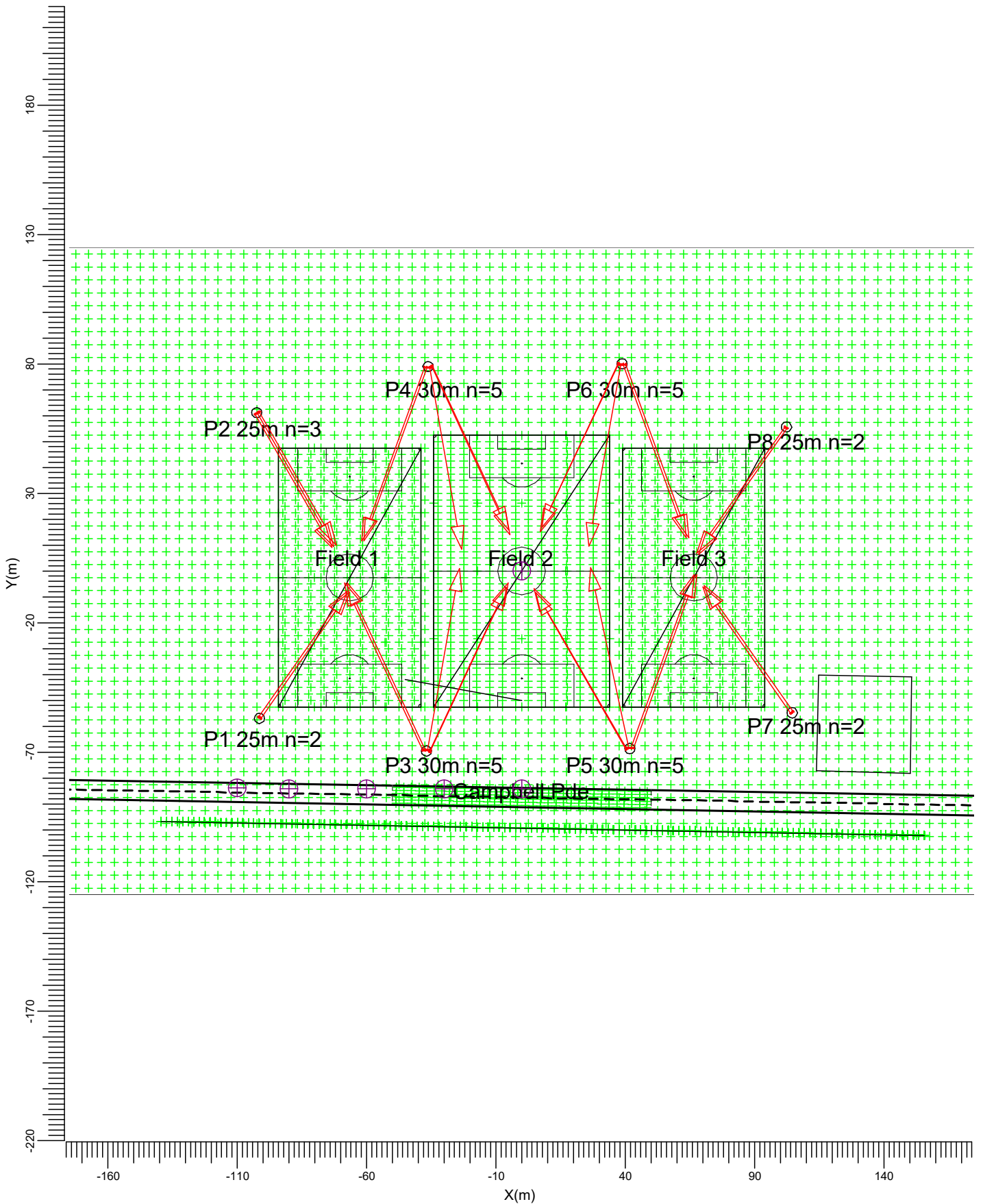
MF=0.86, from Rated useful life L94B10=15000 hrs,
and LMF=0.92 (dirt) from BS5489.1 Table B.1 (E1/2/3/4 MH>6m and 6 year clean)
Note: L80B10=50,000 hours, abrupt failure value (driver)=1.5%@15000 hrs.

1.2 3-D Project Overview



—▶ BVP525 T30 50K A-NBLT/30

1.3 Top Project Overview



—▶ BVP525 T30 50K A-NBLT/30

Scale
1:2000

2. Summary

2.1 Observer Information

Code	Observer	Position		
		X (m)	Y (m)	Z (m)
Aa	Centre	-0.00	-0.00	1.00
Bb	Campbell Pde TI (O1)	-109.95	-83.71	1.50
Cc	Campbell Pde TI (O2)	-90.00	-84.22	1.50
Dd	Campbell Pde TI (O3)	-60.00	-84.22	1.50
Ee	Campbell Pde TI (O4)	-30.00	-84.22	1.50
Ff	Campbell Pde TI (O5)	-0.00	-84.22	1.50

2.2 Project Luminaires

Code	Qty	Luminaire Type	Lamp Type	Power (W)	Flux (lm)
A	29	BVP525 T30 50K A-NBLT/30	1 * LED1930/757	1301.5	1 * 183011

The total installed power: 37.74 (kWatt)

Number of Luminaires Per Switching Mode:

Switching Mode	Luminaire Code	Power (kWatt)
	A	
All 50 lx	16	20.82
All 100 lx	29	37.74
Field 1 100 lx	15	19.52
Field 2 100 lx	20	26.03
Field 3 100 lx	14	18.22
All Initial	29	37.74

Number of Luminaires Per Arrangement:

Arrangement	Luminaire Code	Power (kWatt)
	A	
P1 25m	2	2.60
P2 25m	3	3.90
P3 30m	5	6.51
P4 30m	5	6.51
P5 30m	5	6.51
P6 30m	5	6.51
P7 25m	2	2.60
P8 25m	2	2.60

2.3 Calculation Results

Switching Modes:

Code	Switching Mode	Maintenance factor
1	All 50 lx	0.86
2	All 100 lx	0.86
3	Field 1 100 lx	0.86
4	Field 2 100 lx	0.86
5	Field 3 100 lx	0.86
6	All Initial	1.00

(II)luminance Calculations:

Calculation	Switching Mode	Type	Unit	Ave	Max Min/Ave	Min/Max
Field 1 50 lx	1	Horizontal Illuminance	lux	57.8	0.58	0.42
Field 1 100 lx	2	Horizontal Illuminance	lux	115	0.70	0.55
Field 1 100 lx only	3	Horizontal Illuminance	lux	114	0.70	0.55
Field 2 50 lx	1	Horizontal Illuminance	lux	69.0	0.71	0.60
Field 2 100 lx	2	Horizontal Illuminance	lux	111	0.64	0.52
Field 2 100 lx only	4	Horizontal Illuminance	lux	109	0.64	0.52
Field 3 50 lx	1	Horizontal Illuminance	lux	61.5	0.65	0.49
Field 3 100 lx	2	Horizontal Illuminance	lux	111	0.72	0.58
Field 3 100 lx only	5	Horizontal Illuminance	lux	110	0.72	0.58
South Bdy Ev All	6	Surface Illuminance	lux	1.85	3.93	
Surrounds Ev All	6	Illuminance -> Aa	lux	8.12		

Glare Rating for Grid of Observers:

Calculation	Switching Mode	Observer Grid	Reference Grid	Reflectance	GR-Max
Field 1 100 lx GR	6	Field 1 GR@1.5m	Field 1	0.25	46.7
Field 2 100 lx GR	6	Field 2 GR@1.5m	Field 2	0.25	46.2
Field 3 100 lx GR	6	Field 3 GR@1.5m	Field 3	0.25	46.1

Obtrusive Light Calculations:

Switching Mode	Observer Code	Adaptation Luminance (cd/m2)	Direction	Threshold Increment (%)
6	Bb	0.10	(1.00, -0.02, 0.00)	5.2
6	Cc	0.10	(1.00, -0.02, 0.00)	5.2
6	Dd	0.10	(1.00, -0.02, 0.00)	4.9
6	Ee	0.10	(1.00, -0.02, 0.00)	1.9
6	Ff	0.10	(1.00, -0.02, 0.00)	1.6

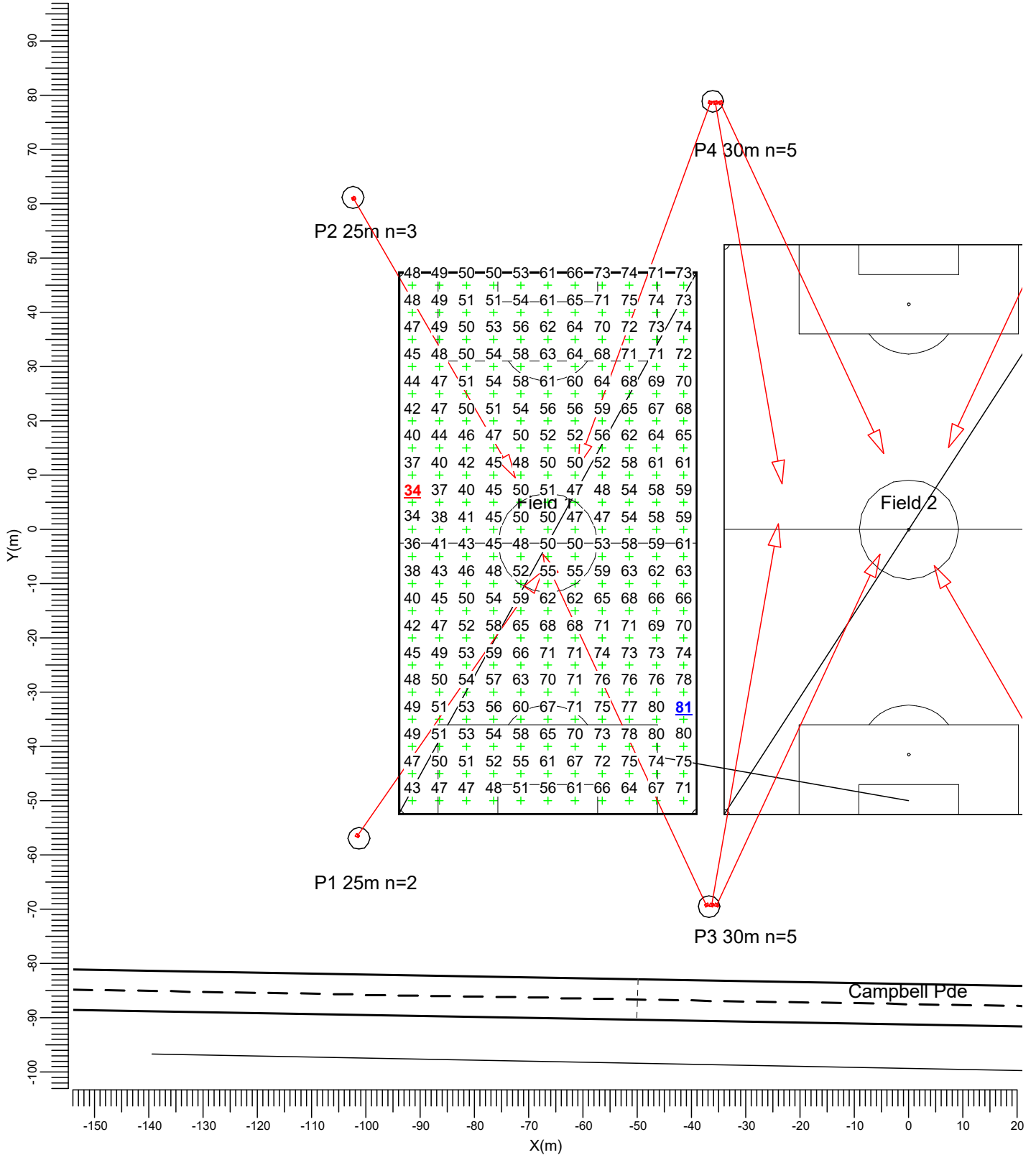
Switching Mode	ULR
1	0.01
2	0.01
3	0.01
4	0.01
5	0.01
6	0.01

3. Calculation Results

3.1 Field 1 50 lx: Graphical Table

All 50 lx

Grid : Field 1 at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)



—▶ BVP525 T30 50K A-NBLT/30

Average
57.8

Min/Ave
0.58

Min/Max
0.42

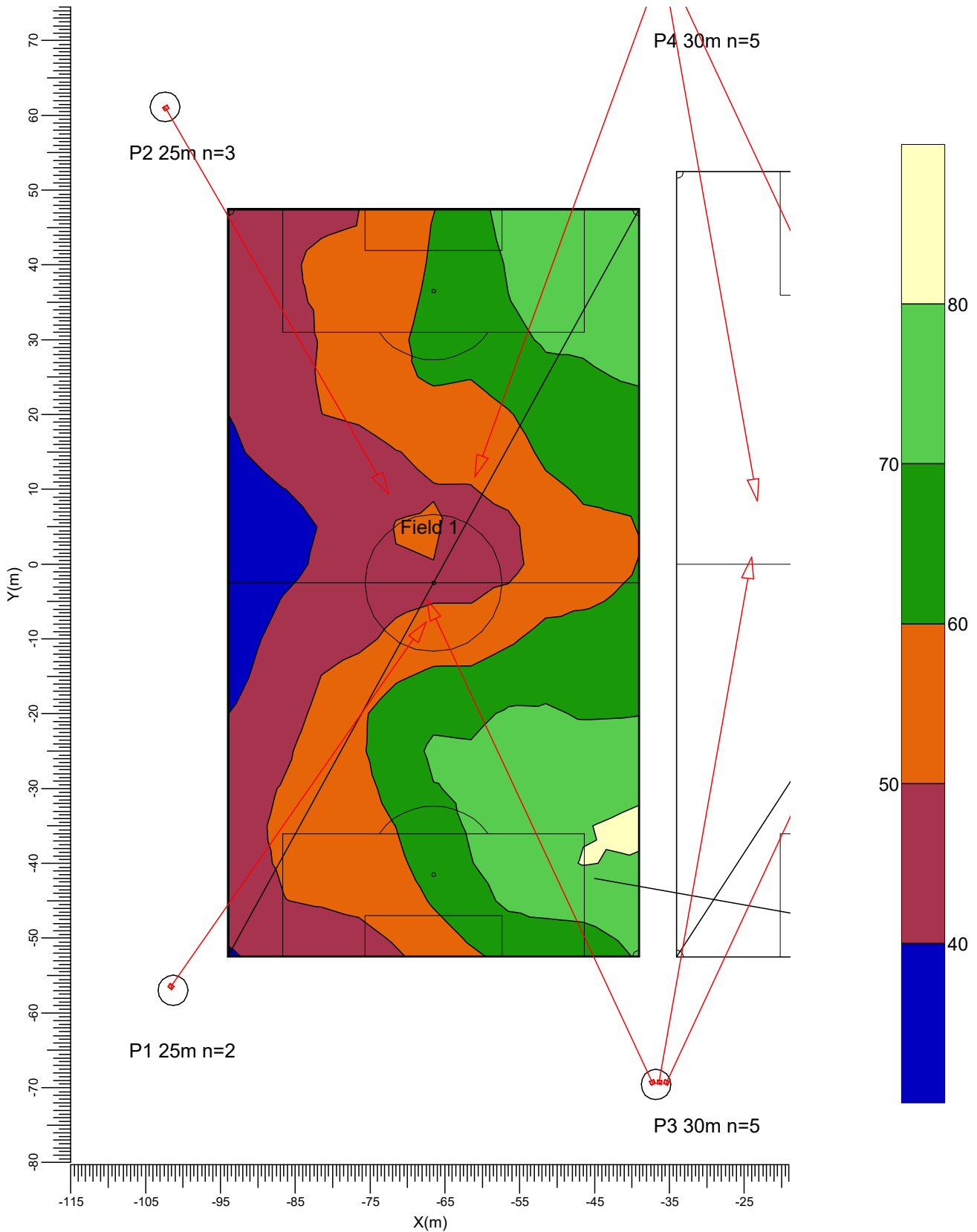
Project maintenance factor
0.86

Scale
1:1000

3.2 Field 1 50 lx: Filled Iso Contour

All 50 lx

Grid : Field 1 at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)



—▶ BVP525 T30 50K A-NBLT/30

Average
57.8

Min/Ave
0.58

Min/Max
0.42

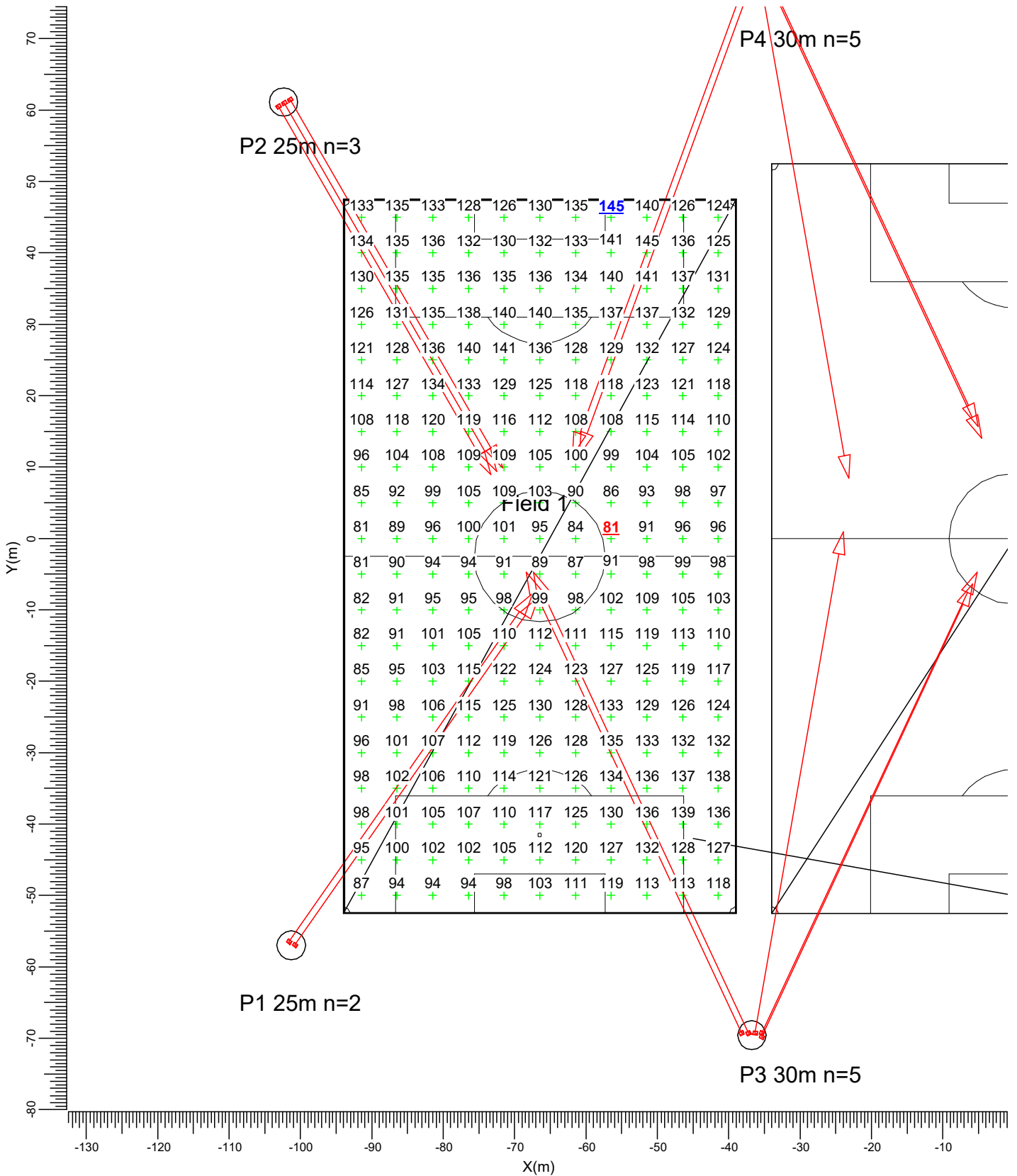
Project maintenance factor
0.86

Scale
1:750

3.3 Field 1 100 lx: Graphical Table

All 100 lx

Grid : Field 1 at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)



➤ BVP525 T30 50K A-NBLT/30

Average
115

Min/Ave
0.70

Min/Max
0.55

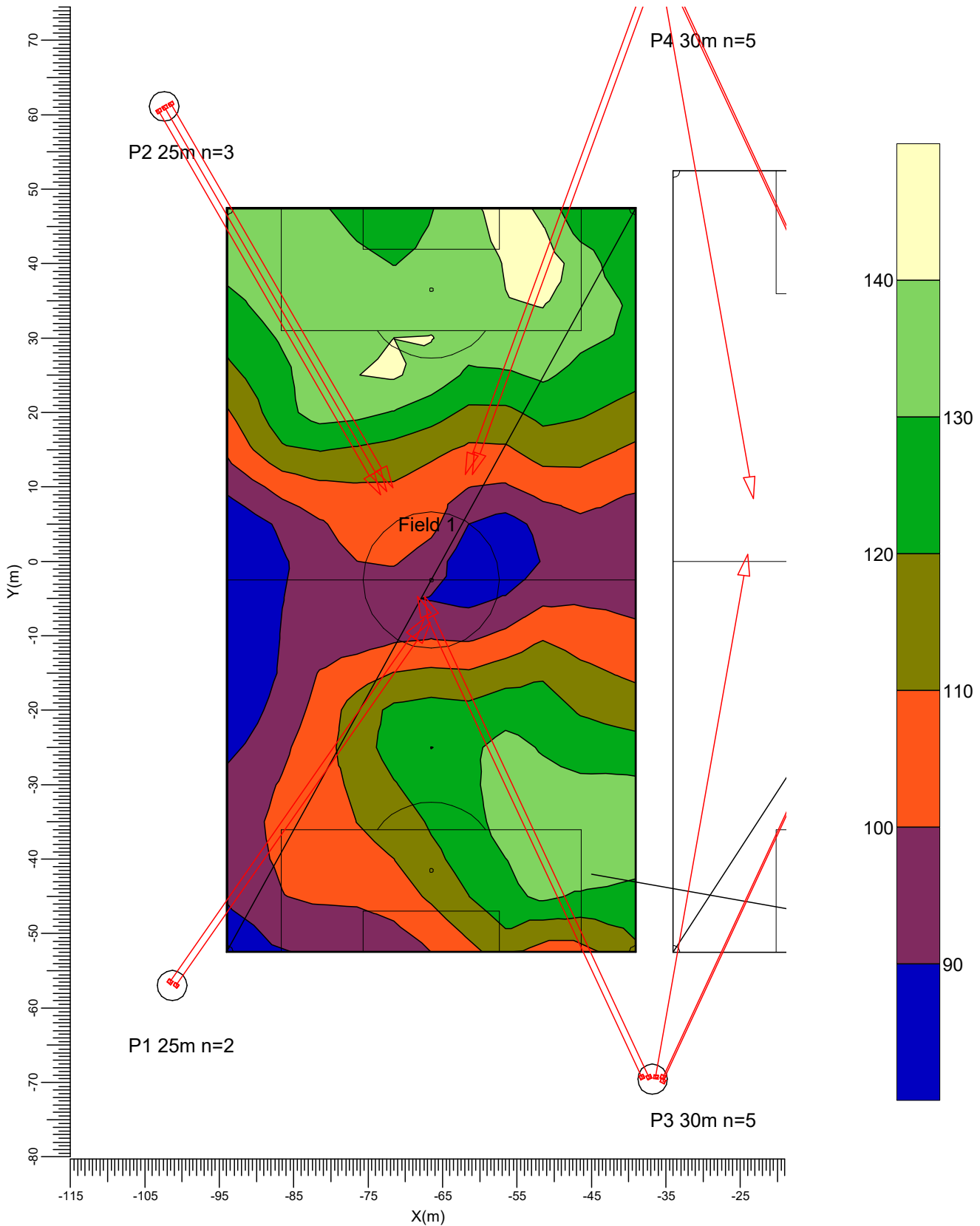
Project maintenance factor
0.86

Scale
1:750

3.4 Field 1 100 lx: Filled Iso Contour

All 100 lx

Grid : Field 1 at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)



➤ BVP525 T30 50K A-NBLT/30

Average
115

Min/Ave
0.70

Min/Max
0.55

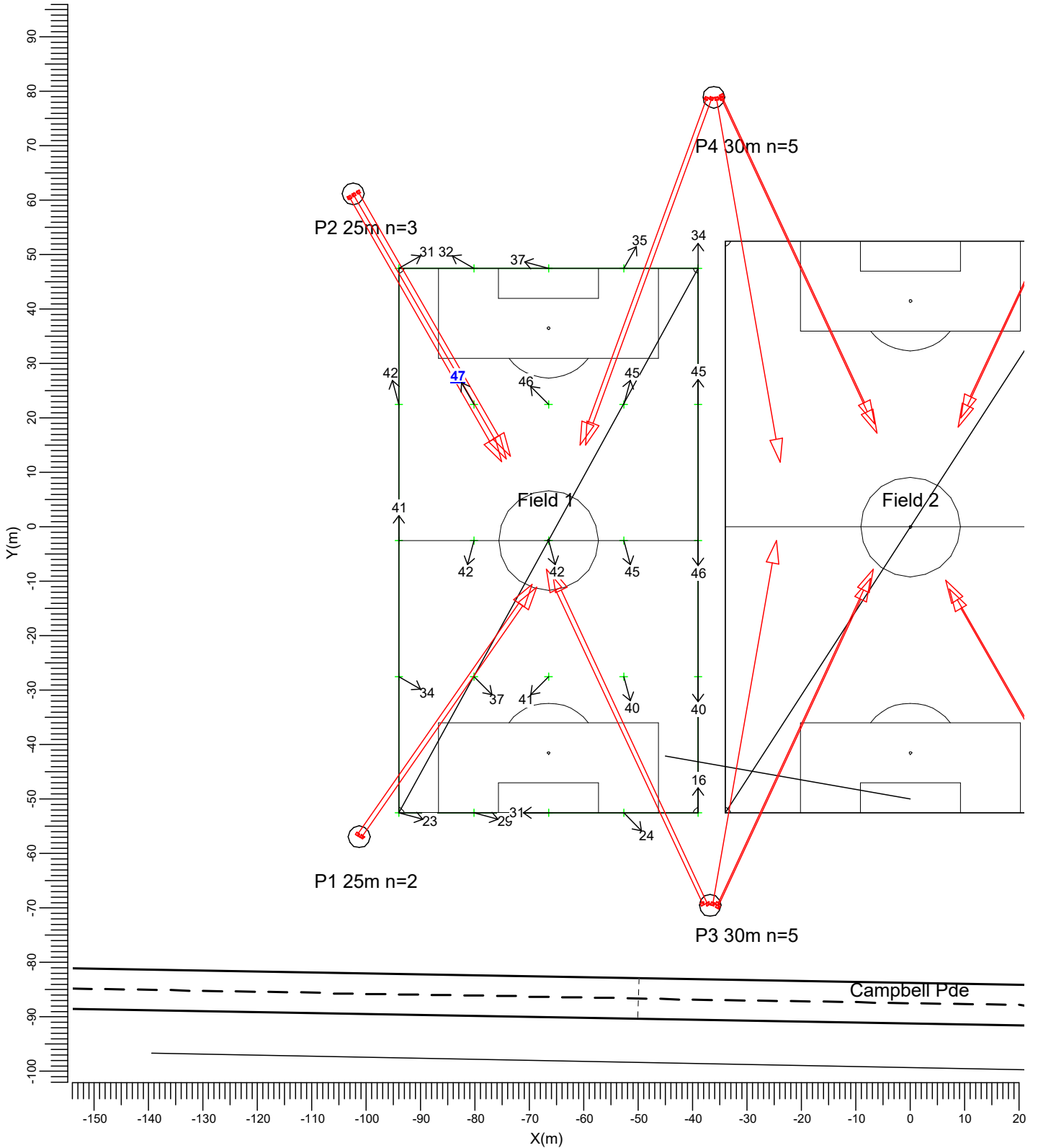
Project maintenance factor
0.86

Scale
1:750

3.5 Field 1 100 lx GR: Graphical Table

All Initial

Grid of Observers : Field 1 GR@1.5m
 Calculation : Glare Rating
 Grid for Background Luminance: Field 1 (Reflectance: 0.25)
 Vertical Viewing Angle : -2.0 deg



—▶ BVP525 T30 50K A-NBLT/30

Maximum
46.7

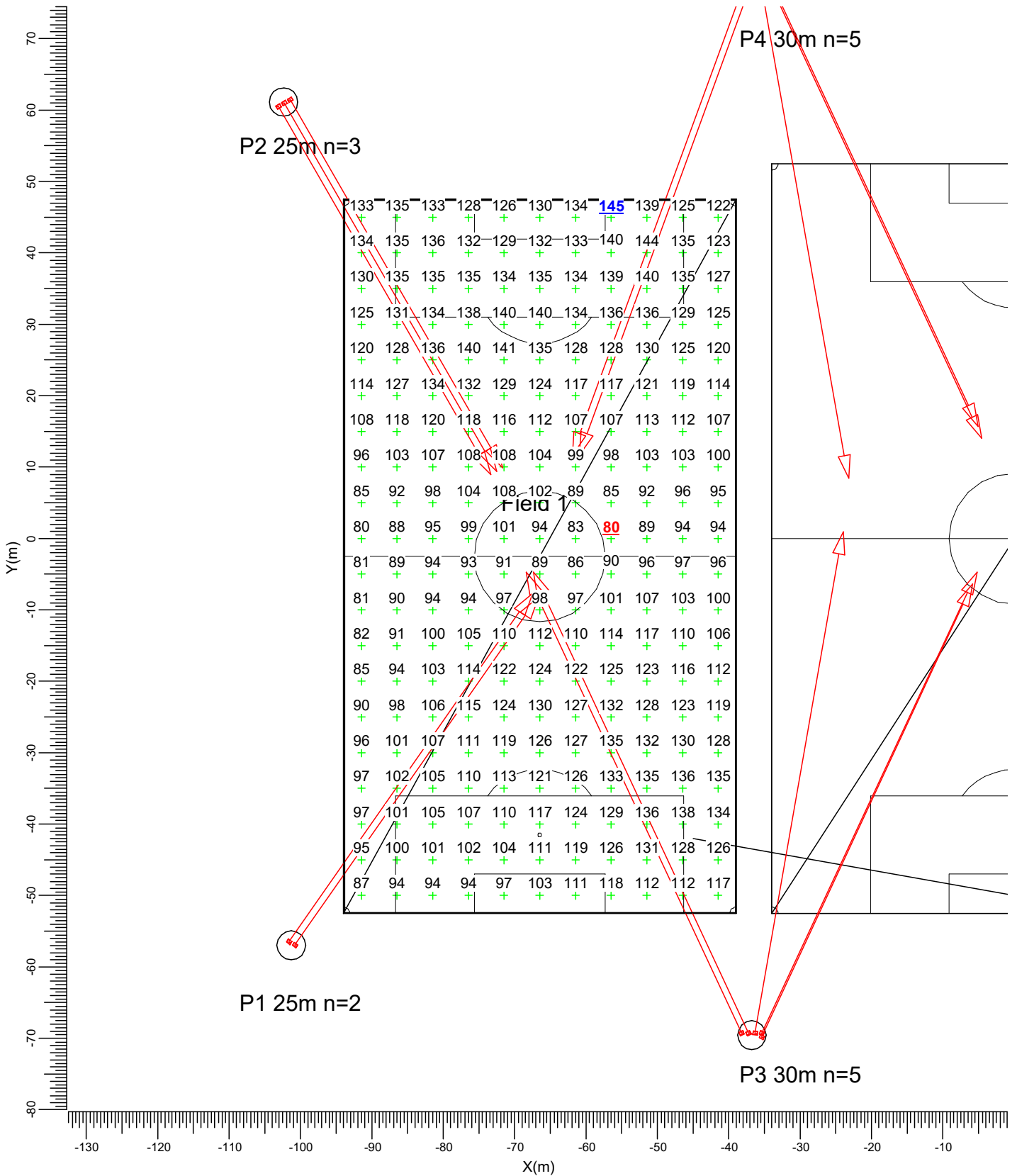
Project maintenance factor
1.00

Scale
1:1000

3.6 Field 1 100 lx only: Graphical Table

Field 1 100 lx

Grid : Field 1 at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)



➤ BVP525 T30 50K A-NBLT/30

Average
114

Min/Ave
0.70

Min/Max
0.55

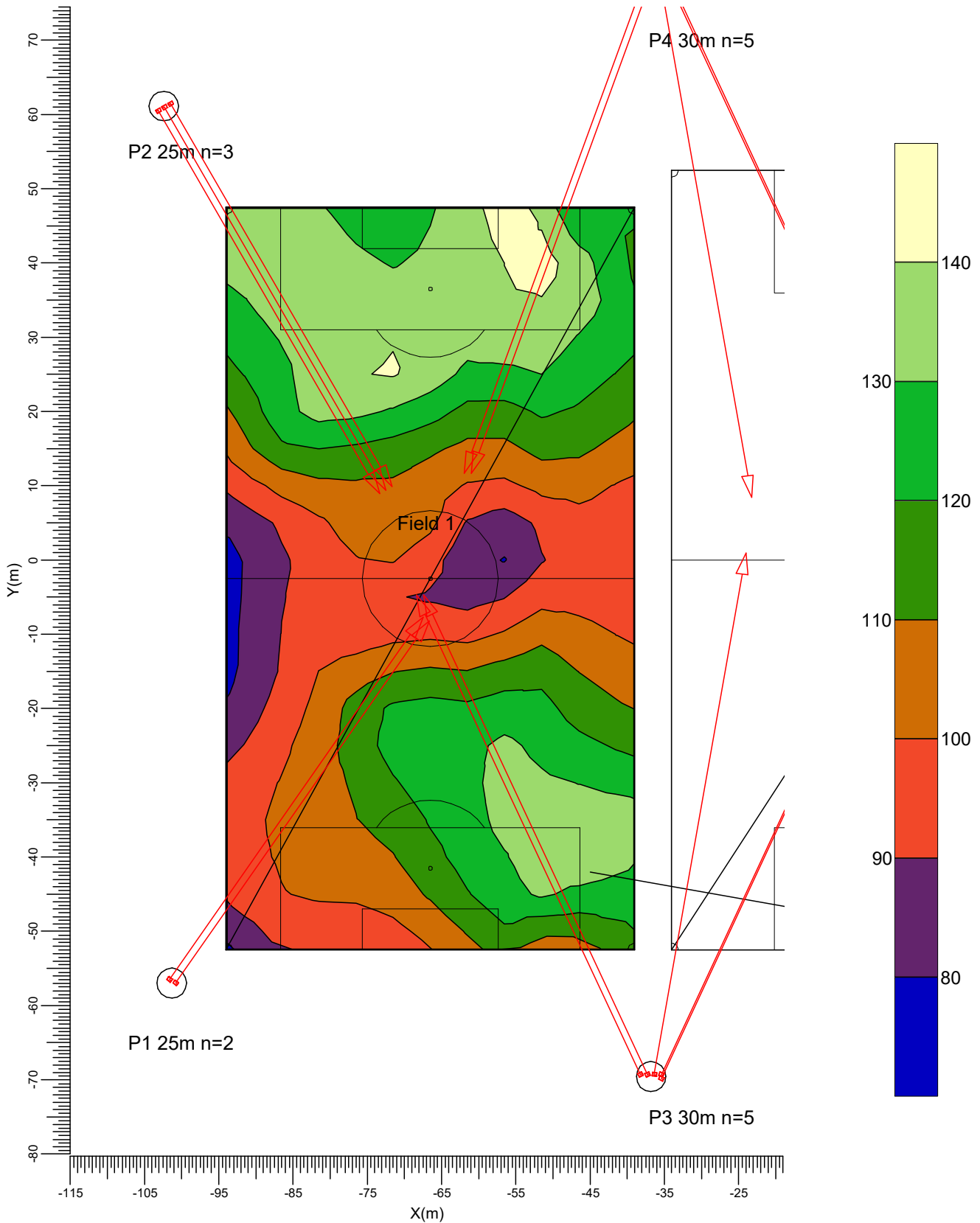
Project maintenance factor
0.86

Scale
1:750

3.7 Field 1 100 lx only: Filled Iso Contour

Field 1 100 lx

Grid : Field 1 at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)



➤ BVP525 T30 50K A-NBLT/30

Average
114

Min/Ave
0.70

Min/Max
0.55

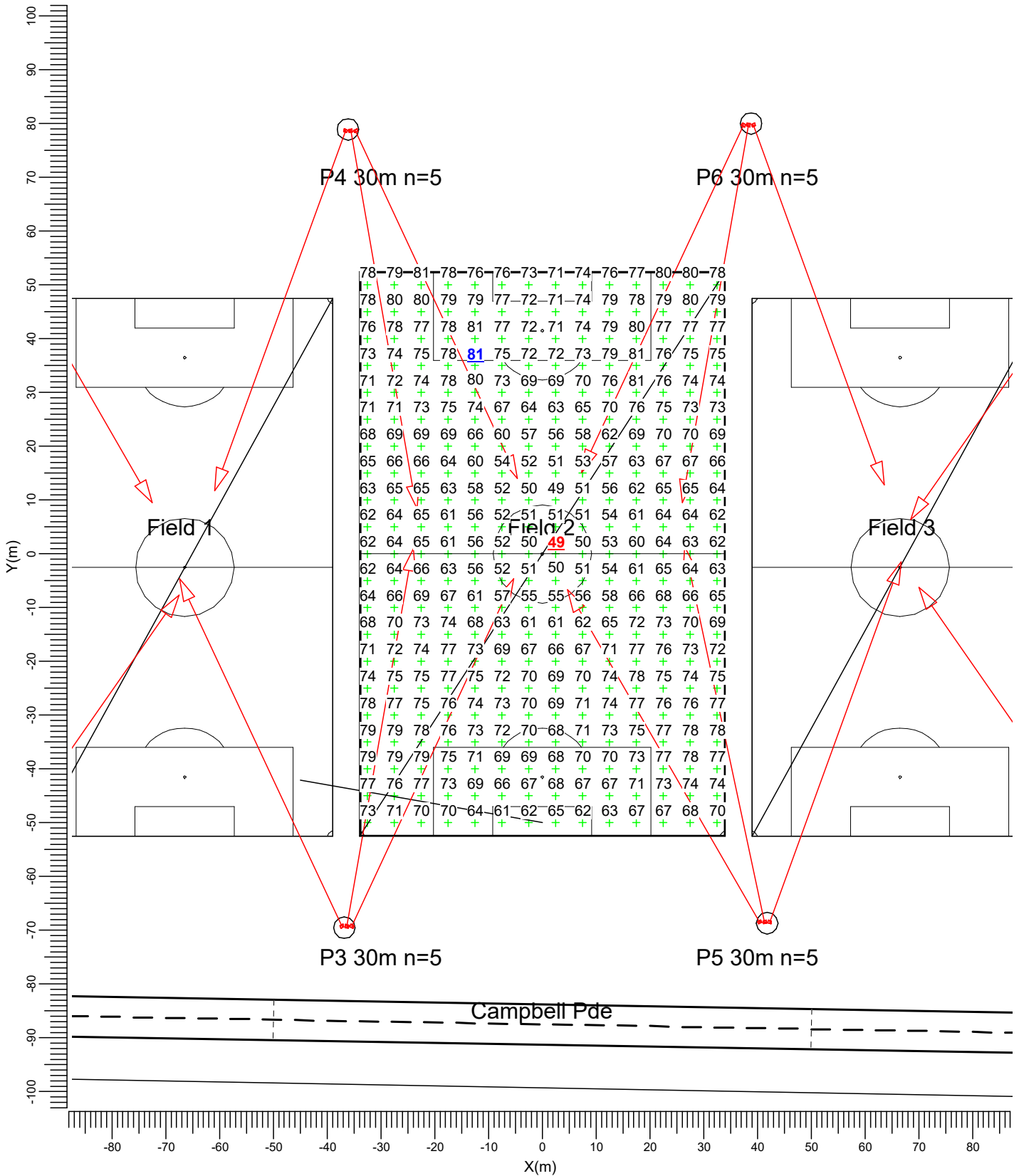
Project maintenance factor
0.86

Scale
1:750

3.8 Field 2 50 lx: Graphical Table

All 50 lx

Grid : Field 2 at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)



➤ BVP525 T30 50K A-NBLT/30

Average
69.0

Min/Ave
0.71

Min/Max
0.60

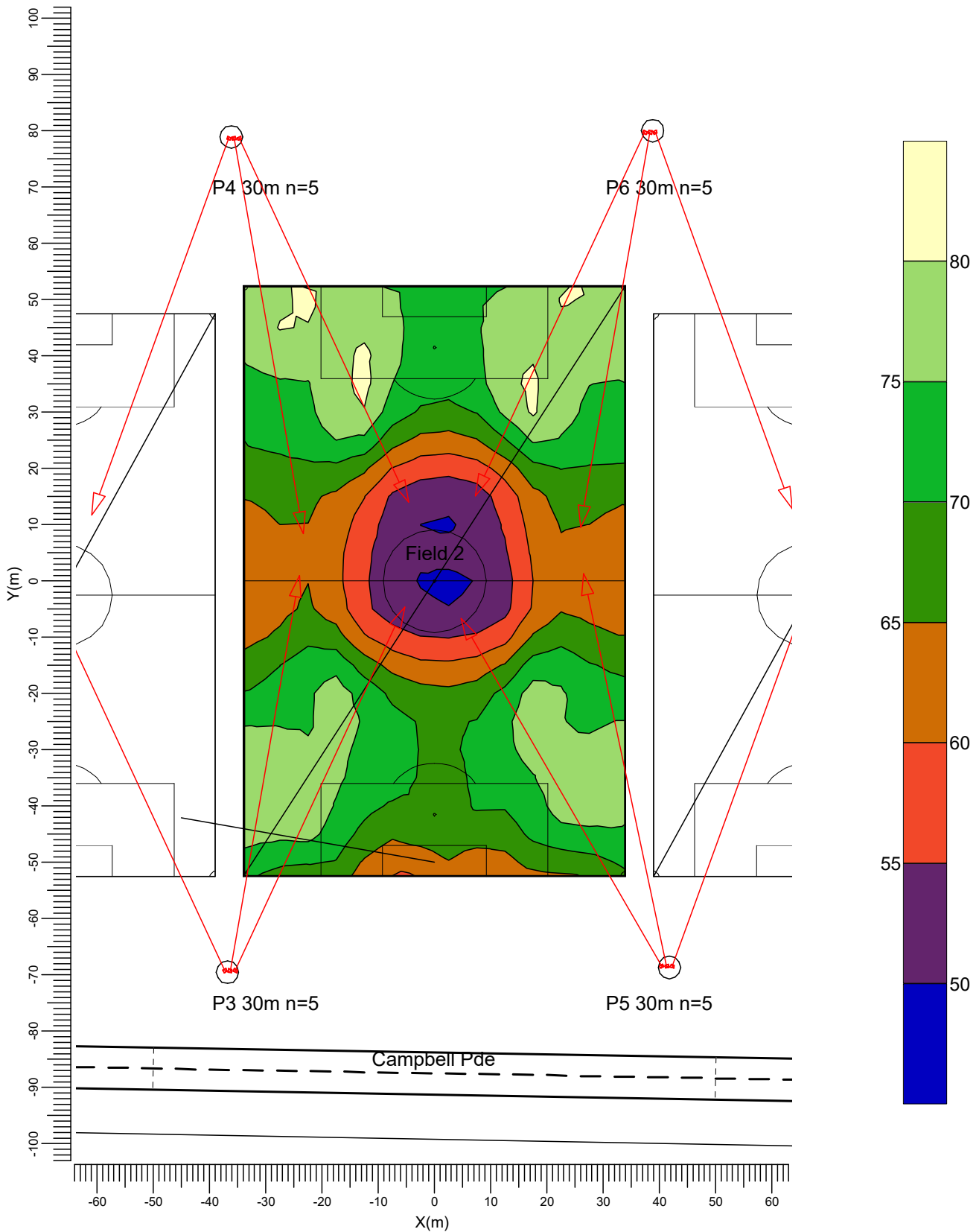
Project maintenance factor
0.86

Scale
1:1000

3.9 Field 2 50 lx: Filled Iso Contour

All 50 lx

Grid : Field 2 at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)



—▶ BVP525 T30 50K A-NBLT/30

Average
69.0

Min/Ave
0.71

Min/Max
0.60

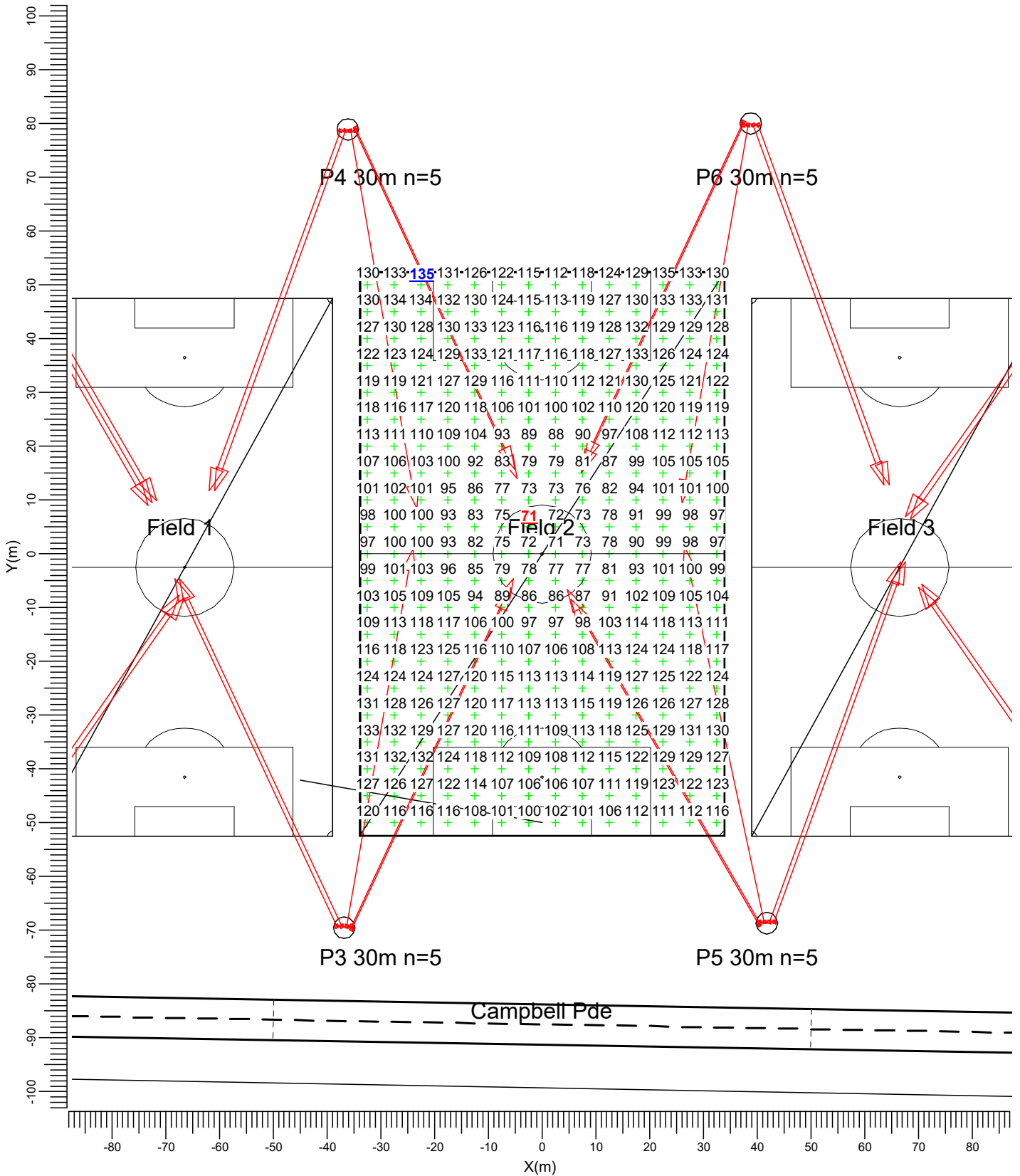
Project maintenance factor
0.86

Scale
1:1000

3.10 Field 2 100 lx: Graphical Table

All 100 lx

Grid : Field 2 at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)



—▶ BVP525 T30 50K A-NBLT/30

Average
111

Min/Ave
0.64

Min/Max
0.52

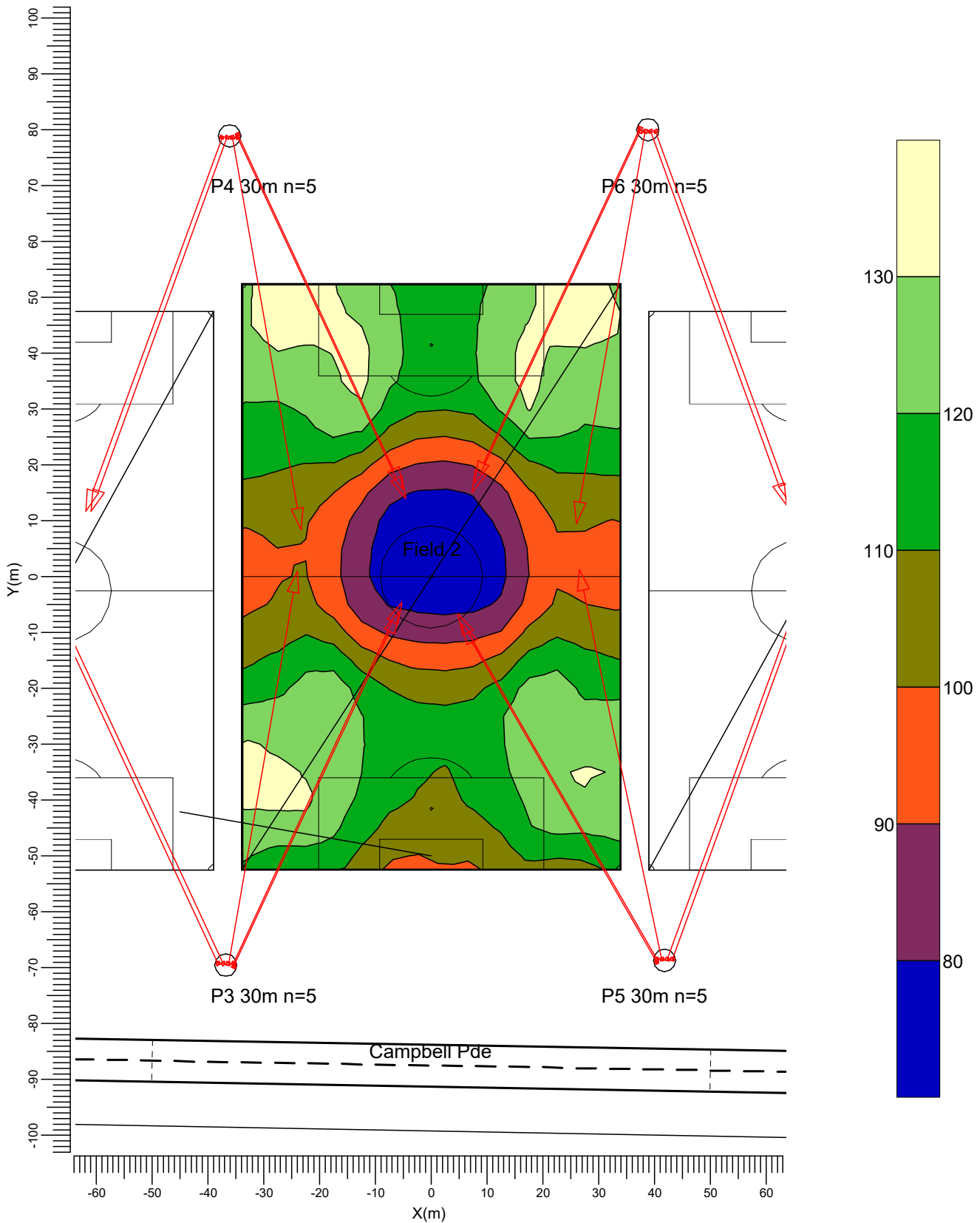
Project maintenance factor
0.86

Scale
1:1000

3.11 Field 2 100 lx: Filled Iso Contour

All 100 lx

Grid : Field 2 at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)



—▶ BVP525 T30 50K A-NBLT/30

Average
111

Min/Ave
0.64

Min/Max
0.52

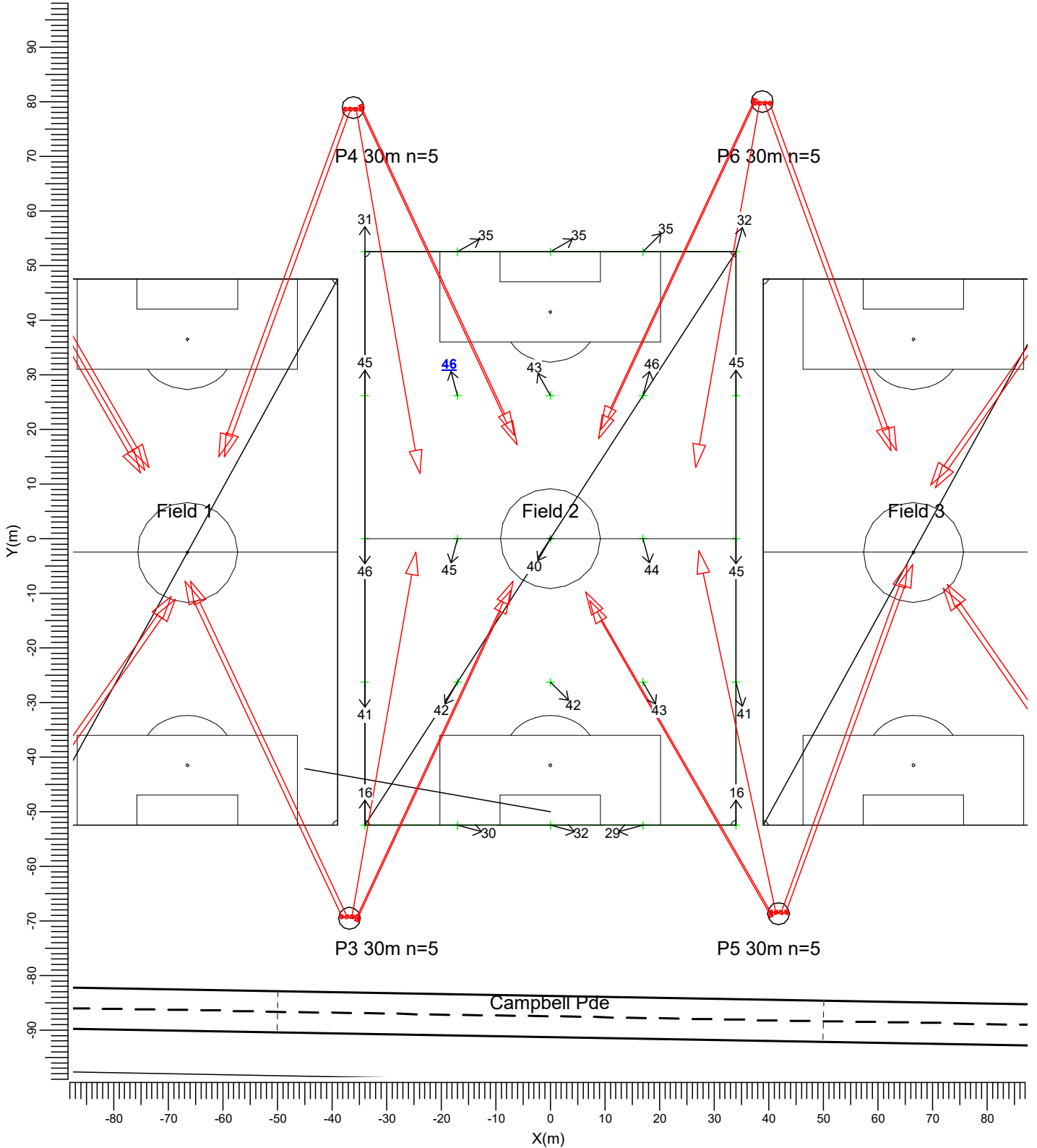
Project maintenance factor
0.86

Scale
1:1000

3.12 Field 2 100 lx GR: Graphical Table

All Initial

Grid of Observers : Field 2 GR@1.5m
 Calculation : Glare Rating
 Grid for Background Luminance: Field 2 (Reflectance: 0.25)
 Vertical Viewing Angle : -2.0 deg



—▶ BVP525 T30 50K A-NBLT/30

Maximum
46.2

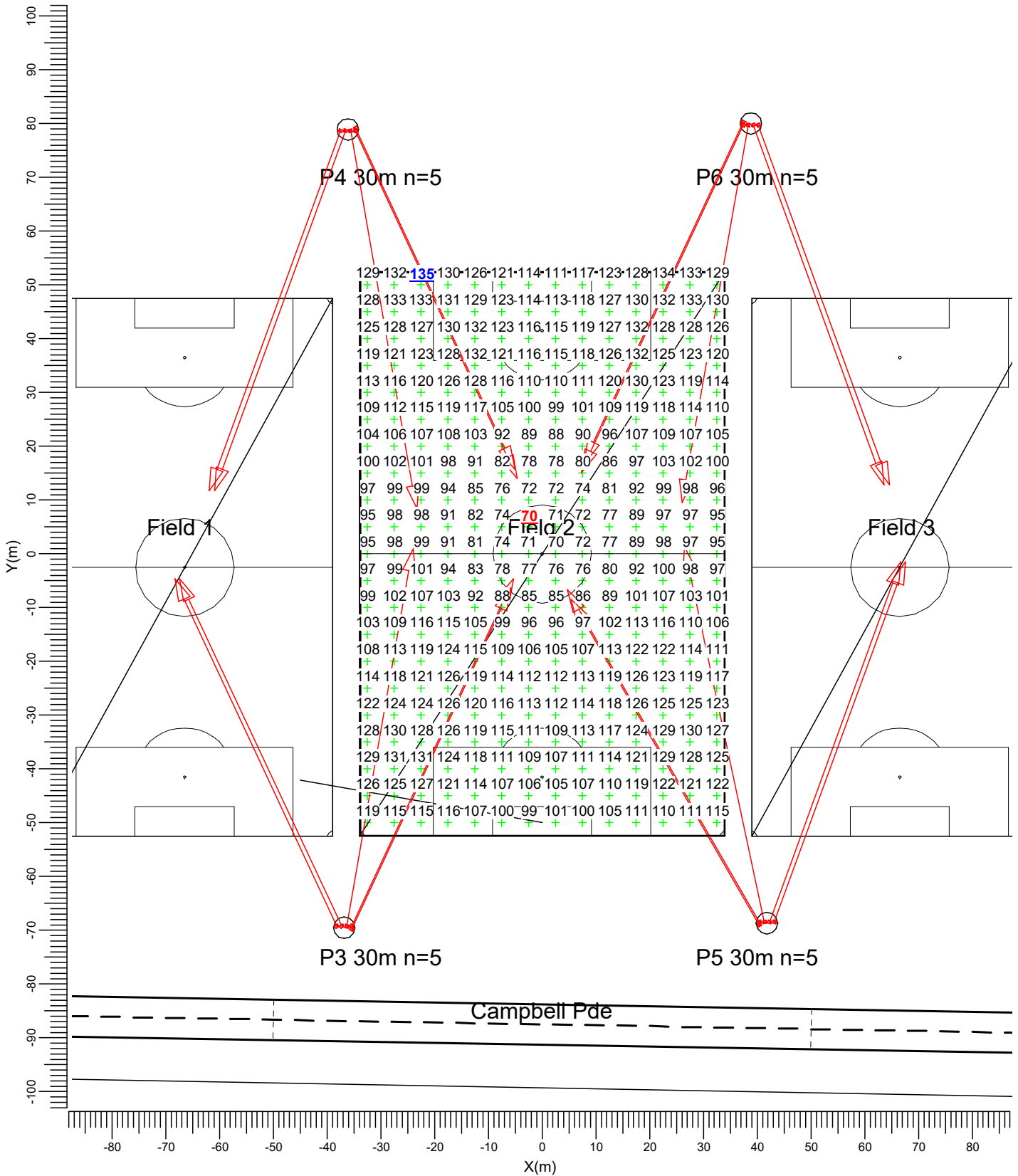
Project maintenance factor
1.00

Scale
1:1000

3.13 Field 2 100 lx only: Graphical Table

Field 2 100 lx

Grid : Field 2 at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)



—▶ BVP525 T30 50K A-NBLT/30

Average
109

Min/Ave
0.64

Min/Max
0.52

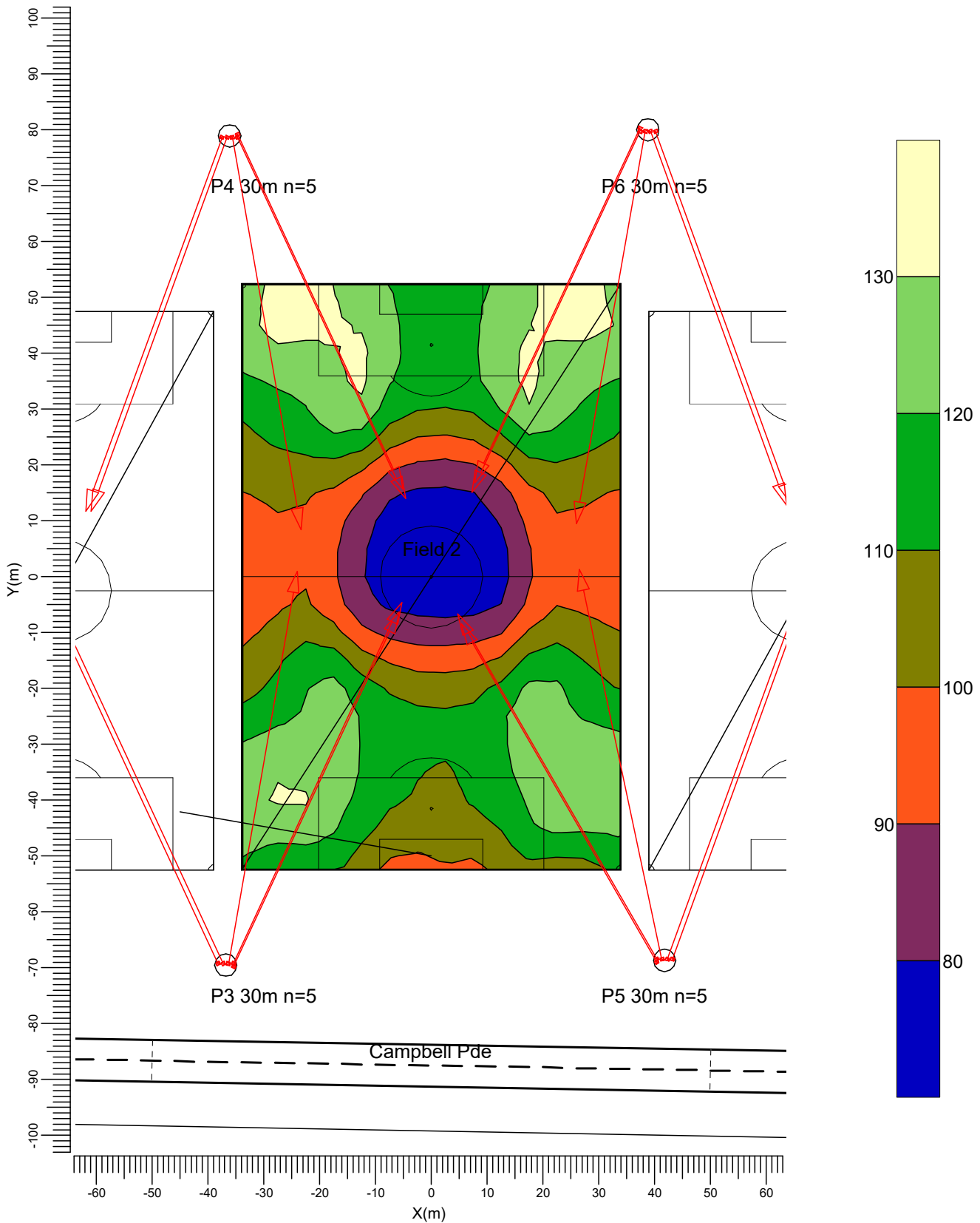
Project maintenance factor
0.86

Scale
1:1000

3.14 Field 2 100 lx only: Filled Iso Contour

Field 2 100 lx

Grid : Field 2 at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)



—▶ BVP525 T30 50K A-NBLT/30

Average
109

Min/Ave
0.64

Min/Max
0.52

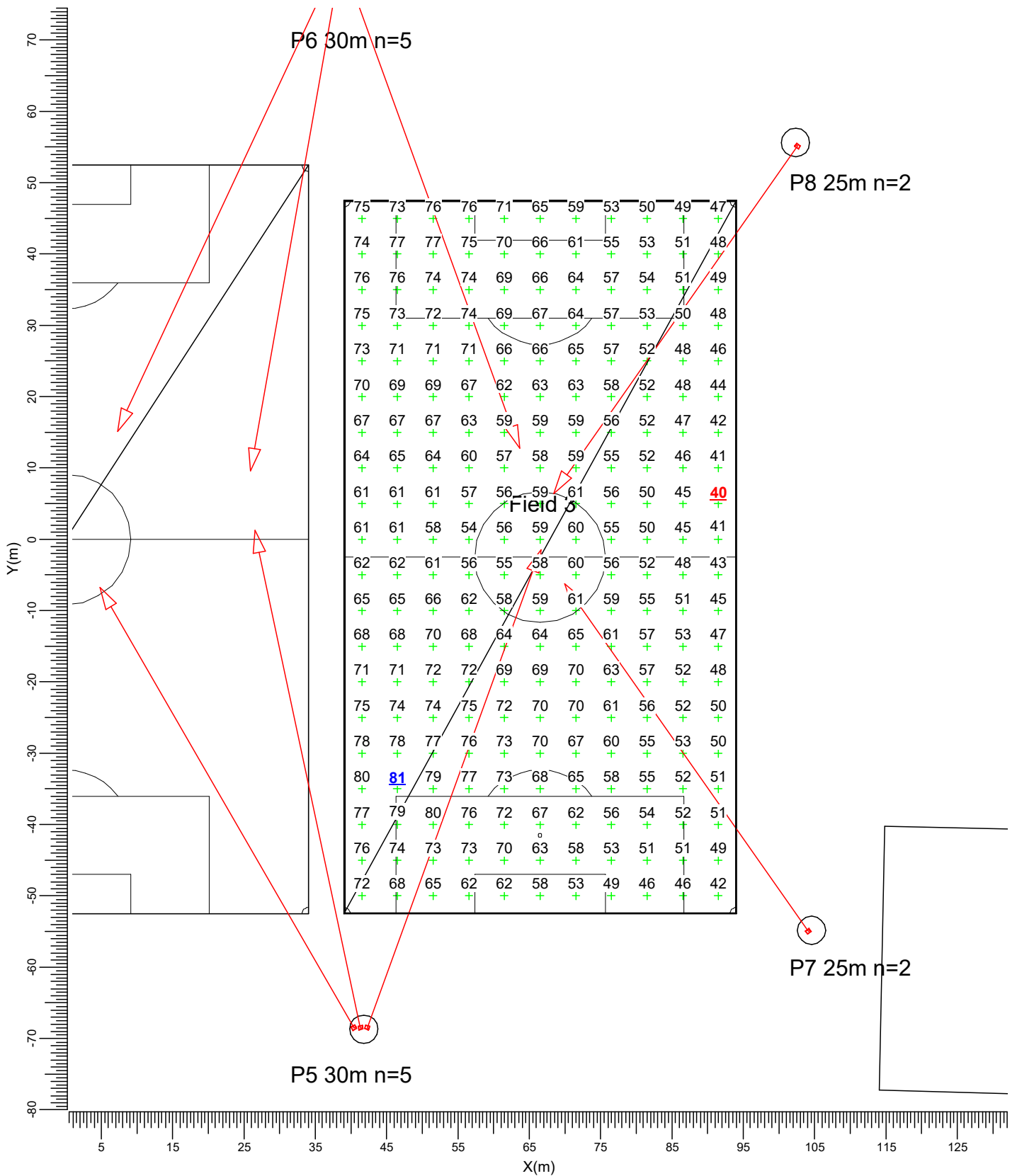
Project maintenance factor
0.86

Scale
1:1000

3.15 Field 3 50 lx: Graphical Table

All 50 lx

Grid : Field 3 at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)



➤ BVP525 T30 50K A-NBLT/30

Average
61.5

Min/Ave
0.65

Min/Max
0.49

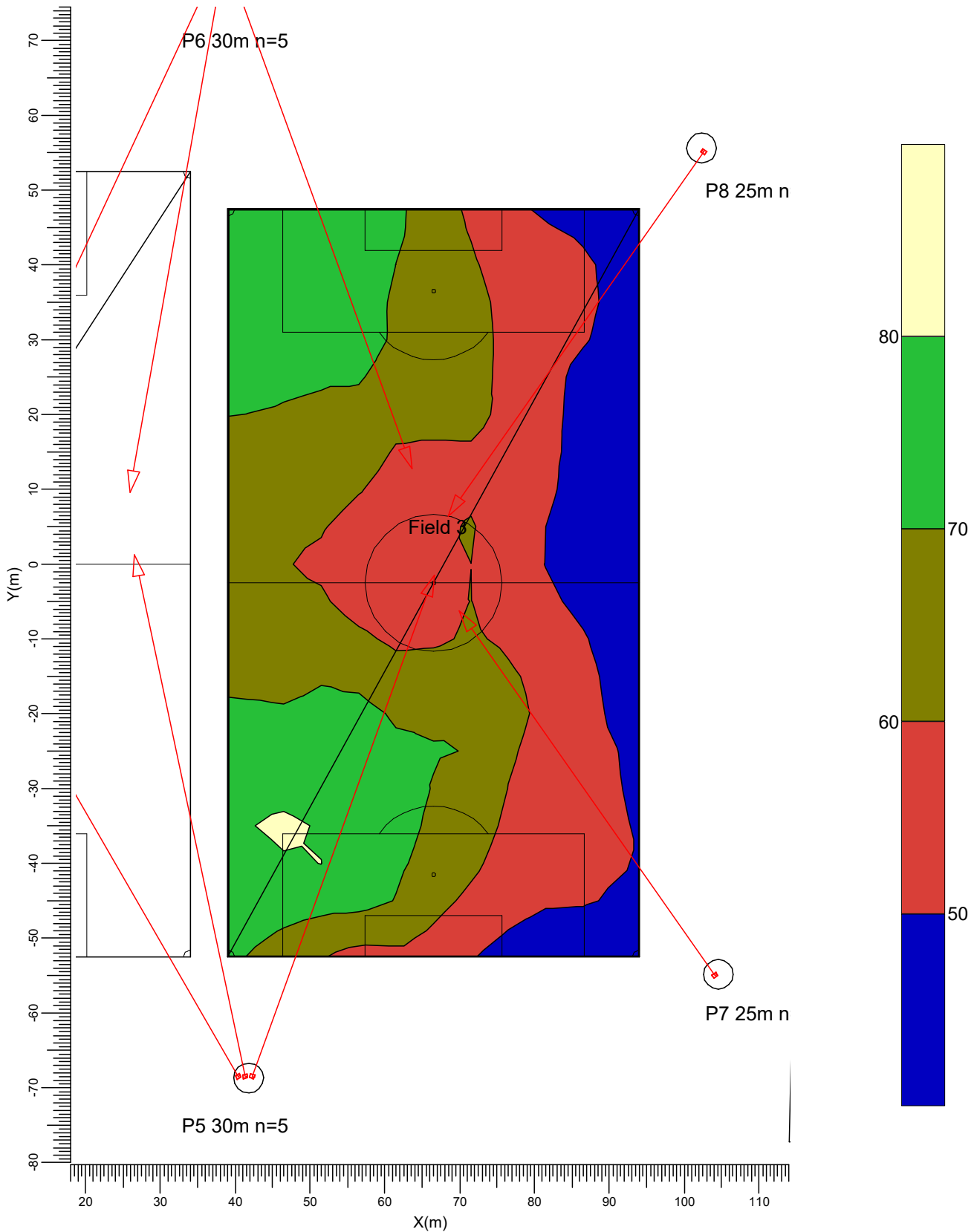
Project maintenance factor
0.86

Scale
1:750

3.16 Field 3 50 lx: Filled Iso Contour

All 50 lx

Grid : Field 3 at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)



➤ BVP525 T30 50K A-NBLT/30

Average
61.5

Min/Ave
0.65

Min/Max
0.49

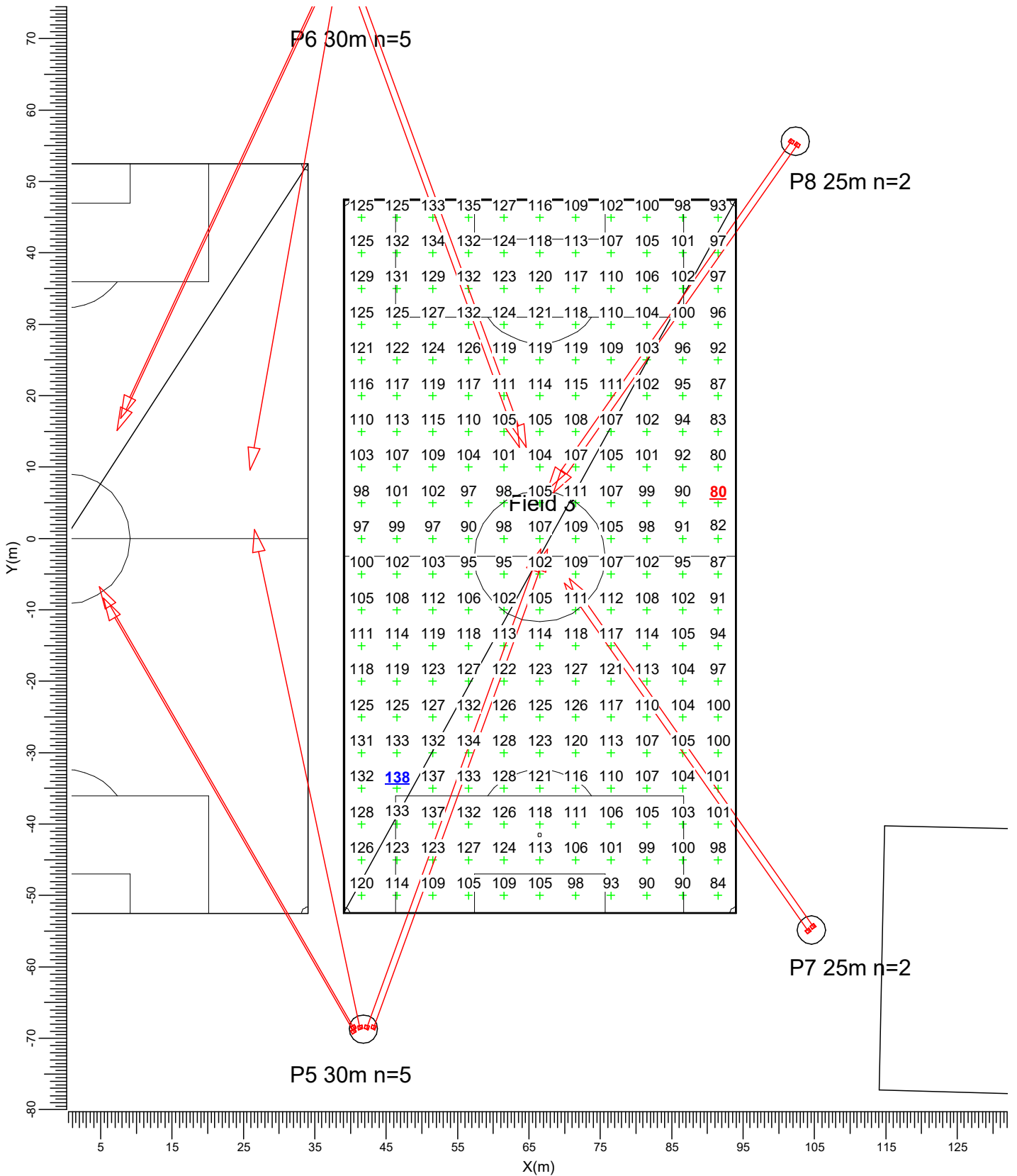
Project maintenance factor
0.86

Scale
1:750

3.17 Field 3 100 lx: Graphical Table

All 100 lx

Grid : Field 3 at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)



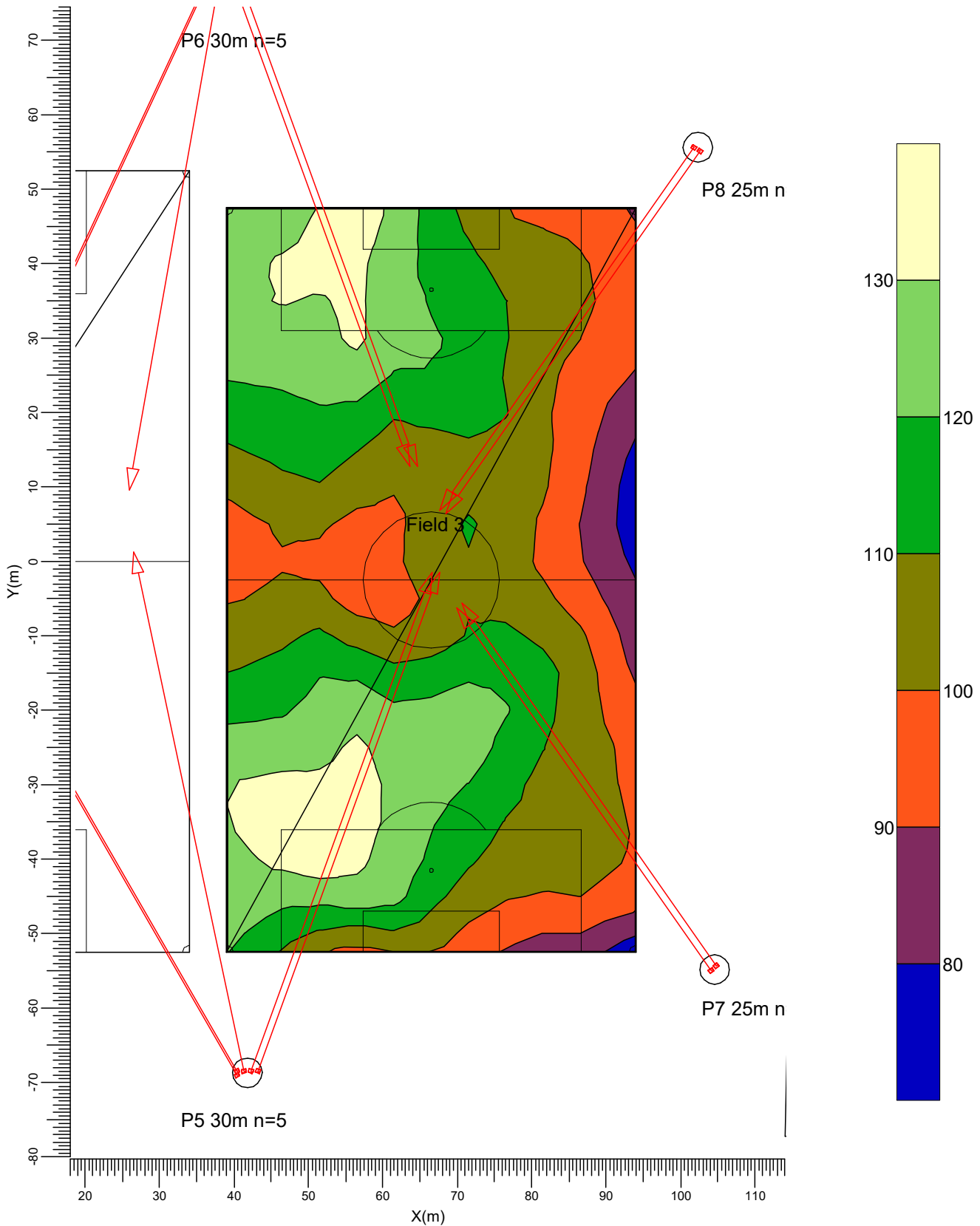
➤ BVP525 T30 50K A-NBLT/30

Average 111 Min/Ave 0.72 Min/Max 0.58 Project maintenance factor 0.86 Scale 1:750

3.18 Field 3 100 lx: Filled Iso Contour

All 100 lx

Grid : Field 3 at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)



➤ BVP525 T30 50K A-NBLT/30

Average
111

Min/Ave
0.72

Min/Max
0.58

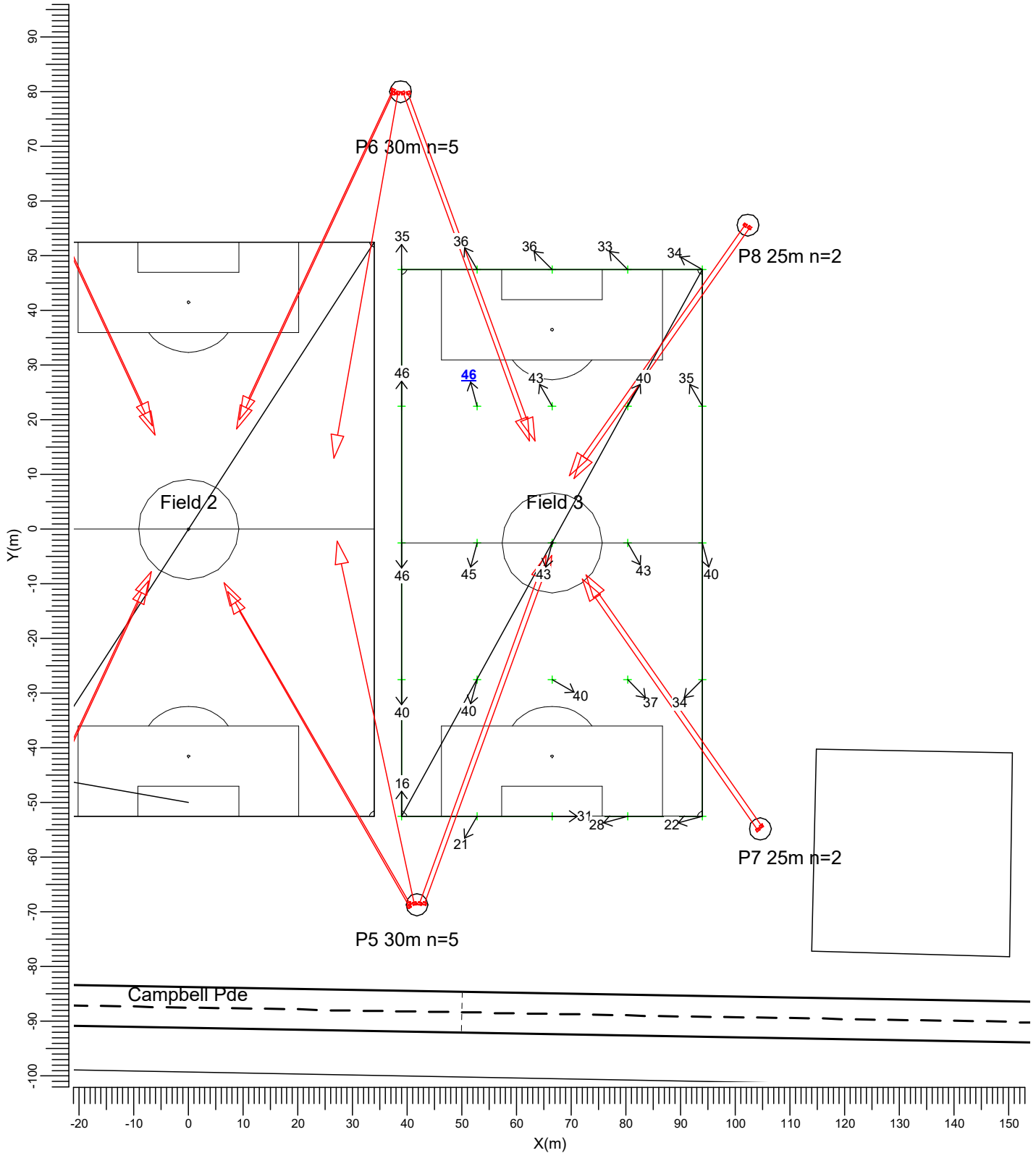
Project maintenance factor
0.86

Scale
1:750

3.19 Field 3 100 lx GR: Graphical Table

All Initial

Grid of Observers : Field 3 GR@1.5m
 Calculation : Glare Rating
 Grid for Background Luminance: Field 3 (Reflectance: 0.25)
 Vertical Viewing Angle : -2.0 deg



→ BVP525 T30 50K A-NBLT/30

Maximum
46.1

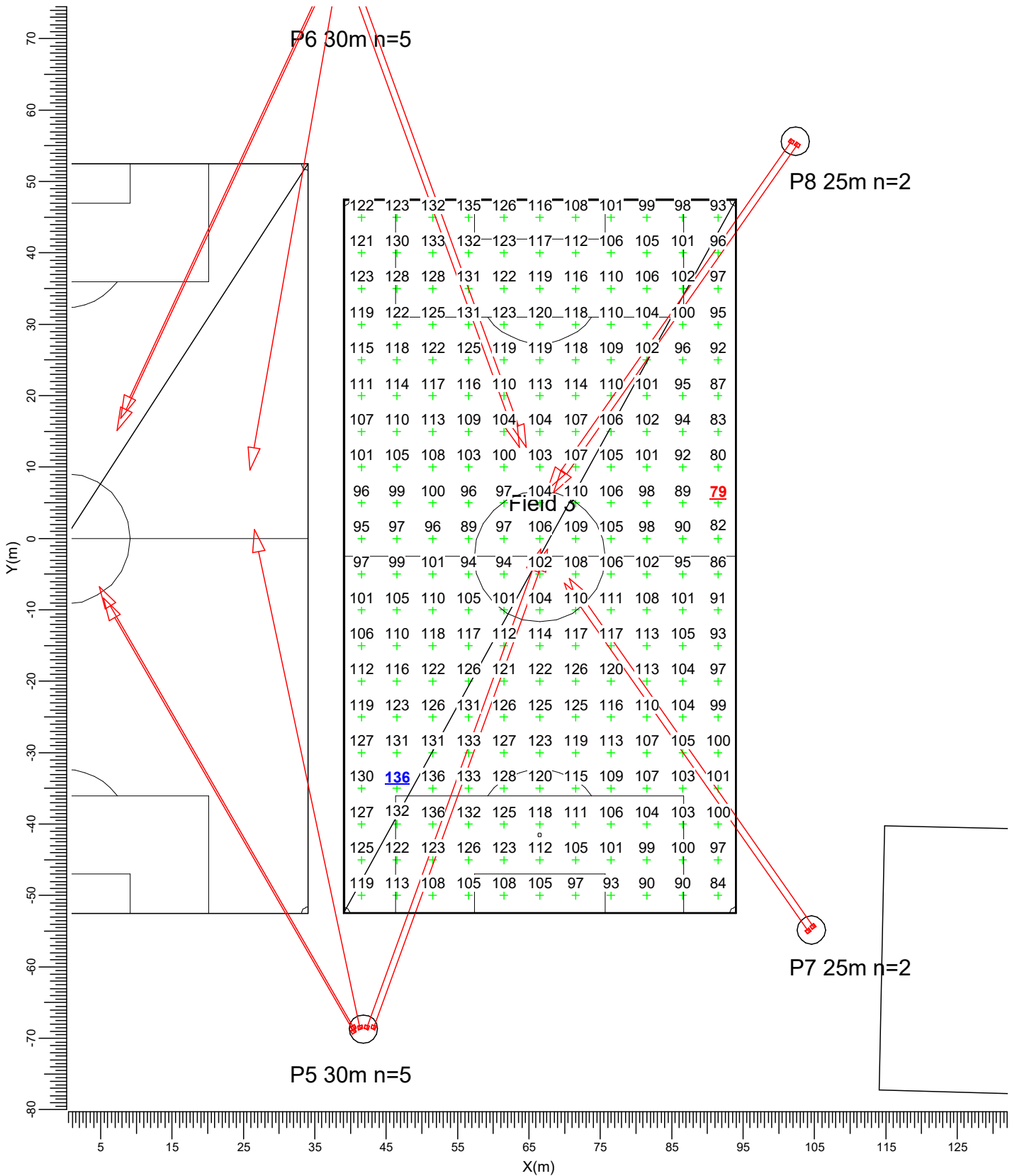
Project maintenance factor
1.00

Scale
1:1000

3.20 Field 3 100 lx only: Graphical Table

Field 3 100 lx

Grid : Field 3 at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)



➤ BVP525 T30 50K A-NBLT/30

Average
110

Min/Ave
0.72

Min/Max
0.58

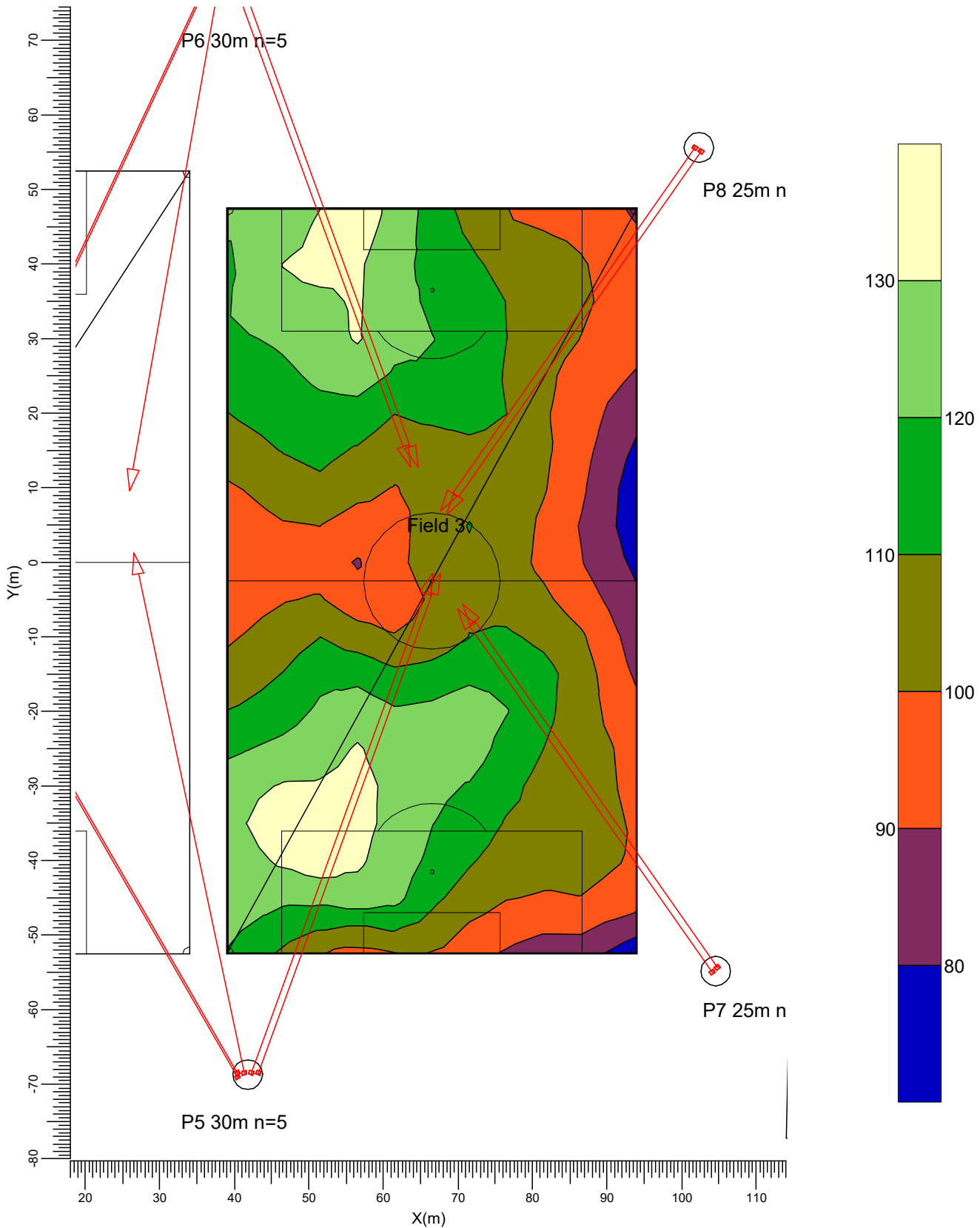
Project maintenance factor
0.86

Scale
1:750

3.21 Field 3 100 lx only: Filled Iso Contour

Field 3 100 lx

Grid : Field 3 at Z = -0.00 m
Calculation : Horizontal Illuminance (lux)



—▶ BVP525 T30 50K A-NBLT/30

Average
110

Min/Ave
0.72

Min/Max
0.58

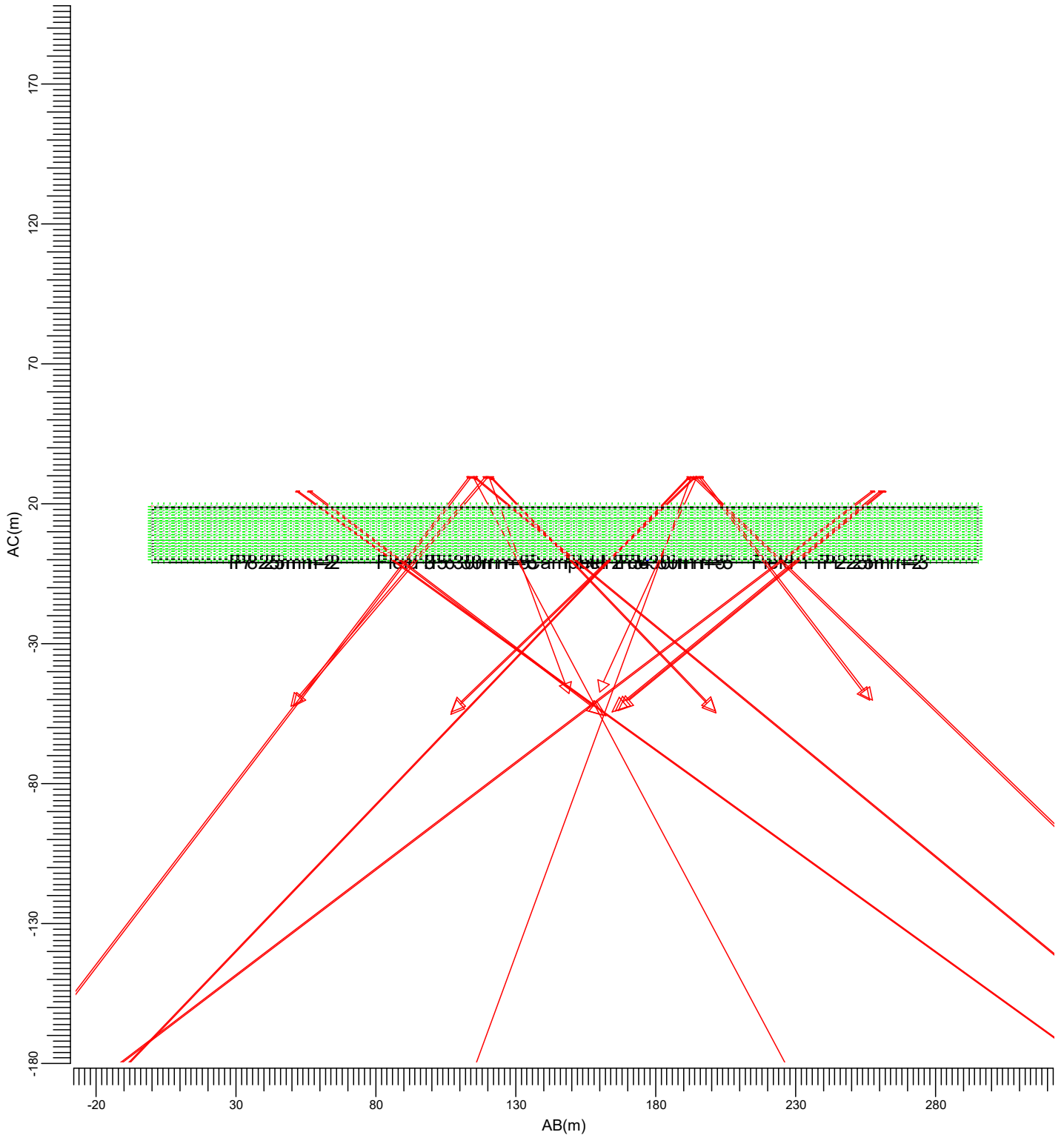
Project maintenance factor
0.86

Scale
1:750

3.22 South Bdy Ev All: Graphical Table

All Initial

Grid : South Bdy
Calculation : Surface Illuminance (lux)



(155.60, -102.10, 20.00) C-----D (-139.40, -96.70, 20.00)
 | |
 (155.60, -102.10, 1.00) A-----B (-139.40, -96.70, 1.00)

—▶ BVP525 T30 50K A-NBLT/30

Average
1.85

Maximum
3.93

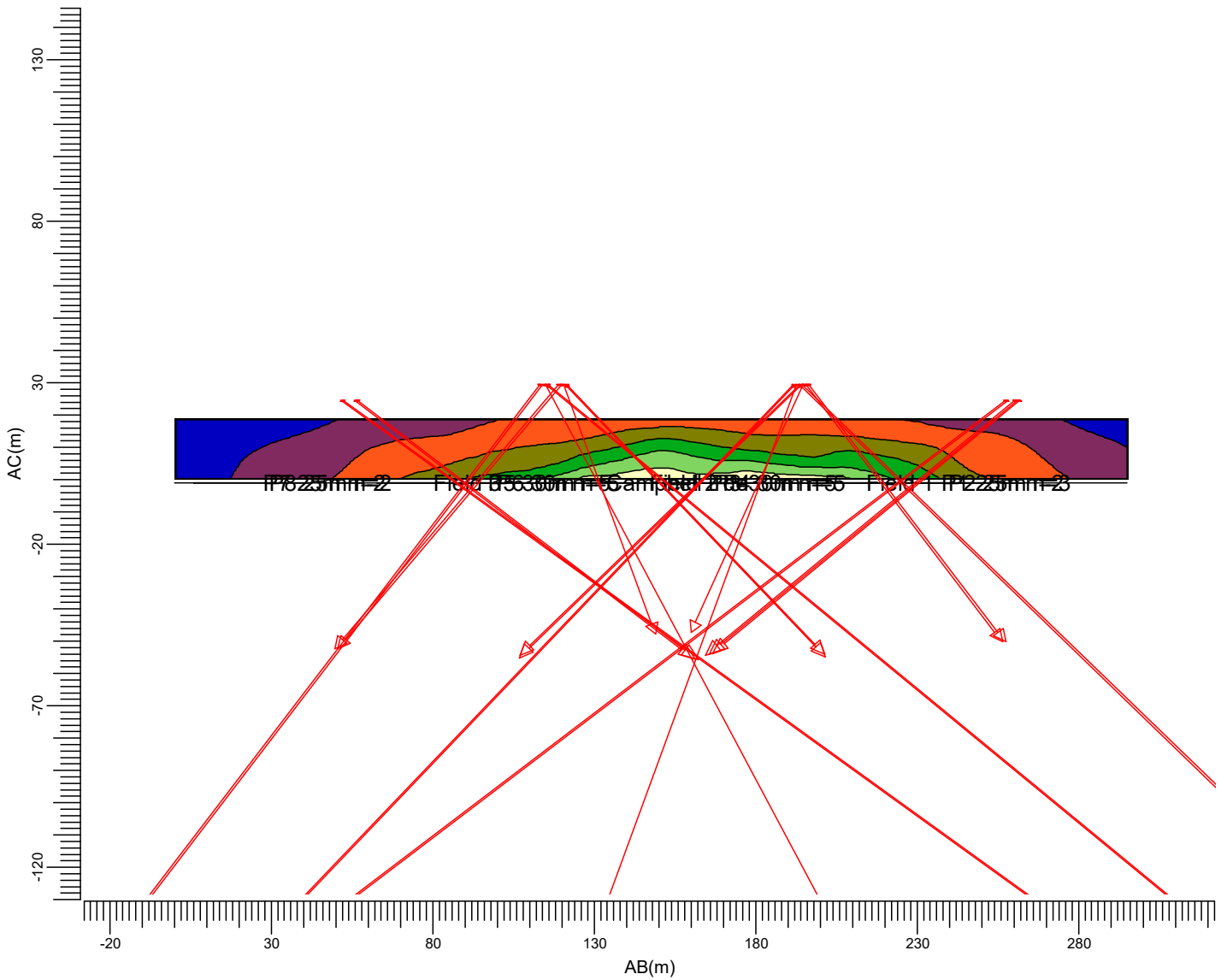
Project maintenance factor
1.00

Scale
1:2000

3.23 South Bdy Ev All: Filled Iso Contour

All Initial

Grid : South Bdy
Calculation : Surface Illuminance (lux)



(155.60, -102.10, 20.00) C-----D (-139.40, -96.70, 20.00)
 | |
 (155.60, -102.10, 1.00) A-----B (-139.40, -96.70, 1.00)

—▶ BVP525 T30 50K A-NBLT/30

Average
1.85

Maximum
3.93

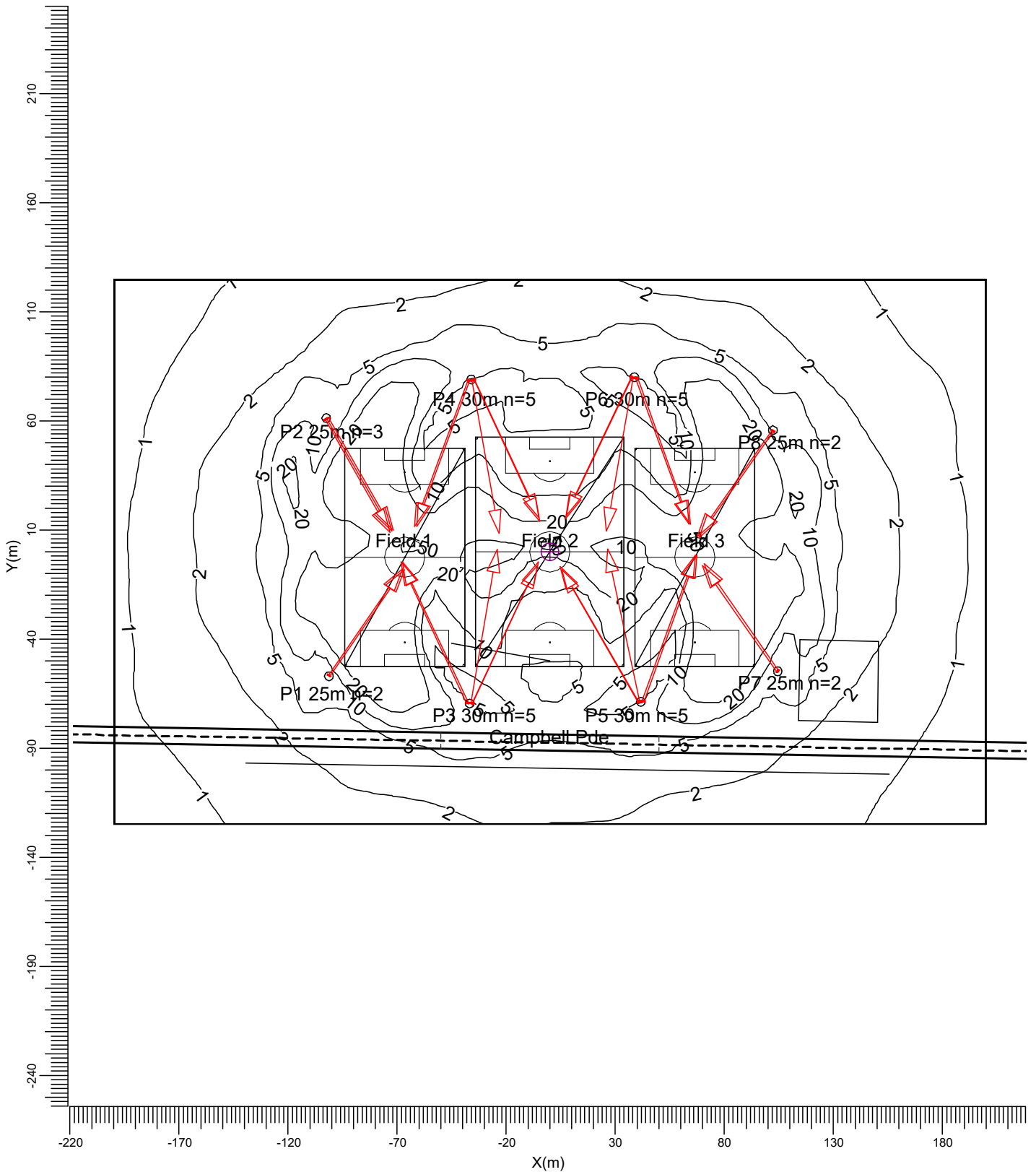
Project maintenance factor
1.00

Scale
1:2000

3.24 Surrounds Ev All: Iso Contour

All Initial

Grid : Surrounds at Z = -0.00 m
 Calculation : Illuminance towards Centre (lux)
 Height above grid : 1.00 m



—▶ BVP525 T30 50K A-NBLT/30

Average
8.12

Project maintenance factor
1.00

Scale
1:2500

4. Luminaire Details

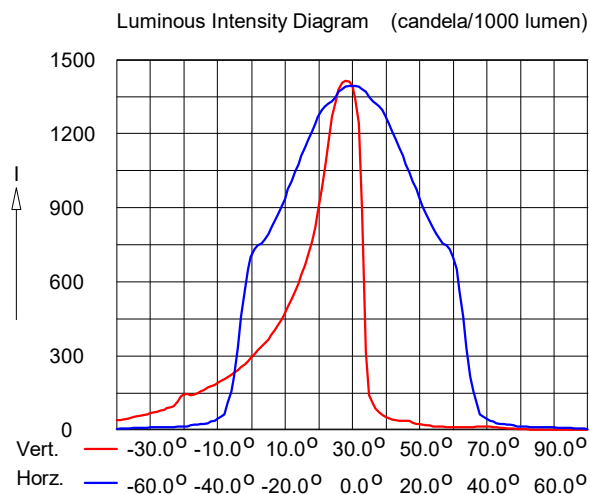
4.1 Project Luminaires

OptiVision LED
BVP525 T30 50K 1xLED1930/757 A-NBLT/30

Light output ratios

DLOR	: 0.74
ULOR	: 0.00
TLOR	: 0.74
Ballast	: N/A
Lamp flux	: 183011 lm
Luminaire wattage	: 1301.5 W
Measurement code	: LVA1505002

Note: Luminaire data not from database.



5. Installation Data

5.1 Legends

Project Luminaires:

Code	Qty	Luminaire Type	Lamp Type	Flux (lm)
A	29	BVP525 T30 50K A-NBLT/30	1 * LED1930/757	1 * 183011

Arrangements:

Code	Arrangement
1	P1 25m
2	P2 25m
3	P3 30m
4	P4 30m
5	P7 25m
6	P8 25m
7	P5 30m
8	P6 30m

Switching Modes:

Code	Switching Mode
1	All 50 lx
2	All 100 lx
3	Field 1 100 lx
4	Field 2 100 lx
5	Field 3 100 lx
6	All Initial

5.2 Luminaire Positioning and Orientation

Including Aiming Points:

Qty and Code	Position			Aiming Points			Arr.	Switching Modes					
	X (m)	Y (m)	Z (m)	X (m)	Y (m)	Z (m)		1	2	3	4	5	6
1 * A	-101.58	-56.43	25.25	-67.46	-7.70	-0.00	1	+	+	+	-	-	+
1 * A	-100.76	-56.91	25.25	-66.64	-8.18	-0.00	1	-	+	+	-	-	+
1 * A	-103.09	60.50	25.25	-73.35	8.98	-0.00	2	-	+	+	-	-	+
1 * A	-102.27	60.97	25.25	-72.53	9.45	-0.00	2	+	+	+	-	-	+
1 * A	-101.44	61.45	25.25	-71.70	9.93	-0.00	2	-	+	+	-	-	+
1 * A	-38.23	-69.23	30.25	-68.35	-4.64	0.00	3	-	+	+	+	-	+
1 * A	-37.27	-69.23	30.25	-67.39	-4.64	0.00	3	+	+	+	+	-	+
1 * A	-36.33	-69.23	30.25	-23.96	0.95	0.00	3	+	+	+	+	-	+
1 * A	-35.38	-69.77	29.71	-5.80	-6.34	0.00	3	-	+	+	+	-	+
1 * A	-35.38	-69.23	30.25	-5.26	-4.64	0.00	3	+	+	+	+	-	+
1 * A	-37.52	78.63	30.25	-61.89	11.66	0.00	4	-	+	+	+	-	+
1 * A	-36.57	78.63	30.25	-60.94	11.66	0.00	4	+	+	+	+	-	+
1 * A	-35.63	78.63	30.25	-23.26	8.45	0.00	4	+	+	+	+	-	+
1 * A	-34.68	78.63	30.25	-4.56	14.04	0.00	4	+	+	+	+	-	+
1 * A	-34.68	79.17	29.71	-5.10	15.74	0.00	4	-	+	+	+	-	+
1 * A	104.08	-54.95	25.25	69.96	-6.22	-0.00	5	+	+	-	-	+	+
1 * A	104.75	-54.28	25.25	70.63	-5.55	-0.00	5	-	+	-	-	+	+

Qty and Code	Position			Aiming Points			Arr.	Switching Modes					
	X (m)	Y (m)	Z (m)	X (m)	Y (m)	Z (m)		1	2	3	4	5	6
1 * A	101.76	55.61	25.25	67.64	6.88	-0.00	6	-	+	-	-	+	+
1 * A	102.58	55.13	25.25	68.46	6.40	-0.00	6	+	+	-	-	+	+
1 * A	40.38	-68.97	29.71	5.38	-8.35	0.00	7	-	+	-	+	+	+
1 * A	40.38	-68.43	30.25	4.75	-6.71	0.00	7	+	+	-	+	+	+
1 * A	41.33	-68.43	30.25	26.51	1.28	0.00	7	+	+	-	+	+	+
1 * A	42.28	-68.43	30.25	66.65	-1.46	0.00	7	+	+	-	+	+	+
1 * A	43.23	-68.43	30.25	67.60	-1.46	0.00	7	-	+	-	+	+	+
1 * A	37.38	79.73	30.25	7.26	15.14	0.00	8	+	+	-	+	+	+
1 * A	37.38	80.27	29.71	7.80	16.84	0.00	8	-	+	-	+	+	+
1 * A	38.33	79.73	30.25	25.96	9.55	0.00	8	+	+	-	+	+	+
1 * A	39.27	79.73	30.25	63.64	12.76	0.00	8	+	+	-	+	+	+
1 * A	40.23	79.73	30.25	64.60	12.76	0.00	8	-	+	-	+	+	+

Including Aiming Angles:

Qty and Code	Position			Aiming Angles			Arr.	Switching Modes					
	X (m)	Y (m)	Z (m)	Rot.	Tilt90	Tilt0		1	2	3	4	5	6
1 * A	-101.58	-56.43	25.25	55.0	67.0	0.0	1	+	+	+	-	-	+
1 * A	-100.76	-56.91	25.25	55.0	67.0	0.0	1	-	+	+	-	-	+
1 * A	-103.09	60.50	25.25	-60.0	67.0	0.0	2	-	+	+	-	-	+
1 * A	-102.27	60.97	25.25	-60.0	67.0	0.0	2	+	+	+	-	-	+
1 * A	-101.44	61.45	25.25	-60.0	67.0	0.0	2	-	+	+	-	-	+
1 * A	-38.23	-69.23	30.25	115.0	67.0	0.0	3	-	+	+	+	-	+
1 * A	-37.27	-69.23	30.25	115.0	67.0	0.0	3	+	+	+	+	-	+
1 * A	-36.33	-69.23	30.25	80.0	67.0	0.0	3	+	+	+	+	-	+
1 * A	-35.38	-69.77	29.71	65.0	67.0	0.0	3	-	+	+	+	-	+
1 * A	-35.38	-69.23	30.25	65.0	67.0	0.0	3	+	+	+	+	-	+
1 * A	-37.52	78.63	30.25	-110.0	67.0	0.0	4	-	+	+	+	-	+
1 * A	-36.57	78.63	30.25	-110.0	67.0	0.0	4	+	+	+	+	-	+
1 * A	-35.63	78.63	30.25	-80.0	67.0	0.0	4	+	+	+	+	-	+
1 * A	-34.68	78.63	30.25	-65.0	67.0	0.0	4	+	+	+	+	-	+
1 * A	-34.68	79.17	29.71	-65.0	67.0	0.0	4	-	+	+	+	-	+
1 * A	104.08	-54.95	25.25	125.0	67.0	0.0	5	+	+	-	-	+	+
1 * A	104.75	-54.28	25.25	125.0	67.0	0.0	5	-	+	-	-	+	+
1 * A	101.76	55.61	25.25	-125.0	67.0	0.0	6	-	+	-	-	+	+
1 * A	102.58	55.13	25.25	-125.0	67.0	0.0	6	+	+	-	-	+	+
1 * A	40.38	-68.97	29.71	120.0	67.0	0.0	7	-	+	-	+	+	+
1 * A	40.38	-68.43	30.25	120.0	67.0	0.0	7	+	+	-	+	+	+
1 * A	41.33	-68.43	30.25	102.0	67.0	0.0	7	+	+	-	+	+	+
1 * A	42.28	-68.43	30.25	70.0	67.0	0.0	7	+	+	-	+	+	+
1 * A	43.23	-68.43	30.25	70.0	67.0	0.0	7	-	+	-	+	+	+
1 * A	37.38	79.73	30.25	-115.0	67.0	0.0	8	+	+	-	+	+	+
1 * A	37.38	80.27	29.71	-115.0	67.0	0.0	8	-	+	-	+	+	+
1 * A	38.33	79.73	30.25	-100.0	67.0	0.0	8	+	+	-	+	+	+
1 * A	39.27	79.73	30.25	-70.0	67.0	0.0	8	+	+	-	+	+	+
1 * A	40.23	79.73	30.25	-70.0	67.0	0.0	8	-	+	-	+	+	+