

# H.C Den Bosch

Datum: 23-02-2010

Ontwerper: F. Pasveer

Opmerkingen: lichthinder onderzoek voldoet aan omgevingszone E2  
landelijk gebied met uitzondering van dieren asiel.

hoofdveld 8 masten 25m  
38 schijnwerpers MVP507NB

berekening met afscherming ( schutting h=4m )

Rapport is uitgebreid met waarnemers op de A2 over  
een lengte van ca 720 meter.

Omdat in de praktijk de bedrijfsomstandigheden vrijwel altijd zullen verschillen van de voor de berekeningen gekozen uitgangspunten zijn afwijkingen in de opgegeven luminanties of verlichtingssterkten niet uitgesloten. Een rol hierbij spelen onder meer andere ruimtelijke omstandigheden en armatuurposities, toleranties in lampen, armaturen en hulpapparatuur, evenals afwijkende temperatuur en spanning.

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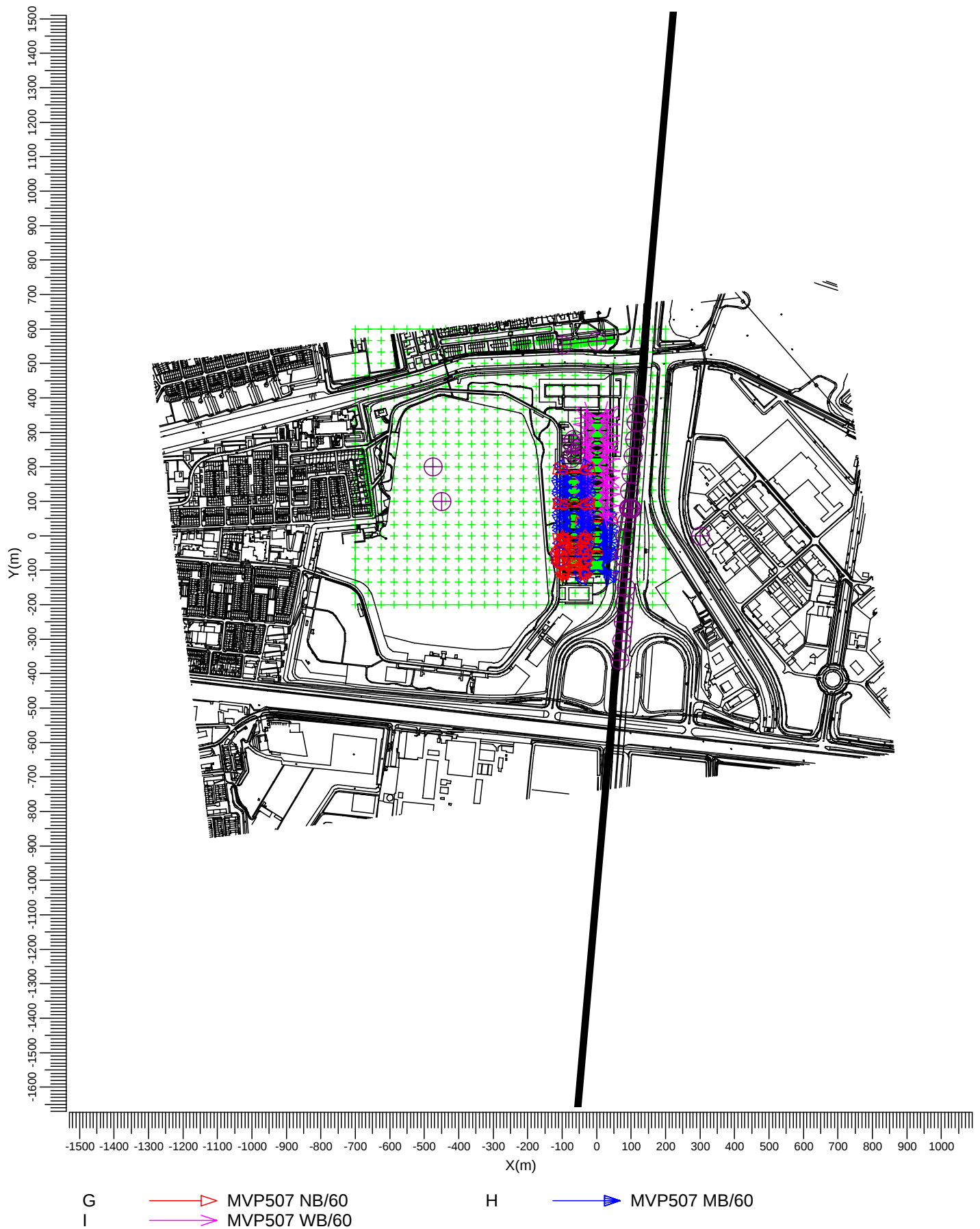
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# 1. Projectbeschrijving

## 1.1 Overzicht van boven

Schaal  
1:15000

## 2. Samenvatting

### 2.1 Algemeen

Algemene behoudfactor: 1.00.

### 2.2 Waarnemers

| Code | Waarnemer           | Positie [m] |         |      |
|------|---------------------|-------------|---------|------|
|      |                     | X           | Y       | Z    |
| Aa   | zoomweg wn 2        | -475.00     | 200.00  | 1.50 |
| Bb   | moerkerklaan wn 3   | -100.00     | 554.00  | 1.50 |
| Cc   | moerkerklaan wn 4   | -0.00       | 565.00  | 1.50 |
| Dd   | woonhuis asiel wn 5 | -67.00      | 280.00  | 1.50 |
| Ee   | woonhuis asiel wn 6 | -73.00      | 270.00  | 1.50 |
| Ff   | zoomweg wn 1        | -450.00     | 100.00  | 1.50 |
| Gg   | camera              | -107.00     | -60.00  | 6.00 |
| Hh   | wn 7 oost zijde A2  | 300.00      | -0.00   | 1.50 |
| Ii   | hokken wn 8         | -75.00      | 224.00  | 1.50 |
| Jj   | hokken wn 9         | -61.00      | 240.00  | 1.50 |
| Kk   | Enkelbaans weg (01) | 102.58      | 79.21   | 6.50 |
| Ll   | Enkelbaans weg (02) | 98.84       | 79.53   | 6.50 |
| Mm   | Enkelbaans weg (03) | 95.10       | 79.86   | 6.50 |
| Nn   | Enkelbaans weg (04) | 91.37       | 80.19   | 6.50 |
| Oo   | A2-wn1              | 79.00       | -60.00  | 6.50 |
| Pp   | A2-wn2              | 76.00       | -105.00 | 6.50 |
| Qq   | A2-wn3              | 84.00       | -150.00 | 6.50 |
| Rr   | A2-wn4              | 80.00       | -195.00 | 6.50 |
| Ss   | A2-wn5              | 77.00       | -250.00 | 6.50 |
| Tt   | A2-wn6              | 72.00       | -305.00 | 6.50 |
| Uu   | A2-wn7              | 66.00       | -360.00 | 6.50 |
| Vv   | A2-wn8              | 82.00       | -5.00   | 6.50 |
| Ww   | A2-wn9              | 86.00       | 40.00   | 6.50 |
| Xx   | A2-wn10             | 95.00       | 130.00  | 6.50 |
| Yy   | A2-wn11             | 100.00      | 180.00  | 6.50 |
| Zz   | A2-wn12             | 105.00      | 230.00  | 6.50 |
| [{   | A2-wn13             | 110.00      | 280.00  | 6.50 |
| \    | A2-wn14             | 115.00      | 330.00  | 6.50 |
| }]   | A2-wn15             | 120.00      | 380.00  | 6.50 |

### 2.3 Gegevens obstakel

| Obstakel             | Transmissiefactor | Positie |        |      |
|----------------------|-------------------|---------|--------|------|
|                      |                   | X       | Y      | Z    |
| schutting asiel oost | 0                 | -46.00  | 210.00 | 0.00 |
| schutting asiel zuid | 0                 | -100.00 | 210.00 | 0.00 |

### 2.4 Armatuurtypen

| Code | Aantal | Armatuurtype | Aantal x lamptype        | Vermogen [W] | Lichtstroom [lm] |
|------|--------|--------------|--------------------------|--------------|------------------|
| G    | 50     | MVP507 NB/60 | 1 * MHN-LA2000W/400V/842 | 2123.0       | 1 * 220000       |
| H    | 44     | MVP507 MB/60 | 1 * MHN-LA2000W/400V/842 | 2123.0       | 1 * 220000       |
| I    | 48     | MVP507 WB/60 | 1 * MHN-LA2000W/400V/842 | 2123.0       | 1 * 220000       |

Totaal geïnstalleerd vermogen: 301.47 kW

Aantal armaturen per schakelstap:

| Schakelstap | Armatuurcode |   |   | Vermogen [kW] |
|-------------|--------------|---|---|---------------|
|             | G            | H | I |               |
| hoofdveld   | 38           | 0 | 0 | 80.67         |

| Schakelstap | Armatuurcode |    |    | Vermogen [kW] |
|-------------|--------------|----|----|---------------|
|             | G            | H  | I  |               |
| veld 1      | 4            | 12 | 0  | 33.97         |
| veld 2      | 4            | 12 | 0  | 33.97         |
| veld 3      | 4            | 12 | 0  | 33.97         |
| veld 4      | 0            | 0  | 16 | 33.97         |
| veld 5      | 0            | 0  | 16 | 33.97         |
| veld 6      | 0            | 0  | 16 | 33.97         |
| jeugdveld   | 0            | 8  | 0  | 16.98         |
| alles       | 50           | 44 | 48 | 301.47        |

## 2.5 Berekeningsresultaten

Schakelstappen:

| Code | Schakelstap |
|------|-------------|
| 1    | hoofdveld   |
| 2    | veld 1      |
| 3    | veld 2      |
| 4    | veld 3      |
| 5    | veld 4      |
| 6    | veld 5      |
| 7    | veld 6      |
| 8    | jeugdveld   |
| 9    | alles       |

Verlichtingssterkte / luminantie:

| Berekening               | Schakelstap | Type berekening                 | Eenheid | Gem  | Min  | Max   | Min/gem |
|--------------------------|-------------|---------------------------------|---------|------|------|-------|---------|
| gevels moerkerln 61-301  | 9           | (Vlak-) verlichtingssterkte     | lux     |      |      | 0.05  |         |
| geveld moerkerln 49-59   | 9           | (Vlak-) verlichtingssterkte     | lux     |      |      | 0.03  |         |
| gevels moerkerln 37-47   | 9           | (Vlak-) verlichtingssterkte     | lux     |      |      | 0.03  |         |
| zuid gevel asiel         | 9           | (Vlak-) verlichtingssterkte     | lux     |      |      | 11.41 |         |
| oost gevel asiel         | 9           | (Vlak-) verlichtingssterkte     | lux     |      |      | 14.51 |         |
| gevels zoomweg           | 9           | (Vlak-) verlichtingssterkte     | lux     |      |      | 0.01  |         |
| hoofdveld                | 1           | (Vlak-) verlichtingssterkte     | lux     | 740  |      |       | 0.80    |
| veld 1                   | 2           | (Vlak-) verlichtingssterkte     | lux     | 365  |      |       | 0.72    |
| veld 2                   | 3           | (Vlak-) verlichtingssterkte     | lux     | 378  |      |       | 0.74    |
| veld 3                   | 4           | (Vlak-) verlichtingssterkte     | lux     | 364  |      |       | 0.74    |
| veld 4                   | 5           | (Vlak-) verlichtingssterkte     | lux     | 382  |      |       | 0.77    |
| veld 5                   | 6           | (Vlak-) verlichtingssterkte     | lux     | 378  |      |       | 0.77    |
| veld 6                   | 7           | (Vlak-) verlichtingssterkte     | lux     | 378  |      |       | 0.76    |
| jeugdveld                | 8           | (Vlak-) verlichtingssterkte     | lux     | 296  |      |       | 0.72    |
| wedstrijd vertikaal      | 1           | Verlichtingssterkte -> Gg       | lux     | 563  |      |       | 0.56    |
| woonhuis oostgevel asiel | 9           | (Vlak-) verlichtingssterkte     | lux     |      |      | 4.45  |         |
| Berekening               | 1           | Horizontale verlichtingssterkte | lux     | 0.00 | 0.00 |       | 0.04    |

## Wegdek luminantie:

| Berekening          | Schakelstap | Type berekening  | Eenheid | Gem  | Min  | Min/gem | TI [%]    |
|---------------------|-------------|------------------|---------|------|------|---------|-----------|
| Enkelbaans weg (01) | 1           | Luminantie -> Kk | cd/m2   | 0.00 | 0.00 | 0.00    | Onbepaald |
| Enkelbaans weg (02) | 1           | Luminantie -> Ll | cd/m2   | 0.00 | 0.00 | 0.00    | Onbepaald |
| Enkelbaans weg (03) | 1           | Luminantie -> Mm | cd/m2   | 0.00 | 0.00 | 0.00    | Onbepaald |
| Enkelbaans weg (04) | 1           | Luminantie -> Nn | cd/m2   | 0.00 | 0.00 | 0.00    | Onbepaald |

## Verblindingswaarde:

| Berekening         | Schakelstap | Waarnemer | Referentierekenraster | Reflectiefactor | VW max |
|--------------------|-------------|-----------|-----------------------|-----------------|--------|
| wn3                | 9           | Bb        | oosterplas            | 0.25            | 10.0   |
| woonhuis asiel wn5 | 9           | Dd        | oosterplas            | 0.25            | 22.1   |
| woonhuis asiel wn6 | 9           | Ee        | oosterplas            | 0.25            | 21.6   |
| wn 1               | 9           | Ff        | oosterplas            | 0.25            | 10.0   |
| wn 2               | 9           | Aa        | oosterplas            | 0.25            | 10.0   |
| wn 4               | 9           | Cc        | oosterplas            | 0.25            | 14.3   |
| oostzijde A2 wn 7  | 9           | Hh        | oosterplas            | 0.25            | 10.0   |
| hokken wn 8        | 9           | li        | oosterplas            | 0.25            | 28.9   |
| hokken wn 9        | 9           | Jj        | oosterplas            | 0.25            | 21.8   |
| A2-wn1             | 9           | Oo        | oosterplas            | 0.25            | 27.8   |
| A2-wn2             | 9           | Pp        | oosterplas            | 0.25            | 24.2   |
| A2-wn3             | 9           | Qq        | oosterplas            | 0.25            | 19.9   |
| A2-wn4             | 1           | Rr        | oosterplas            | 0.25            | 27.2   |
| A2-wn5             | 1           | Ss        | oosterplas            | 0.25            | 22.1   |
| A2-wn6             | 1           | Tt        | oosterplas            | 0.25            | 20.8   |
| A2-wn7             | 1           | Uu        | oosterplas            | 0.25            | 19.1   |
| A2-wn8             | 9           | Vv        | oosterplas            | 0.25            | 24.6   |
| A2-wn9             | 9           | Ww        | oosterplas            | 0.25            | 21.8   |
| A2-wn10            | 9           | Xx        | oosterplas            | 0.25            | 15.4   |
| A2-wn11            | 9           | Yy        | oosterplas            | 0.25            | 14.5   |
| A2-wn12            | 9           | Zz        | oosterplas            | 0.25            | 13.0   |
| A2-wn13            | 9           | [[        | oosterplas            | 0.25            | 12.3   |
| A2-wn14            | 9           | \\        | oosterplas            | 0.25            | 10.5   |
| A2-wn15            | 9           | ]]        | oosterplas            | 0.25            | 10.2   |

## Berekeningen lichthinder:

| Schakelstap | Waarnemercode | Code armatuurtype | Positie |        |       | Instelrichting in hoeken |          |         | Maximale lichtintensiteit (cd) |
|-------------|---------------|-------------------|---------|--------|-------|--------------------------|----------|---------|--------------------------------|
|             |               |                   | X       | Y      | Z     | Draai                    | Kantel90 | Kantel0 |                                |
| 9           | Aa            | G                 | -107.00 | -77.00 | 25.00 | -51.18                   | 52.00    | -0.00   | 294                            |
| 9           | Bb            | G                 | -35.00  | -77.00 | 25.00 | -104.73                  | 47.01    | -0.00   | 807                            |
| 9           | Cc            | G                 | -35.00  | -77.00 | 25.00 | -104.73                  | 47.01    | -0.00   | 916                            |
| 9           | Dd            | I                 | -29.00  | 351.84 | 15.00 | -56.85                   | 62.00    | -0.00   | 2050                           |
| 9           | Ee            | G                 | -35.00  | -77.00 | 25.00 | -104.73                  | 47.01    | -0.00   | 1024                           |
| 9           | Ff            | G                 | -107.00 | -77.00 | 25.00 | -51.18                   | 52.00    | -0.00   | 356                            |
| 9           | Hh            | G                 | -107.00 | -43.00 | 25.00 | 18.44                    | 65.96    | 0.00    | 418                            |
| 9           | li            | G                 | -35.00  | 190.00 | 18.00 | -169.98                  | 60.00    | 0.00    | 7205                           |
| 9           | Oo            | G                 | -107.00 | -43.00 | 25.00 | 18.44                    | 65.96    | 0.00    | 1860                           |
| 9           | Pp            | G                 | -107.00 | -77.00 | 25.00 | -27.54                   | 66.00    | -0.00   | 2167                           |
| 9           | Qq            | G                 | -107.00 | -77.00 | 25.00 | -27.54                   | 66.00    | -0.00   | 1645                           |
| 9           | Rr            | G                 | -107.00 | -77.00 | 25.00 | -27.54                   | 66.00    | -0.00   | 1253                           |
| 9           | Ss            | G                 | -35.00  | -43.00 | 25.00 | 104.73                   | 47.01    | 0.00    | 1487                           |
| 9           | Tt            | G                 | -35.00  | -43.00 | 25.00 | 104.73                   | 47.01    | 0.00    | 1350                           |
| 9           | Uu            | G                 | -35.00  | -43.00 | 25.00 | 104.73                   | 47.01    | 0.00    | 1171                           |
| 9           | Vv            | G                 | -107.00 | -43.00 | 25.00 | 27.54                    | 66.00    | 0.00    | 1930                           |
| 9           | Ww            | G                 | -107.00 | -43.00 | 25.00 | 27.54                    | 66.00    | 0.00    | 1504                           |
| 9           | Xx            | G                 | -35.00  | -77.00 | 25.00 | -104.73                  | 47.01    | -0.00   | 1307                           |
| 9           | Yy            | G                 | -35.00  | -77.00 | 25.00 | -104.73                  | 47.01    | -0.00   | 1286                           |
| 9           | Zz            | G                 | -35.00  | -77.00 | 25.00 | -104.73                  | 47.01    | -0.00   | 1192                           |
| 9           | [[            | G                 | -35.00  | -77.00 | 25.00 | -104.73                  | 47.01    | -0.00   | 1108                           |
| 9           | \\            | G                 | -35.00  | -77.00 | 25.00 | -104.73                  | 47.01    | -0.00   | 1048                           |
| 9           | ]]            | G                 | -35.00  | -77.00 | 25.00 | -104.73                  | 47.01    | -0.00   | 985                            |

| Schakelstaap | Waarnemercode | Adaptatieve<br>luminantie<br>(cd/m2) |  | Richting             | TI (%) |
|--------------|---------------|--------------------------------------|--|----------------------|--------|
|              |               |                                      |  |                      |        |
| 9            | Oo            | 1.00                                 |  | (-0.09, -1.00, 0.00) | 0.0    |
| 9            | Pp            | 1.00                                 |  | (-0.09, -1.00, 0.00) | 0.0    |
| 9            | Qq            | 1.00                                 |  | (-0.09, -1.00, 0.00) | 0.0    |
| 9            | Rr            | 1.00                                 |  | (-0.09, -1.00, 0.00) | 0.0    |
| 9            | Ss            | 1.00                                 |  | (-0.09, -1.00, 0.00) | 0.0    |
| 9            | Tt            | 1.00                                 |  | (-0.09, -1.00, 0.00) | 0.0    |
| 9            | Uu            | 1.00                                 |  | (-0.09, -1.00, 0.00) | 0.0    |
| 9            | Vv            | 1.00                                 |  | (-0.09, -1.00, 0.00) | 0.1    |
| 9            | Ww            | 1.00                                 |  | (-0.09, -1.00, 0.00) | 0.1    |
| 9            | Xx            | 1.00                                 |  | (-0.09, -1.00, 0.00) | 0.1    |
| 9            | Yy            | 1.00                                 |  | (-0.09, -1.00, 0.00) | 0.1    |
| 9            | Zz            | 1.00                                 |  | (-0.09, -1.00, 0.00) | 0.1    |
| 9            | [{            | 1.00                                 |  | (-0.09, -1.00, 0.00) | 0.1    |
| 9            | \             | 1.00                                 |  | (-0.09, -1.00, 0.00) | 0.1    |
| 9            | ]]            | 1.00                                 |  | (-0.09, -1.00, 0.00) | 0.1    |

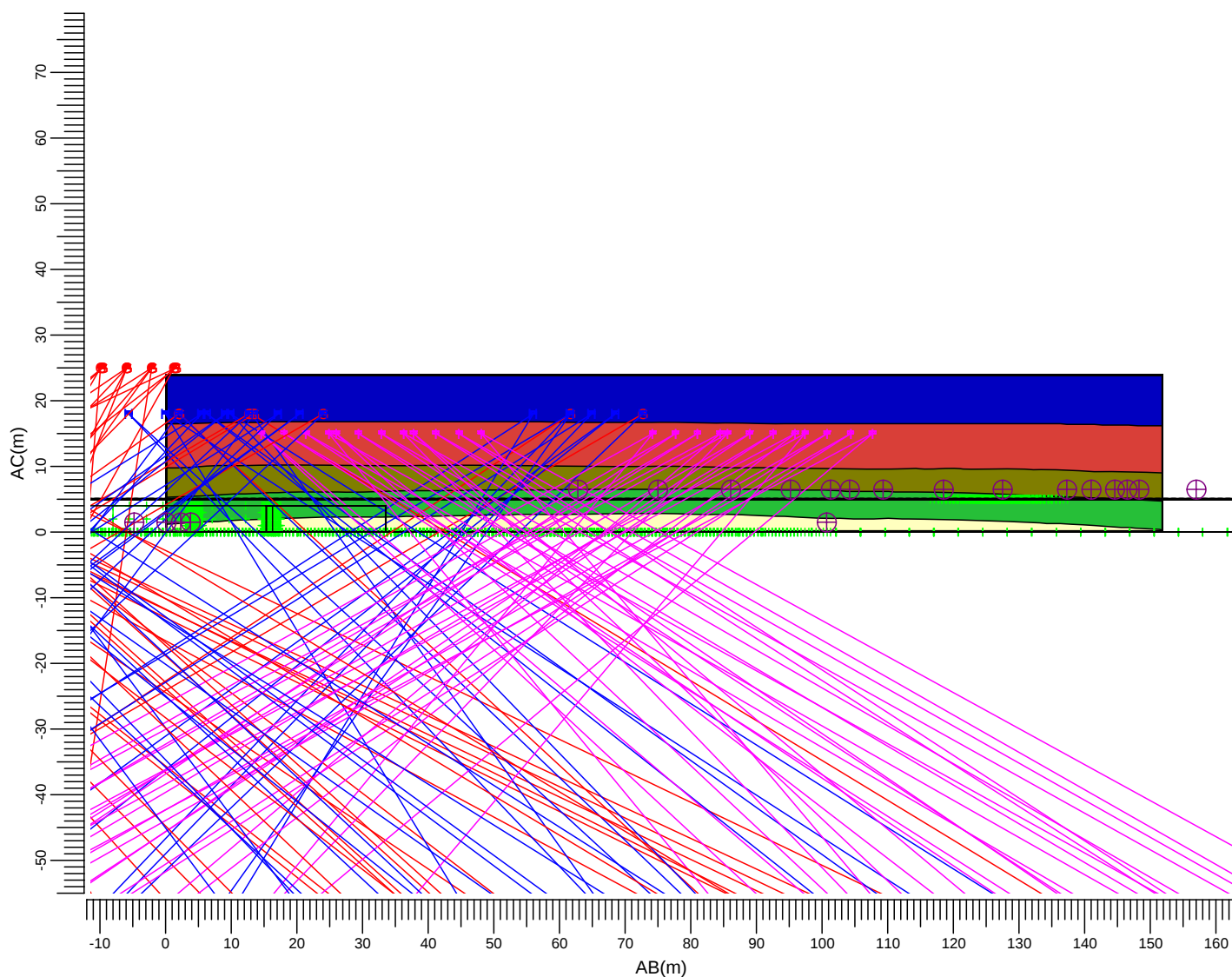
| ULR<br>(lichtrendement<br>'naar boven') |      |
|-----------------------------------------|------|
| 1                                       | 0.00 |
| 2                                       | 0.00 |
| 3                                       | 0.00 |
| 4                                       | 0.00 |
| 5                                       | 0.00 |
| 6                                       | 0.00 |
| 7                                       | 0.00 |
| 8                                       | 0.00 |
| 9                                       | 0.00 |

### 3. Berekeningsresultaten

#### 3.1 gevels moerkerln 61-301: Gevuld isolijndiagram

alles

Rekenraster : gevels moerkerln 61-301  
Berekening : (Vlak-) verlichtingssterkte (lux)



(-100.00, 553.00, 24.00) C-----D (51.00, 570.00, 24.00)  
(-100.00, 553.00, -0.00) A-----B (51.00, 570.00, -0.00)

G → MVP507 NB/60  
I → MVP507 WB/60

H → MVP507 MB/60

Maximum  
0.05

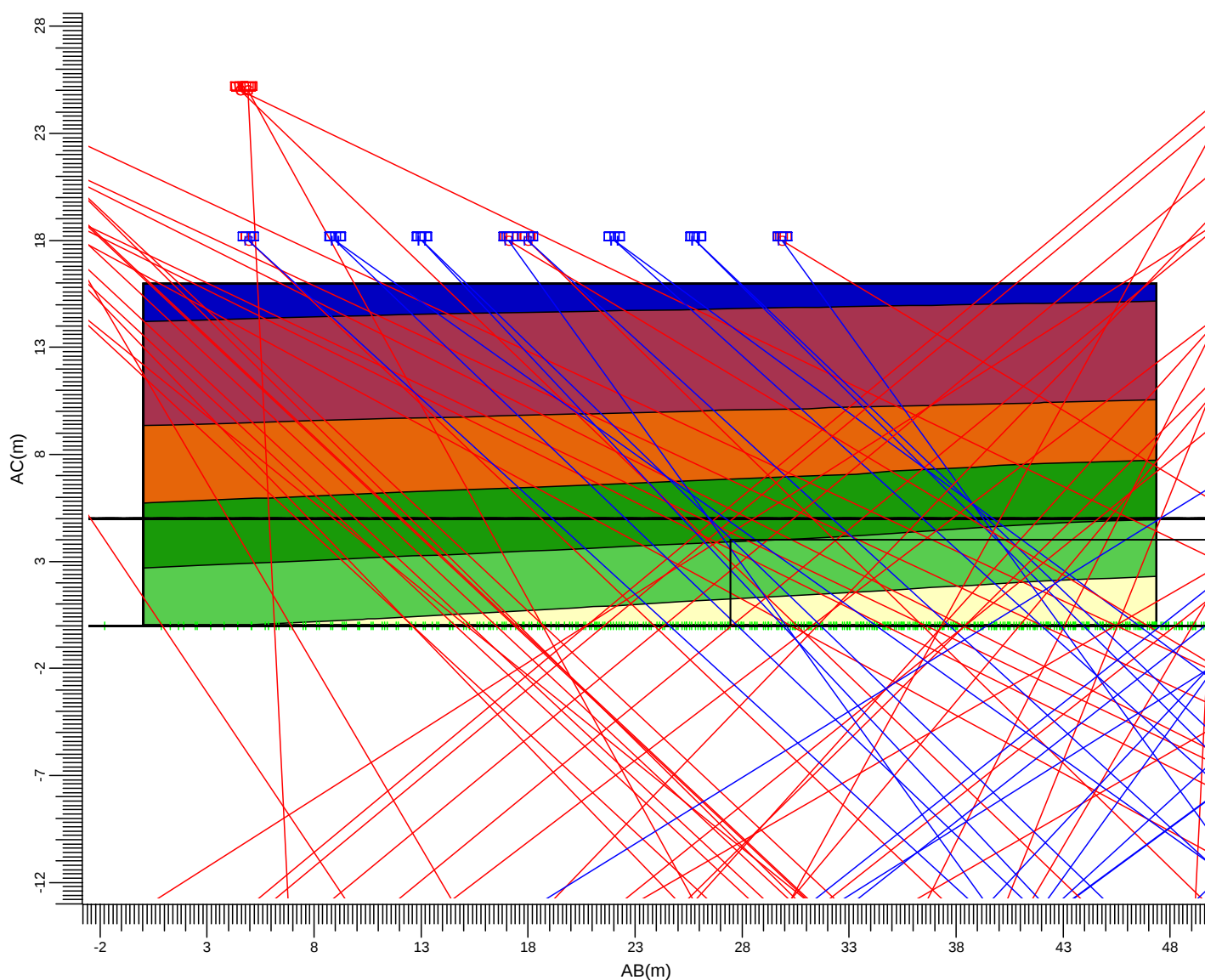
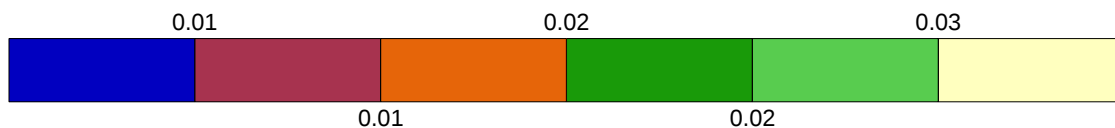
Algemene behoudfactor  
1.00

Schaal  
1:1000

## 3.2 gevel moerkerkn 49-59: Gevuld isolijndiagram

alles

Rekenraster : gevels moerkerkn 49-59  
Berekening : (Vlak-) verlichtingssterkte (lux)



(-173.00, 565.00, 16.00) C-----D (-126.00, 571.00, 16.00)  
(-173.00, 565.00, -0.00) A-----B (-126.00, 571.00, -0.00)

G MVP507 NB/60  
I MVP507 WB/60

H MVP507 MB/60

Maximum  
0.03

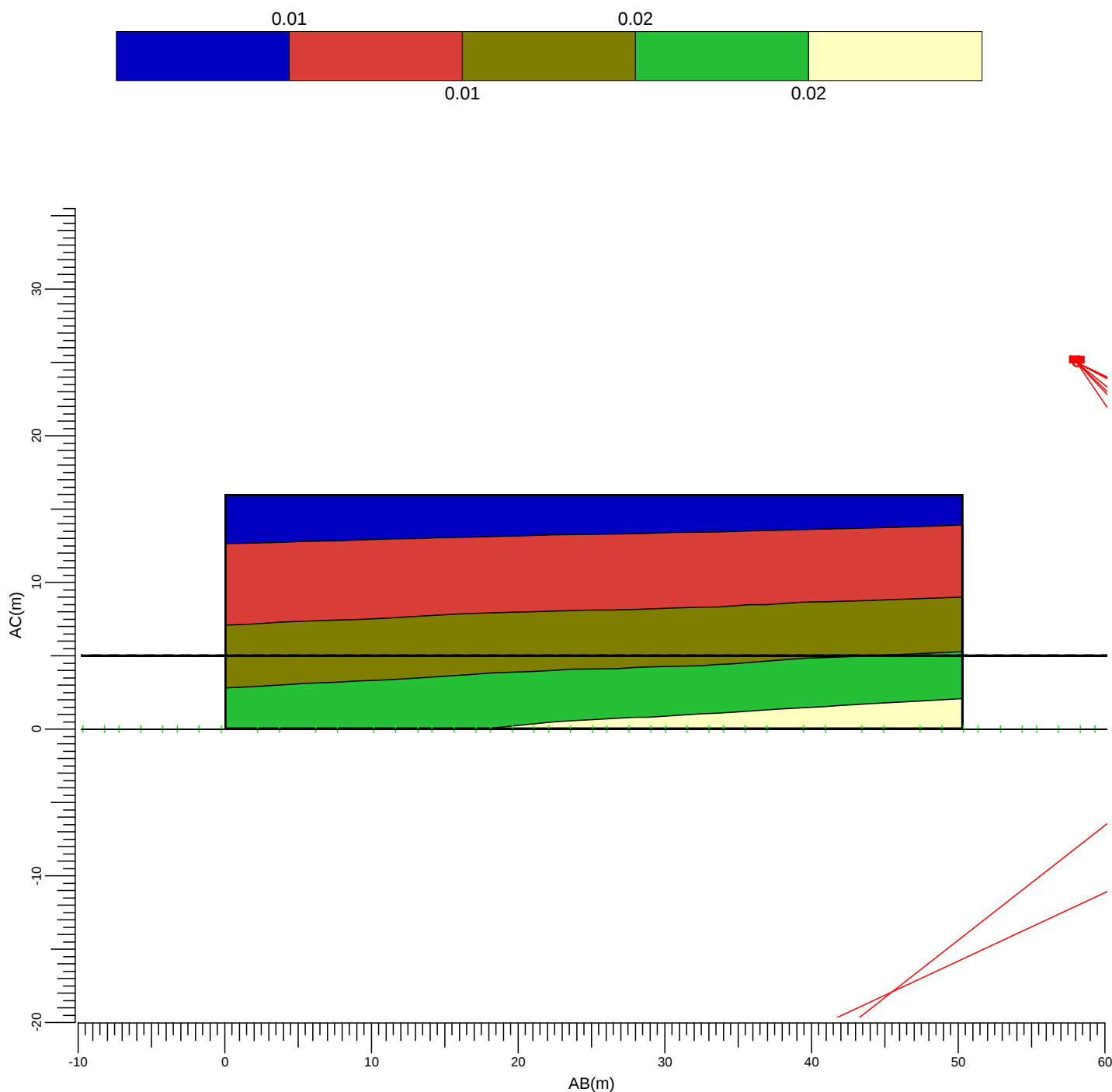
Algemene behoudfactor  
1.00

Schaal  
1:300

## 3.3 gevels moerkerkln 37-47: Gevuld isolijndiagram

alles

Rekenraster : gevels moerkerkln 37-47  
 Berekening : (Vlak-) verlichtingssterkte (lux)



(-241.00, 552.00, 16.00) C-----D (-191.00, 558.00, 16.00)  
 (-241.00, 552.00, -0.00) A-----B (-191.00, 558.00, -0.00)

G → MVP507 NB/60  
 I → MVP507 WB/60

H → MVP507 MB/60

Maximum  
0.03

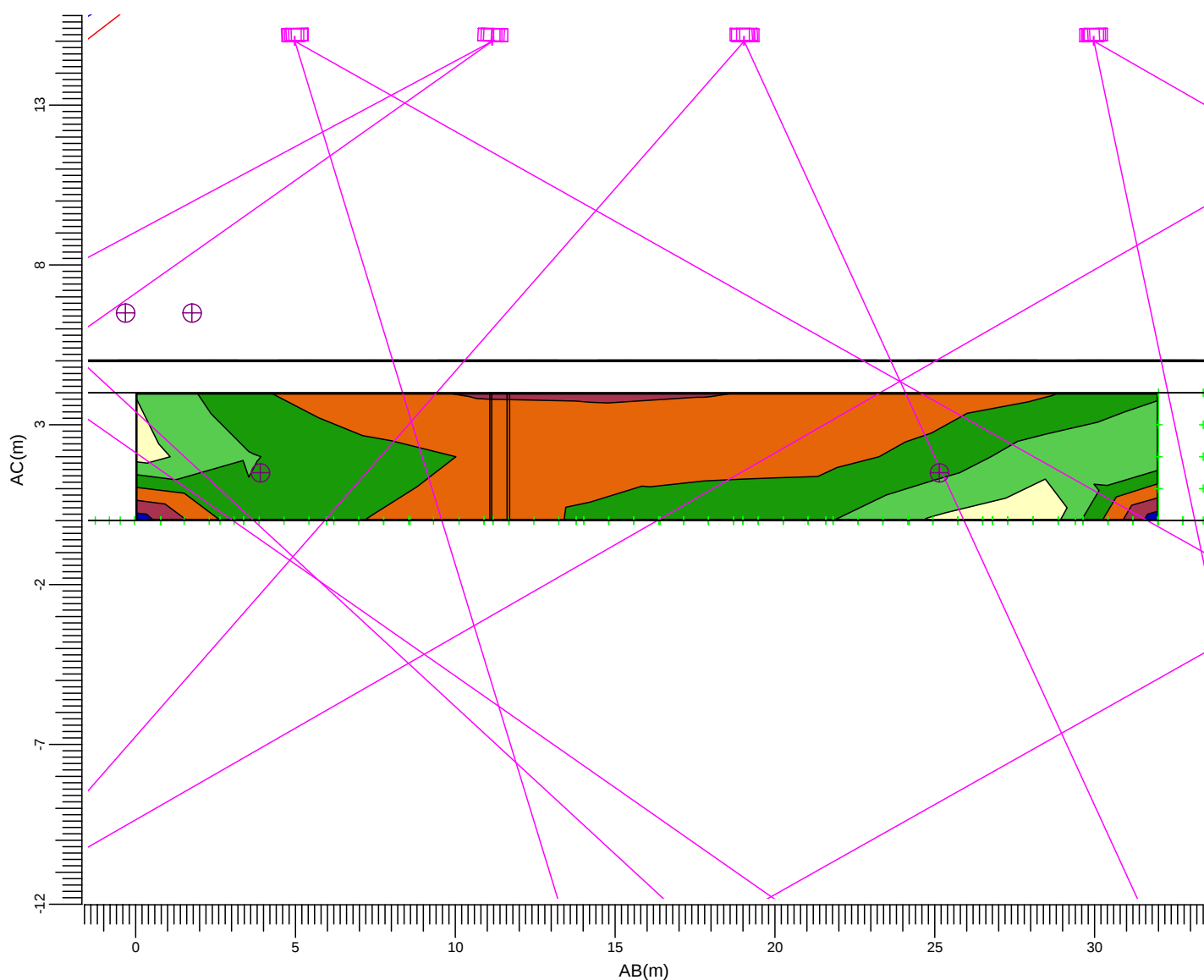
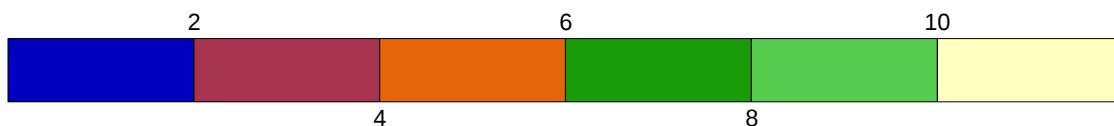
Algemene behoudfactor  
1.00

Schaal  
1:400

## 3.4 zuid gevel asiel: Gevuld isolijndiagram

alles

Rekenraster : zuid gevel asiel  
Berekening : (Vlak-) verlichtingssterkte (lux)



(-70.00, 215.00, 4.00) C-----D (-50.00, 240.00, 4.00)  
(-70.00, 215.00, -0.00) A-----B (-50.00, 240.00, -0.00)

G → MVP507 NB/60  
I → MVP507 WB/60

H → MVP507 MB/60

Maximum  
11.41

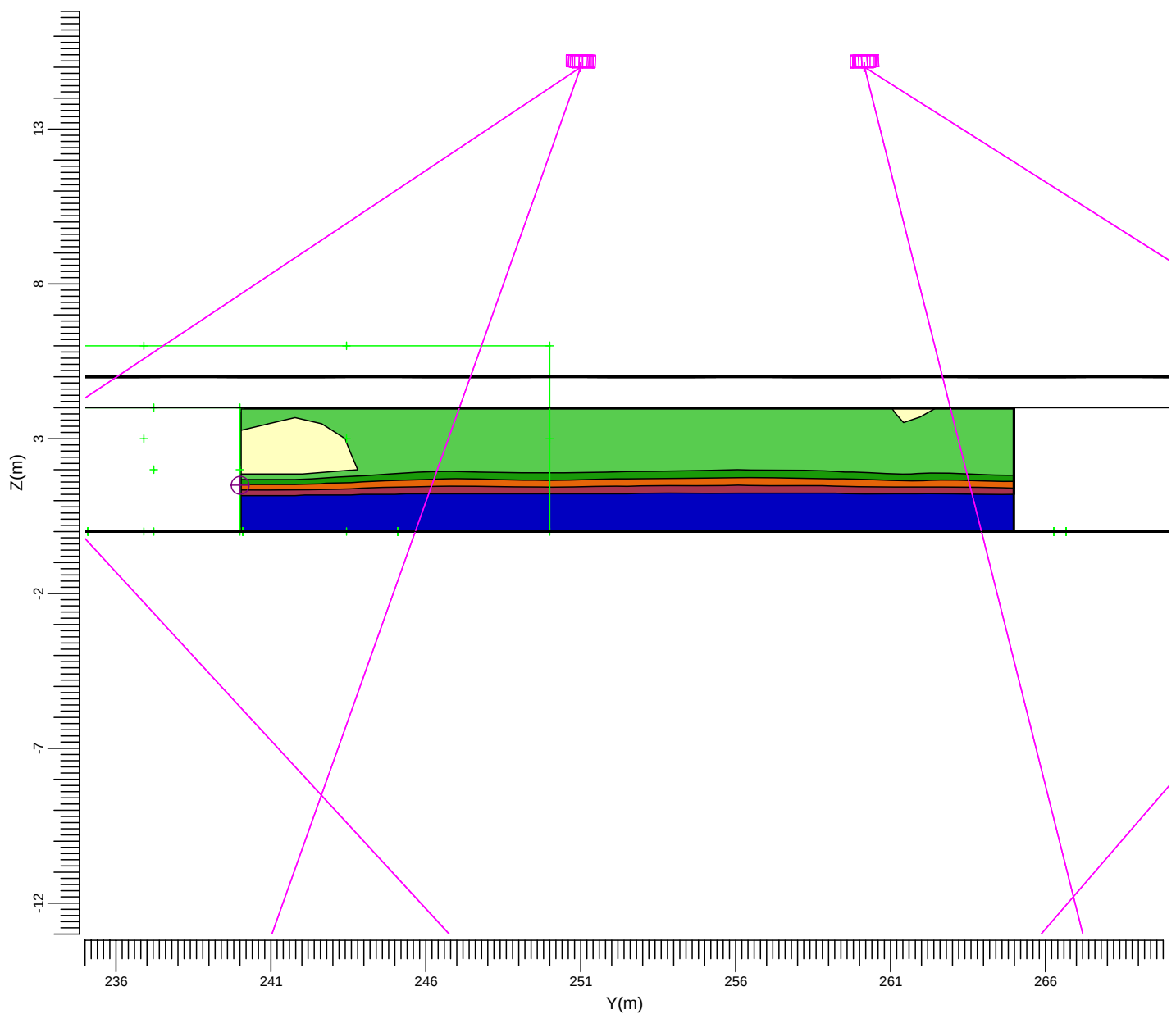
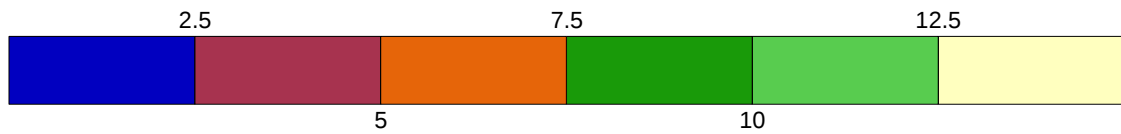
Algemene behoudfactor  
1.00

Schaal  
1:200

## 3.5 oost gevel asiel: Gevuld isolijndiagram

alles

Rekenraster : oost gevel asiel op X = -50.00 m  
 Berekening : (Vlak-) verlichtingssterkte (lux)



G MVP507 NB/60  
 I MVP507 WB/60

H MVP507 MB/60

Maximum  
14.51

Algemene behoudfactor  
1.00

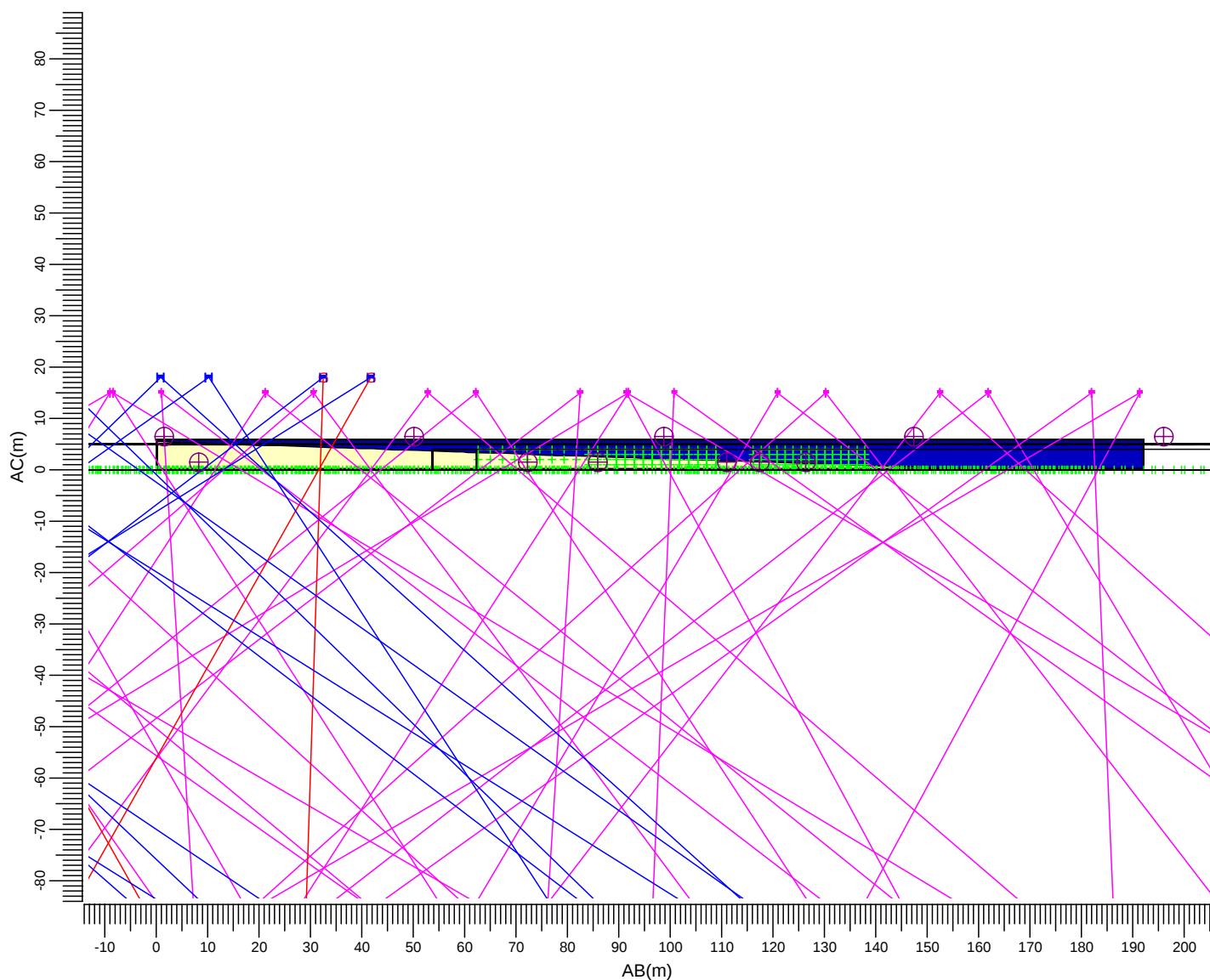
Schaal  
1:200

## 3.6 gevels zoomweg: Gevuld isolijndiagram

alles

Rekenraster : zoomweg  
Berekening : (Vlak-) verlichtingssterkte (lux)

0.01



(-650.00, 60.00, 6.00) C-----D (-680.00, 250.00, 6.00)  
(-650.00, 60.00, -0.00) A-----B (-680.00, 250.00, -0.00)

G → MVP507 NB/60  
I → MVP507 WB/60

H → MVP507 MB/60

Maximum  
0.01

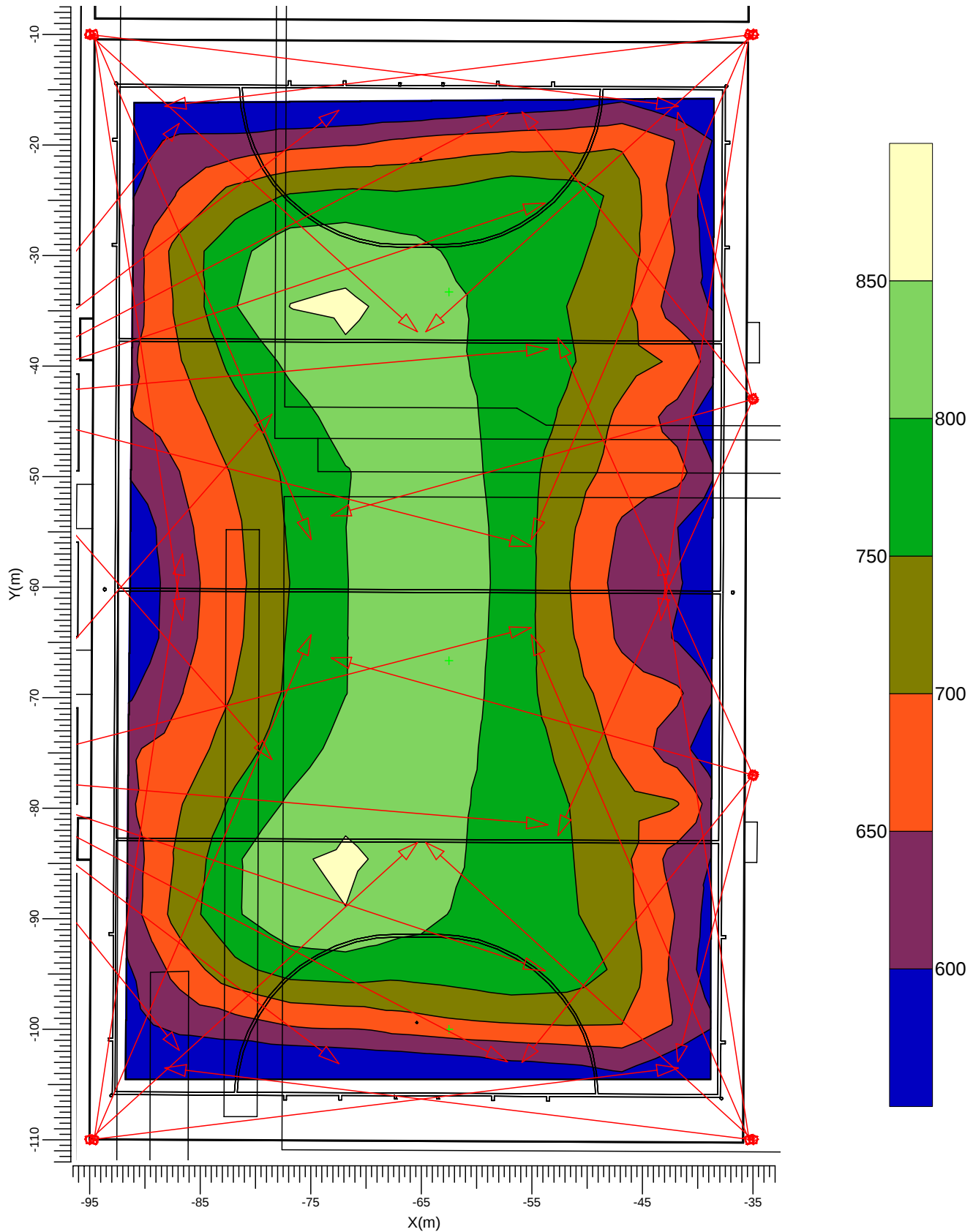
Algemene behoudfactor  
1.00

Schaal  
1:1250

## 3.7 hoofdveld: Gevuld isolijndiagram

hoofdveld

Rekenraster : hoofdveld op Z = -0.00 m  
 Berekening : (Vlak-) verlichtingssterkte (lux)



G ———> MVP507 NB/60

Gemiddeld  
740

Min/gem  
0.80

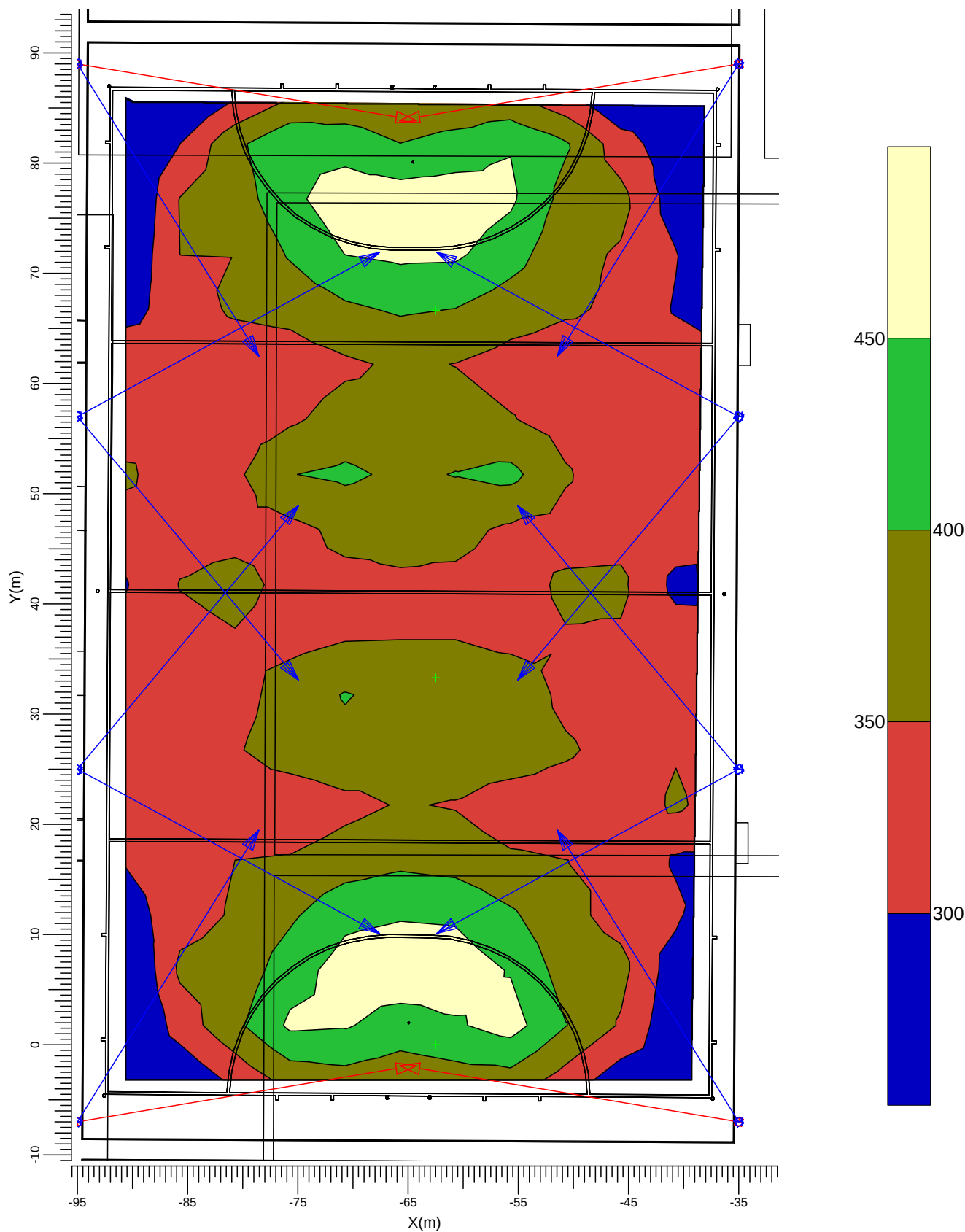
Algemene behoudfactor  
1.00

Schaal  
1:500

## 3.8 veld 1: Gevuld isolijndiagram

veld 1

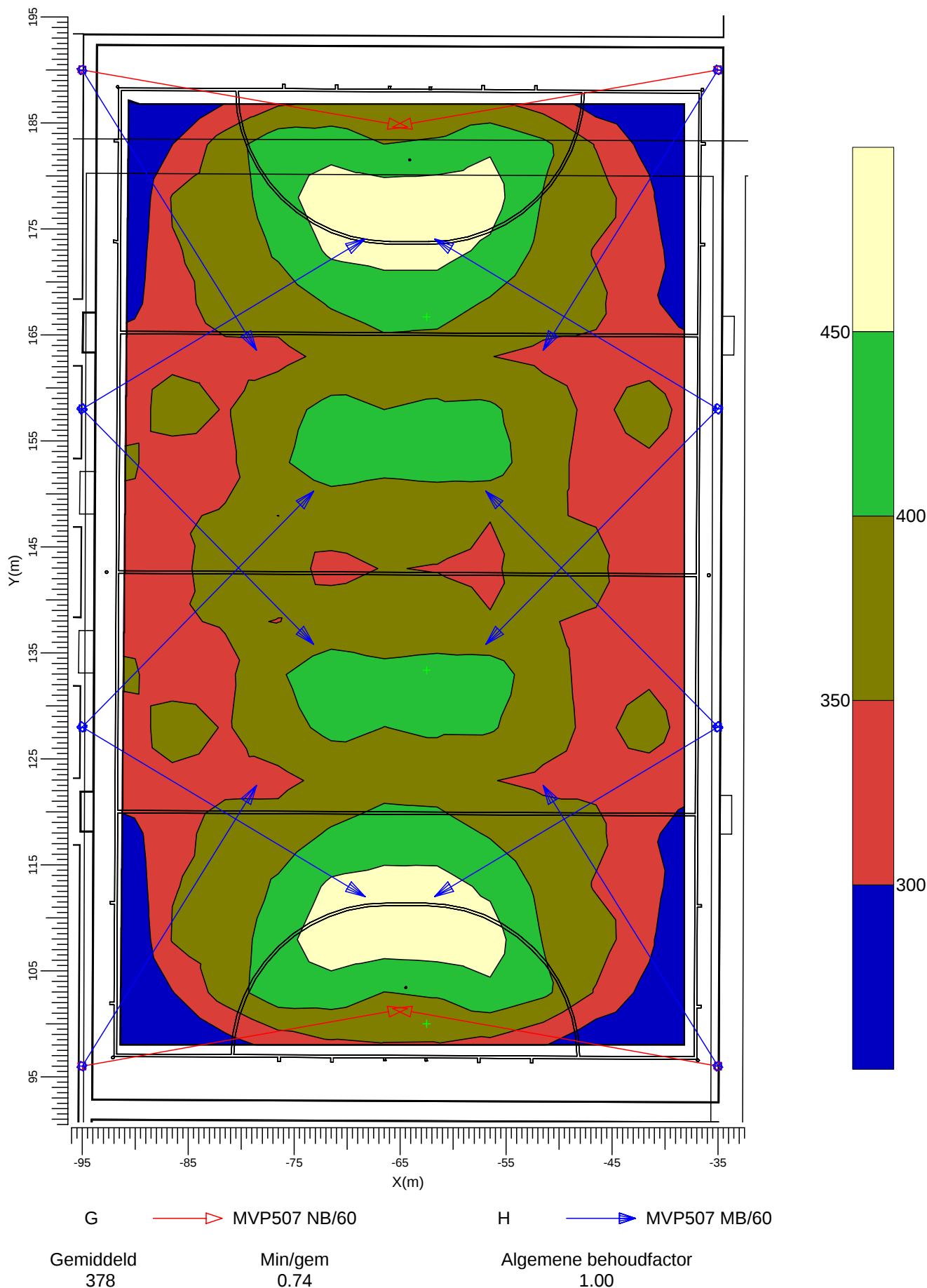
Rekenraster : veld 1 op Z = -0.00 m  
 Berekening : (Vlak-) verlichtingssterkte (lux)



## 3.9 veld 2: Gevuld isolijndiagram

veld 2

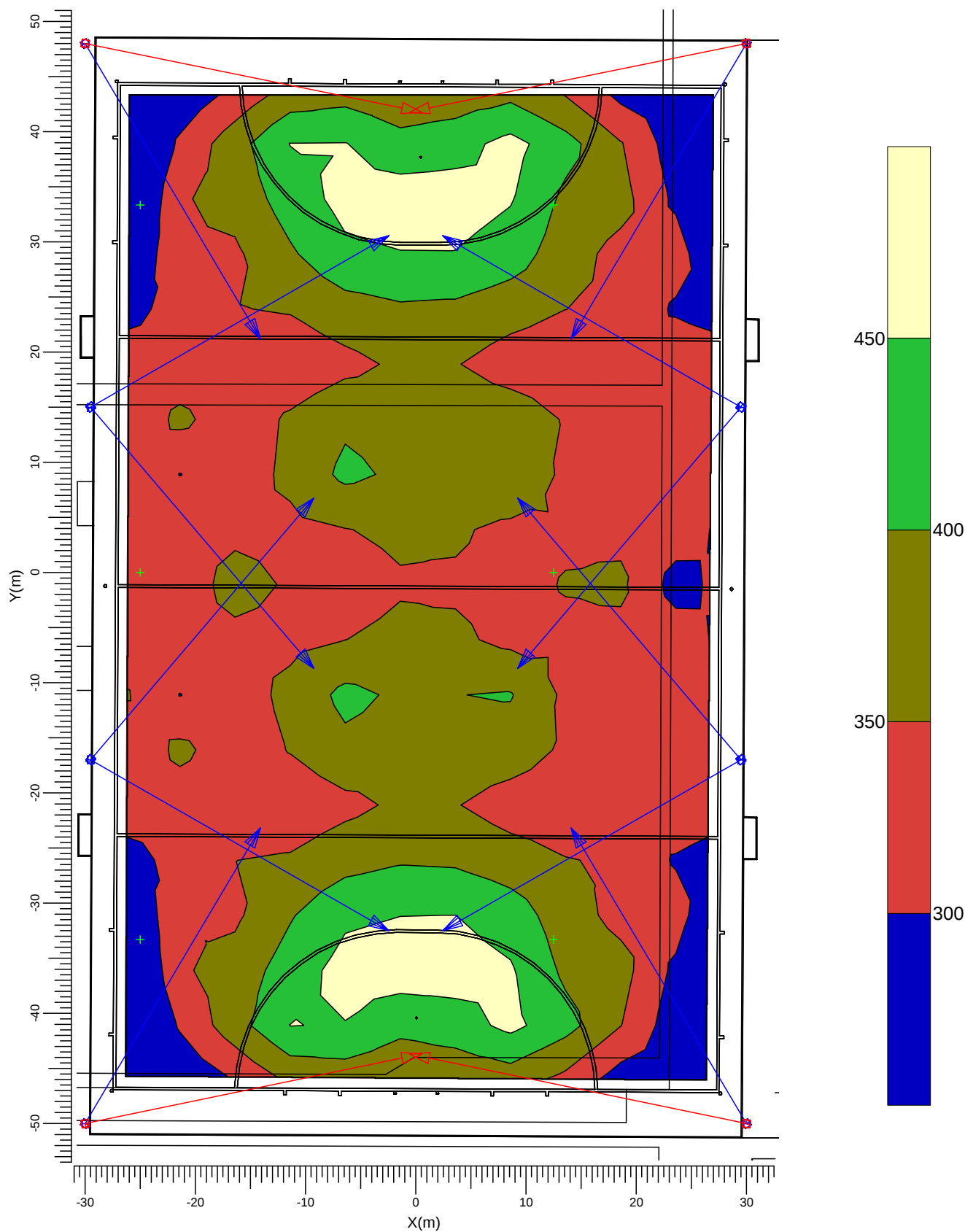
Rekenraster : veld 2 op Z = -0.00 m  
 Berekening : (Vlak-) verlichtingssterkte (lux)



## 3.10 veld 3: Gevuld isolijndiagram

veld 3

Rekenraster : veld 3 op Z = -0.00 m  
 Berekening : (Vlak-) verlichtingssterkte (lux)



G ———&gt; MVP507 NB/60

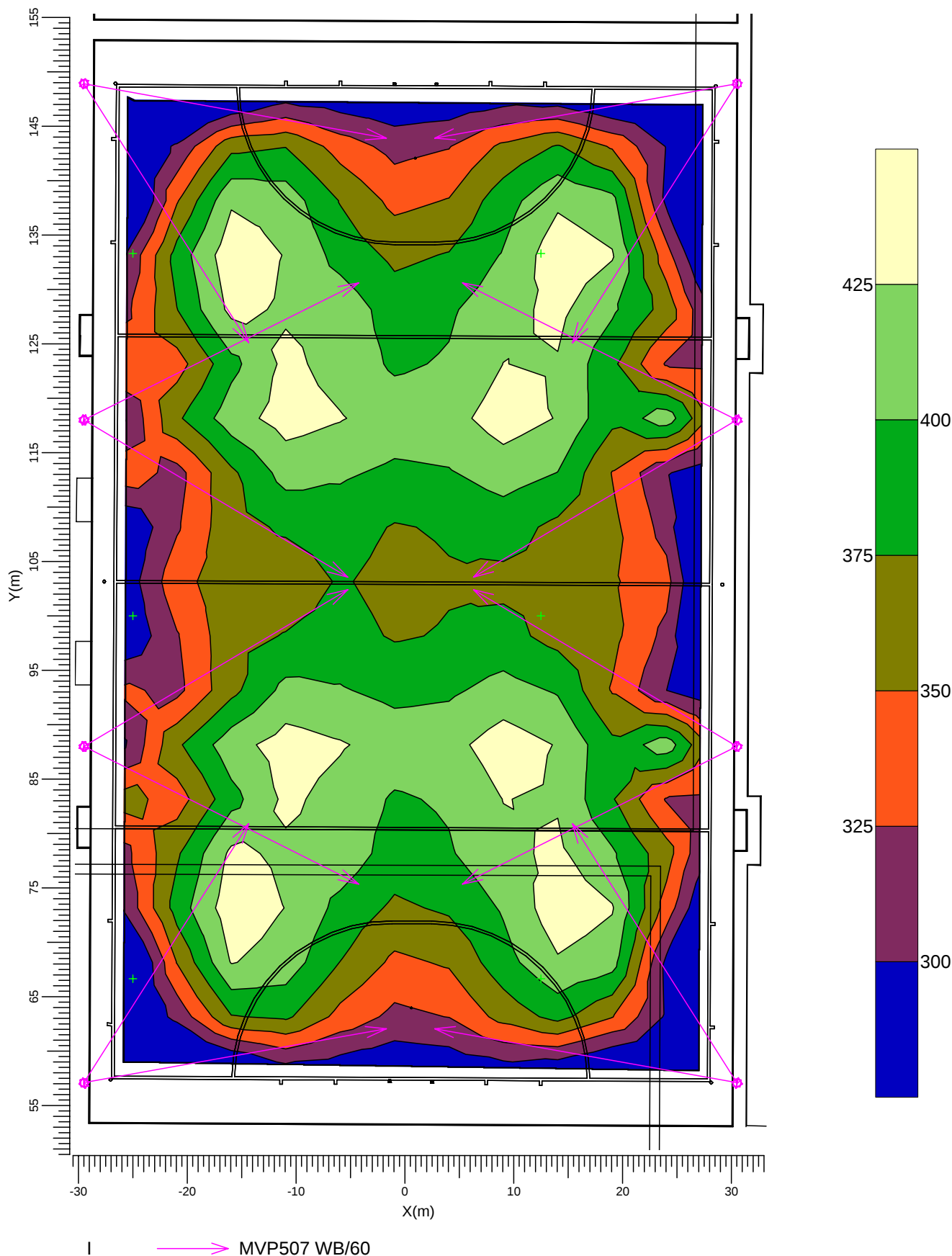
H ———&gt; MVP507 MB/60

Gemiddeld  
364Min/gem  
0.74Algemene behoudfactor  
1.00Schaal  
1:500

## 3.11 veld 4: Gevuld isolijndiagram

veld 4

Rekenraster : veld 4 op Z = -0.00 m  
Berekening : (Vlak-) verlichtingssterkte (lux)



Gemiddeld  
382

Min/gem  
0.77

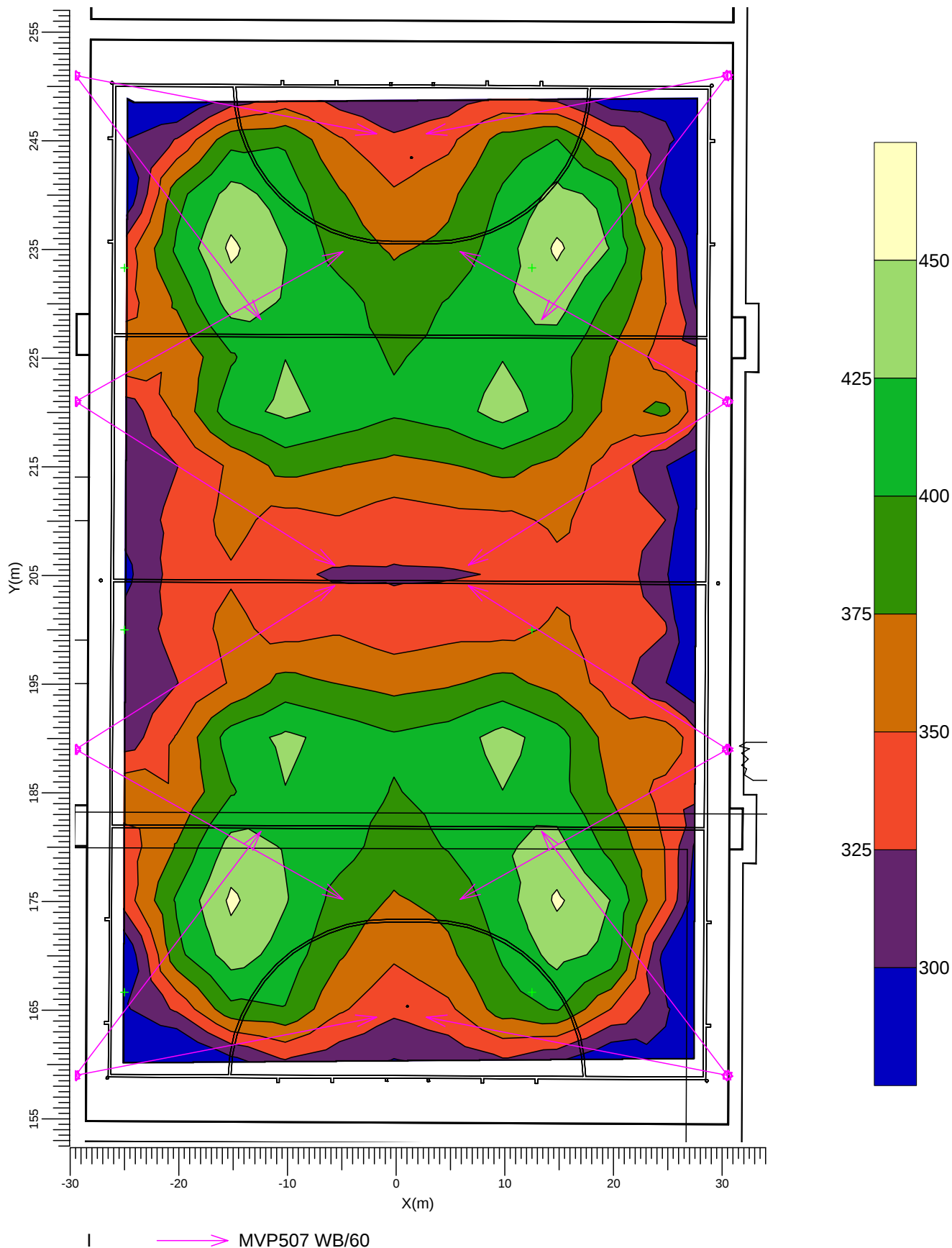
Algemene behoudfactor  
1.00

Schaal  
1:500

## 3.12 veld 5: Gevuld isolijndiagram

veld 5

Rekenraster : veld 5 op Z = -0.00 m  
 Berekening : (Vlak-) verlichtingssterkte (lux)



Gemiddeld  
378

Min/gem  
0.77

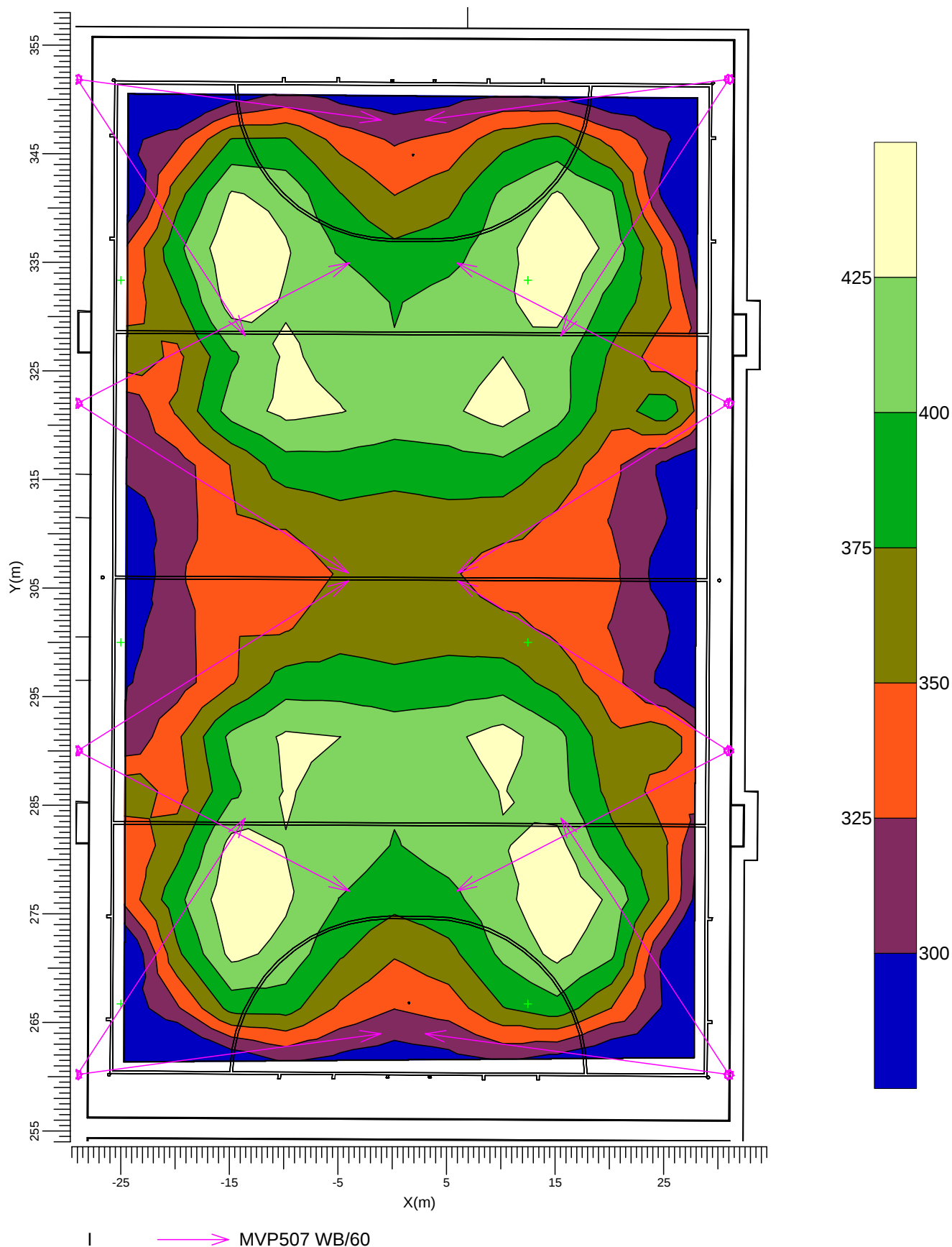
Algemene behoudfactor  
1.00

Schaal  
1:500

## 3.13 veld 6: Gevuld isolijndiagram

veld 6

Rekenraster : veld 6 op Z = -0.00 m  
Berekening : (Vlak-) verlichtingssterkte (lux)



Gemiddeld  
378

Min/gem  
0.76

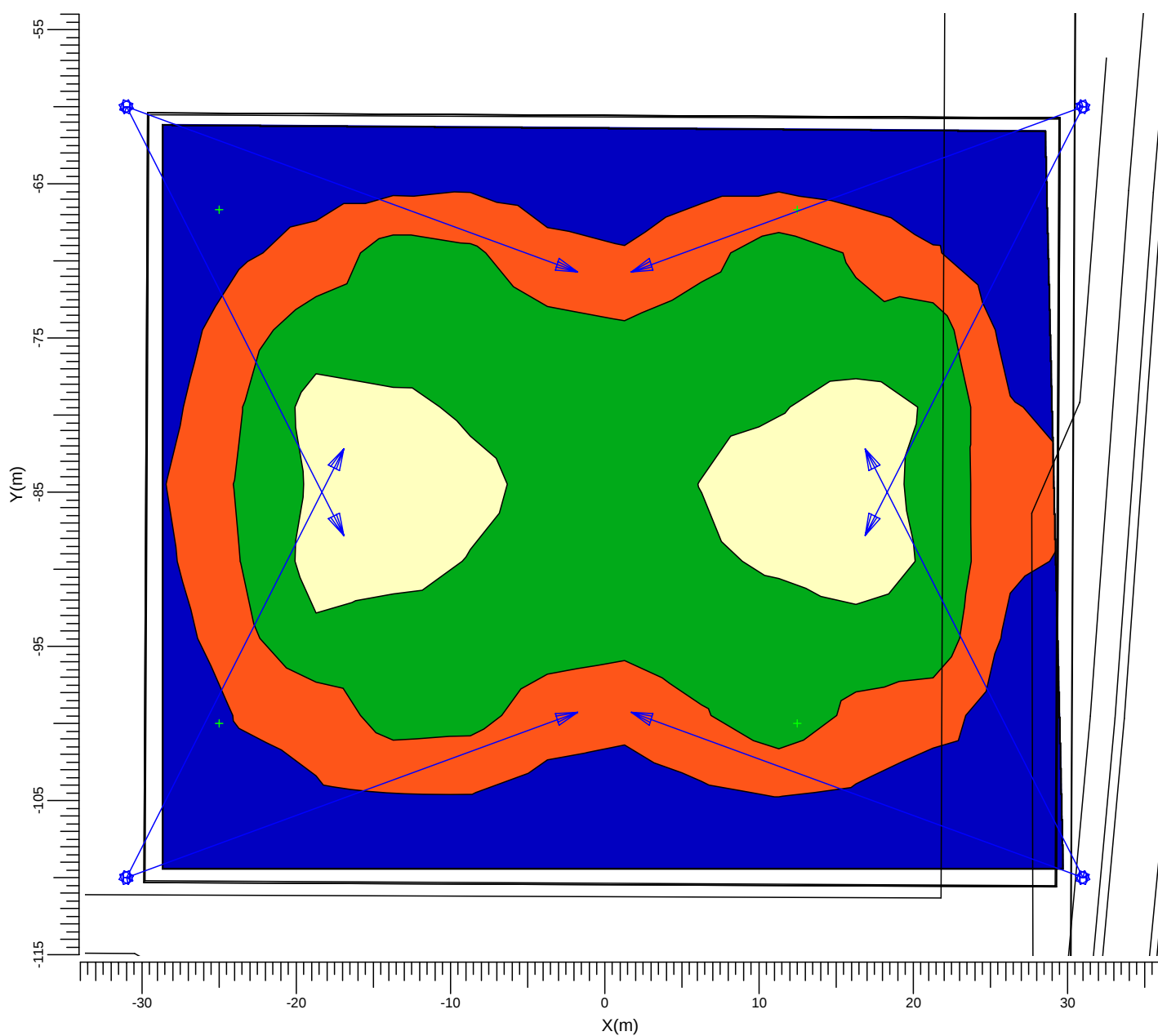
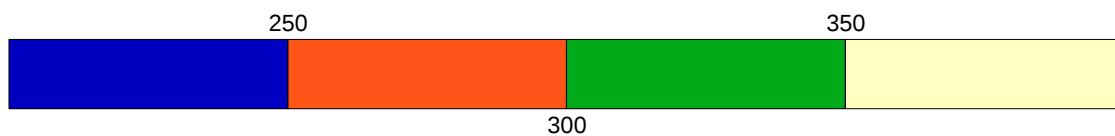
Algemene behoudfactor  
1.00

Schaal  
1:500

## 3.14 jeugdveld: Gevuld isolijndiagram

jeugdveld

Rekenraster : jeugdveld op Z = -0.00 m  
Berekening : (Vlak-) verlichtingssterkte (lux)



Gemiddeld  
296

Min/gem  
0.72

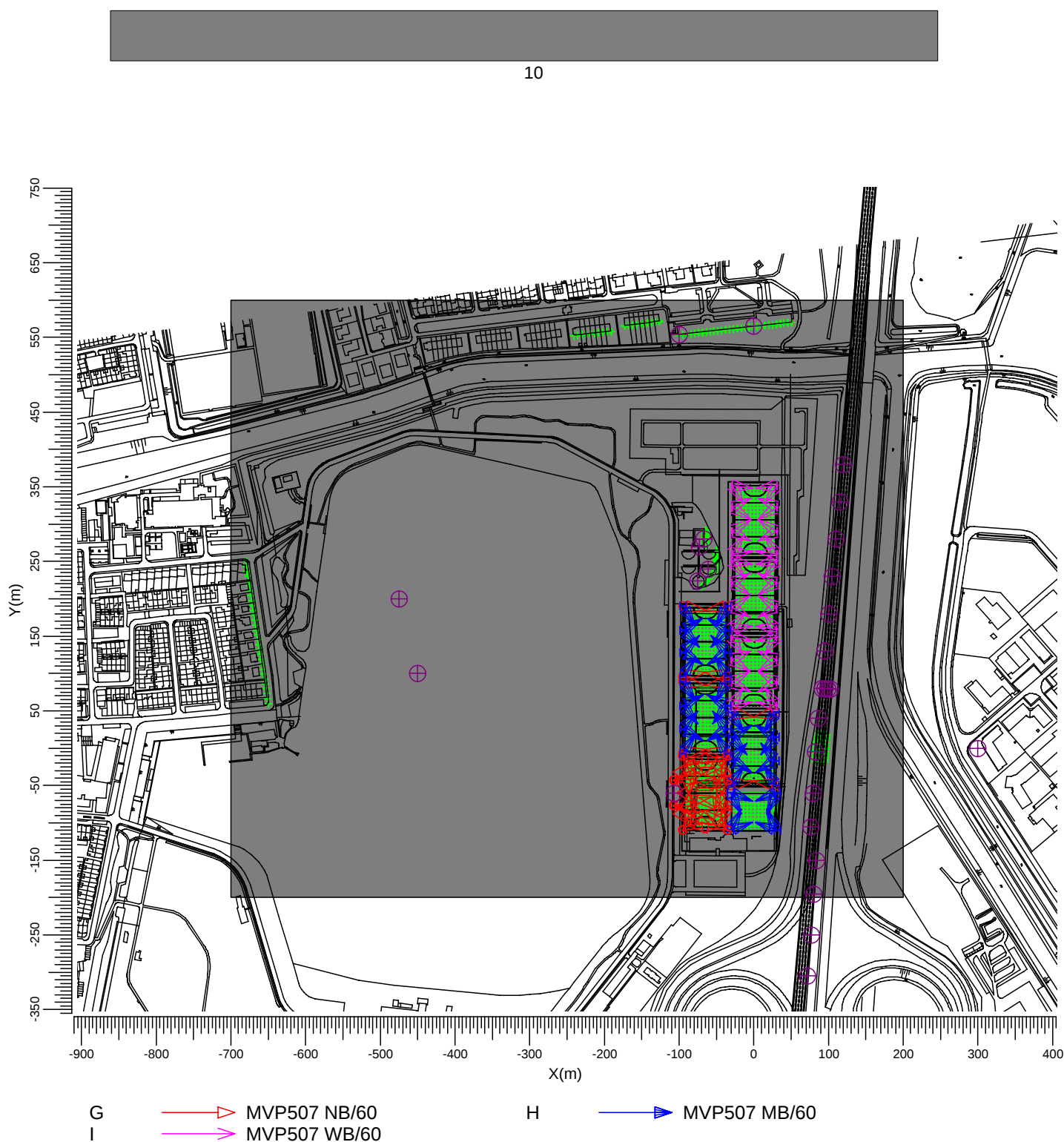
Algemene behoudfactor  
1.00

Schaal  
1:400

## 3.15 wn3: Gevuld isolijndiagram

alles

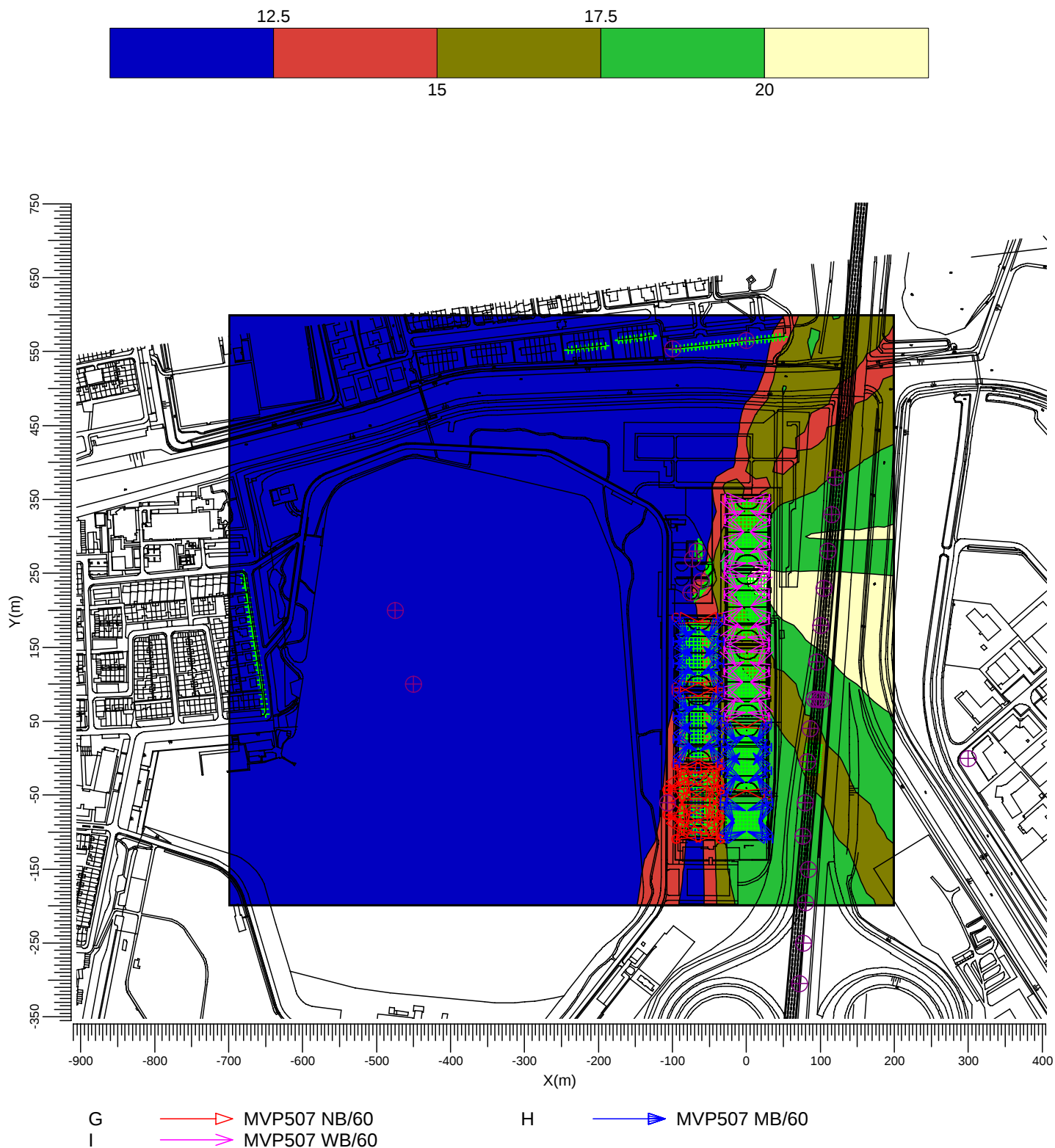
Rekenraster : oosterplas op Z = -0.00 m  
 Berekening : Verblindingswaarde voor moerkerklaan wn 3 (-100.00, 554.00, 1.50)  
 Reflectiefactor : 0.25



## 3.16 woonhuis asiel wn5: Gevuld isolijndiagram

alles

Rekenraster : oosterplas op Z = -0.00 m  
 Berekening : Verblindingswaarde voor woonhuis asiel wn 5 (-67.00, 280.00, 1.50)  
 Reflectiefactor : 0.25



Maximum  
22.1

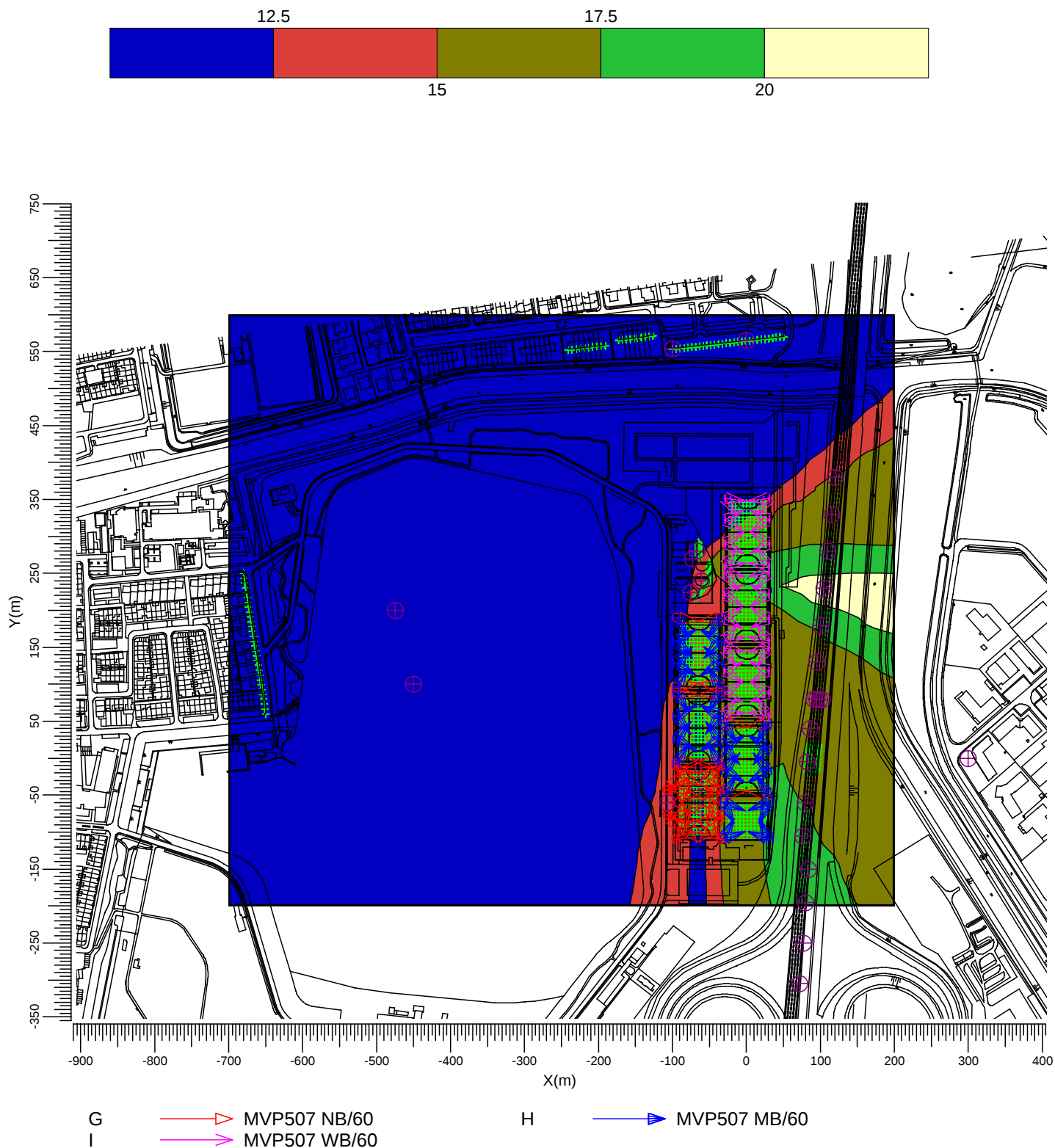
Algemene behoudfactor  
1.00

Schaal  
1:7500

## 3.17 woonhuis asiel wn6: Gevuld isolijndiagram

alles

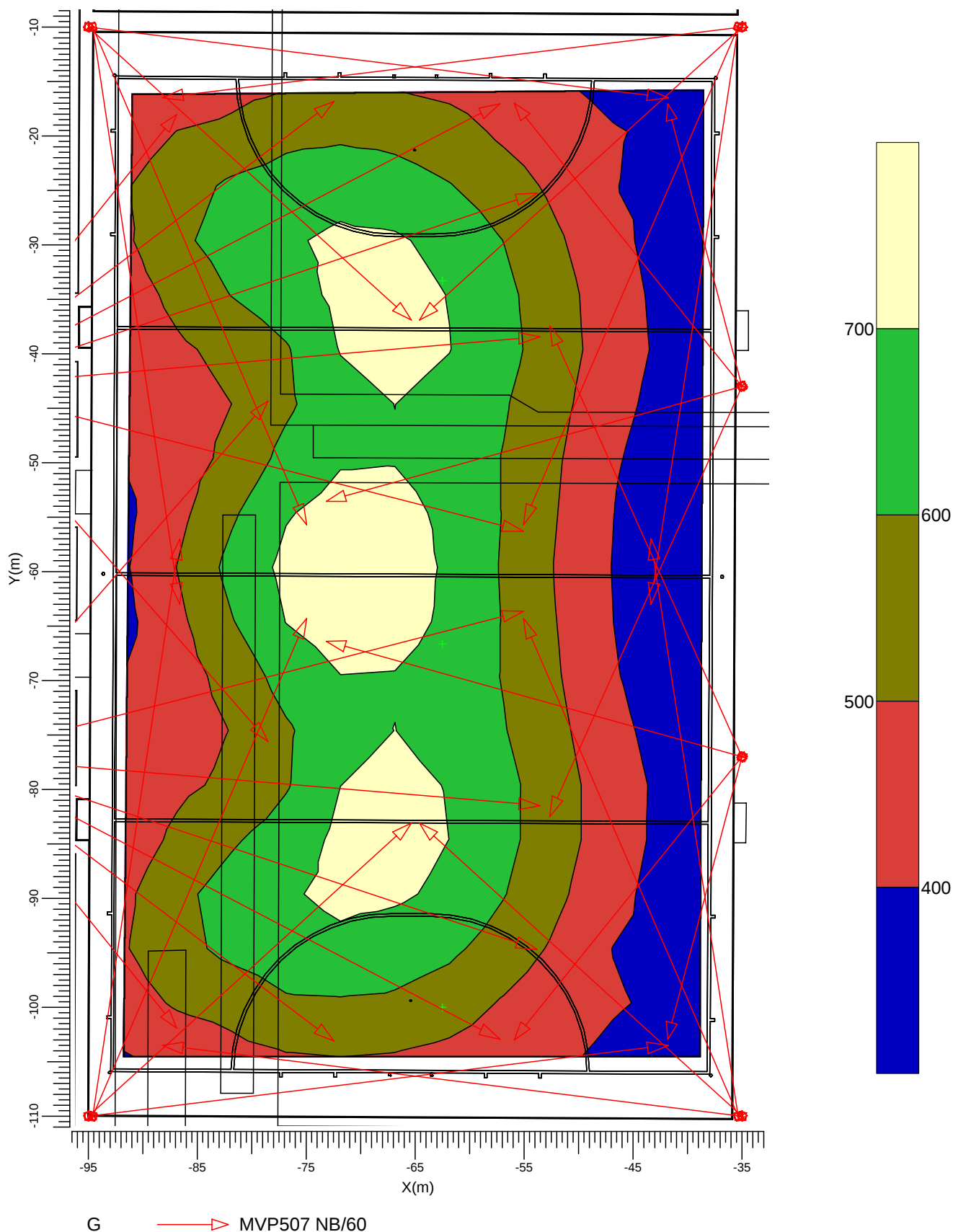
Rekenraster : oosterplas op Z = -0.00 m  
 Berekening : Verblindingswaarde voor woonhuis asiel wn 6 (-73.00, 270.00, 1.50)  
 Reflectiefactor : 0.25



## 3.18 wedstrijd vertikaal: Gevuld isolijndiagram

hoofdveld

Rekenraster : hoofdveld op Z = -0.00 m  
 Berekening : Verlichtingssterkte richting camera (lux)  
 Boven rekenraster : 1.50 m



Gemiddeld  
563

Min/gem  
0.56

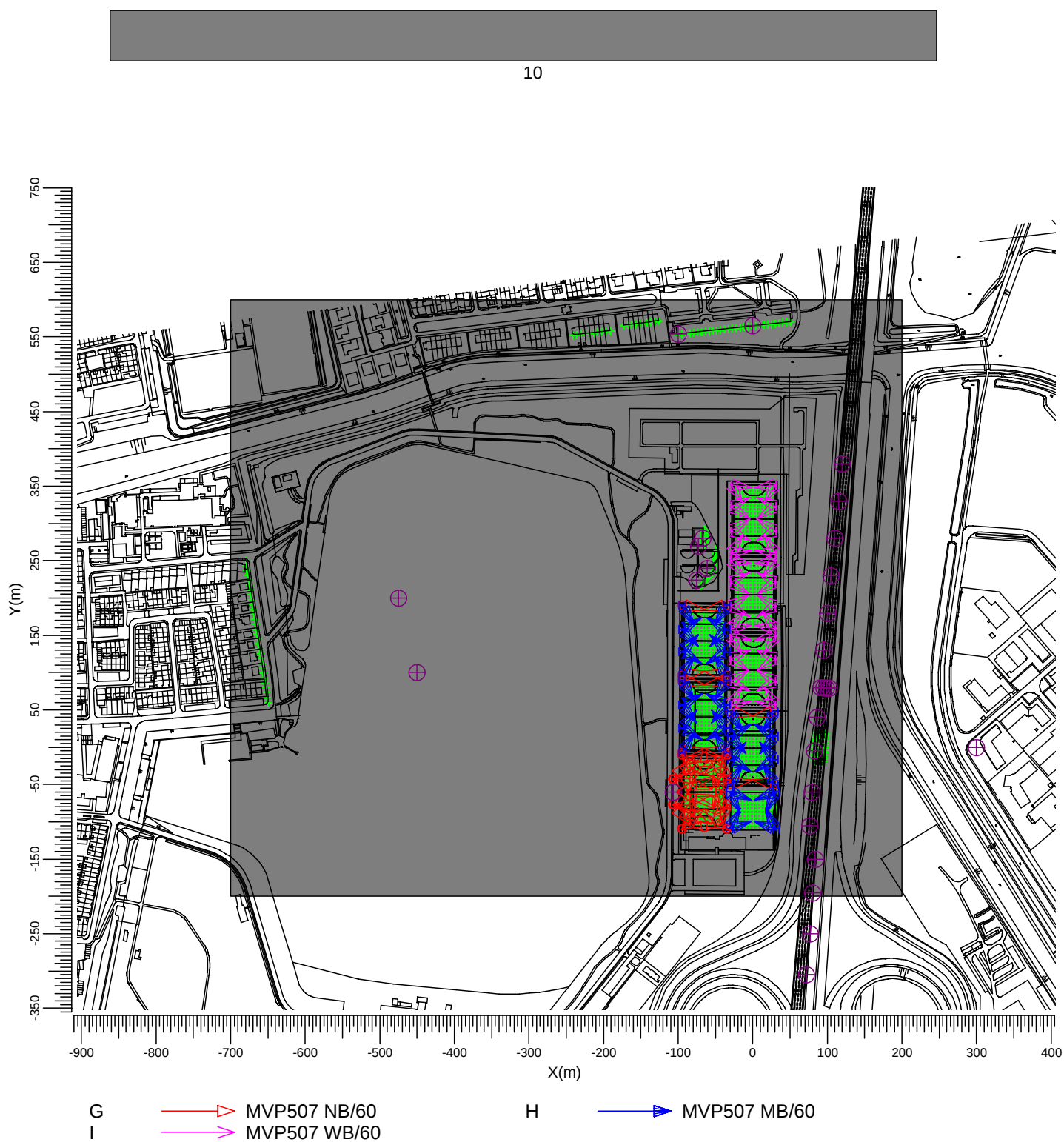
Algemene behoudfactor  
1.00

Schaal  
1:500

## 3.19 wn 1: Gevuld isolijndiagram

alles

Rekenraster : oosterplas op Z = -0.00 m  
Berekening : Verblindingswaarde voor zoomweg wn 1 (-450.00, 100.00, 1.50)  
Reflectiefactor : 0.25



Maximum  
10.0

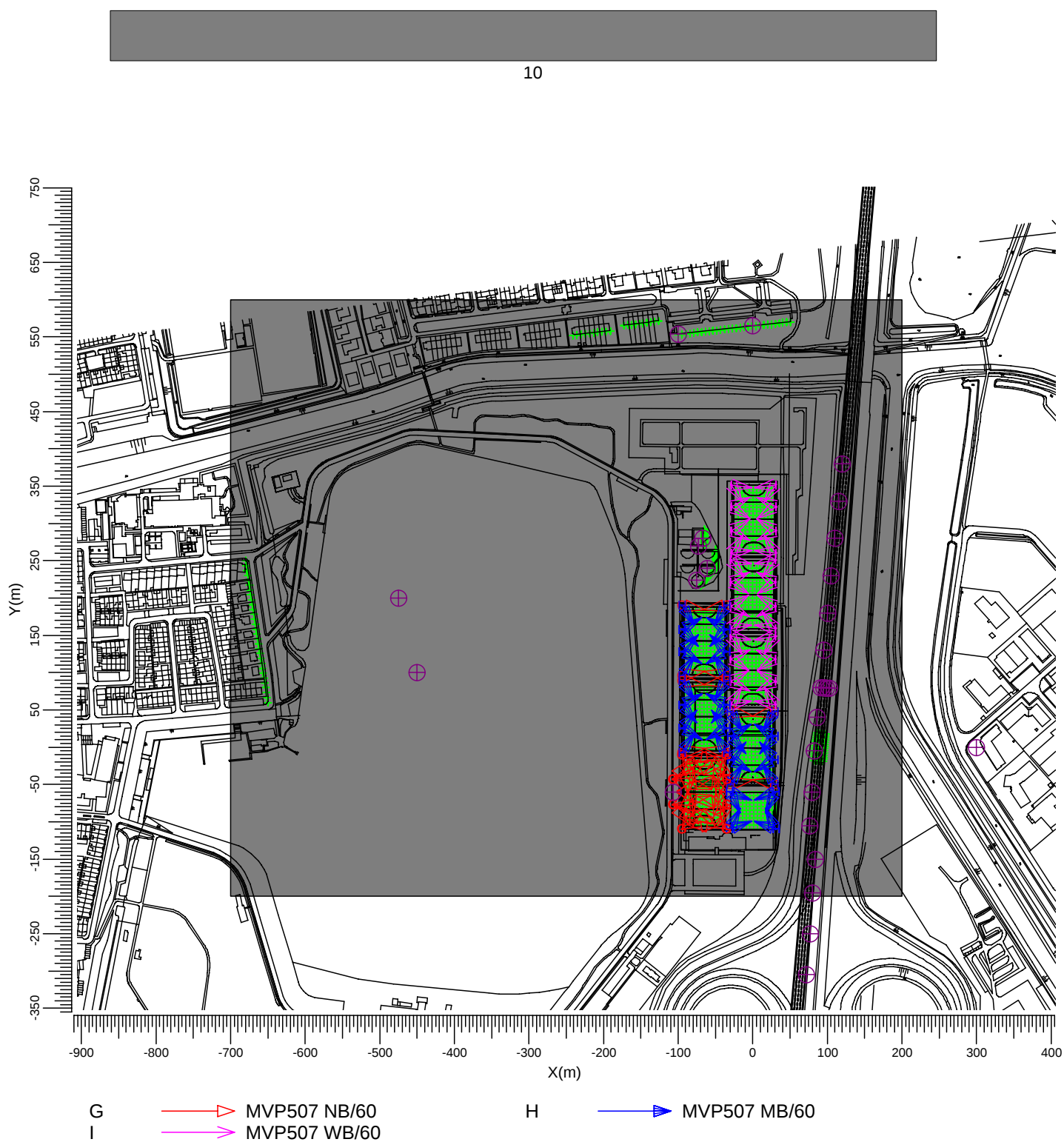
Algemene behoudfactor  
1.00

Schaal  
1:7500

## 3.20 wn 2: Gevuld isolijndiagram

alles

Rekenraster : oosterplas op Z = -0.00 m  
Berekening : Verblindingswaarde voor zoomweg wn 2 (-475.00, 200.00, 1.50)  
Reflectiefactor : 0.25



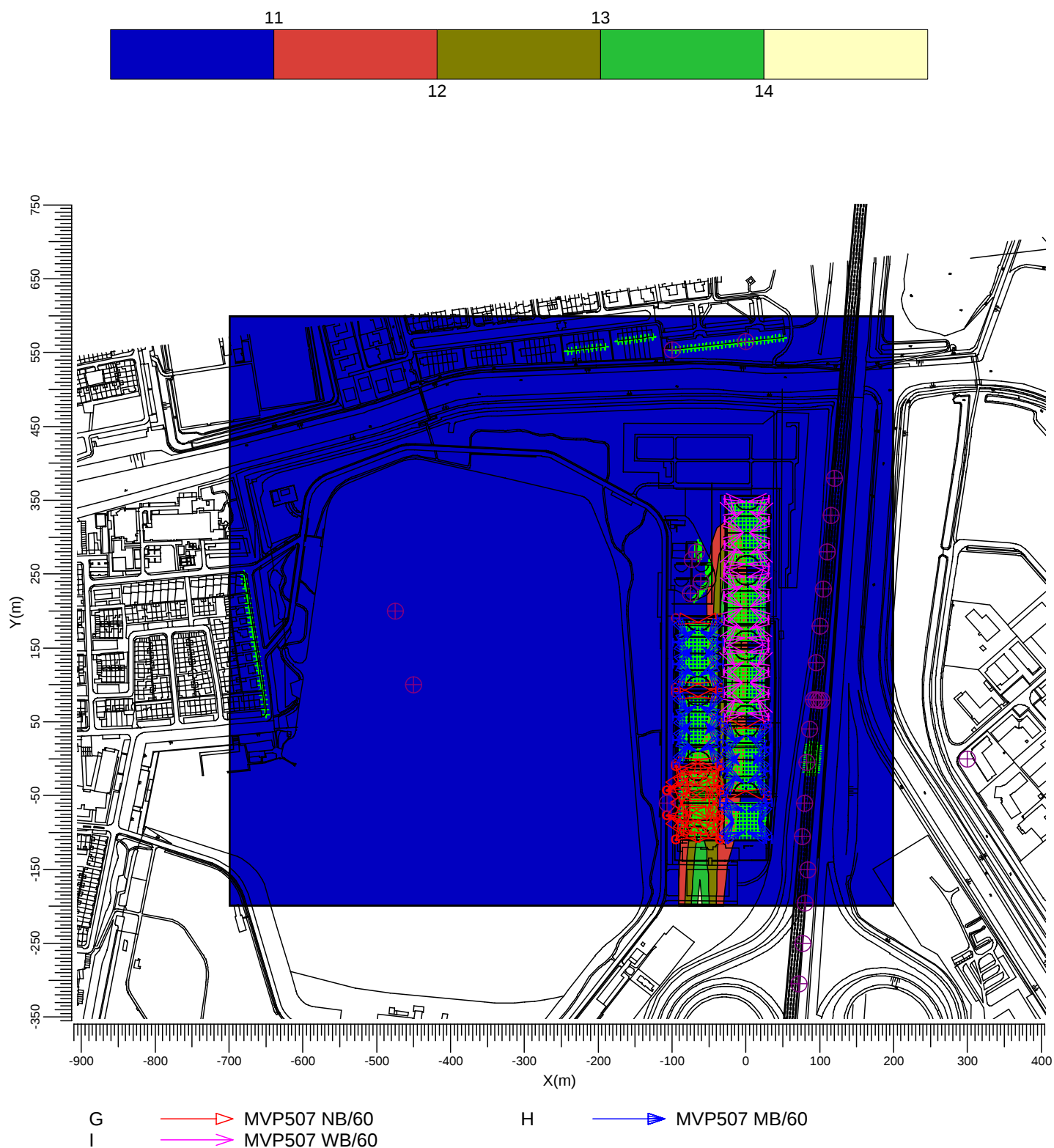
Maximum  
10.0

Algemene behoudfactor  
1.00

Schaal  
1:7500

alles

Rekenraster : oosterplas op Z = -0.00 m  
Berekening : Verblindingswaarde voor moerkerklaan wn 4 (-0.00, 565.00, 1.50)  
Reflectiefactor : 0.25

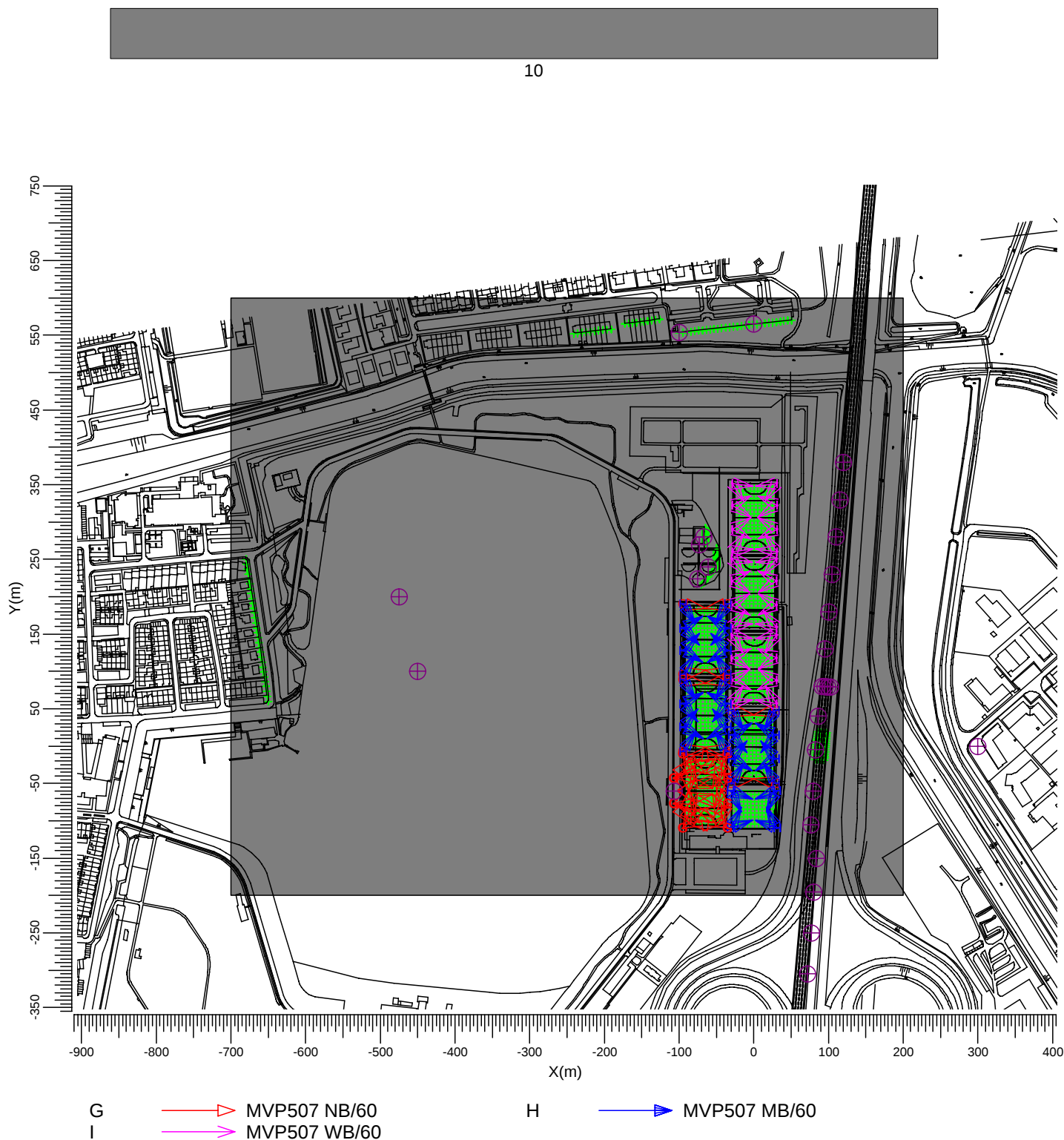


Schaal  
1:7500

## 3.22 oostzijde A2 wn 7: Gevuld isolijndiagram

alles

Rekenraster : oosterplas op Z = -0.00 m  
 Berekening : Verblindingswaarde voor wn 7 oost zijde A2 (300.00, -0.00, 1.50)  
 Reflectiefactor : 0.25



Maximum  
10.0

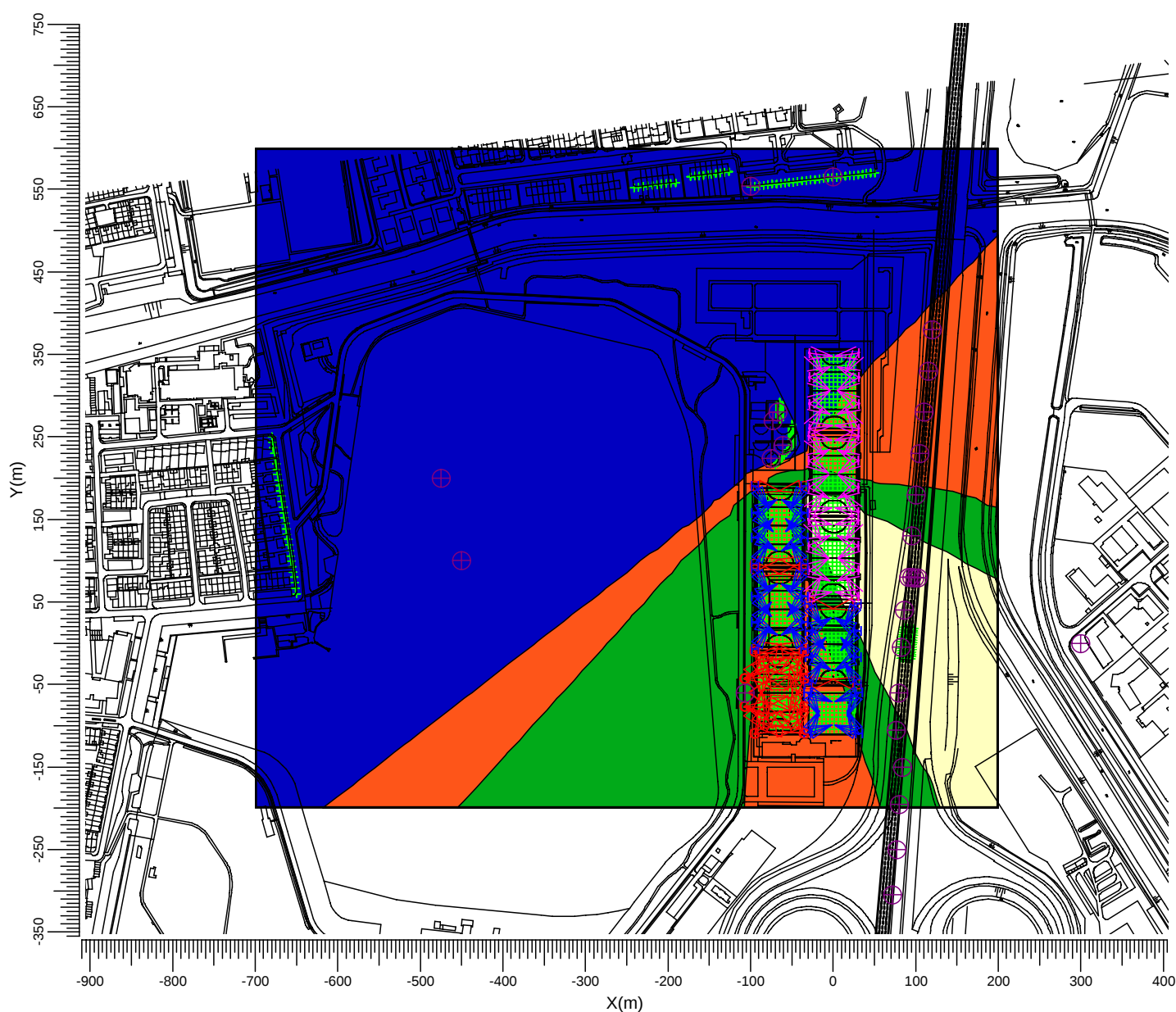
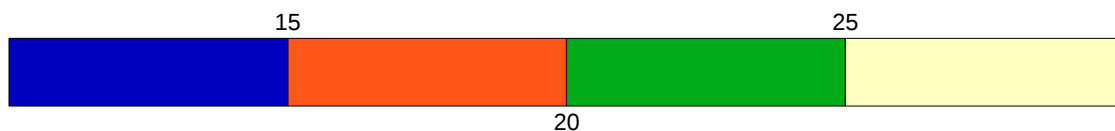
Algemene behoudfactor  
1.00

Schaal  
1:7500

## 3.23 hokken wn 8: Gevuld isolijndiagram

alles

Rekenraster : oosterplas op Z = -0.00 m  
 Berekening : Verblindingswaarde voor hokken wn 8 (-75.00, 224.00, 1.50)  
 Reflectiefactor : 0.25



G → MVP507 NB/60  
 I → MVP507 WB/60

H → MVP507 MB/60

Maximum  
28.9

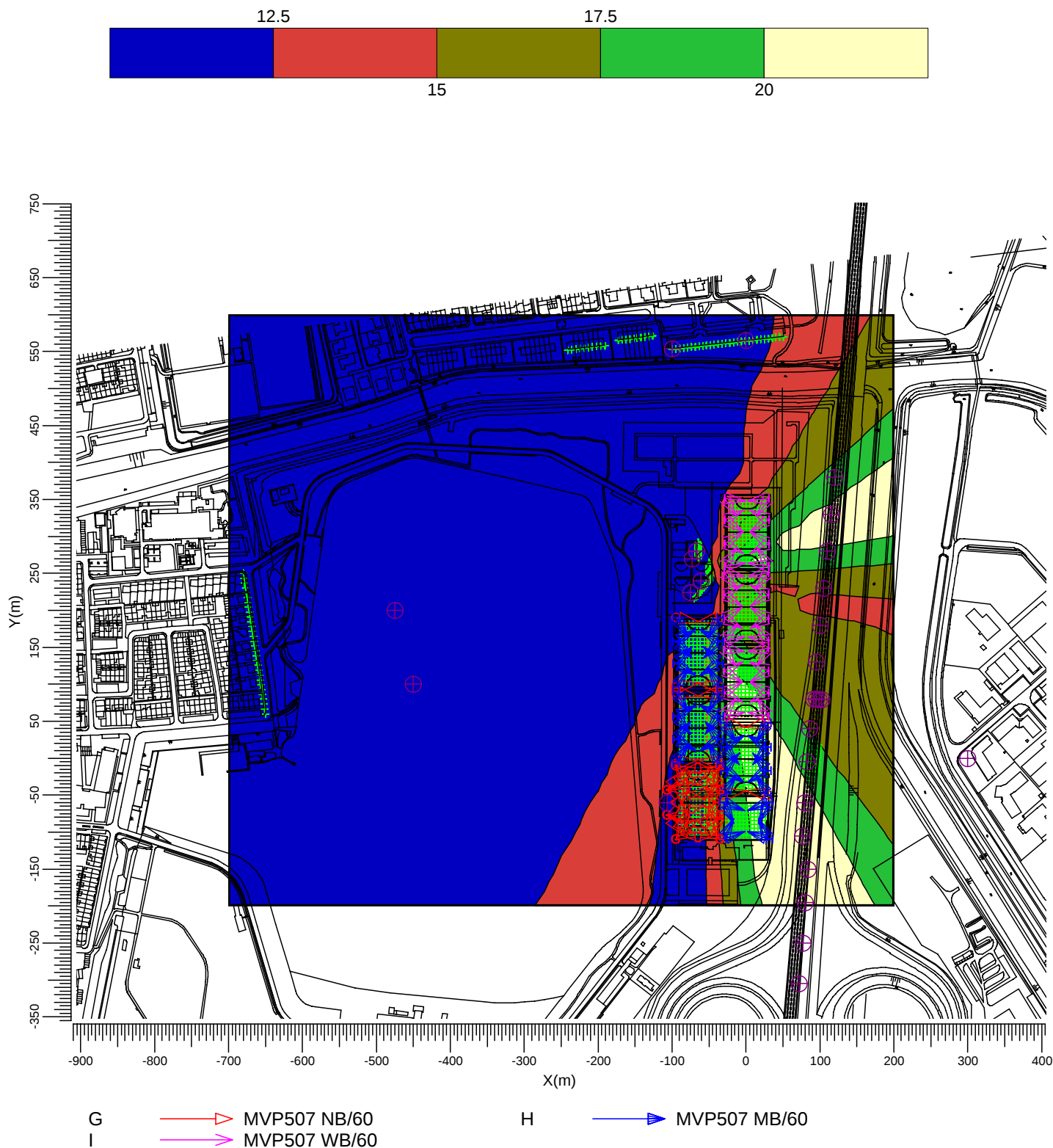
Algemene behoudfactor  
1.00

Schaal  
1:7500

## 3.24 hokken wn 9: Gevuld isolijndiagram

alles

Rekenraster : oosterplas op Z = -0.00 m  
 Berekening : Verblindingswaarde voor hokken wn 9 (-61.00, 240.00, 1.50)  
 Reflectiefactor : 0.25



Maximum  
21.8

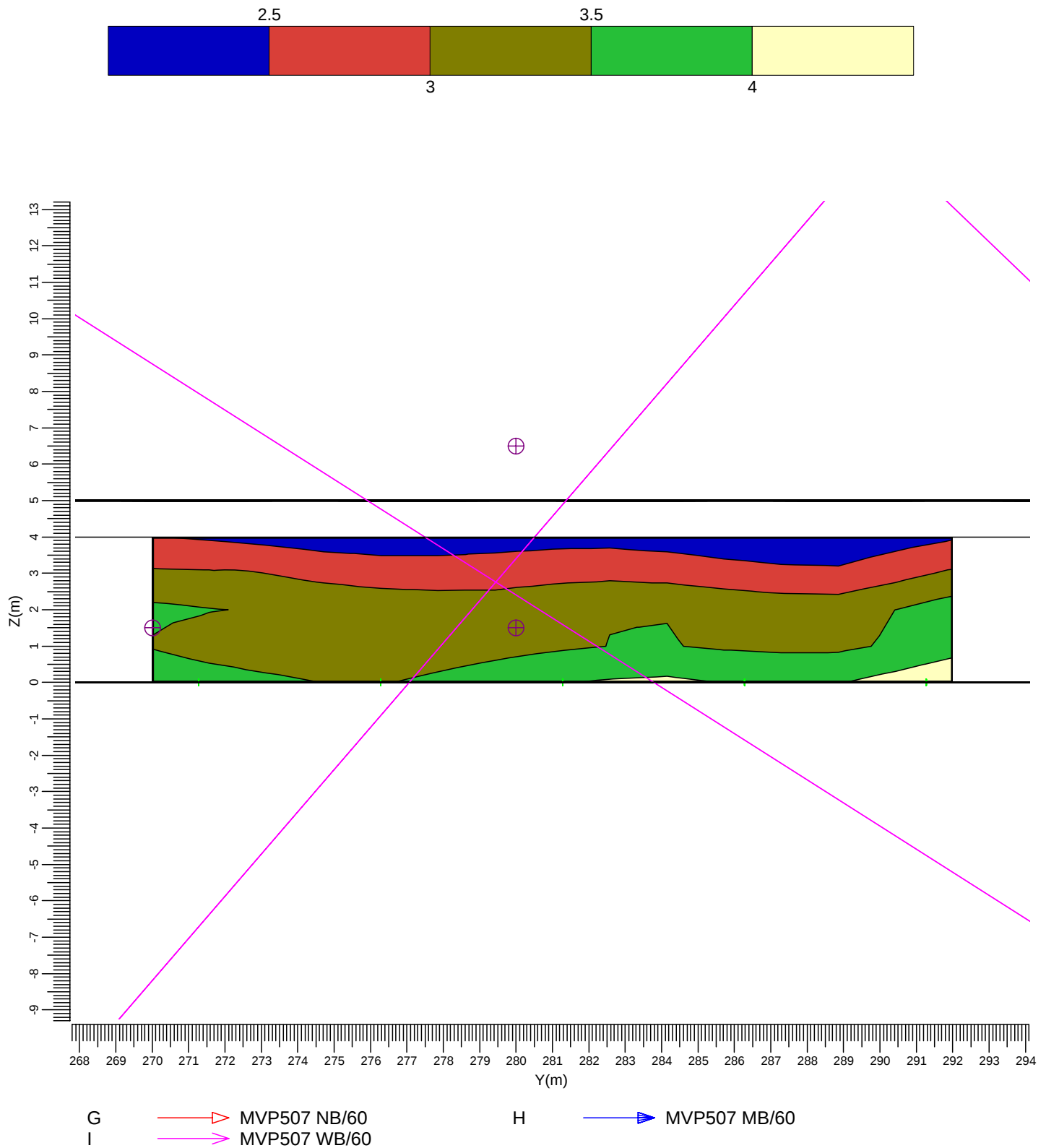
Algemene behoudfactor  
1.00

Schaal  
1:7500

## 3.25 woonhuis oostgevel asiel: Gevuld isolijndiagram

alles

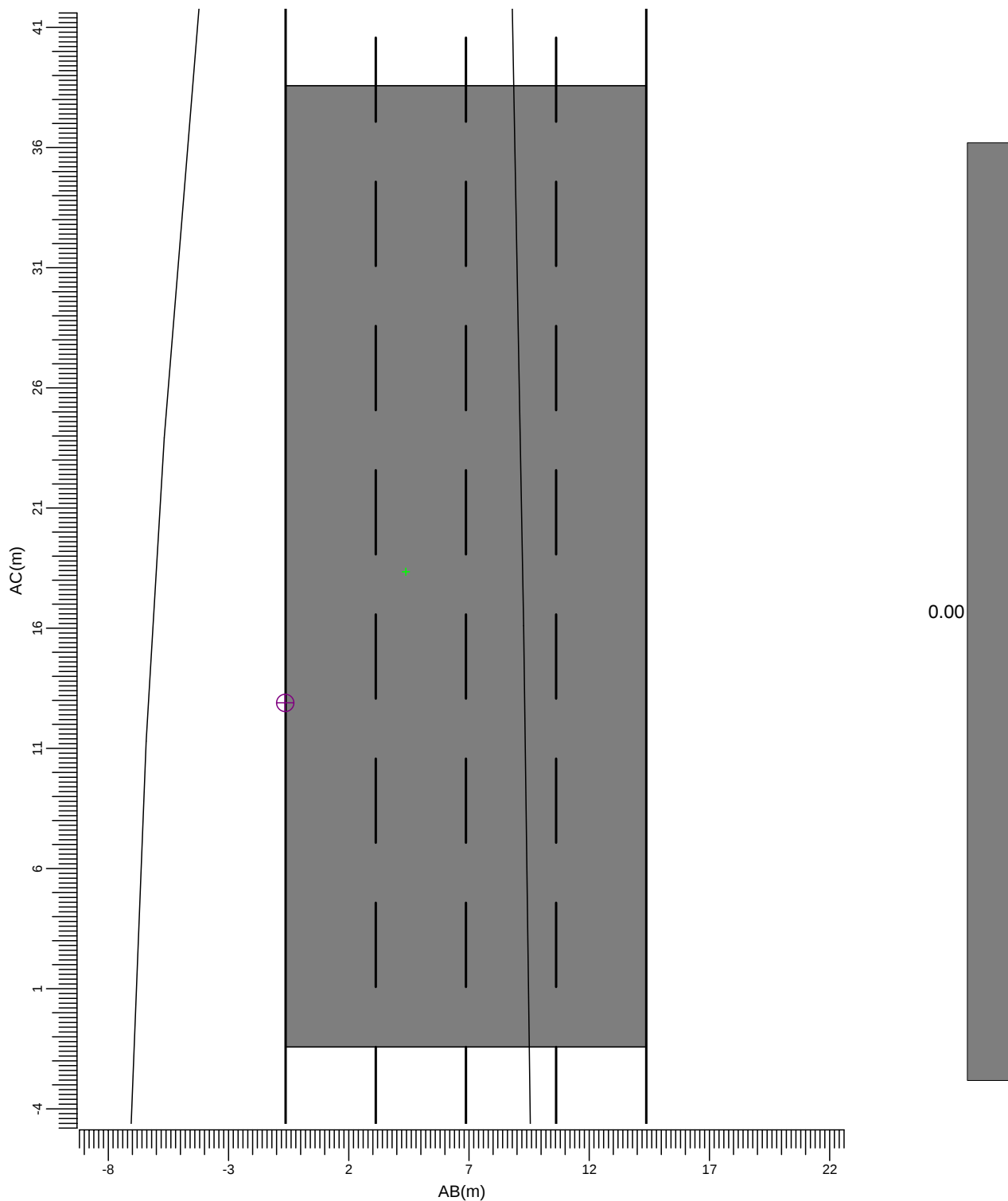
Rekenraster : woonhuis oostgevel asiel op X = -65.00 m  
 Berekening : (Vlak-) verlichtingssterkte (lux)



## 3.26 Enkelbaans weg (01): Gevuld isolijndiagram

hoofdveld

Rekenraster : Enkelbaans weg TI (102.58, 79.21, 6.50) = Onbepaald  
 Berekening : Luminantie richting Enkelbaans weg (01) (102.58, 79.21, 6.50) (cd/m<sup>2</sup>)  
 Wegdek : CIE C1 met Q0 = 0.100



|                       |         |                       |
|-----------------------|---------|-----------------------|
| (84.77, 19.10, 5.00)  | C-----D | (98.47, 17.90, 5.00)  |
| (81.53, -17.90, 5.00) | A-----B | (95.23, -19.10, 5.00) |

G → MVP507 NB/60

Gemiddeld  
0.00

Minimum  
0.00

Min/gem  
0.00

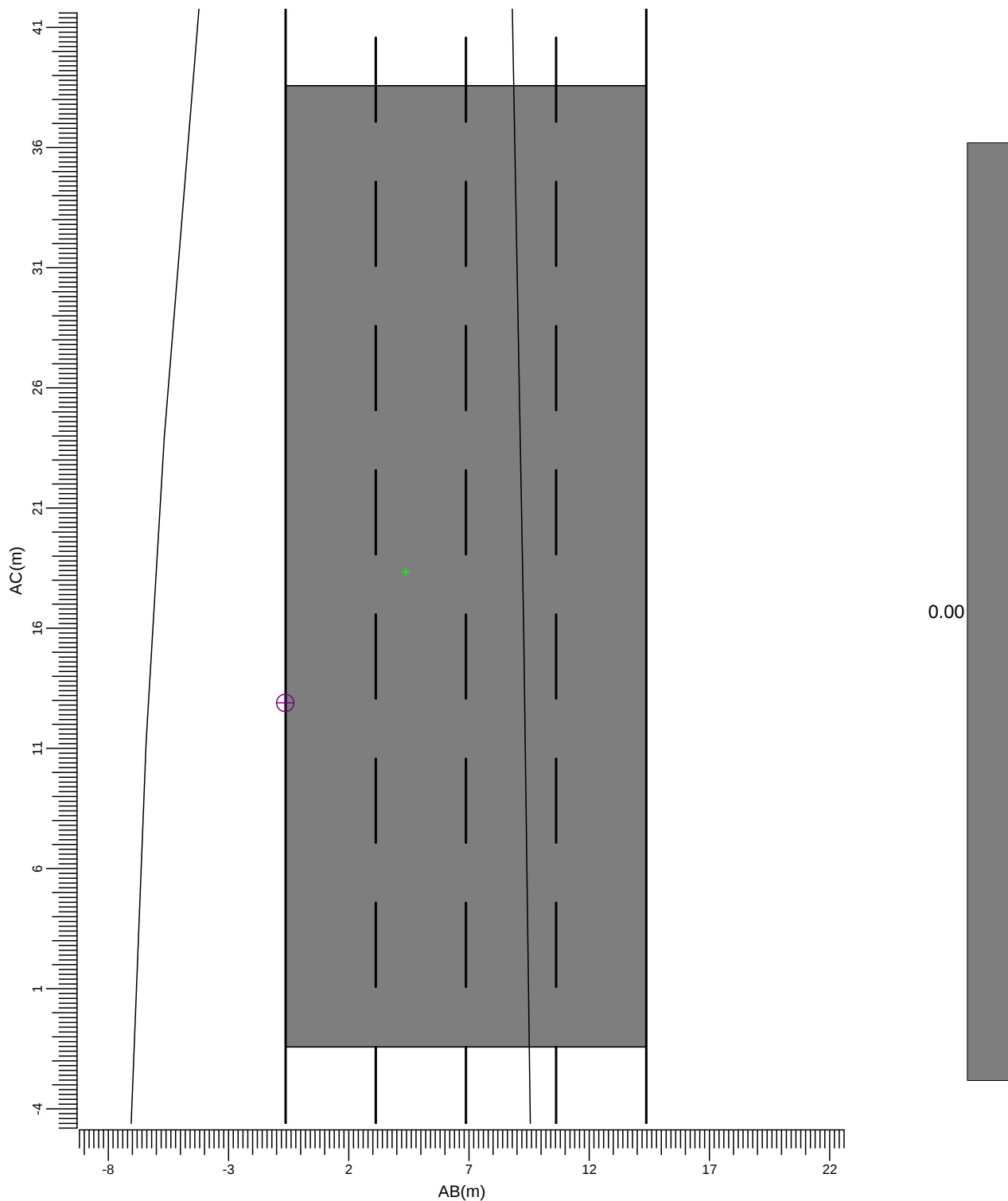
Algemene behoudfactor  
1.00

Schaal  
1:250

## 3.27 Enkelbaans weg (02): Gevuld isolijndiagram

hoofdveld

Rekenraster : Enkelbaans weg TI ( 98.84, 79.53, 6.50) = Onbepaald  
 Berekening : Luminantie richting Enkelbaans weg (02) (98.84, 79.53, 6.50) (cd/m<sup>2</sup>)  
 Wegdek : CIE C1 met Q0 = 0.100



|                       |         |                       |
|-----------------------|---------|-----------------------|
| (84.77, 19.10, 5.00)  | C-----D | (98.47, 17.90, 5.00)  |
| (81.53, -17.90, 5.00) | A-----B | (95.23, -19.10, 5.00) |

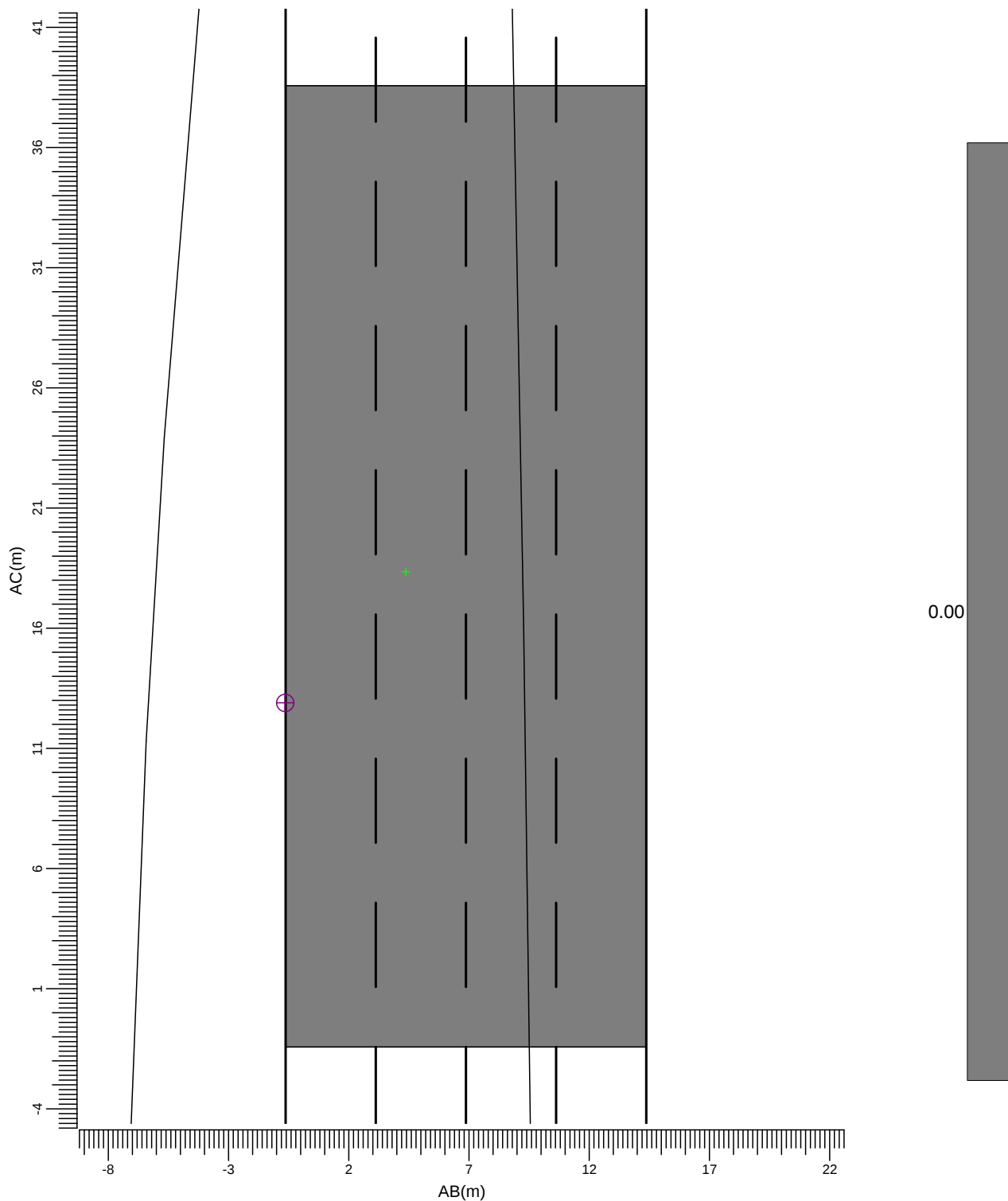
G → MVP507 NB/60

Gemiddeld  
0.00Minimum  
0.00Min/gem  
0.00Algemene behoudfactor  
1.00Schaal  
1:250

## 3.28 Enkelbaans weg (03): Gevuld isolijndiagram

hoofdveld

Rekenraster : Enkelbaans weg TI ( 95.10, 79.86, 6.50) = Onbepaald  
 Berekening : Luminantie richting Enkelbaans weg (03) (95.10, 79.86, 6.50) (cd/m<sup>2</sup>)  
 Wegdek : CIE C1 met Q0 = 0.100



|                       |         |                       |
|-----------------------|---------|-----------------------|
| (84.77, 19.10, 5.00)  | C-----D | (98.47, 17.90, 5.00)  |
| (81.53, -17.90, 5.00) | A-----B | (95.23, -19.10, 5.00) |

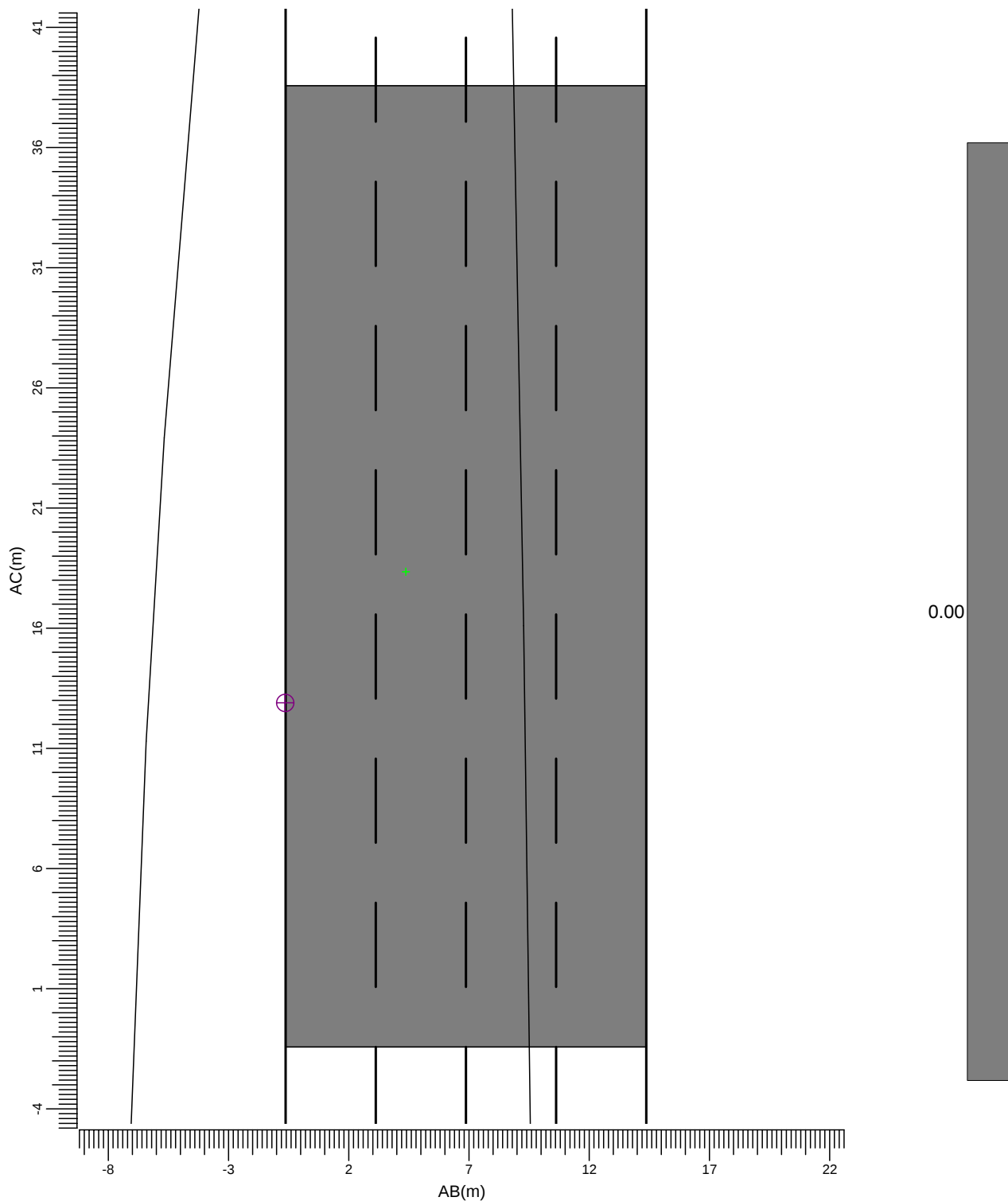
G → MVP507 NB/60

Gemiddeld  
0.00Minimum  
0.00Min/gem  
0.00Algemene behoudfactor  
1.00Schaal  
1:250

## 3.29 Enkelbaans weg (04): Gevuld isolijndiagram

hoofdveld

Rekenraster : Enkelbaans weg TI ( 91.37, 80.19, 6.50) = Onbepaald  
 Berekening : Luminantie richting Enkelbaans weg (04) (91.37, 80.19, 6.50) (cd/m<sup>2</sup>)  
 Wegdek : CIE C1 met Q0 = 0.100



|                       |         |                       |
|-----------------------|---------|-----------------------|
| (84.77, 19.10, 5.00)  | C-----D | (98.47, 17.90, 5.00)  |
| (81.53, -17.90, 5.00) | A-----B | (95.23, -19.10, 5.00) |

G → MVP507 NB/60

Gemiddeld  
0.00

Minimum  
0.00

Min/gem  
0.00

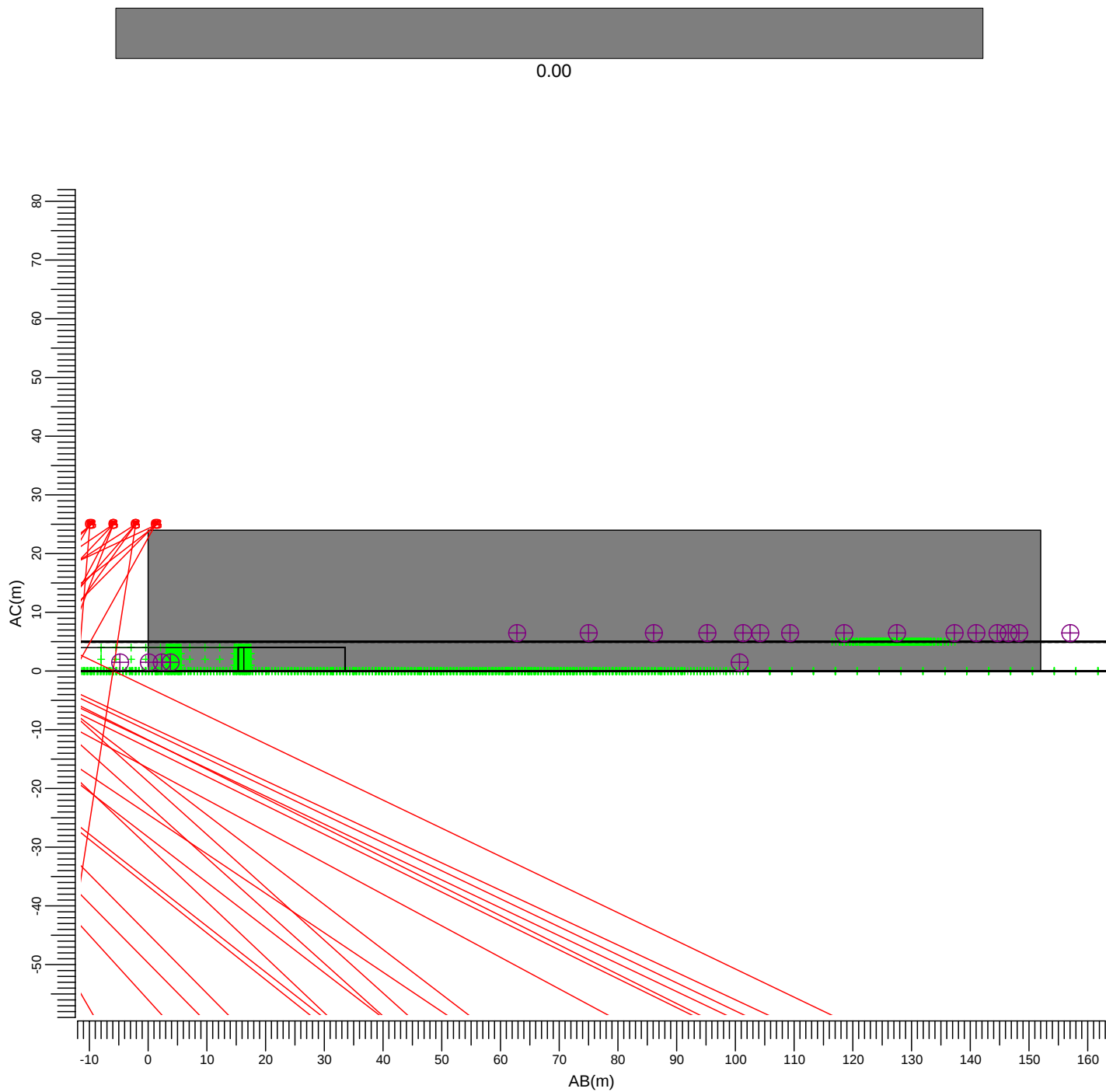
Algemene behoudfactor  
1.00

Schaal  
1:250

## 3.30 Berekening: Gevuld isolijndiagram

hoofdveld

Rekenraster : gevels moerkerkn 61-301  
 Berekening : Horizontale verlichtingssterkte (lux)



(-100.00, 553.00, 24.00) C-----D (51.00, 570.00, 24.00)  
 (-100.00, 553.00, -0.00) A-----B (51.00, 570.00, -0.00)

G  MVP507 NB/60

Gemiddeld  
0.00

Minimum  
0.00

Min/gem  
0.04

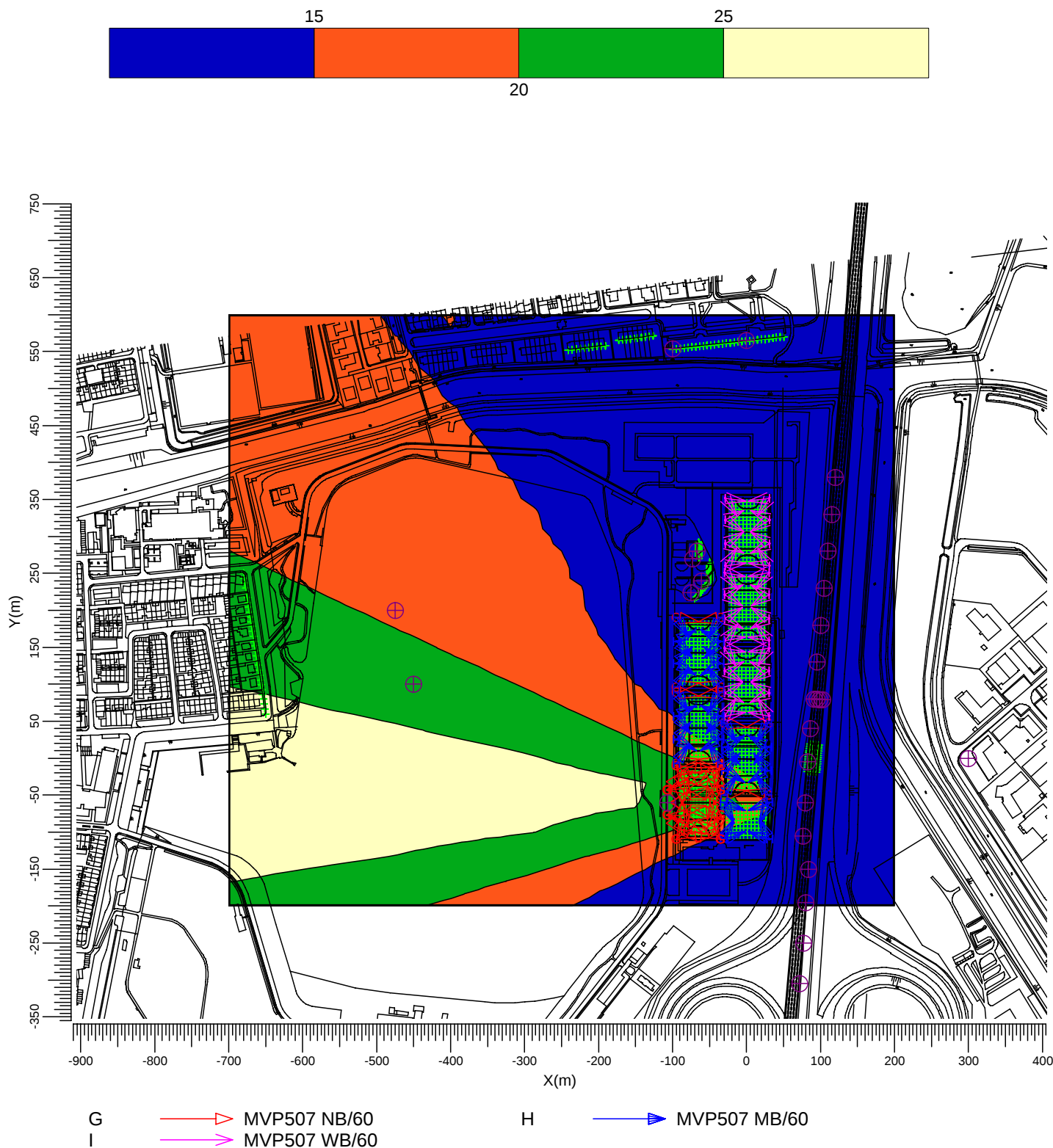
Algemene behoudfactor  
1.00

Schaal  
1:1000

## 3.31 A2-wn1: Gevuld isolijndiagram

alles

Rekenraster : oosterplas op Z = -0.00 m  
 Berekening : Verblindingswaarde voor A2-wn1 (79.00, -60.00, 6.50)  
 Reflectiefactor : 0.25



Maximum  
27.8

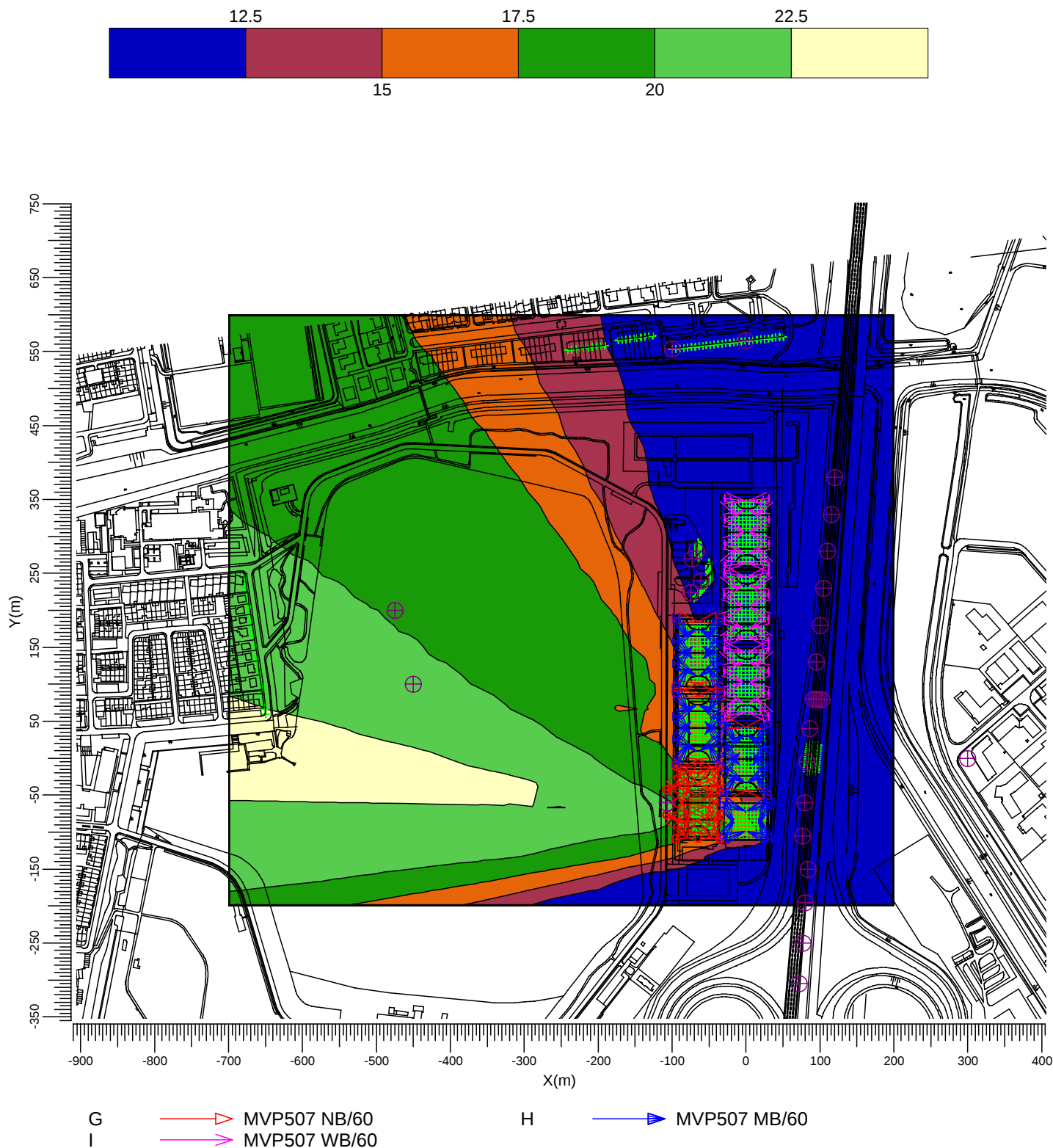
Algemene behoudfactor  
1.00

Schaal  
1:7500

## 3.32 A2-wn2: Gevuld isolijndiagram

alles

Rekenraster : oosterplas op Z = -0.00 m  
 Berekening : Verblindingswaarde voor A2-wn2 (76.00, -105.00, 6.50)  
 Reflectiefactor : 0.25



Maximum  
24.2

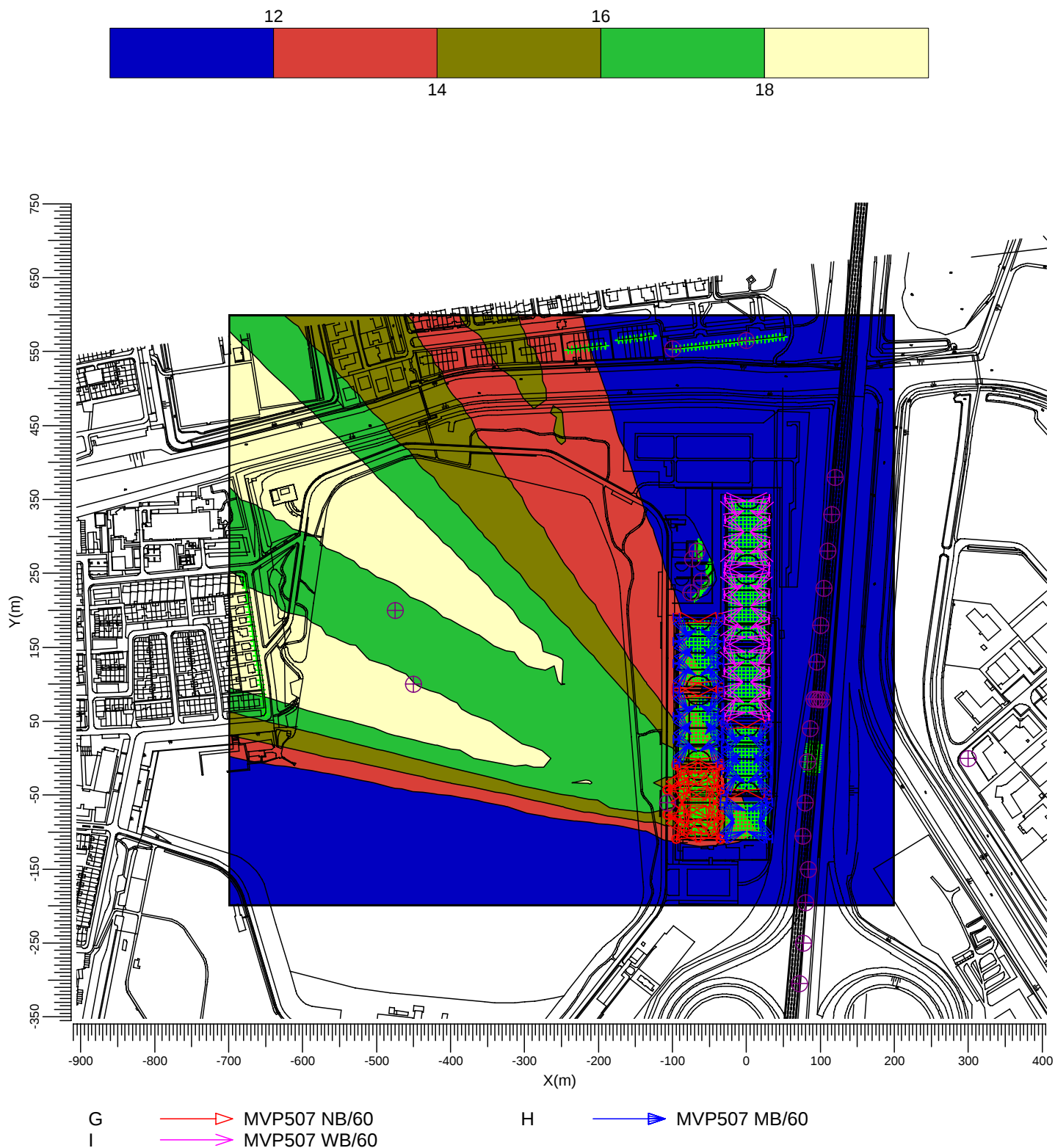
Algemene behoudfactor  
1.00

Schaal  
1:7500

## 3.33 A2-wn3: Gevuld isolijndiagram

alles

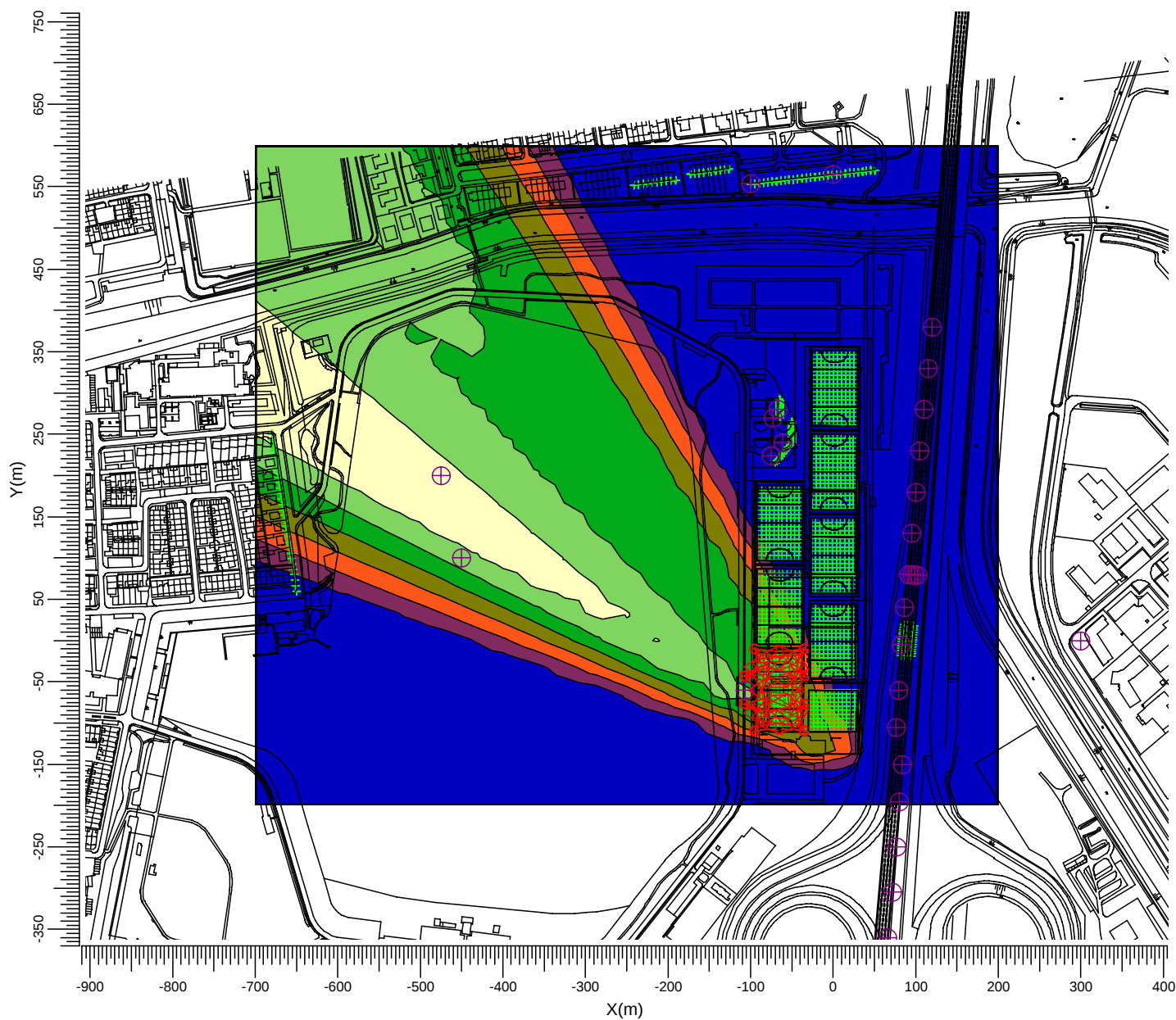
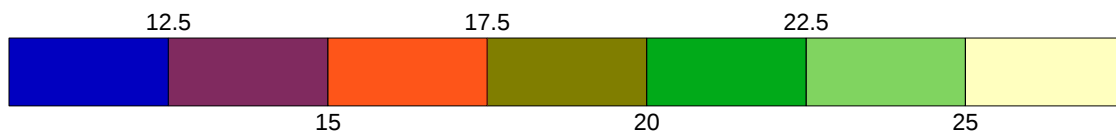
Rekenraster : oosterplas op Z = -0.00 m  
 Berekening : Verblindingswaarde voor A2-wn3 (84.00, -150.00, 6.50)  
 Reflectiefactor : 0.25



## 3.34 A2-wn4: Gevuld isolijndiagram

hoofdveld

Rekenraster : oosterplas op Z = -0.00 m  
Berekening : Verblindingswaarde voor A2-wn4 (80.00, -195.00, 6.50)  
Reflectiefactor : 0.25



G → MVP507 NB/60

Maximum  
27.2

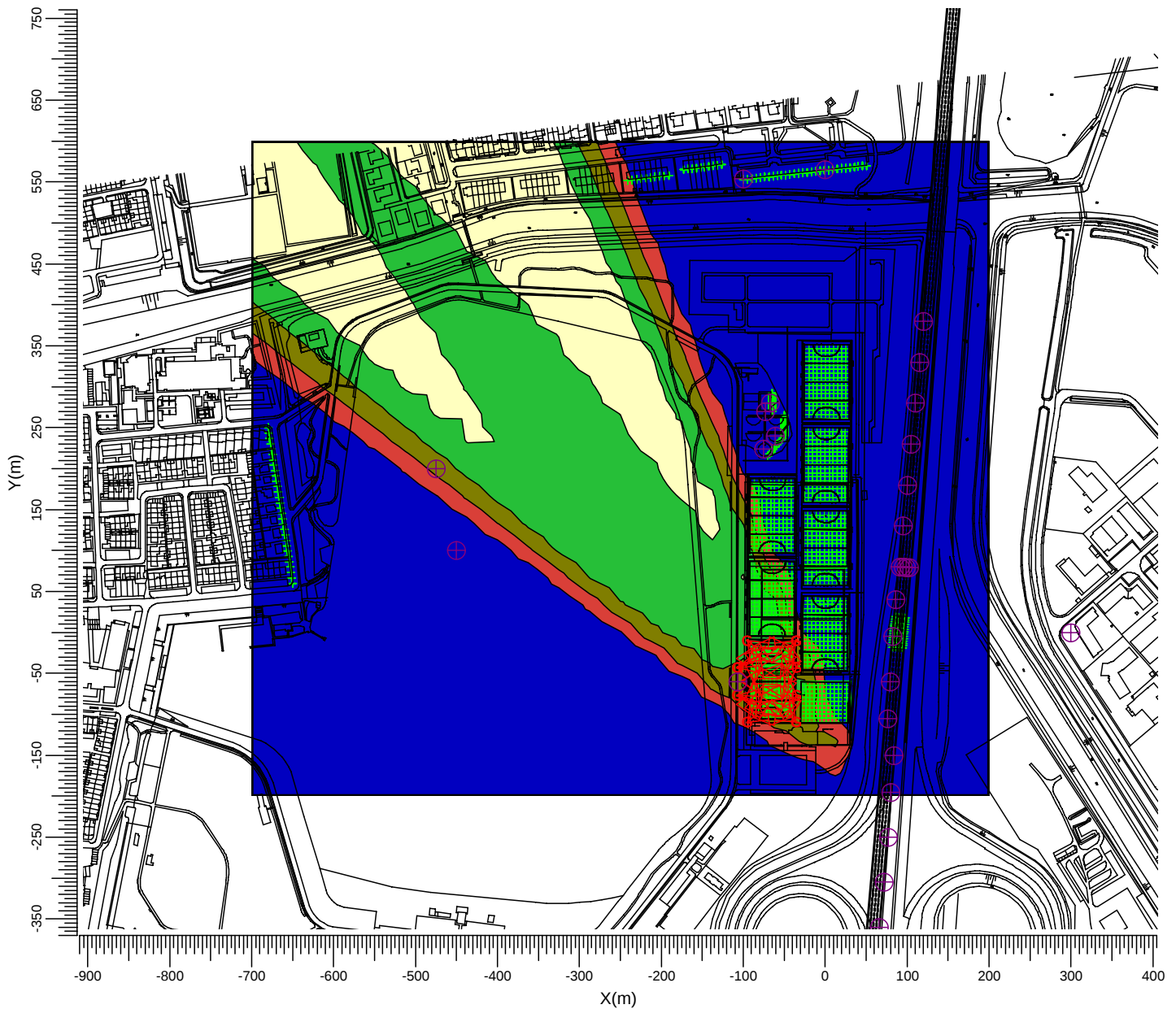
Algemene behoudfactor  
1.00

Schaal  
1:7500

## 3.35 A2-wn5: Gevuld isolijndiagram

hoofdveld

Rekenraster : oosterplas op Z = -0.00 m  
Berekening : Verblindingswaarde voor A2-wn5 (77.00, -250.00, 6.50)  
Reflectiefactor : 0.25



G → MVP507 NB/60

Maximum  
22.1

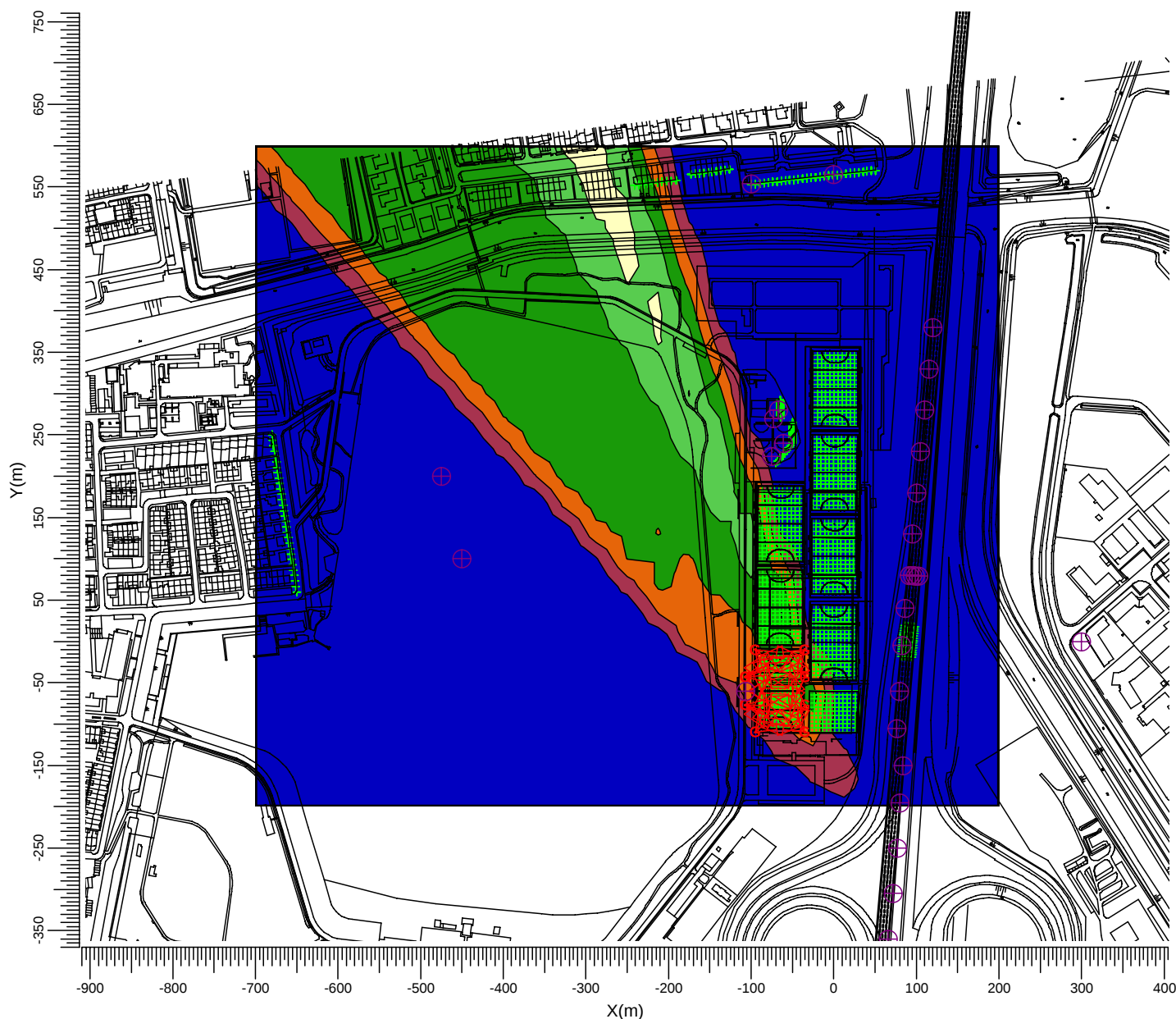
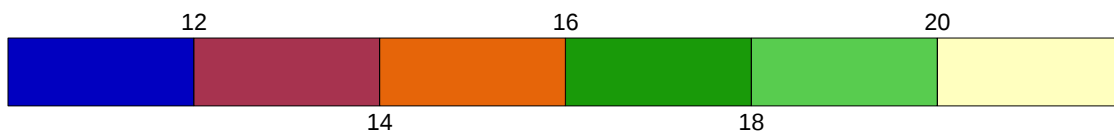
Algemene behoudfactor  
1.00

Schaal  
1:7500

## 3.36 A2-wn6: Gevuld isolijndiagram

hoofdveld

Rekenraster : oosterplas op Z = -0.00 m  
Berekening : Verblindingswaarde voor A2-wn6 (72.00, -305.00, 6.50)  
Reflectiefactor : 0.25



G  MVP507 NB/60

Maximum  
20.8

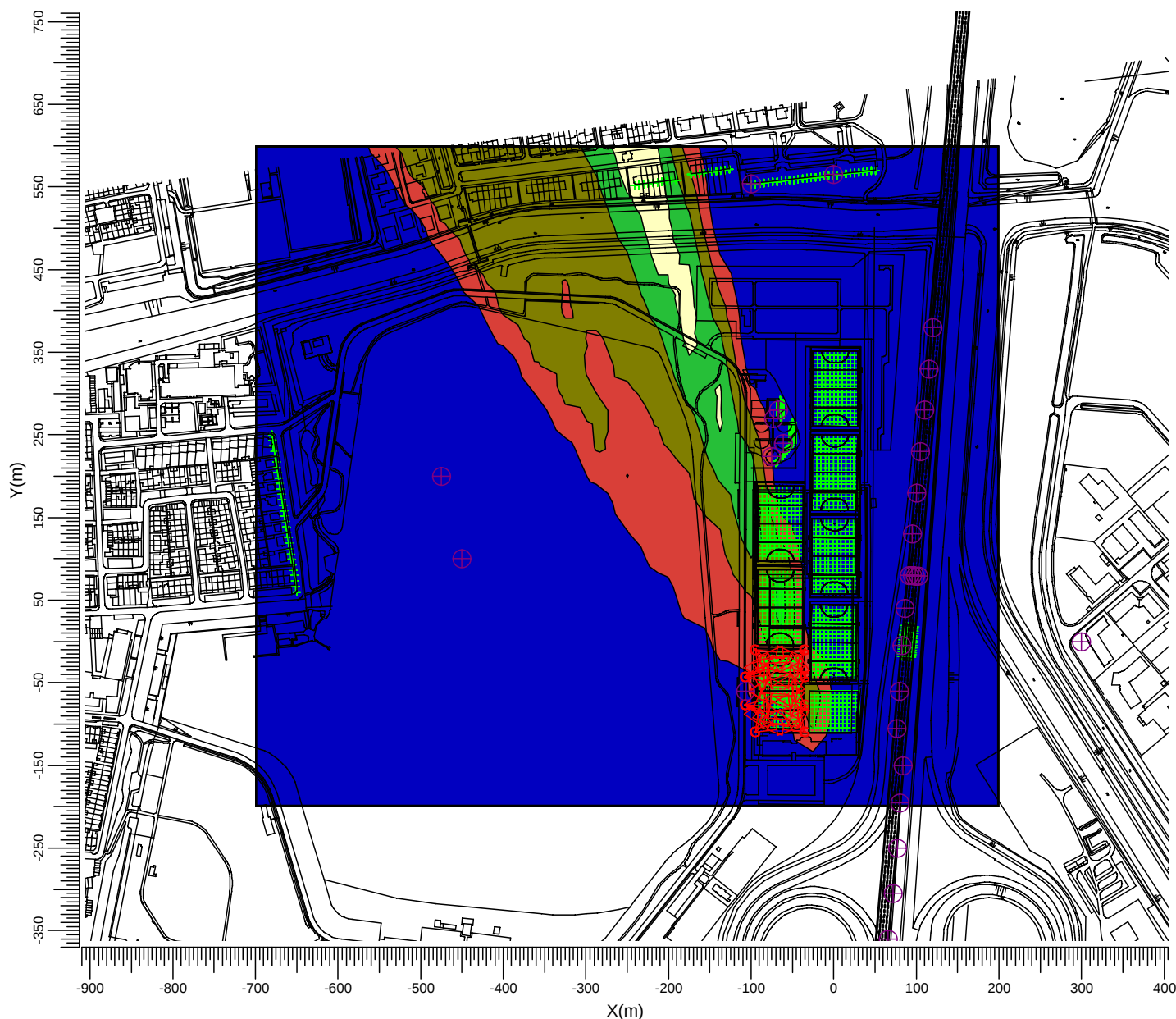
Algemene behoudfactor  
1.00

Schaal  
1:7500

## 3.37 A2-wn7: Gevuld isolijndiagram

hoofdveld

Rekenraster : oosterplas op Z = -0.00 m  
Berekening : Verblindingswaarde voor A2-wn7 (66.00, -360.00, 6.50)  
Reflectiefactor : 0.25



G  MVP507 NB/60

Maximum  
19.1

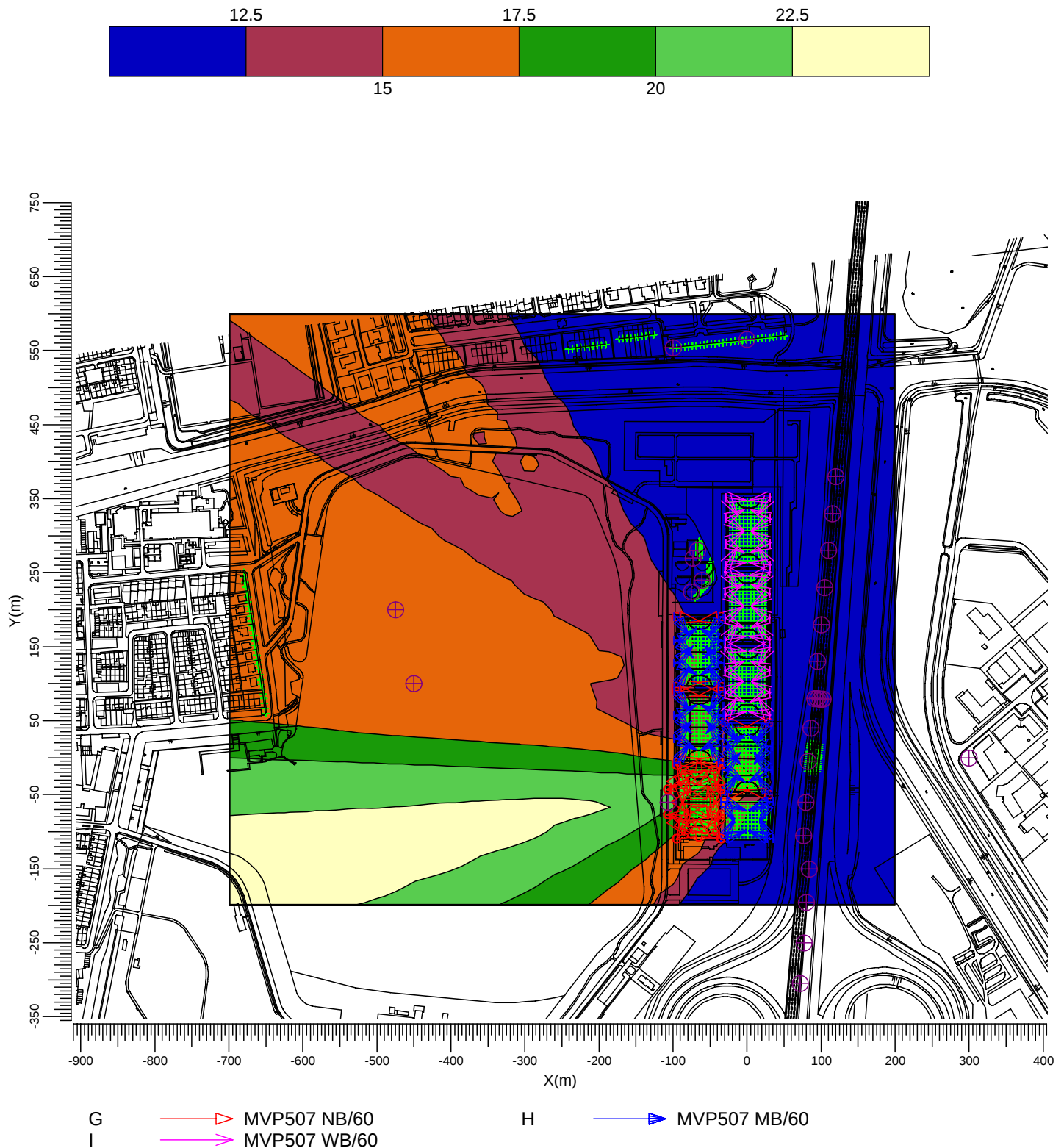
Algemene behoudfactor  
1.00

Schaal  
1:7500

## 3.38 A2-wn8: Gevuld isolijndiagram

alles

Rekenraster : oosterplas op Z = -0.00 m  
 Berekening : Verblindingswaarde voor A2-wn8 (82.00, -5.00, 6.50)  
 Reflectiefactor : 0.25



Maximum  
24.6

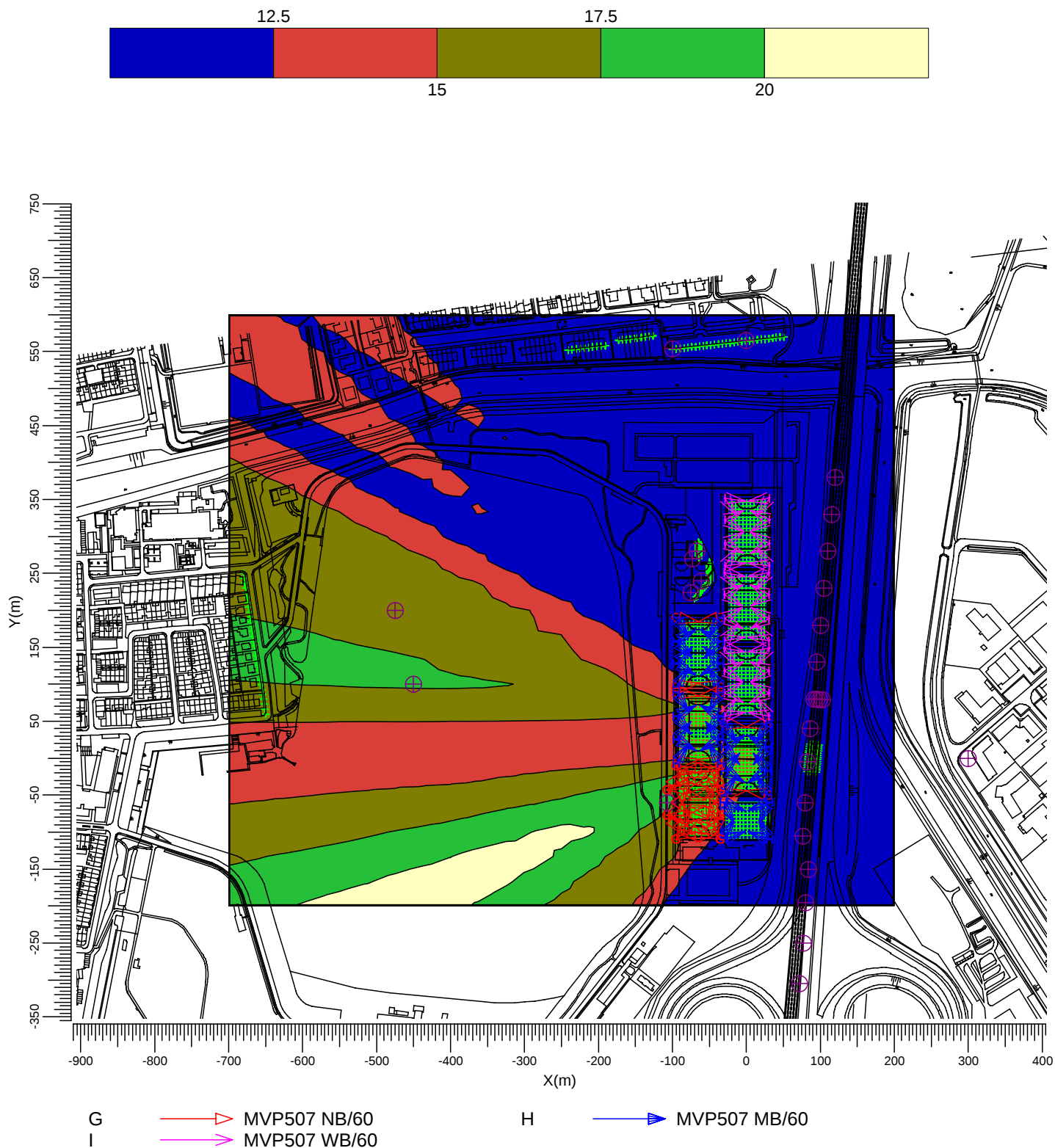
Algemene behoudfactor  
1.00

Schaal  
1:7500

## 3.39 A2-wn9: Gevuld isolijndiagram

alles

Rekenraster : oosterplas op Z = -0.00 m  
 Berekening : Verblindingswaarde voor A2-wn9 (86.00, 40.00, 6.50)  
 Reflectiefactor : 0.25



Maximum  
21.8

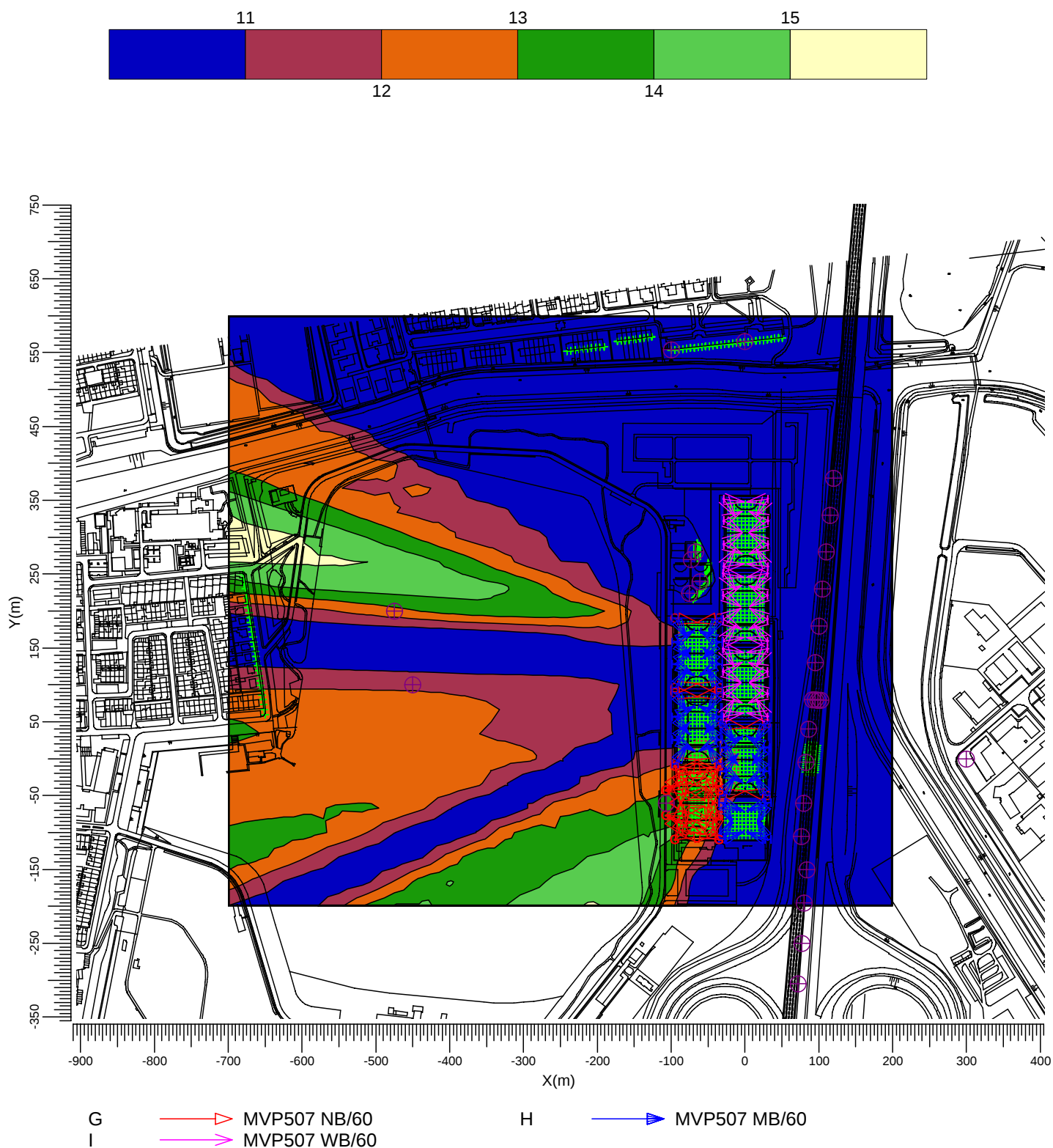
Algemene behoudfactor  
1.00

Schaal  
1:7500

## 3.40 A2-wn10: Gevuld isolijndiagram

alles

Rekenraster : oosterplas op Z = -0.00 m  
 Berekening : Verblindingswaarde voor A2-wn10 (95.00, 130.00, 6.50)  
 Reflectiefactor : 0.25



Maximum  
15.4

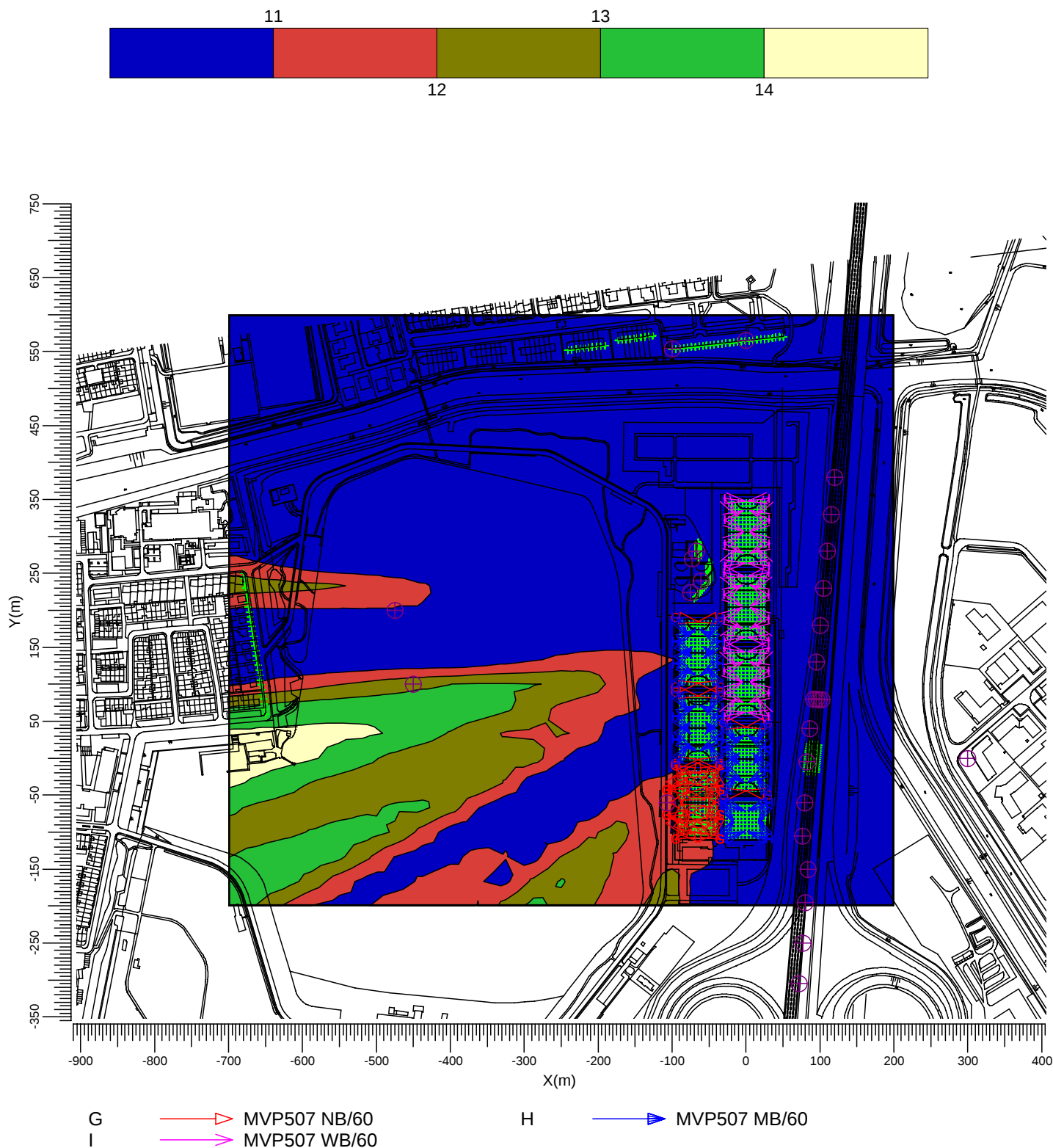
Algemene behoudfactor  
1.00

Schaal  
1:7500

## 3.41 A2-wn11: Gevuld isolijndiagram

alles

Rekenraster : oosterplas op Z = -0.00 m  
 Berekening : Verblindingswaarde voor A2-wn11 (100.00, 180.00, 6.50)  
 Reflectiefactor : 0.25



Maximum  
14.5

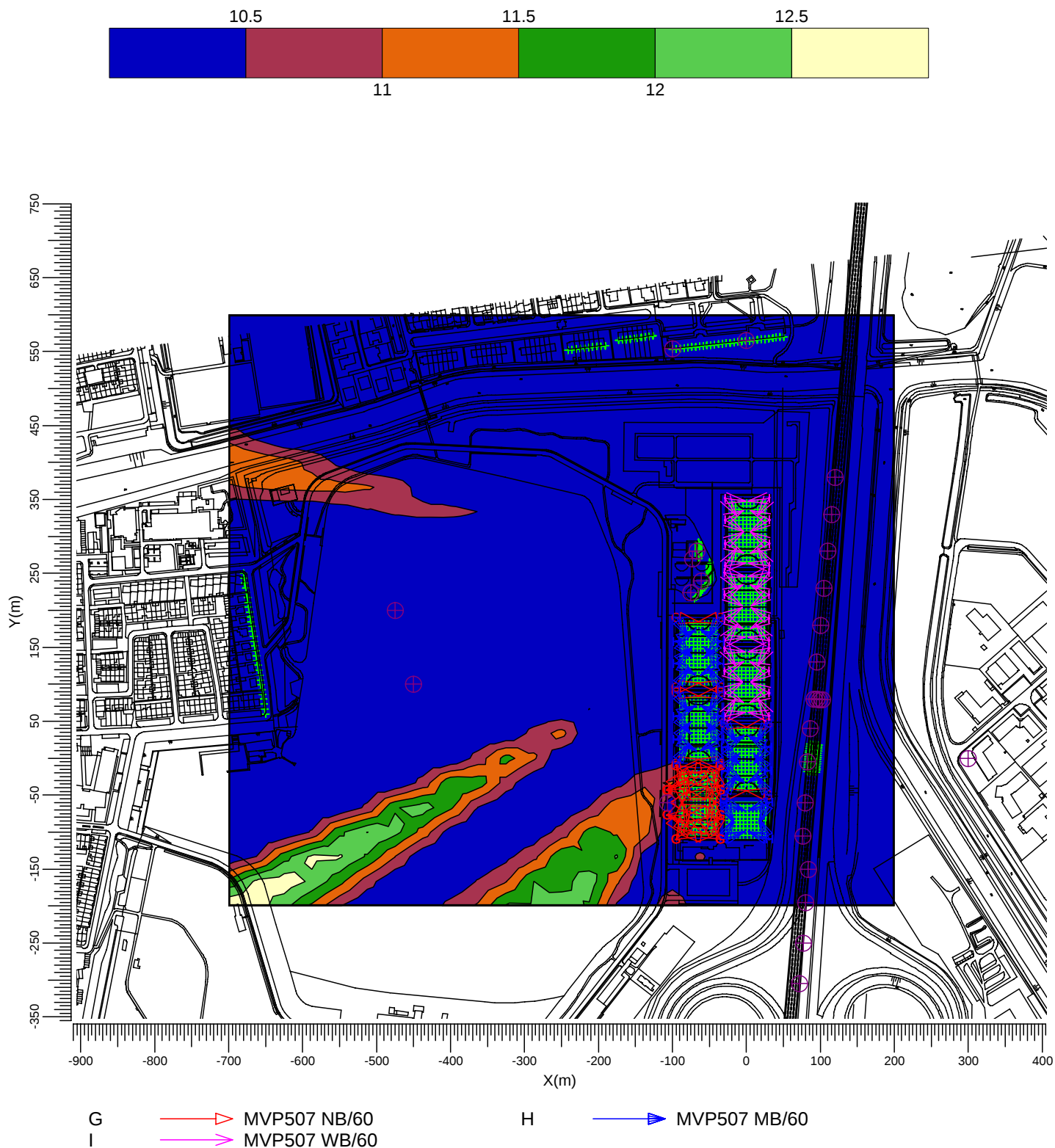
Algemene behoudfactor  
1.00

Schaal  
1:7500

## 3.42 A2-wn12: Gevuld isolijndiagram

alles

Rekenraster : oosterplas op Z = -0.00 m  
 Berekening : Verblindingswaarde voor A2-wn12 (105.00, 230.00, 6.50)  
 Reflectiefactor : 0.25



Maximum  
13.0

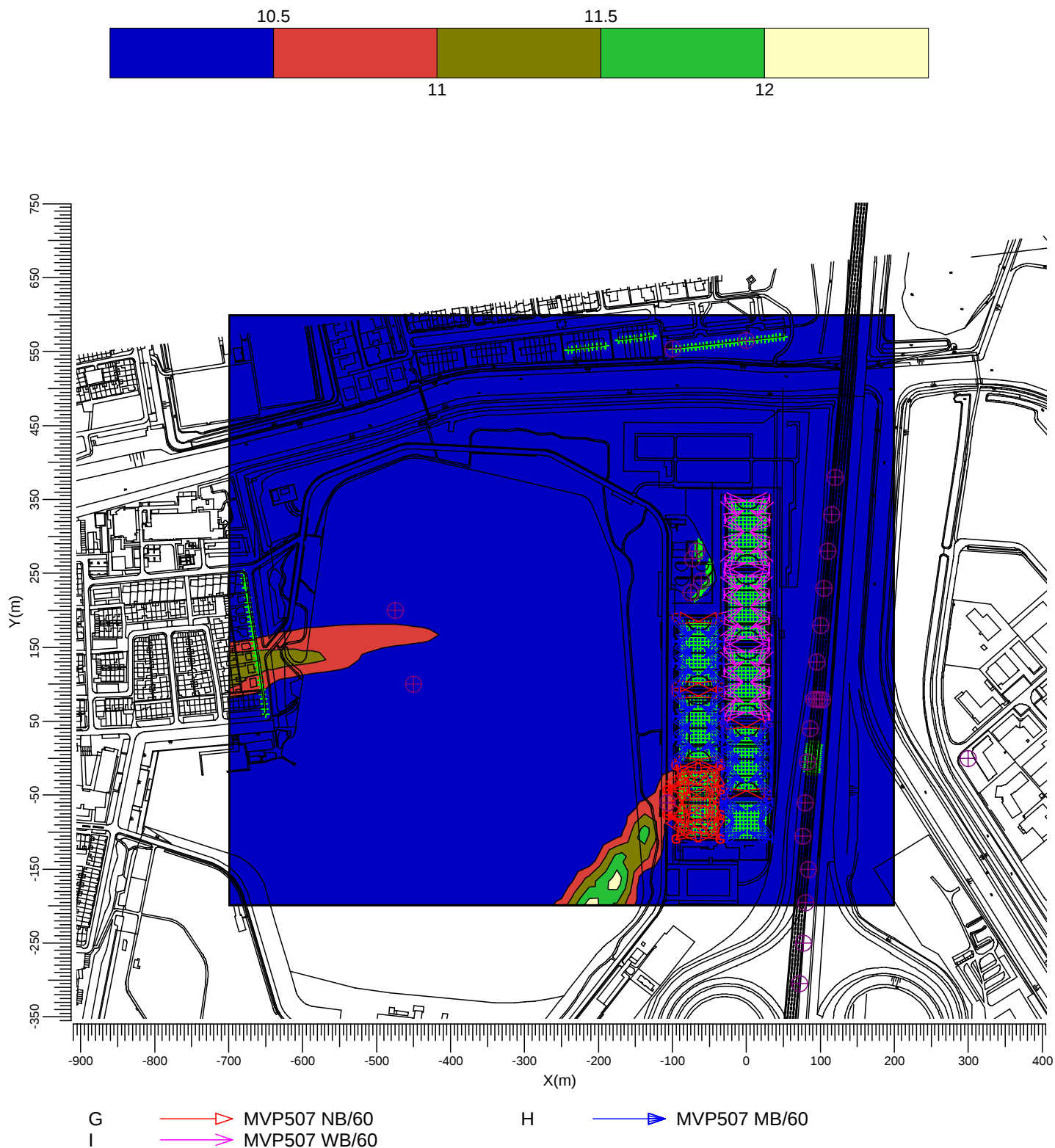
Algemene behoudfactor  
1.00

Schaal  
1:7500

## 3.43 A2-wn13: Gevuld isolijndiagram

alles

Rekenraster : oosterplas op Z = -0.00 m  
 Berekening : Verblindingswaarde voor A2-wn13 (110.00, 280.00, 6.50)  
 Reflectiefactor : 0.25



Maximum  
12.3

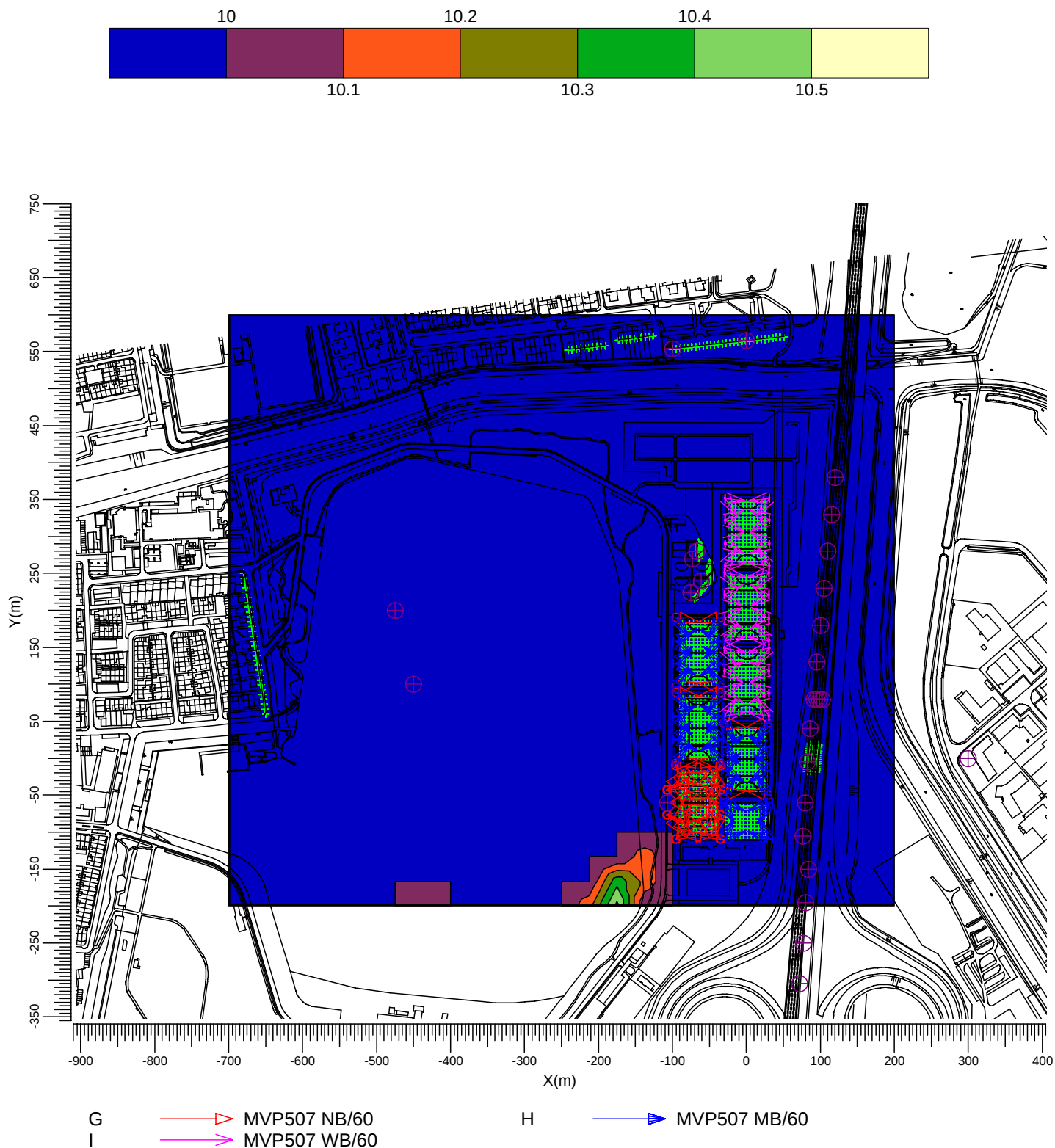
Algemene behoudfactor  
1.00

Schaal  
1:7500

## 3.44 A2-wn14: Gevuld isolijndiagram

alles

Rekenraster : oosterplas op Z = -0.00 m  
 Berekening : Verblindingswaarde voor A2-wn14 (115.00, 330.00, 6.50)  
 Reflectiefactor : 0.25



Maximum  
10.5

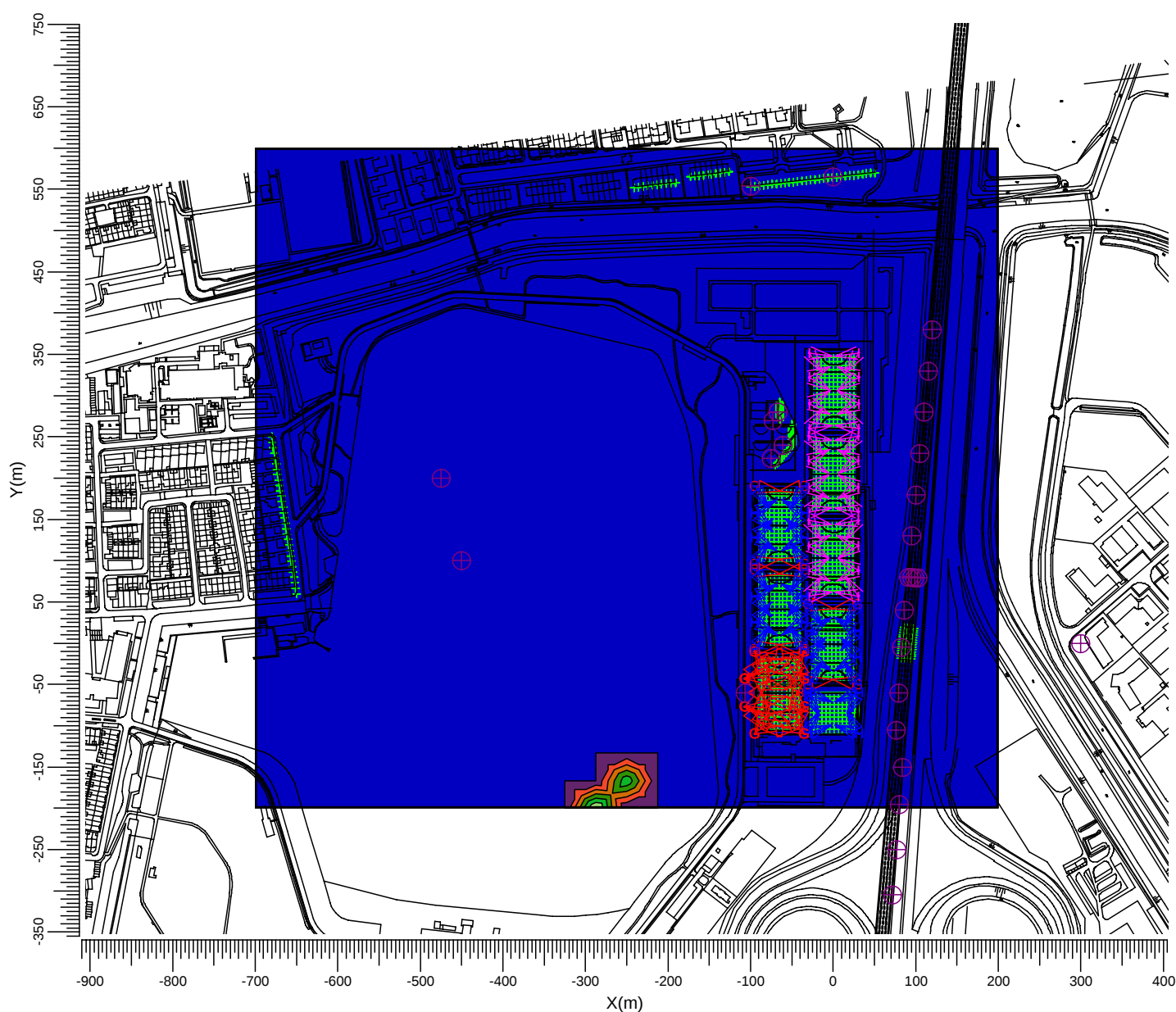
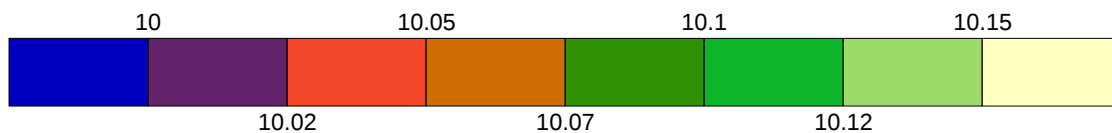
Algemene behoudfactor  
1.00

Schaal  
1:7500

## 3.45 A2-wn15: Gevuld isolijndiagram

alles

Rekenraster : oosterplas op Z = -0.00 m  
 Berekening : Verblindingswaarde voor A2-wn15 (120.00, 380.00, 6.50)  
 Reflectiefactor : 0.25



G → MVP507 NB/60  
 I → MVP507 WB/60

H → MVP507 MB/60

Maximum  
10.2

Algemene behoudfactor  
1.00

Schaal  
1:7500

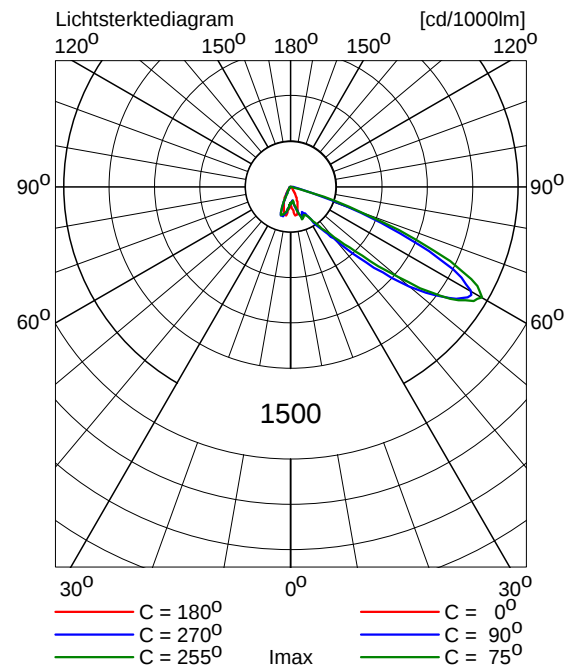
## 4. Armatuurgegevens

### 4.1 Armatuurtypen

OPTIVISION MVP507 1xMHN-LA2000W/400V/842 NB/60



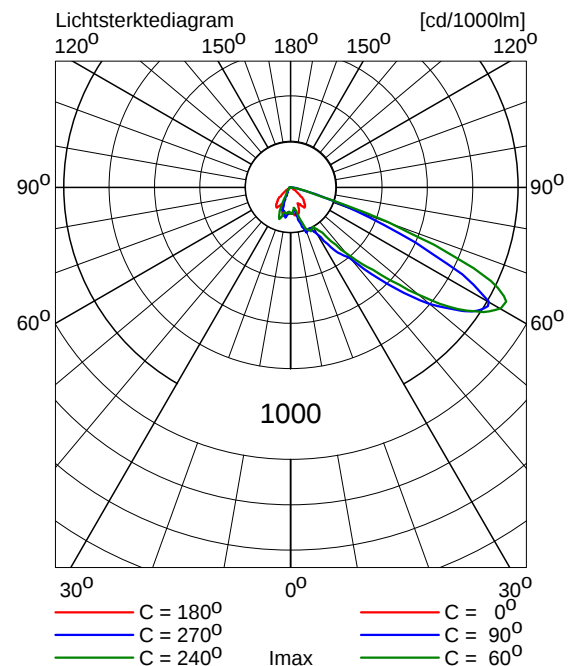
Armatuurrendement  
     Omlaag : 0.79  
     Omhoog : 0.00  
     Totaal : 0.79  
 Voorschakelapparaat : Standaard  
 Lichtstroom / lamp : 220000 lm  
 Vermogen / armatuur : 2123.0 W  
 Meetcode : LVMA107800



OPTIVISION MVP507 1xMHN-LA2000W/400V/842 MB/60



Armatuurrendement  
     Omlaag : 0.79  
     Omhoog : 0.00  
     Totaal : 0.79  
 Voorschakelapparaat : Standaard  
 Lichtstroom / lamp : 220000 lm  
 Vermogen / armatuur : 2123.0 W  
 Meetcode : LVMA106900



## OPTIVISION MVP507 1xMHN-LA2000W/400V/842 WB/60



## Armatuurrendement

Omlaag : 0.80

Omhoog : 0.00

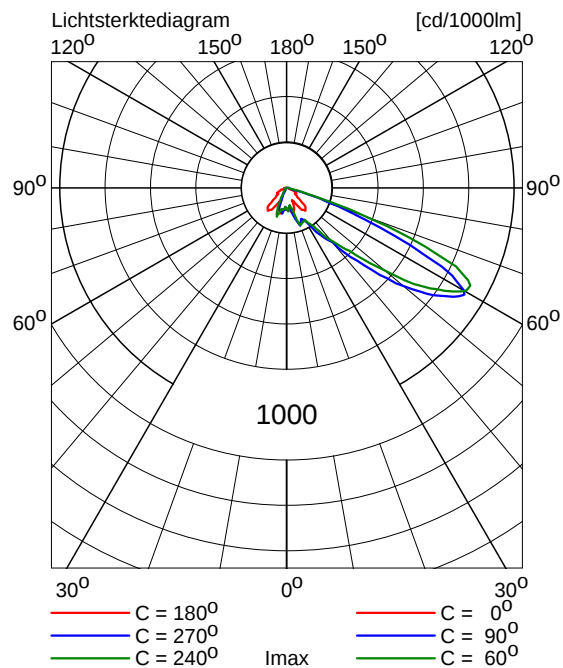
Totaal : 0.80

Voorschakelapparaat : Standaard

Lichtstroom / lamp : 220000 lm

Vermogen / armatuur : 2123.0 W

Meetcode : LVMA107700



## 5. Installatiegegevens

### 5.1 Legenda

Armatuurtypen:

| Code | Aantal | Armatuurtype | Aantal x lamptype        | Lichtstroom<br>[lm] |
|------|--------|--------------|--------------------------|---------------------|
| G    | 50     | MVP507 NB/60 | 1 * MHN-LA2000W/400V/842 | 1 * 220000          |
| H    | 44     | MVP507 MB/60 | 1 * MHN-LA2000W/400V/842 | 1 * 220000          |
| I    | 48     | MVP507 WB/60 | 1 * MHN-LA2000W/400V/842 | 1 * 220000          |

Schakelstappen:

| Code | Schakelstap |
|------|-------------|
| 1    | hoofdveld   |
| 2    | veld 1      |
| 3    | veld 2      |
| 4    | veld 3      |
| 5    | veld 4      |
| 6    | veld 5      |
| 7    | veld 6      |
| 8    | jeugdveld   |
| 9    | alles       |

### 5.2 Positie en instelrichting per armatuur

Instelrichting: richtpunten

| Aantal<br>x code | Positie [m] |         |       | Richtpunt [m] |         |      | ULR  | Schakelstap |   |   |   |   |   |   |   |   |
|------------------|-------------|---------|-------|---------------|---------|------|------|-------------|---|---|---|---|---|---|---|---|
|                  | X           | Y       | Z     | X             | Y       | Z    |      | 1           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 * G            | -107.00     | -77.00  | 25.00 | -55.07        | -63.67  | 0.00 | 0.01 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -77.00  | 25.00 | -72.47        | -103.12 | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -77.00  | 25.00 | -86.94        | -101.93 | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -77.00  | 25.00 | -78.54        | -44.37  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -77.00  | 25.00 | -53.84        | -94.73  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -77.00  | 25.00 | -53.58        | -81.52  | 0.00 | 0.01 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -77.00  | 25.00 | -57.21        | -102.96 | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -43.00  | 25.00 | -55.07        | -56.33  | 0.00 | 0.01 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -43.00  | 25.00 | -72.47        | -16.88  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -43.00  | 25.00 | -86.94        | -18.07  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -43.00  | 25.00 | -78.54        | -75.63  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -43.00  | 25.00 | -53.84        | -25.27  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -43.00  | 25.00 | -53.58        | -38.48  | 0.00 | 0.01 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -43.00  | 25.00 | -57.21        | -17.04  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -95.00      | -110.00 | 25.00 | -41.78        | -103.51 | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -95.00      | -110.00 | 25.00 | -65.36        | -83.11  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -95.00      | -10.00  | 25.00 | -41.78        | -16.49  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -95.00      | -10.00  | 25.00 | -65.36        | -36.89  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * H            | -95.00      | -7.00   | 18.00 | -78.55        | 19.48   | 0.00 | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * G            | -95.00      | -7.00   | 18.00 | -64.25        | -1.88   | 0.00 | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -95.00      | 25.00   | 18.00 | -74.96        | 48.89   | 0.00 | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -95.00      | 25.00   | 18.00 | -67.62        | 10.10   | 0.00 | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -95.00      | 57.00   | 18.00 | -74.96        | 33.11   | 0.00 | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -95.00      | 57.00   | 18.00 | -67.62        | 71.90   | 0.00 | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -95.00      | 89.00   | 18.00 | -78.55        | 62.52   | 0.00 | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * G            | -95.00      | 89.00   | 18.00 | -64.25        | 83.88   | 0.00 | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -95.00      | 96.00   | 18.00 | -78.51        | 122.46  | 0.00 | 0.00 | -           | - | + | - | - | - | - | - | + |

| Aantal<br>x code | Positie [m] |         |       | Richtpunt [m] |         |      | ULR  | Schakelstap |   |   |   |   |   |   |   |   |
|------------------|-------------|---------|-------|---------------|---------|------|------|-------------|---|---|---|---|---|---|---|---|
|                  | X           | Y       | Z     | X             | Y       | Z    |      | 1           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 * G            | -95.00      | 96.00   | 18.00 | -64.30        | 101.43  | 0.00 | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -95.00      | 128.00  | 18.00 | -73.12        | 150.21  | 0.00 | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -95.00      | 128.00  | 18.00 | -68.26        | 111.96  | 0.00 | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -95.00      | 158.00  | 18.00 | -73.12        | 135.79  | 0.00 | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -95.00      | 158.00  | 18.00 | -68.26        | 174.04  | 0.00 | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -95.00      | 190.00  | 18.00 | -78.51        | 163.54  | 0.00 | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * G            | -95.00      | 190.00  | 18.00 | -64.30        | 184.57  | 0.00 | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * G            | -94.64      | -110.00 | 25.00 | -86.62        | -56.99  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -94.64      | -110.00 | 25.00 | -74.95        | -64.29  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -94.64      | -10.00  | 25.00 | -86.62        | -63.01  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -94.64      | -10.00  | 25.00 | -74.95        | -55.71  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.36      | -110.00 | 25.00 | -43.38        | -56.99  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.36      | -110.00 | 25.00 | -55.05        | -64.29  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.36      | -10.00  | 25.00 | -43.38        | -63.01  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.36      | -10.00  | 25.00 | -55.05        | -55.71  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -110.00 | 25.00 | -88.22        | -103.51 | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -110.00 | 25.00 | -64.64        | -83.11  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -77.00  | 25.00 | -52.67        | -37.47  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -77.00  | 25.00 | -41.82        | -102.94 | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -77.00  | 25.00 | -73.16        | -66.42  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -77.00  | 25.00 | -55.94        | -103.00 | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -43.00  | 25.00 | -52.67        | -82.53  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -43.00  | 25.00 | -41.82        | -17.06  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -43.00  | 25.00 | -73.16        | -53.58  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -43.00  | 25.00 | -55.94        | -17.00  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -10.00  | 25.00 | -88.22        | -16.49  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -10.00  | 25.00 | -64.64        | -36.89  | 0.00 | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * H            | -35.00      | -7.00   | 18.00 | -51.45        | 19.48   | 0.00 | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -7.00   | 18.00 | -65.75        | -1.88   | 0.00 | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -35.00      | 25.00   | 18.00 | -55.04        | 48.89   | 0.00 | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -35.00      | 25.00   | 18.00 | -62.38        | 10.10   | 0.00 | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -35.00      | 57.00   | 18.00 | -55.04        | 33.11   | 0.00 | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -35.00      | 57.00   | 18.00 | -62.38        | 71.90   | 0.00 | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -35.00      | 89.00   | 18.00 | -51.45        | 62.52   | 0.00 | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | 89.00   | 18.00 | -65.75        | 83.88   | 0.00 | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -35.00      | 96.00   | 18.00 | -51.49        | 122.46  | 0.00 | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * G            | -35.00      | 96.00   | 18.00 | -65.70        | 101.43  | 0.00 | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -35.00      | 128.00  | 18.00 | -56.88        | 150.21  | 0.00 | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -35.00      | 128.00  | 18.00 | -61.74        | 111.96  | 0.00 | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -35.00      | 158.00  | 18.00 | -56.88        | 135.79  | 0.00 | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -35.00      | 158.00  | 18.00 | -61.74        | 174.04  | 0.00 | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -35.00      | 190.00  | 18.00 | -51.49        | 163.54  | 0.00 | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * G            | -35.00      | 190.00  | 18.00 | -65.70        | 184.57  | 0.00 | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -31.00      | -110.00 | 18.00 | -16.88        | -82.20  | 0.00 | 0.00 | -           | - | - | - | - | - | - | + | + |
| 1 * H            | -31.00      | -110.00 | 18.00 | -1.72         | -99.28  | 0.00 | 0.00 | -           | - | - | - | - | - | - | + | + |
| 1 * H            | -31.00      | -60.00  | 18.00 | -16.88        | -87.80  | 0.00 | 0.00 | -           | - | - | - | - | - | - | + | + |
| 1 * H            | -31.00      | -60.00  | 18.00 | -1.72         | -70.72  | 0.00 | 0.00 | -           | - | - | - | - | - | - | + | + |
| 1 * G            | -30.00      | -50.00  | 18.00 | 0.54          | -43.72  | 0.00 | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | -30.00      | -50.00  | 18.00 | -14.08        | -23.19  | 0.00 | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * G            | -30.00      | 48.00   | 18.00 | 0.54          | 41.72   | 0.00 | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | -30.00      | 48.00   | 18.00 | -14.08        | 21.19   | 0.00 | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | -29.50      | -17.00  | 18.00 | -2.46         | -32.52  | 0.00 | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | -29.50      | -17.00  | 18.00 | -9.27         | 6.72    | 0.00 | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | -29.50      | 15.00   | 18.00 | -2.46         | 30.52   | 0.00 | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | -29.50      | 15.00   | 18.00 | -9.27         | -8.72   | 0.00 | 0.00 | -           | - | - | + | - | - | - | - | + |

| Aantal<br>x code | Positie [m] |         |       | Richtpunt [m] |        |       | ULR  | Schakelstap |   |   |   |   |   |   |   |   |
|------------------|-------------|---------|-------|---------------|--------|-------|------|-------------|---|---|---|---|---|---|---|---|
|                  | X           | Y       | Z     | X             | Y      | Z     |      | 1           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 * I            | -29.50      | 57.09   | 15.00 | -14.38        | 80.91  | 0.00  | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | -29.50      | 57.09   | 15.00 | -1.73         | 62.07  | 0.00  | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | -29.50      | 88.00   | 15.00 | -5.26         | 102.43 | 0.00  | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | -29.50      | 88.00   | 15.00 | -4.27         | 75.38  | 0.00  | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | -29.50      | 118.00  | 15.00 | -5.26         | 103.57 | 0.00  | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | -29.50      | 118.00  | 15.00 | -4.27         | 130.62 | 0.00  | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | -29.50      | 148.91  | 15.00 | -14.38        | 125.09 | 0.00  | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | -29.50      | 148.91  | 15.00 | -1.73         | 143.93 | 0.00  | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | -29.50      | 159.00  | 15.00 | -1.80         | 164.34 | 0.00  | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | -29.50      | 159.00  | 15.00 | -12.43        | 181.46 | 0.00  | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | -29.50      | 189.00  | 15.00 | -5.64         | 204.04 | 0.00  | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | -29.50      | 189.00  | 15.00 | -4.89         | 175.20 | 0.00  | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | -29.50      | 221.00  | 15.00 | -5.64         | 205.96 | 0.00  | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | -29.50      | 221.00  | 15.00 | -4.89         | 234.80 | 0.00  | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | -29.50      | 251.00  | 15.00 | -1.80         | 245.66 | 0.00  | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | -29.50      | 251.00  | 15.00 | -12.43        | 228.54 | 0.00  | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | -29.00      | 260.16  | 15.00 | -1.04         | 263.94 | 0.00  | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | -29.00      | 260.16  | 15.00 | -13.57        | 283.78 | 0.00  | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | -29.00      | 290.00  | 15.00 | -4.04         | 305.61 | -0.00 | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | -29.00      | 290.00  | 15.00 | -3.93         | 277.07 | 0.00  | 0.00 | -           | - | - | - | - | - | - | + | + |
| 1 * I            | -29.00      | 322.00  | 15.00 | -4.04         | 306.39 | -0.00 | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | -29.00      | 322.00  | 15.00 | -3.93         | 334.93 | 0.00  | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | -29.00      | 351.84  | 15.00 | -1.04         | 348.06 | 0.00  | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | -29.00      | 351.84  | 15.00 | -13.57        | 328.22 | 0.00  | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * H            | 29.50       | -17.00  | 18.00 | 2.46          | -32.52 | 0.00  | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | 29.50       | -17.00  | 18.00 | 9.27          | 6.72   | 0.00  | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | 29.50       | 15.00   | 18.00 | 2.46          | 30.52  | 0.00  | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | 29.50       | 15.00   | 18.00 | 9.27          | -8.72  | 0.00  | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * G            | 30.00       | -50.00  | 18.00 | -0.54         | -43.72 | 0.00  | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | 30.00       | -50.00  | 18.00 | 14.08         | -23.19 | 0.00  | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * G            | 30.00       | 48.00   | 18.00 | -0.54         | 41.72  | 0.00  | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | 30.00       | 48.00   | 18.00 | 14.08         | 21.19  | 0.00  | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * I            | 30.50       | 57.09   | 15.00 | 15.38         | 80.91  | 0.00  | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | 30.50       | 57.09   | 15.00 | 2.73          | 62.07  | 0.00  | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | 30.50       | 88.00   | 15.00 | 6.26          | 102.43 | 0.00  | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | 30.50       | 88.00   | 15.00 | 5.27          | 75.38  | 0.00  | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | 30.50       | 118.00  | 15.00 | 6.26          | 103.57 | 0.00  | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | 30.50       | 118.00  | 15.00 | 5.27          | 130.62 | 0.00  | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | 30.50       | 148.91  | 15.00 | 15.38         | 125.09 | 0.00  | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | 30.50       | 148.91  | 15.00 | 2.73          | 143.93 | 0.00  | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | 30.50       | 159.00  | 15.00 | 2.80          | 164.34 | 0.00  | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | 30.50       | 159.00  | 15.00 | 13.43         | 181.46 | 0.00  | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | 30.50       | 189.00  | 15.00 | 6.64          | 204.04 | 0.00  | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | 30.50       | 189.00  | 15.00 | 5.89          | 175.20 | 0.00  | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | 30.50       | 221.00  | 15.00 | 6.64          | 205.96 | 0.00  | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | 30.50       | 221.00  | 15.00 | 5.89          | 234.80 | 0.00  | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | 30.50       | 251.00  | 15.00 | 2.80          | 245.66 | 0.00  | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | 30.50       | 251.00  | 15.00 | 13.43         | 228.54 | 0.00  | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * H            | 31.00       | -110.00 | 18.00 | 16.88         | -82.20 | 0.00  | 0.00 | -           | - | - | - | - | - | - | + | + |
| 1 * H            | 31.00       | -110.00 | 18.00 | 1.72          | -99.28 | 0.00  | 0.00 | -           | - | - | - | - | - | - | + | + |
| 1 * H            | 31.00       | -60.00  | 18.00 | 16.88         | -87.80 | 0.00  | 0.00 | -           | - | - | - | - | - | - | + | + |
| 1 * H            | 31.00       | -60.00  | 18.00 | 1.72          | -70.72 | 0.00  | 0.00 | -           | - | - | - | - | - | - | + | + |
| 1 * I            | 31.00       | 260.16  | 15.00 | 3.04          | 263.94 | 0.00  | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | 31.00       | 260.16  | 15.00 | 15.57         | 283.78 | 0.00  | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | 31.00       | 290.00  | 15.00 | 6.04          | 305.61 | -0.00 | 0.00 | -           | - | - | - | - | - | + | - | + |

| Aantal<br>x code | Positie [m] |        |       | Richtpunt [m] |        |       | ULR  | Schakelstap |   |   |   |   |   |   |   |   |
|------------------|-------------|--------|-------|---------------|--------|-------|------|-------------|---|---|---|---|---|---|---|---|
|                  | X           | Y      | Z     | X             | Y      | Z     |      | 1           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 * I            | 31.00       | 290.00 | 15.00 | 5.93          | 277.07 | 0.00  | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | 31.00       | 322.00 | 15.00 | 6.04          | 306.39 | -0.00 | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | 31.00       | 322.00 | 15.00 | 5.93          | 334.93 | 0.00  | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | 31.00       | 351.84 | 15.00 | 3.04          | 348.06 | 0.00  | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | 31.00       | 351.84 | 15.00 | 15.57         | 328.22 | 0.00  | 0.00 | -           | - | - | - | - | - | + | - | + |

Instelrichting: richthoeken

| Aantal<br>x code | Positie [m] |         |       | Instelrichting in hoeken |          |         | ULR  | Schakelstap |   |   |   |   |   |   |   |   |
|------------------|-------------|---------|-------|--------------------------|----------|---------|------|-------------|---|---|---|---|---|---|---|---|
|                  | X           | Y       | Z     | Draai                    | Kantel90 | Kantel0 |      | 1           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 * G            | -107.00     | -77.00  | 25.00 | 14.4                     | 65.0     | -0.0    | 0.01 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -77.00  | 25.00 | -37.1                    | 60.0     | -0.0    | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -77.00  | 25.00 | -51.2                    | 52.0     | -0.0    | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -77.00  | 25.00 | 48.9                     | 60.0     | -0.0    | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -77.00  | 25.00 | -18.4                    | 66.0     | -0.0    | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -77.00  | 25.00 | -4.8                     | 65.0     | -0.0    | 0.01 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -77.00  | 25.00 | -27.5                    | 66.0     | -0.0    | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -43.00  | 25.00 | -14.4                    | 65.0     | 0.0     | 0.01 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -43.00  | 25.00 | 37.1                     | 60.0     | 0.0     | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -43.00  | 25.00 | 51.2                     | 52.0     | 0.0     | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -43.00  | 25.00 | -48.9                    | 60.0     | 0.0     | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -43.00  | 25.00 | 18.4                     | 66.0     | 0.0     | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -43.00  | 25.00 | 4.8                      | 65.0     | 0.0     | 0.01 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -107.00     | -43.00  | 25.00 | 27.5                     | 66.0     | 0.0     | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -95.00      | -110.00 | 25.00 | 6.9                      | 65.0     | 0.0     | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -95.00      | -110.00 | 25.00 | 42.2                     | 58.0     | 0.0     | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -95.00      | -10.00  | 25.00 | -6.9                     | 65.0     | -0.0    | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -95.00      | -10.00  | 25.00 | -42.2                    | 58.0     | -0.0    | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * H            | -95.00      | -7.00   | 18.00 | 58.1                     | 60.0     | 0.0     | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * G            | -95.00      | -7.00   | 18.00 | 9.4                      | 60.0     | 0.0     | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -95.00      | 25.00   | 18.00 | 50.0                     | 60.0     | 0.0     | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -95.00      | 25.00   | 18.00 | -28.6                    | 60.0     | 0.0     | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -95.00      | 57.00   | 18.00 | -50.0                    | 60.0     | -0.0    | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -95.00      | 57.00   | 18.00 | 28.6                     | 60.0     | -0.0    | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -95.00      | 89.00   | 18.00 | -58.1                    | 60.0     | -0.0    | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * G            | -95.00      | 89.00   | 18.00 | -9.4                     | 60.0     | -0.0    | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -95.00      | 96.00   | 18.00 | 58.1                     | 60.0     | 0.0     | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * G            | -95.00      | 96.00   | 18.00 | 10.0                     | 60.0     | 0.0     | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -95.00      | 128.00  | 18.00 | 45.4                     | 60.0     | 0.0     | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -95.00      | 128.00  | 18.00 | -31.0                    | 60.0     | 0.0     | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -95.00      | 158.00  | 18.00 | -45.4                    | 60.0     | -0.0    | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -95.00      | 158.00  | 18.00 | 31.0                     | 60.0     | -0.0    | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -95.00      | 190.00  | 18.00 | -58.1                    | 60.0     | -0.0    | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * G            | -95.00      | 190.00  | 18.00 | -10.0                    | 60.0     | -0.0    | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * G            | -94.64      | -110.00 | 25.00 | 81.4                     | 65.0     | 0.0     | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -94.64      | -110.00 | 25.00 | 66.7                     | 63.3     | 0.0     | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -94.64      | -10.00  | 25.00 | -81.4                    | 65.0     | -0.0    | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -94.64      | -10.00  | 25.00 | -66.7                    | 63.3     | -0.0    | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.36      | -110.00 | 25.00 | 98.6                     | 65.0     | -0.0    | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.36      | -110.00 | 25.00 | 113.3                    | 63.3     | -0.0    | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.36      | -10.00  | 25.00 | -98.6                    | 65.0     | 0.0     | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.36      | -10.00  | 25.00 | -113.3                   | 63.3     | 0.0     | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -110.00 | 25.00 | 173.1                    | 65.0     | -0.0    | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -110.00 | 25.00 | 137.8                    | 58.0     | -0.0    | 0.00 | +           | - | - | - | - | - | - | - | + |

| Aantal<br>x code | Positie [m] |         | Instelrichting in hoeken |        |          |         | ULR  | Schakelstap |   |   |   |   |   |   |   |   |
|------------------|-------------|---------|--------------------------|--------|----------|---------|------|-------------|---|---|---|---|---|---|---|---|
|                  | X           | Y       | Z                        | Draai  | Kantel90 | Kantel0 |      | 1           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 * G            | -35.00      | -77.00  | 25.00                    | 114.1  | 60.0     | -0.0    | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -77.00  | 25.00                    | -104.7 | 47.0     | -0.0    | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -77.00  | 25.00                    | 164.5  | 57.7     | -0.0    | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -77.00  | 25.00                    | -128.8 | 53.2     | -0.0    | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -43.00  | 25.00                    | -114.1 | 60.0     | 0.0     | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -43.00  | 25.00                    | 104.7  | 47.0     | 0.0     | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -43.00  | 25.00                    | -164.5 | 57.7     | 0.0     | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -43.00  | 25.00                    | 128.8  | 53.2     | 0.0     | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -10.00  | 25.00                    | -173.1 | 65.0     | 0.0     | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -10.00  | 25.00                    | -137.8 | 58.0     | 0.0     | 0.00 | +           | - | - | - | - | - | - | - | + |
| 1 * H            | -35.00      | -7.00   | 18.00                    | 121.9  | 60.0     | -0.0    | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | -7.00   | 18.00                    | 170.6  | 60.0     | -0.0    | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -35.00      | 25.00   | 18.00                    | 130.0  | 60.0     | -0.0    | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -35.00      | 25.00   | 18.00                    | -151.4 | 60.0     | -0.0    | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -35.00      | 57.00   | 18.00                    | -130.0 | 60.0     | 0.0     | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -35.00      | 57.00   | 18.00                    | 151.4  | 60.0     | 0.0     | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -35.00      | 89.00   | 18.00                    | -121.9 | 60.0     | 0.0     | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * G            | -35.00      | 89.00   | 18.00                    | -170.6 | 60.0     | 0.0     | 0.00 | -           | + | - | - | - | - | - | - | + |
| 1 * H            | -35.00      | 96.00   | 18.00                    | 121.9  | 60.0     | -0.0    | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * G            | -35.00      | 96.00   | 18.00                    | 170.0  | 60.0     | -0.0    | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -35.00      | 128.00  | 18.00                    | 134.6  | 60.0     | -0.0    | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -35.00      | 128.00  | 18.00                    | -149.0 | 60.0     | -0.0    | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -35.00      | 158.00  | 18.00                    | -134.6 | 60.0     | 0.0     | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -35.00      | 158.00  | 18.00                    | 149.0  | 60.0     | 0.0     | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -35.00      | 190.00  | 18.00                    | -121.9 | 60.0     | 0.0     | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * G            | -35.00      | 190.00  | 18.00                    | -170.0 | 60.0     | 0.0     | 0.00 | -           | - | + | - | - | - | - | - | + |
| 1 * H            | -31.00      | -110.00 | 18.00                    | 63.1   | 60.0     | -0.0    | 0.00 | -           | - | - | - | - | - | - | + | + |
| 1 * H            | -31.00      | -110.00 | 18.00                    | 20.1   | 60.0     | -0.0    | 0.00 | -           | - | - | - | - | - | - | + | + |
| 1 * H            | -31.00      | -60.00  | 18.00                    | -63.1  | 60.0     | 0.0     | 0.00 | -           | - | - | - | - | - | - | + | + |
| 1 * H            | -31.00      | -60.00  | 18.00                    | -20.1  | 60.0     | 0.0     | 0.00 | -           | - | - | - | - | - | - | + | + |
| 1 * G            | -30.00      | -50.00  | 18.00                    | 11.6   | 60.0     | 0.0     | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | -30.00      | -50.00  | 18.00                    | 59.3   | 60.0     | 0.0     | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * G            | -30.00      | 48.00   | 18.00                    | -11.6  | 60.0     | -0.0    | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | -30.00      | 48.00   | 18.00                    | -59.3  | 60.0     | -0.0    | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | -29.50      | -17.00  | 18.00                    | -29.9  | 60.0     | -0.0    | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | -29.50      | -17.00  | 18.00                    | 49.5   | 60.0     | -0.0    | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | -29.50      | 15.00   | 18.00                    | 29.9   | 60.0     | 0.0     | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | -29.50      | 15.00   | 18.00                    | -49.5  | 60.0     | 0.0     | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * I            | -29.50      | 57.09   | 15.00                    | 57.6   | 62.0     | 0.0     | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | -29.50      | 57.09   | 15.00                    | 10.2   | 62.0     | 0.0     | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | -29.50      | 88.00   | 15.00                    | 30.8   | 62.0     | 0.0     | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | -29.50      | 88.00   | 15.00                    | -26.6  | 62.0     | 0.0     | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | -29.50      | 118.00  | 15.00                    | -30.8  | 62.0     | -0.0    | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | -29.50      | 118.00  | 15.00                    | 26.6   | 62.0     | -0.0    | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | -29.50      | 148.91  | 15.00                    | -57.6  | 62.0     | -0.0    | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | -29.50      | 148.91  | 15.00                    | -10.2  | 62.0     | -0.0    | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | -29.50      | 159.00  | 15.00                    | 10.9   | 62.0     | 0.0     | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | -29.50      | 159.00  | 15.00                    | 52.8   | 62.0     | 0.0     | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | -29.50      | 189.00  | 15.00                    | 32.2   | 62.0     | 0.0     | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | -29.50      | 189.00  | 15.00                    | -29.3  | 62.0     | 0.0     | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | -29.50      | 221.00  | 15.00                    | -32.2  | 62.0     | -0.0    | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | -29.50      | 221.00  | 15.00                    | 29.3   | 62.0     | -0.0    | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | -29.50      | 251.00  | 15.00                    | -10.9  | 62.0     | -0.0    | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | -29.50      | 251.00  | 15.00                    | -52.8  | 62.0     | -0.0    | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | -29.00      | 260.16  | 15.00                    | 7.7    | 62.0     | 0.0     | 0.00 | -           | - | - | - | - | - | + | - | + |

| Aantal<br>x code | Positie [m] |         | Instelrichting in hoeken |        |          |         | ULR  | Schakelstap |   |   |   |   |   |   |   |   |
|------------------|-------------|---------|--------------------------|--------|----------|---------|------|-------------|---|---|---|---|---|---|---|---|
|                  | X           | Y       | Z                        | Draai  | Kantel90 | Kantel0 |      | 1           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 * I            | -29.00      | 260.16  | 15.00                    | 56.9   | 62.0     | 0.0     | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | -29.00      | 290.00  | 15.00                    | 32.0   | 63.0     | 0.0     | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | -29.00      | 290.00  | 15.00                    | -27.3  | 62.0     | 0.0     | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | -29.00      | 322.00  | 15.00                    | -32.0  | 63.0     | -0.0    | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | -29.00      | 322.00  | 15.00                    | 27.3   | 62.0     | -0.0    | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | -29.00      | 351.84  | 15.00                    | -7.7   | 62.0     | -0.0    | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | -29.00      | 351.84  | 15.00                    | -56.9  | 62.0     | -0.0    | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * H            | 29.50       | -17.00  | 18.00                    | -150.1 | 60.0     | 0.0     | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | 29.50       | -17.00  | 18.00                    | 130.5  | 60.0     | 0.0     | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | 29.50       | 15.00   | 18.00                    | 150.1  | 60.0     | -0.0    | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | 29.50       | 15.00   | 18.00                    | -130.5 | 60.0     | -0.0    | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * G            | 30.00       | -50.00  | 18.00                    | 168.4  | 60.0     | -0.0    | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | 30.00       | -50.00  | 18.00                    | 120.7  | 60.0     | -0.0    | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * G            | 30.00       | 48.00   | 18.00                    | -168.4 | 60.0     | 0.0     | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * H            | 30.00       | 48.00   | 18.00                    | -120.7 | 60.0     | 0.0     | 0.00 | -           | - | - | + | - | - | - | - | + |
| 1 * I            | 30.50       | 57.09   | 15.00                    | 122.4  | 62.0     | -0.0    | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | 30.50       | 57.09   | 15.00                    | 169.8  | 62.0     | -0.0    | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | 30.50       | 88.00   | 15.00                    | 149.2  | 62.0     | -0.0    | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | 30.50       | 88.00   | 15.00                    | -153.4 | 62.0     | -0.0    | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | 30.50       | 118.00  | 15.00                    | -149.2 | 62.0     | 0.0     | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | 30.50       | 118.00  | 15.00                    | 153.4  | 62.0     | 0.0     | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | 30.50       | 148.91  | 15.00                    | -122.4 | 62.0     | 0.0     | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | 30.50       | 148.91  | 15.00                    | -169.8 | 62.0     | 0.0     | 0.00 | -           | - | - | - | + | - | - | - | + |
| 1 * I            | 30.50       | 159.00  | 15.00                    | 169.1  | 62.0     | -0.0    | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | 30.50       | 159.00  | 15.00                    | 127.2  | 62.0     | -0.0    | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | 30.50       | 189.00  | 15.00                    | 147.8  | 62.0     | -0.0    | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | 30.50       | 189.00  | 15.00                    | -150.7 | 62.0     | -0.0    | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | 30.50       | 221.00  | 15.00                    | -147.8 | 62.0     | 0.0     | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | 30.50       | 221.00  | 15.00                    | 150.7  | 62.0     | 0.0     | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | 30.50       | 251.00  | 15.00                    | -169.1 | 62.0     | 0.0     | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * I            | 30.50       | 251.00  | 15.00                    | -127.2 | 62.0     | 0.0     | 0.00 | -           | - | - | - | - | + | - | - | + |
| 1 * H            | 31.00       | -110.00 | 18.00                    | 116.9  | 60.0     | 0.0     | 0.00 | -           | - | - | - | - | - | - | + | + |
| 1 * H            | 31.00       | -110.00 | 18.00                    | 159.9  | 60.0     | 0.0     | 0.00 | -           | - | - | - | - | - | - | + | + |
| 1 * H            | 31.00       | -60.00  | 18.00                    | -116.9 | 60.0     | -0.0    | 0.00 | -           | - | - | - | - | - | - | + | + |
| 1 * H            | 31.00       | -60.00  | 18.00                    | -159.9 | 60.0     | -0.0    | 0.00 | -           | - | - | - | - | - | - | + | + |
| 1 * I            | 31.00       | 260.16  | 15.00                    | 172.3  | 62.0     | -0.0    | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | 31.00       | 260.16  | 15.00                    | 123.1  | 62.0     | -0.0    | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | 31.00       | 290.00  | 15.00                    | 148.0  | 63.0     | -0.0    | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | 31.00       | 290.00  | 15.00                    | -152.7 | 62.0     | -0.0    | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | 31.00       | 322.00  | 15.00                    | -148.0 | 63.0     | 0.0     | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | 31.00       | 322.00  | 15.00                    | 152.7  | 62.0     | 0.0     | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | 31.00       | 351.84  | 15.00                    | -172.3 | 62.0     | 0.0     | 0.00 | -           | - | - | - | - | - | + | - | + |
| 1 * I            | 31.00       | 351.84  | 15.00                    | -123.1 | 62.0     | 0.0     | 0.00 | -           | - | - | - | - | - | + | - | + |

## Techniek en Mobiliteit

Gemeente 's-Hertogenbosch  
Afdeling Sport en Recreatie  
T.a.v. de heer H. Verkammen  
Postbus 12345  
5200 GZ 's-Hertogenbosch

|             |                          |                |                      |
|-------------|--------------------------|----------------|----------------------|
| Datum       | 23 februari 2010         | Contactpersoon | F. Pasveer           |
| Onderwerp   | Lichthinder onderzoek HC | Telefoon       | +31 (0)40 295 71 08  |
| Ons kenmerk | 371217218                | Fax            | +31 (0)40 295 71 10  |
| Uw kenmerk  |                          | E-mail         | fpasveer@heijmans.nl |

Geachte heer Verkammen,

Hierbij doen wij u de gegevens toekomen van het lichthinder onderzoek voor het project "uitbreiding hockeycomplex Oosterplas".  
De uitbreiding van het lichthinder onderzoek betreft het verzoek van RWS, om na te gaan wat de gevolgen zijn voor de weggebruikers op de ring A2 m.b.t. de maximale lichtintensiteit, verblindingwaarde en drempelwaarde verhoging.  
De door u aangegeven en te hanteren grenswaarden voor de lichtemissie zijn aangegeven in de tabel I omgevingszone E2 ( landelijk gebied ), van de aanbeveling "Algemene richtlijn Lichthinder voor Sportvelden " van de NSVV.

Berekeningsresultaten waarnemers A2-wn1 t/m A2-wn15 .  
De max. lichtintensiteit voor deze waarnemers ligt tussen 985 en 2167 cd ( norm 7500 cd )  
De max. verblindingswaarde voor deze waarnemers ligt tussen 10,2 en 27,8 ( norm < 40 )  
De drempelwaarde verhoging ( TI ) voor deze waarnemers is 0,1% (+ armaturen rijbaan max.15% )

Vertrouwende u hiermede van voldoende informatie te hebben voorzien.

Hoogachtend,  
**Heijmans Techniek en Mobiliteit B.V.**  
Regio Zuid

F. Pasveer  
Engineer /adviseur Lichtinstallaties

Bijlage; Lichthinder berekening