

Informal document No. **11**

(50<sup>th</sup> GRE, 7-11 April 2003,  
agenda item 3.3.)

# ALTERNATIVE CO-ORDINATES SYSTEM FOR AFS DRAFT REGULATION

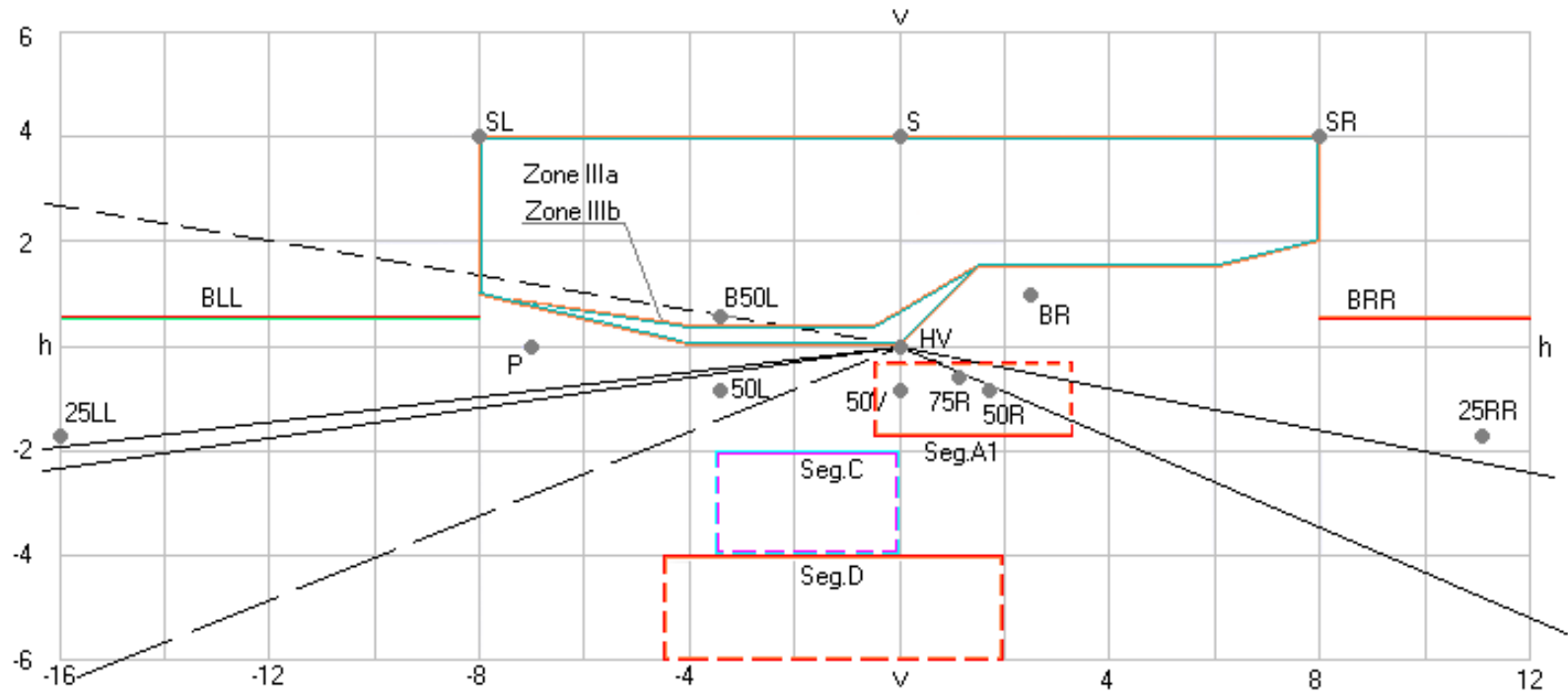
EXPLANATION TO INFORMAL DOCUMENT No. 10

Tomasz Targosiński

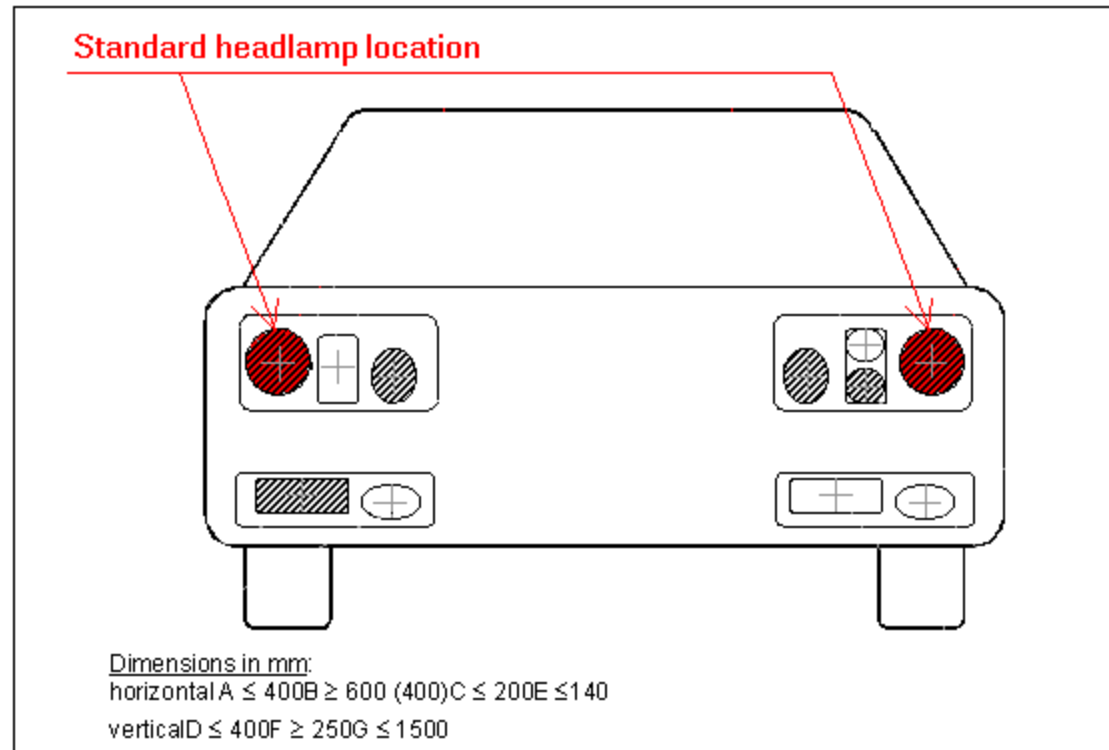
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# MEASURING POINTS AND SEGMENTS ON 25 M SCREEN PROPOSED IN DRAFT XXX



# AFS LIGHTING UNITS PLACEMENT (DRAFT AMENDMENTS TO R48)

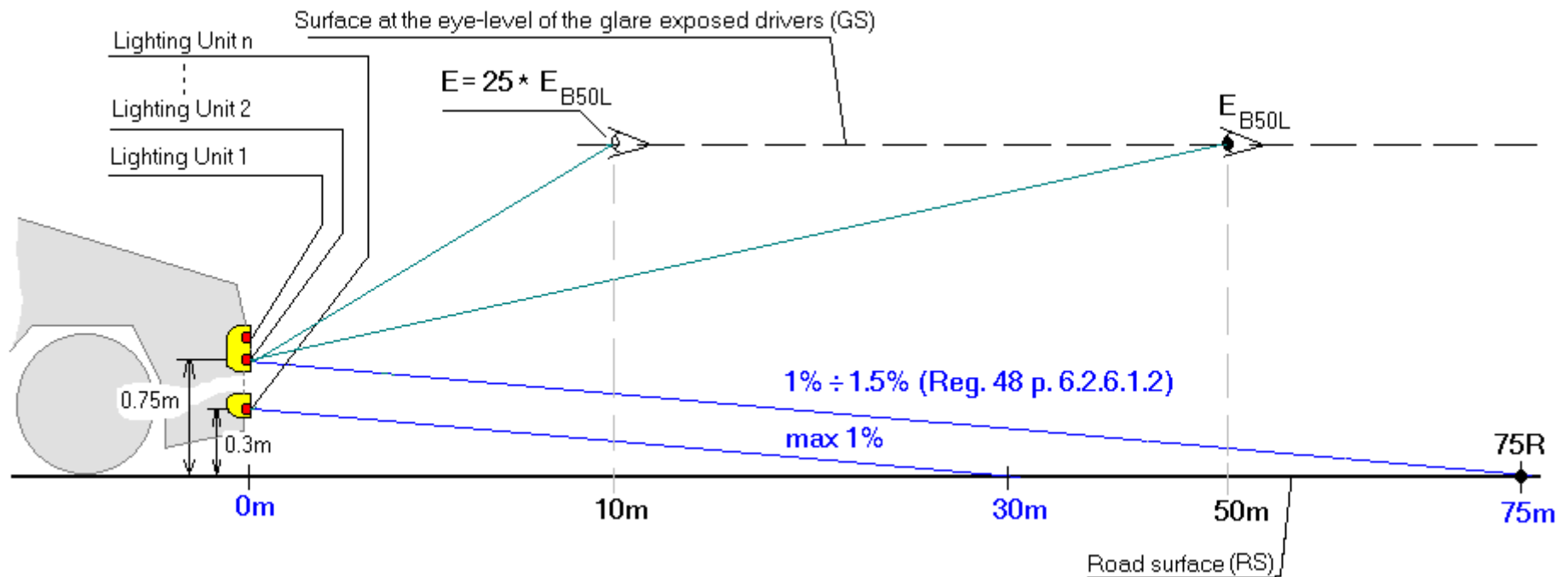


AFS lighting units location is more complex than standard headlamps. Standard headlamps are placed symmetrically in fixed height. For AFS the number of units, vertical distance and different heights of mounting are important as described in draft amendments to R48. In this situation only proper units adjustment gives acceptable road illumination.



# AFS ILLUMINATION ON THE RS AND GS

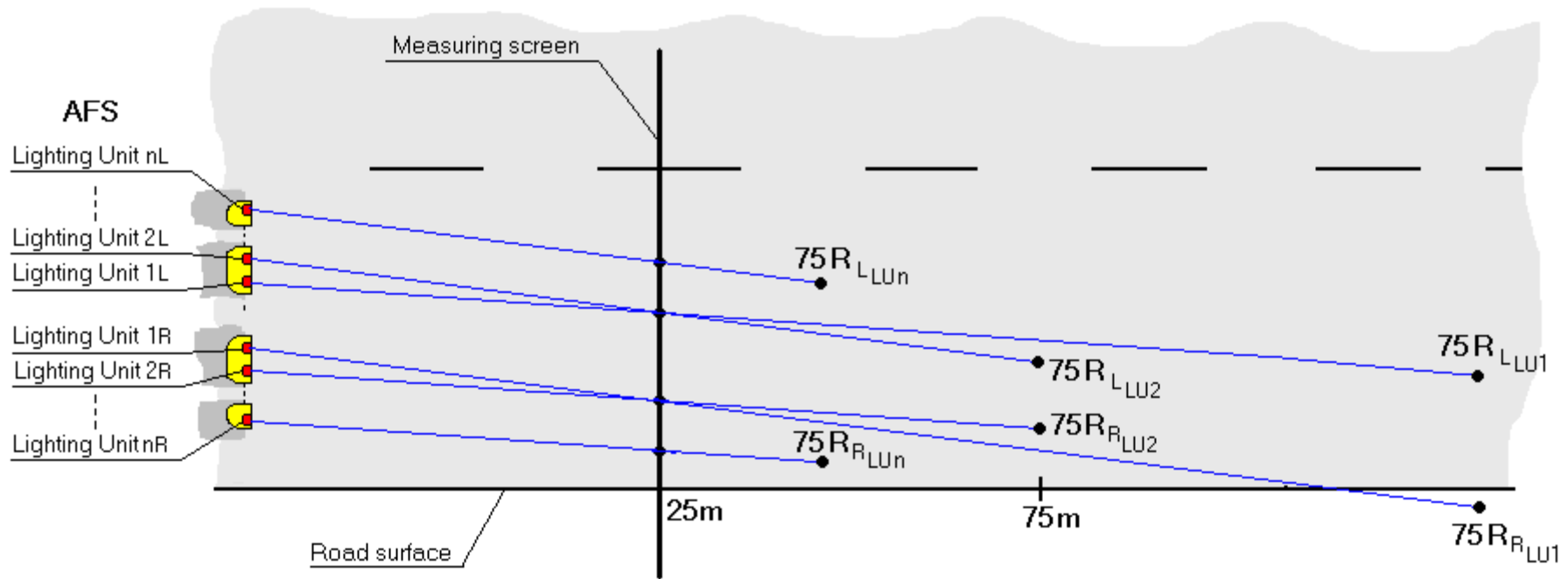
## SIDE VIEW



Points placements and its photometric values on the road surface (RS) and surface at the eye-level of the glare exposed drivers (GS) depend on mounting height and aiming of lighting unit(s) (aiming limit is maximum 1%, according to draft amendments to R48).

# AFS ILLUMINATION ON THE RS AND GS

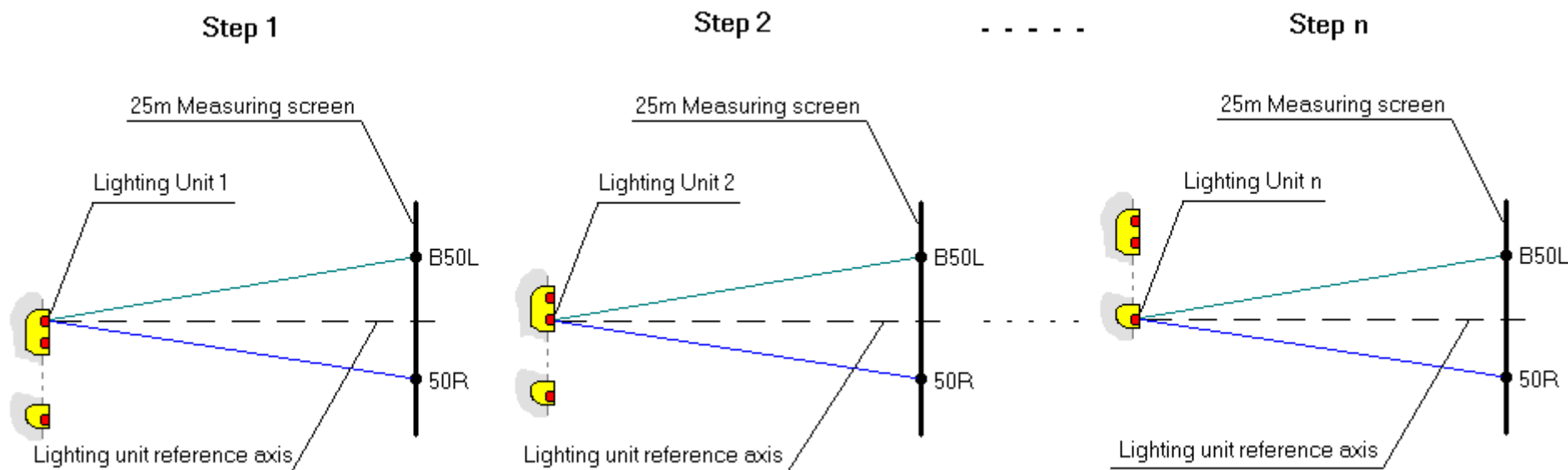
## TOP VIEW



Each point (e.g.75R) on the measuring screen can be translated to many points on the road surface (RS) depending on lighting units mounting positions.

# MEASURING PROCEDURE RESULTS ACCORDNG TO AFS DRAFT XXX

## EXAMPLE FOR 50R AND B50L POINTS



Draft XXX assumption (the same hight and aiming for each unit of one side):

$$E_{50R} = E_{50R \text{ LU1}} + E_{50R \text{ LU2}} + \dots + E_{50R \text{ LUn}}$$

$$E_{B50L} = E_{B50L \text{ LU1}} + E_{B50L \text{ LU2}} + \dots + E_{B50L \text{ LUn}}$$

Value on the Road Surface:

$E_{50R} = \text{unknown!}$

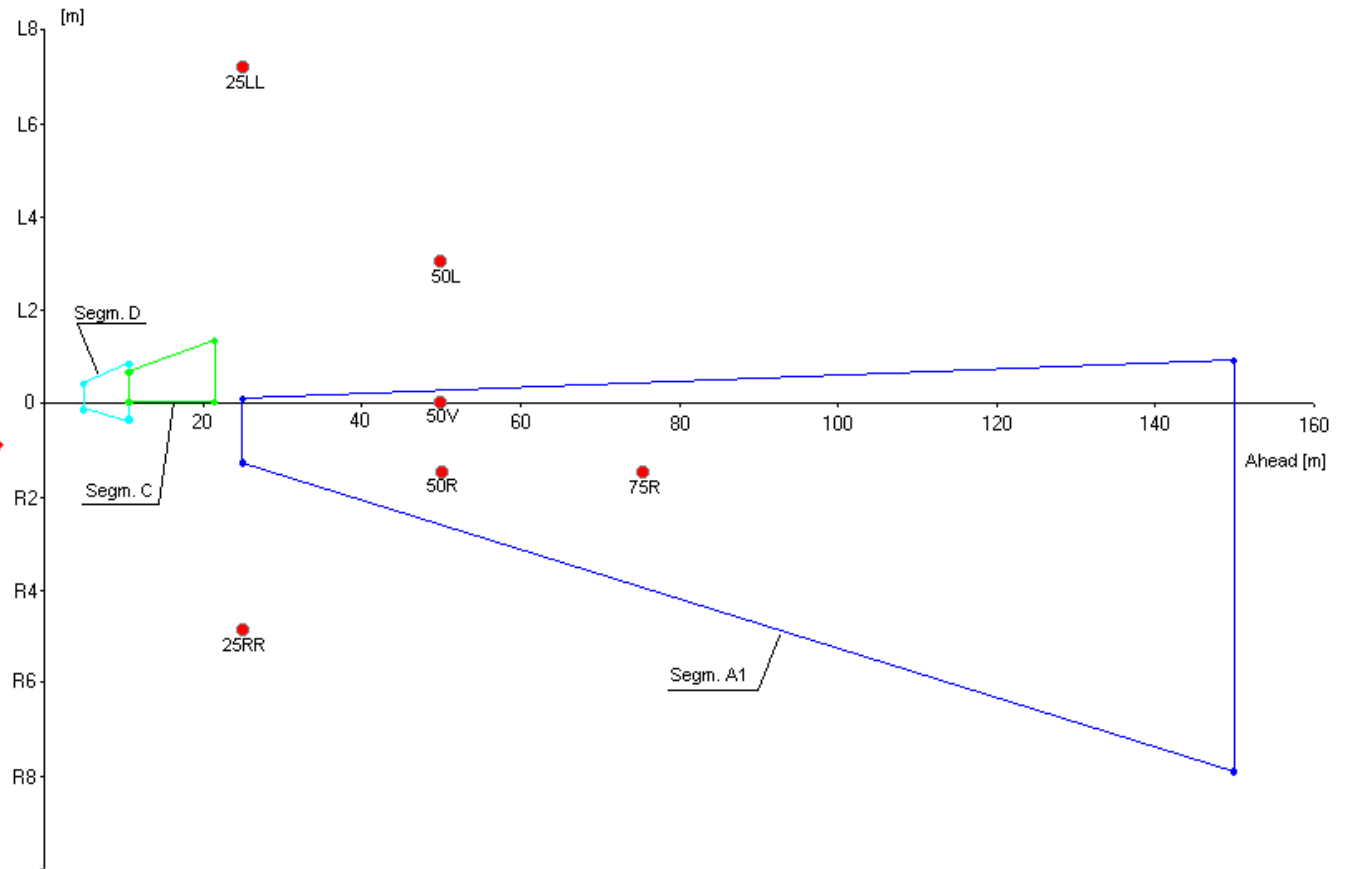
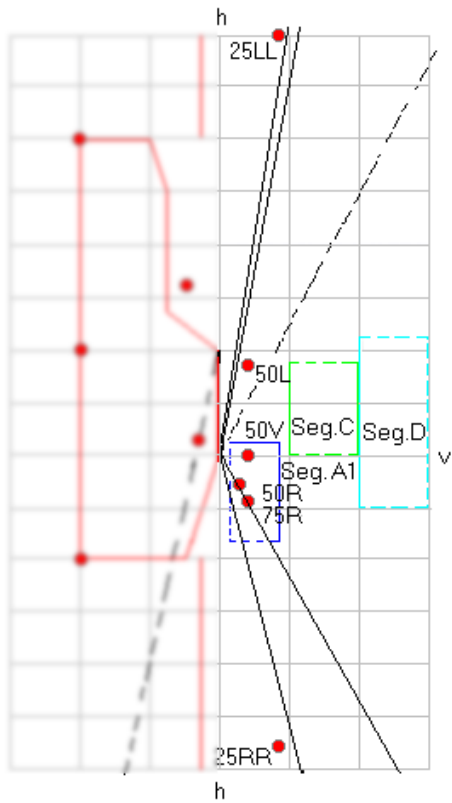
Value on the „Glare” Surface:

$E_{B50L} = \text{unknown!}$





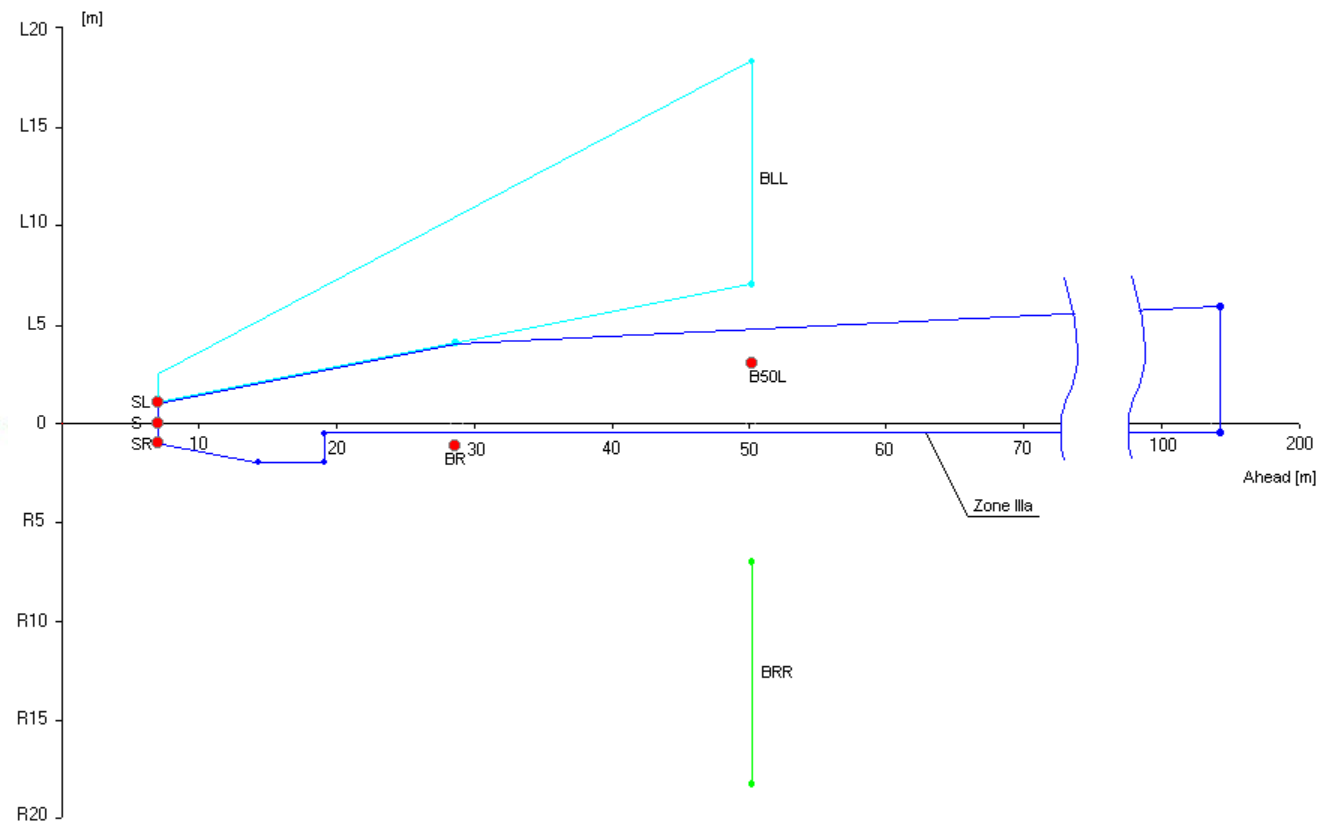
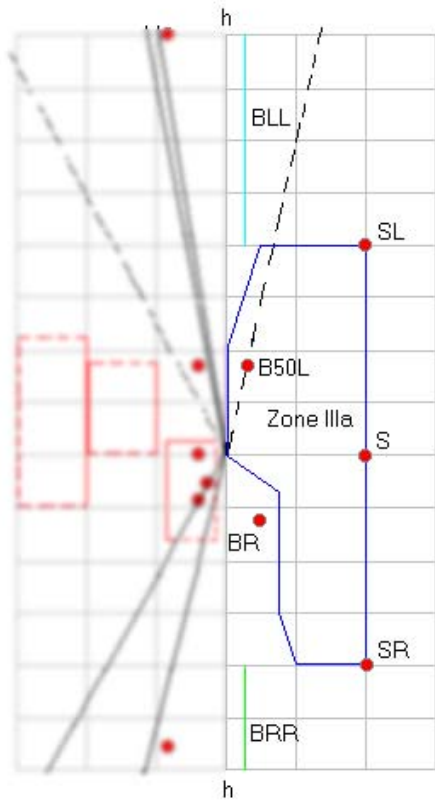
# POINTS AND SEGMENTS POSITION ON THE ROAD SURFACE (RS) (FOR CLASS C BASING PASSING BEAM)



Draft XXX  
co-ordinate system

Alternative equivalent co-ordinate system

# POINTS AND SEGMENTS POSITION AT THE EYE-LEVEL OF THE GLARE EXPOSED DRIVERS (GS) (FOR CLASS C PASSING BEAM)



Draft XXX  
co-ordinate system

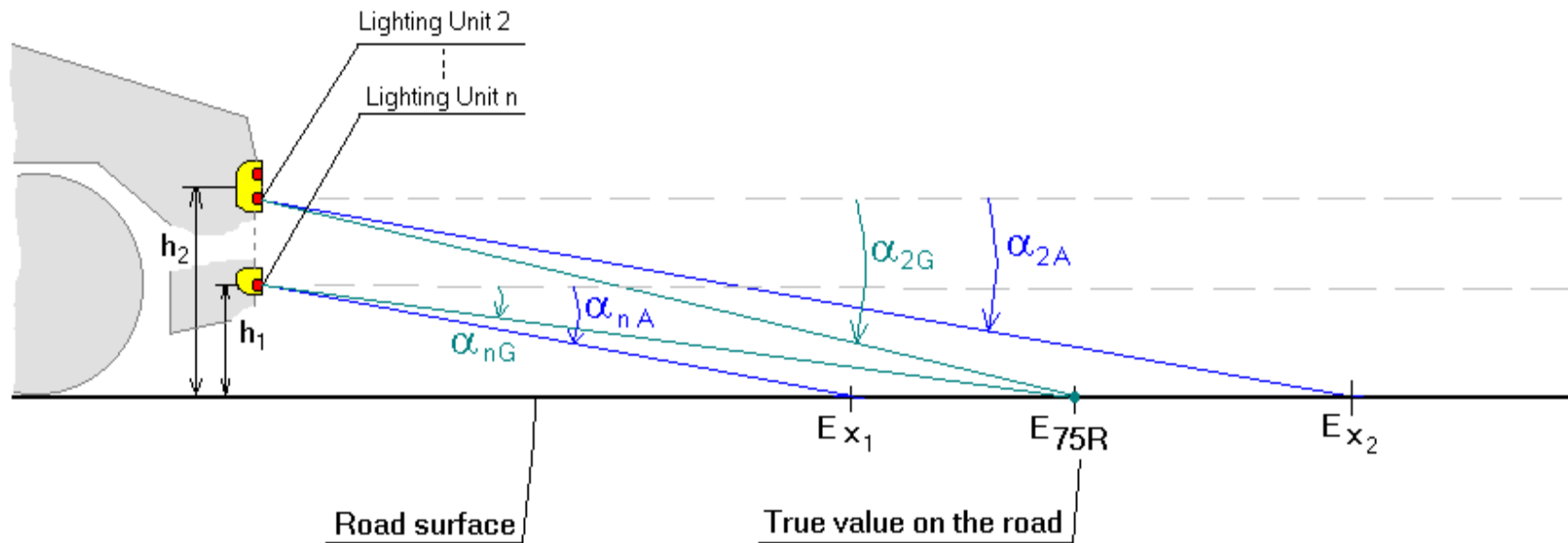
Alternative equivalent co-ordinate system

## MEASURING METHOD

The measurement method is identical as the one applied during standard measurement. The way of determining the angular values are shown on the following drawings.

# MEASURING METHOD

## SIDE VIEW - EXAMPLE FOR 75R

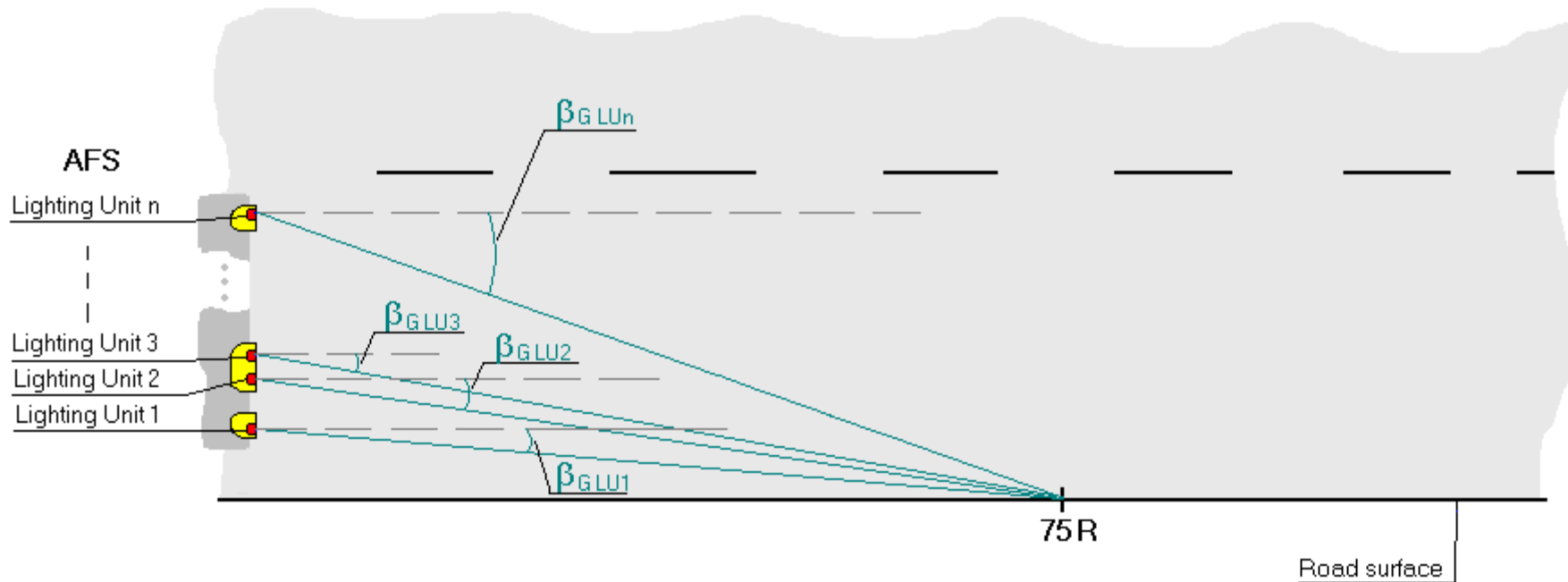


$\alpha_{2A}$ ,  $\alpha_{nA}$ , - Aiming angles specified by applicant (with precision not less than 0,1 deg), usually it is 0,57 deg according to draft amendments to R48.

$\alpha_{2G}$ ,  $\alpha_{nG}$ , - Angles calculated for goniophotometer measurement

# MEASURING METHOD

## TOP VIEW - EXAMPLE FOR 75R

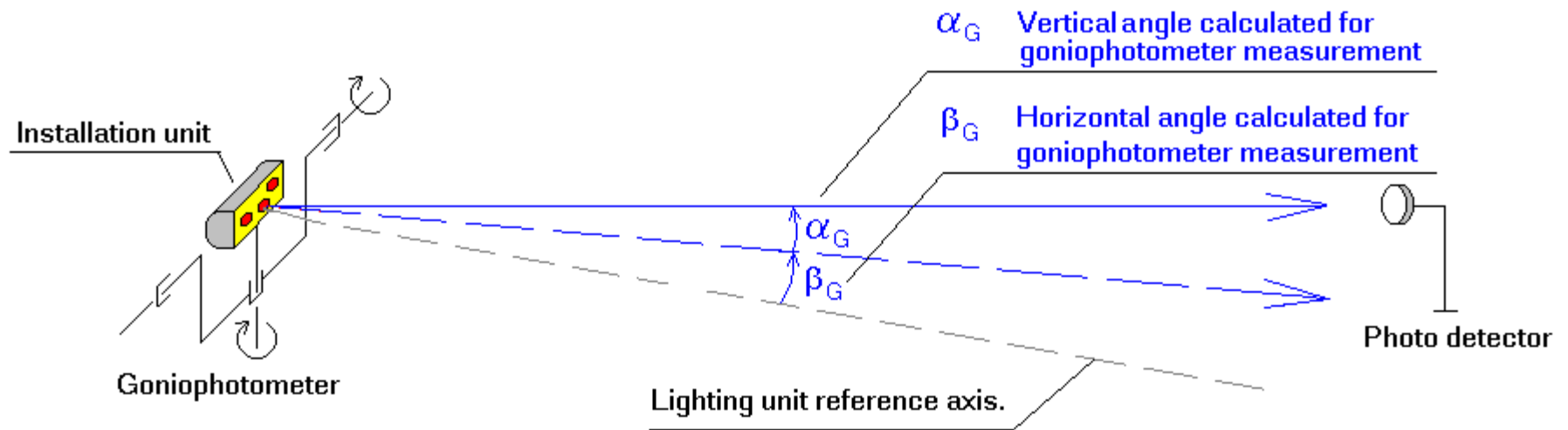


$\beta_{GLUn}$ , - horizontal goniometer angle for lighting unit „n” as calculation result of horizontal distance between system reference axis and position of 75R point. Results of photometric measurement consider true distance between lighting unit and 75R.

### **Conclusion:**

$$E_{75R} = E_{75R LU1} + E_{75R LU2} + \dots + E_{75R LU n} \quad \textbf{\underline{This is true value on road (RS)}}$$

## GONIOPHOTOMETER MEASURING PROCEDURE



Alternative co-ordinates system uses the same goniophotometer as standard measuring method.

## CONCLUSIONS

- It is simple and easy to redefine requirements proposed in TRANS/WP.29/GRE/2002/18 for road level surface (RS) and surface at the eye-level of the glare exposed drivers(GS), situated parallel to the road surface.
- This proposal **is only another way of expression of the same illumination requirements** which are defined for measuring screen surface in TRANS/WP.29/GRE/2002/18.
- The laboratory measuring equipment and methods are unchanged. The goniophotometer is still the basic tool for measurements.
- It is only needed to do **very simple recalculations** of angles and the photometric values from measuring screen co-ordinate system to RS and GS co-ordinate system, depending on placement of lighting units.