H3 Solution, CPSC 314, Jan 2016

1] $N_b = \| \frac{N_F + N_G}{2} \| = (0, -1, 0)$

2] $Ambient = k_a \cdot I_a = (0.25, 0.02, 0.25)$

$L_B = |L - B| = |(-3, -3, 0)| = (-\frac{1}{\sqrt{2}}, -\frac{1}{\sqrt{2}}, 0)$

$E_B = |E - B| = |(-1, -5, 0)| \approx (-0.196, -0.98, 0)$

$DiffuseDotB = L_B \times N_b = \sqrt{2}$

$Diffuse B = k_d \cdot DiffuseDotB \cdot I_l \approx (0.19, 0.56, 0.14)$

$R_B = |2 \cdot DiffuseDotB \cdot N_B - L_B| = (\frac{1}{\sqrt{2}}, -\frac{1}{\sqrt{2}}, 0)$

$SpecularDotB = R_B \times E_B = 0.554$

$SpecularExpB = SpecularDotB^{kse} \approx 0.0028$; $Specular_B = k_s \cdot SpecularExpB \cdot I_l \approx$

$Total B = Ambient + Diffuse B + Specular B \approx (0.44, 0.58, 0.39)$ $\quad (0.0012, 0.0028, 0.0028)$

$L_C = |L - C| = (-0.6, -0.8, 0)$

$RiffuseDotC = L_C \times |N_C| = -0.9130 < 0 \Rightarrow Diffuse_C = Specular_C = 0$

$Total_C = Ambient$

$TotalD = TotalB$

3] $Total_D = \frac{Total_B}{3} + \frac{Total_C \cdot 2}{3} = (0.374, 0.209, 0.298)$ B and C remain the same

4] $N_d = \left| \frac{(N_b 1}{3} + \frac{|N_C| \cdot 2}{3} \right| = (0.5828, -0.0096, 0)$

$L_D = |L - D| = (-0.6739, -0.7894, 0)$ B and C remain the same

$DiffuseDotD = L_D \times |N_D| = -0.6009 < 0 \Rightarrow Diffuse D = Specular D = 0$

$Total_D = Ambient$

H3 Grading Scheme, CPCS 314, Jan 2016

1] 4 total

2] Ambient: 2.5 each (C and B)
Diffuse: 10 each
Specular: 10 each
Totals: 2.5 each

3] Interpolation: 10
Totals: 8

4] Normals: 4
Diffuse: 10
Specular: 10
Totals: 4

Flat shading:
- 5 for D ≠ C or
- for B = C