

Faber Maunsell Lighting

Glasgow Airport Rail Link

Playing Fields Sunlight Assessment

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DRAFT



Sunlight Assessment St James' Park, Paisley**Index**

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1.0 Introduction

This report is a sunlight occlusion study. The analysis indicates the moving shadow that will be cast by the proposed Glasgow rail link viaduct over adjacent sports fields on clear days. This shadow cast analysis indicates the extent of introduced/new shading that the proposed viaduct will create. The introduced/new shading is one of numerous factors that will contribute to ground frost on the sports fields. Other contributing factors, including local ambient temperature, latent soil moisture etc., are independent of the impact of the viaduct and beyond the scope of this report.

1.1 Analysis assumptions

We assume that there is the potential of ground frost in the autumn, winter and spring months. Given this we have taken the following test cases; December 21st – worst case. March/September 21st – end of frost potential period. The extent of the introduced/new shading between these test case extremes can be assessed by interpolation of the test case results.

2.0 December Shadow-cast

December 21st 9.00



December 21st 9.30



2.0 December Shadow-cast

December 21st 10.00



December 21st 10.30



2.0 December Shadow-cast

December 21st 11.00



December 21st 11.30



2.0 December Shadow-cast

December 21st 12.00



December 21st 12.30



2.0 December Shadow-cast

December 21st 13.00



3.0 March Shadow-cast

March 21st 6.30



March 21st 7.00



3.0 March Shadow-cast

March 21st 7.30



March 21st 8.00



3.0 March Shadow-cast

March 21st 8.30



March 21st 9.00



3.0 March Shadow-cast

March 21st 9.30



March 21st 10.00



3.0 March Shadow-cast

March 21st 10.30



March 21st 11.00



3.0 March Shadow-cast

March 21st 11.30



March 21st 12.00



3.0 March Shadow-cast

March 21st 12.30



March 21st 13.00



4.0 Analysis observations

December 21st introduced/new shading characteristic summary

The solid shadow cast of the viaduct affects approximately 30% of 4 of the 11 pitches to the West of the viaduct at 9.30. At this time (dawn break) the sun is weak and the shadow cast unpronounced. The solid shadow cast of the viaduct affects approximately 40% of 3 of the 11 pitches to the West of the viaduct between 10.00 - 10.30. The solid shadow cast of the viaduct affects below 30% of 2 of the 11 pitches to the West of the viaduct at 11.00 falling to no pitch overshadowing by 12.30.

March 21st introduced/new shading characteristic summary

The solid shadow cast of the viaduct affects approximately 50% of 3 of and 25% of 1 of the 11 pitches to the West of the viaduct at 7.00. At this time (dawn break) the sun is weak and the shadow cast unpronounced. The solid shadow cast of the viaduct affects approximately 50% of 3 of the 11 pitches to the West of the viaduct between 7.30 - 8.0. The solid shadow cast of the viaduct affects approximately 40% of 3 of the 11 pitches to the West of the viaduct between 7.30 - 8.0. The solid shadow cast of the viaduct affects approximately 30% of 2 and 10% of 1 of the 11 pitches to the West of the viaduct at 8.30 falling to no pitch overshadowing by 10.30.

5.00 Conclusion

The extent of sunlight occlusion created by the proposed viaduct is only one of numerous factors that will contribute ground frost on the sports fields. Other factors contributing to ground frost including local ambient temperature, latent soil moisture etc are independent of the impact/presence of the viaduct and are beyond the scope of this report. With specific regard to the impact of the viaduct our analysis indicates a morning partial shading of 4 pitches during the months September to March. The introduced/new shading created by the proposed viaduct on the sports field is limited and dynamic and as such our analysis indicates it will not significantly contribute to later/increased ground frost potential at the site.