

Reliability of Visual Inspection for Highway Bridges, Volume II: Appendices
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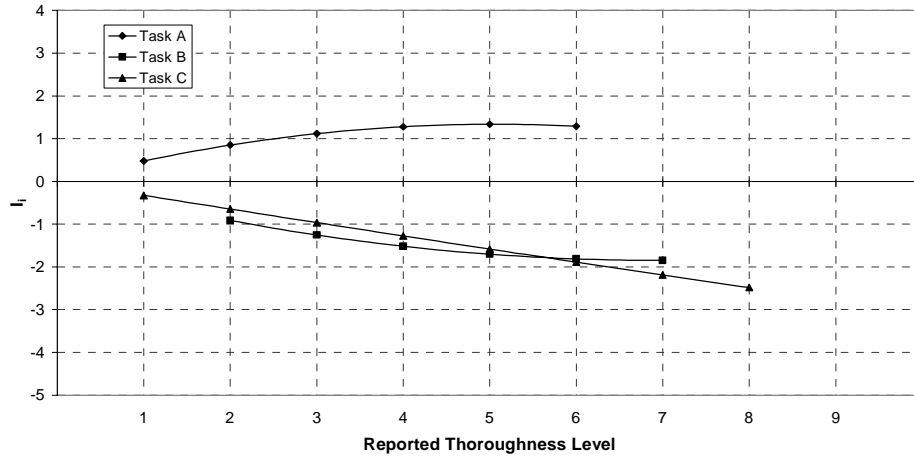
APPENDIX L. FACTOR INFLUENCE FIGURES

Most of the inspector and inspection factors used in the figures in this appendix were assessed in such a way that quantitative data could be collected. However, some of the data were collected in a purely qualitative form. The qualitative data were subsequently transformed into a pseudo-quantitative form for use in the regression analyses. Specifically, the inspector factor General Education Level was transformed into a quantitative form using the following scale:

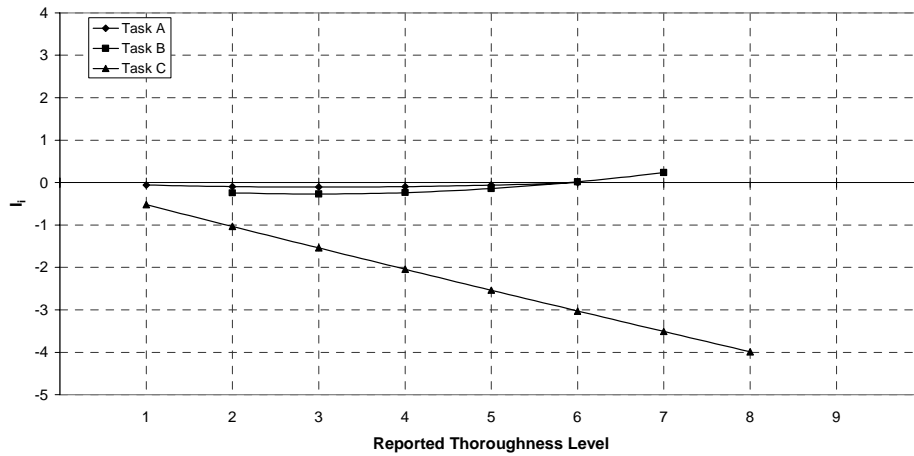
- 1 = Some high school
- 2 = High school degree or equivalent
- 3 = Some trade school
- 4 = Trade school degree
- 5 = Some college
- 6 = Associate's degree
- 7 = Bachelor's degree
- 8 = Some graduate work
- 9 = Master's degree
- 10 = Terminal degree

Similarly, the Formal Bridge Inspection Training factor was calculated as the total number of FHWA training courses that an inspector had reported completing.

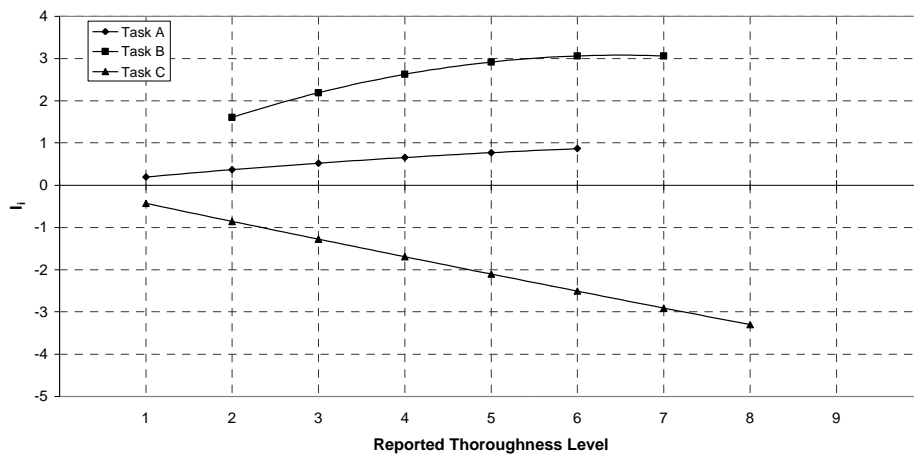
Color vision attributes were quantified in two different manners to simulate different uses of color vision. First, the total number of minor confusions (i.e., errors between contiguous test caps) from the PV-16 color vision test was used as a measure of inspector ability to distinguish similar colors. It was speculated that this could be of importance in assessing structural deterioration that manifests itself only as a slight change in color (e.g., some types of concrete deterioration). Second, the number of major confusions from the PV-16 color vision test was used as a measure of inspector ability to distinguish specific colors (e.g., green-red). It was thought that this type of color vision may be a trait necessary for fatigue crack detection. Direct visual acuity (both near and distance) was quantified as the “bottom” number from the vision test results (e.g., 20/12.5 visual acuity = 12.5).



a. Deck

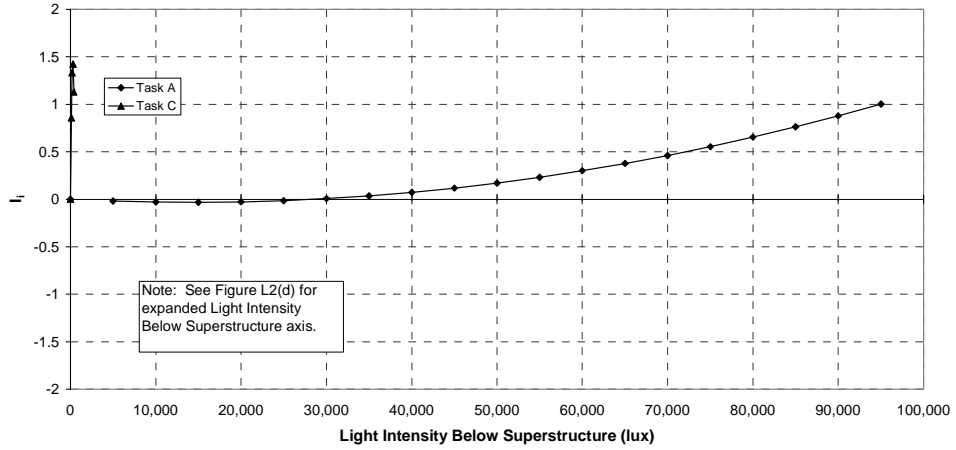


b. Superstructure

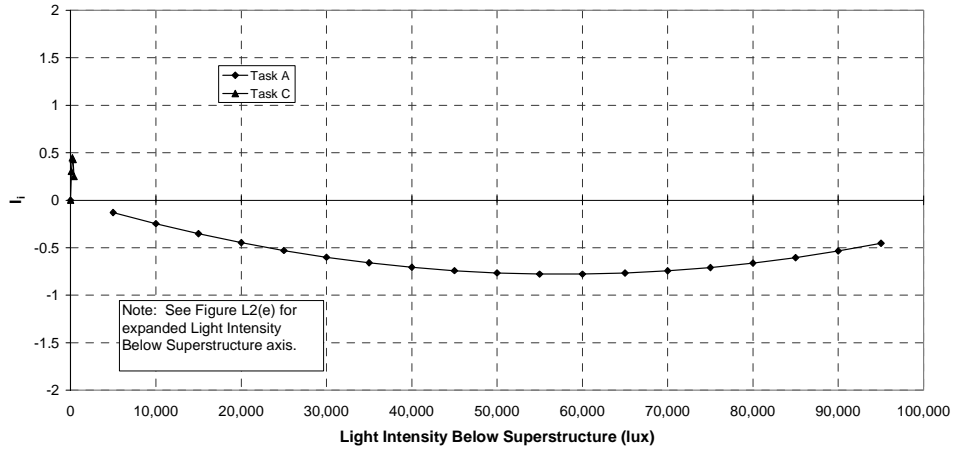


c. Substructure

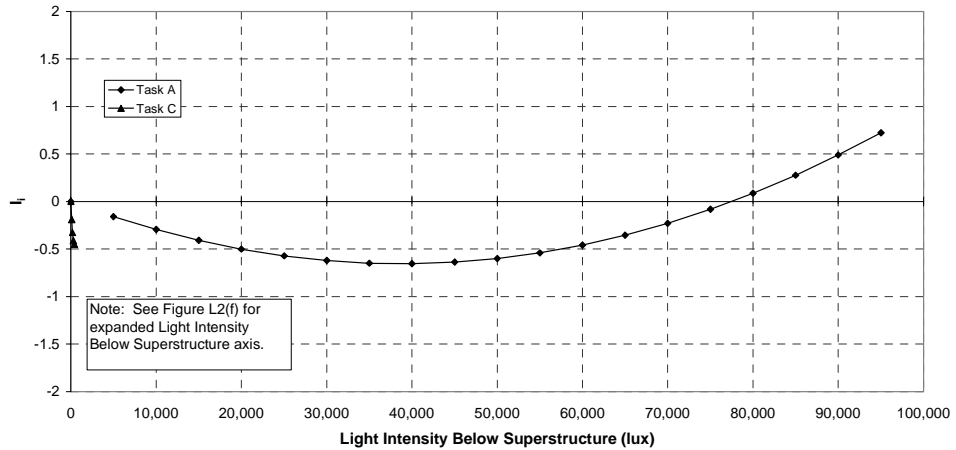
Figure L1. Influence of inspection factor Reported Thoroughness Level (1=Much less thorough than normal, 9=Much more thorough than normal) on Condition Ratings.



a. Deck

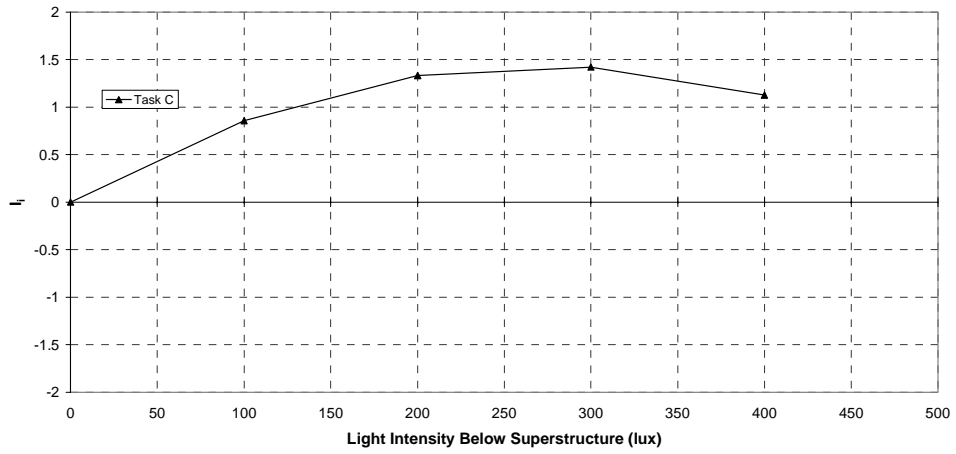


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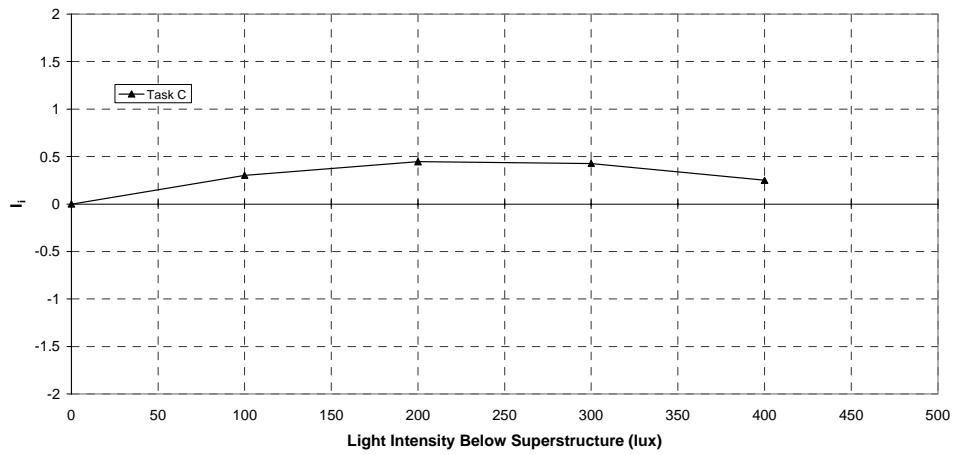


c. Substructure

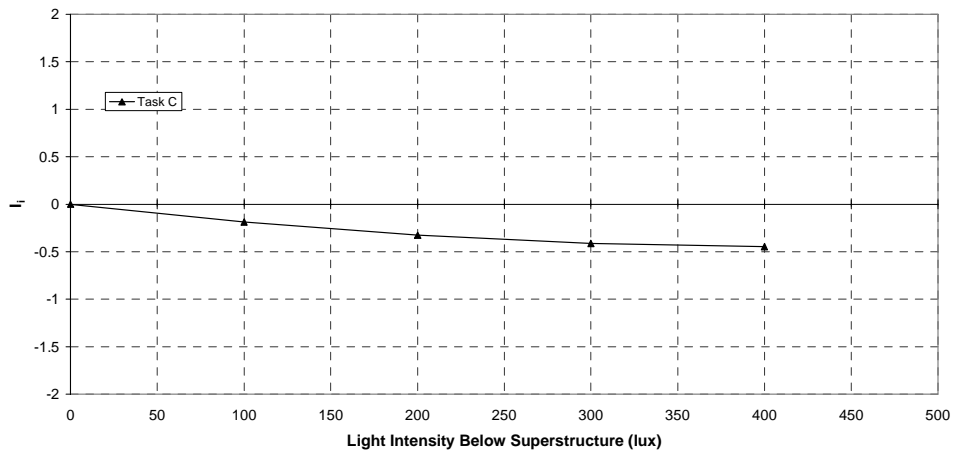
Figure L2. Influence of inspection factor Light Intensity Below Superstructure on Condition Ratings.



d. Deck

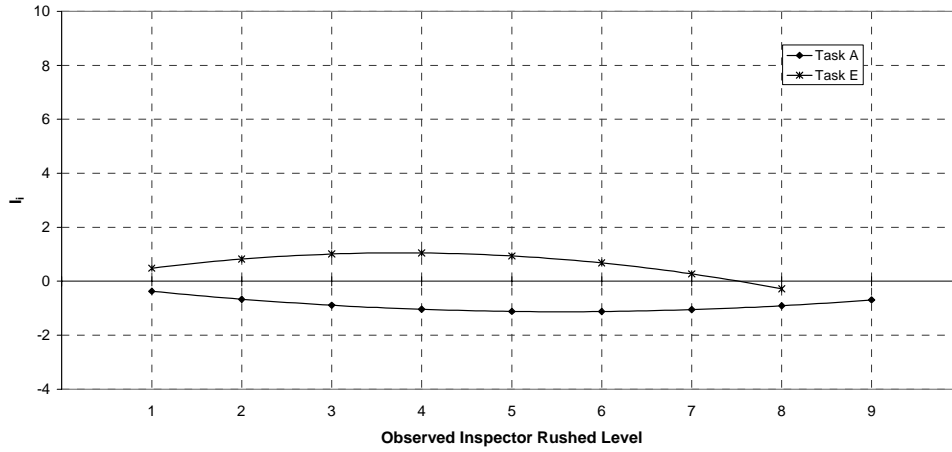


e. Superstructure

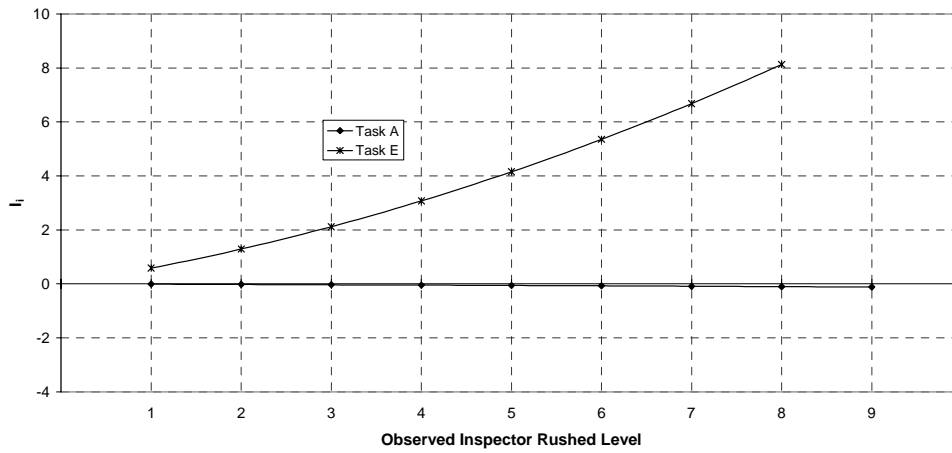


f. Substructure

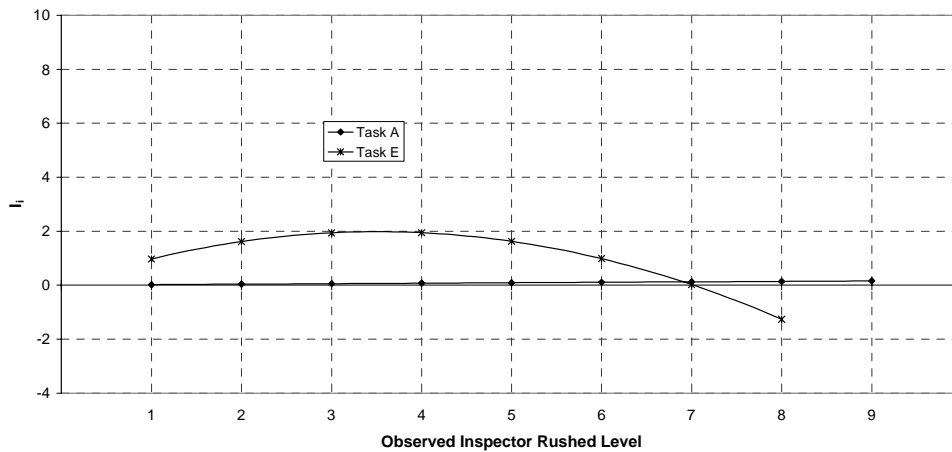
Figure L2. Influence of inspection factor Light Intensity Below Superstructure on Condition Ratings (continued).



a. Deck

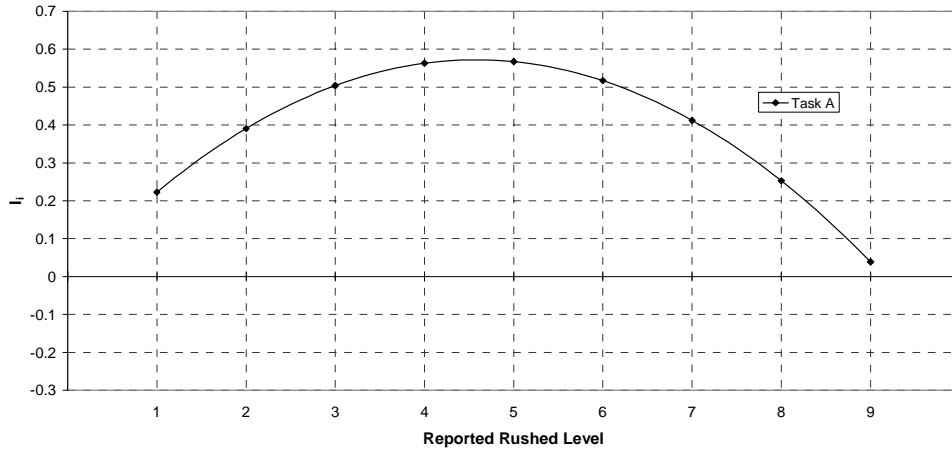


b. Superstructure

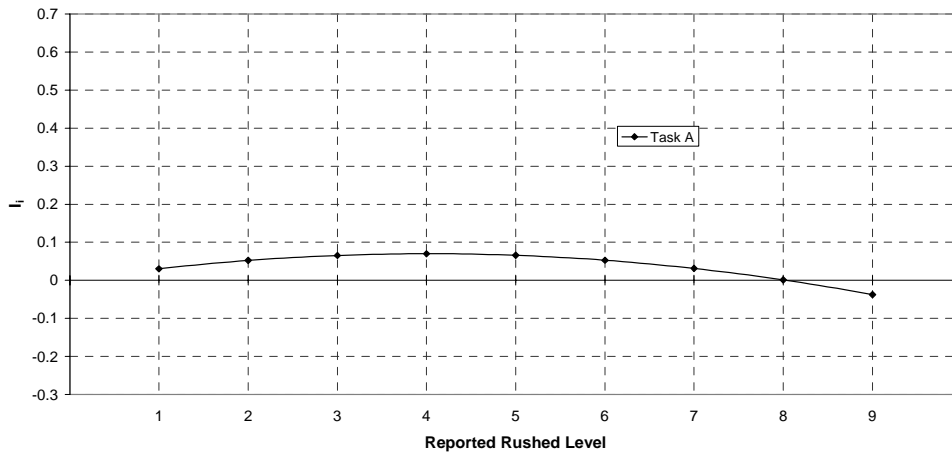


c. Substructure

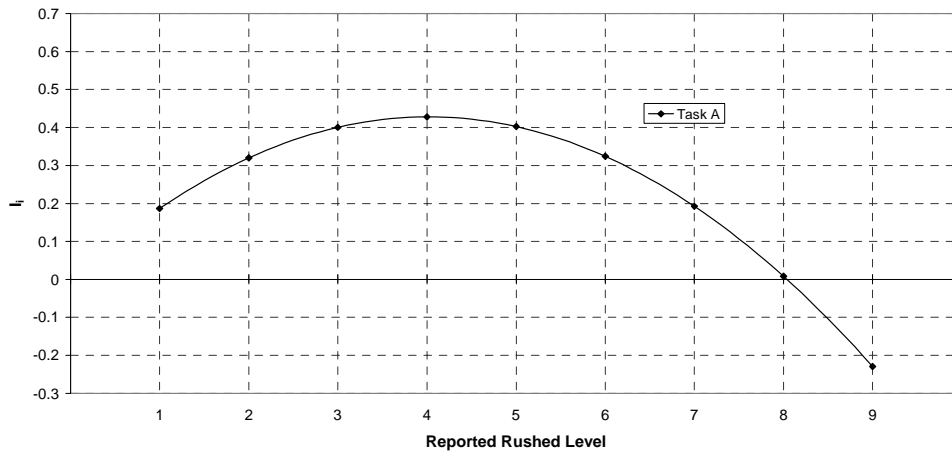
Figure L3. Influence of inspection factor Observed Inspector Rushed Level (1=Not rushed, 9=Very rushed) on Condition Ratings.



a. Deck

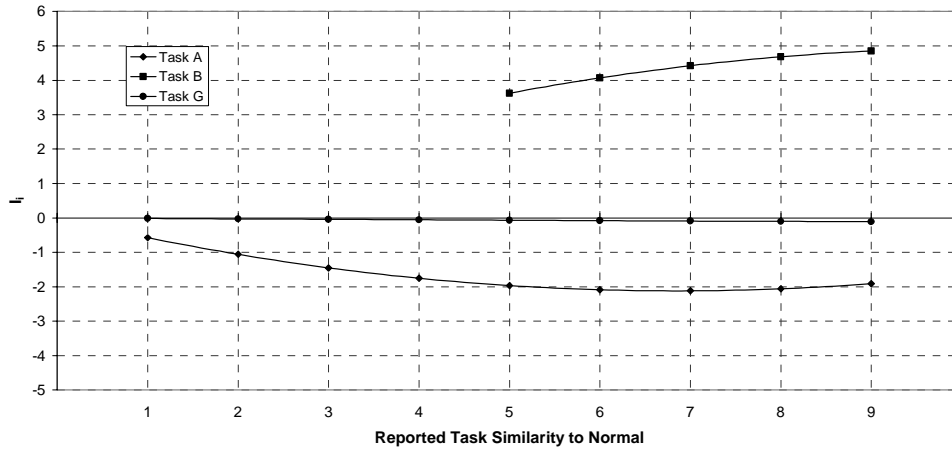


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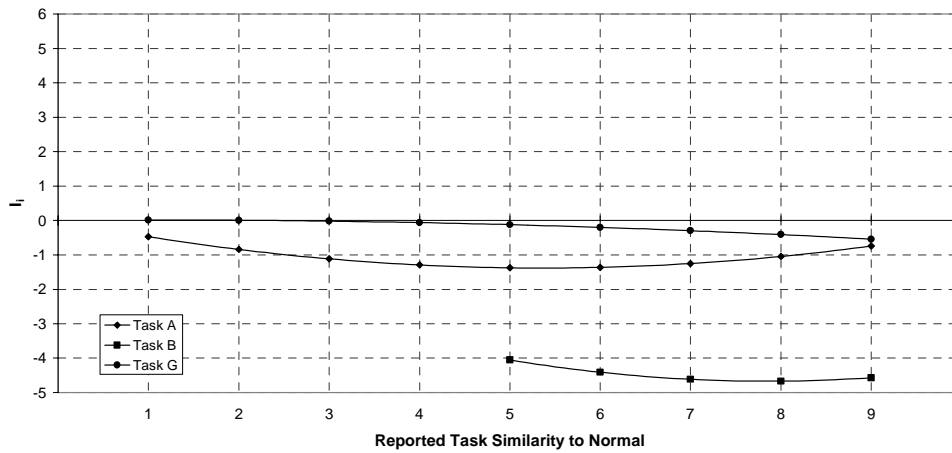


c. Substructure

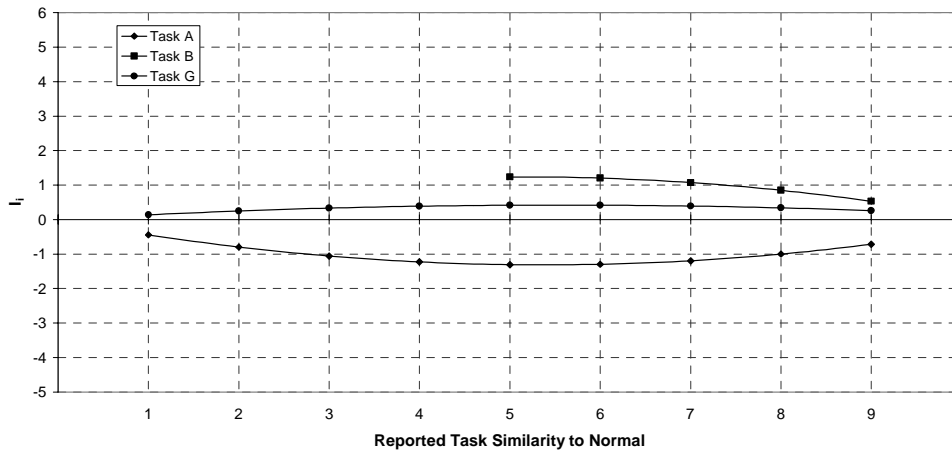
Figure L4. Influence of inspection factor Reported Rushed Level (1=Not rushed, 9=Very rushed) on Condition Ratings.



a. Deck

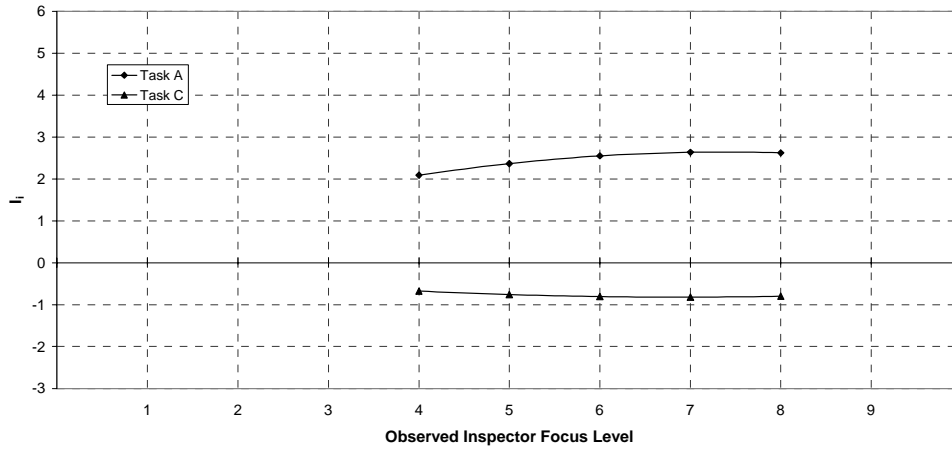


b. Superstructure

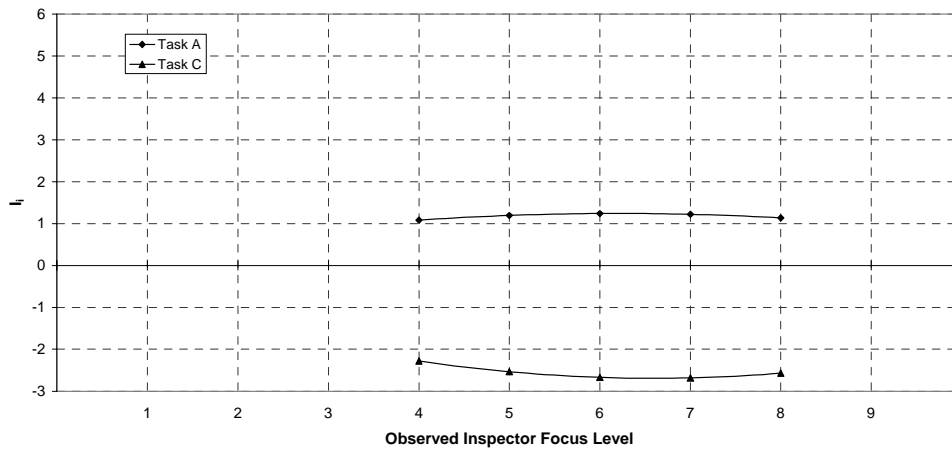


c. Substructure

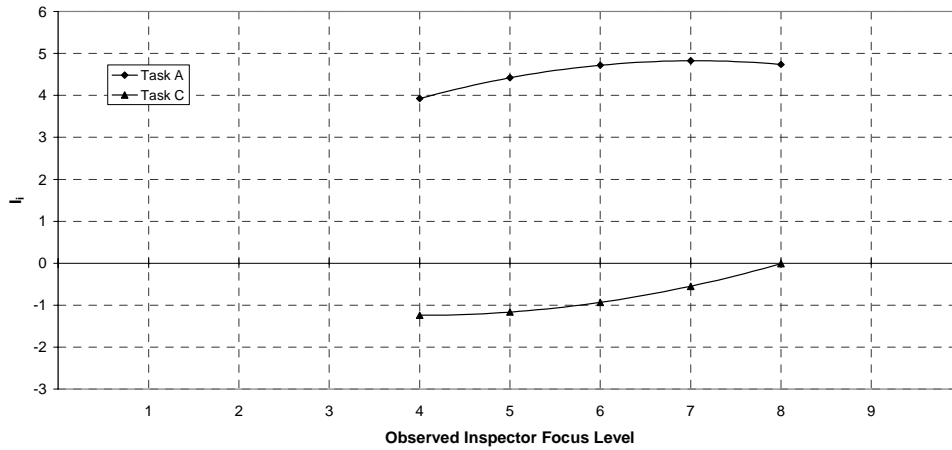
Figure L5. Influence of inspection factor Reported Task Similarity to Normal (1=Not similar, 9=Very similar) on Condition Ratings.



a. Deck

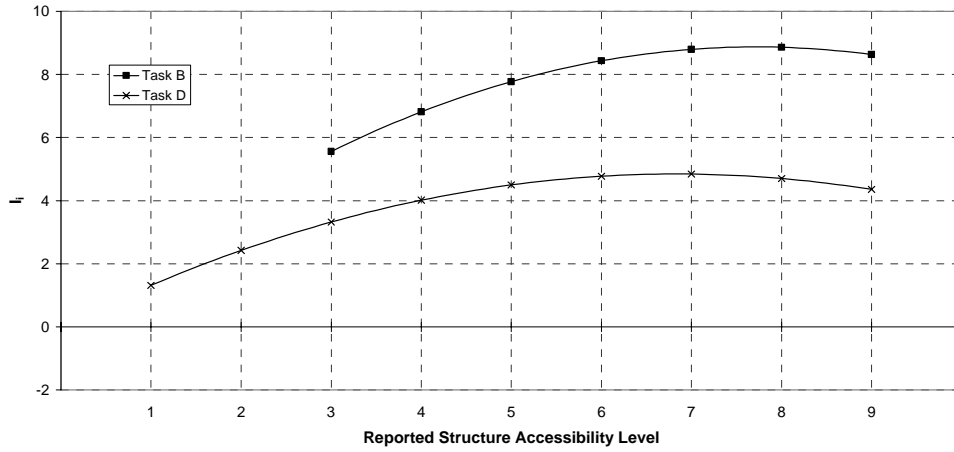


b. Superstructure

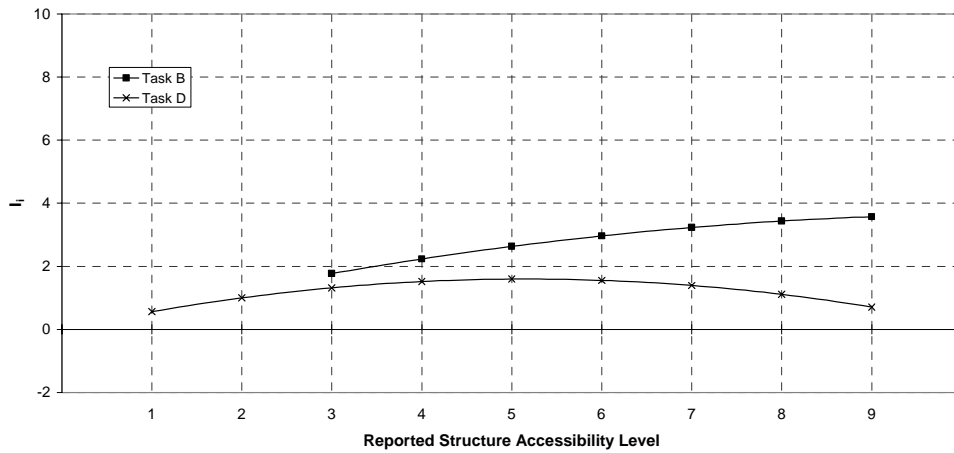


c. Substructure

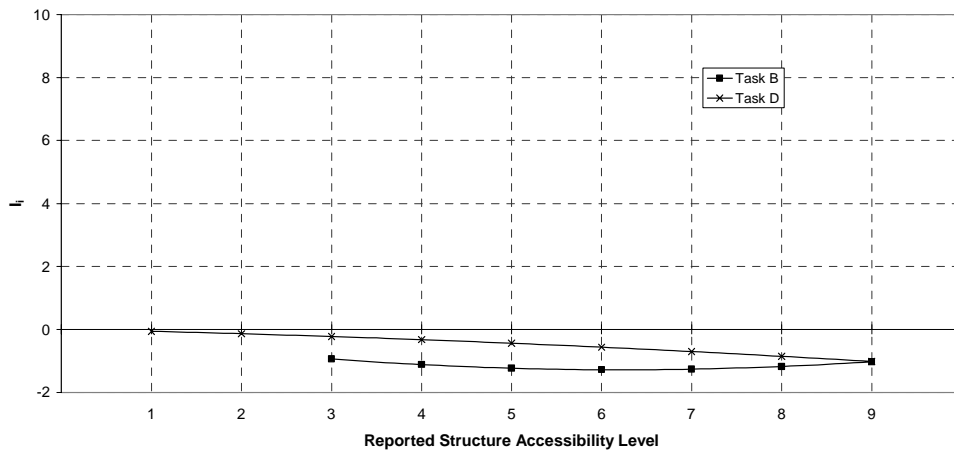
Figure L6. Influence of inspection factor Observed Inspector Focus Level (1=Very unfocused, 9=Very focused) on Condition Ratings.



a. Deck

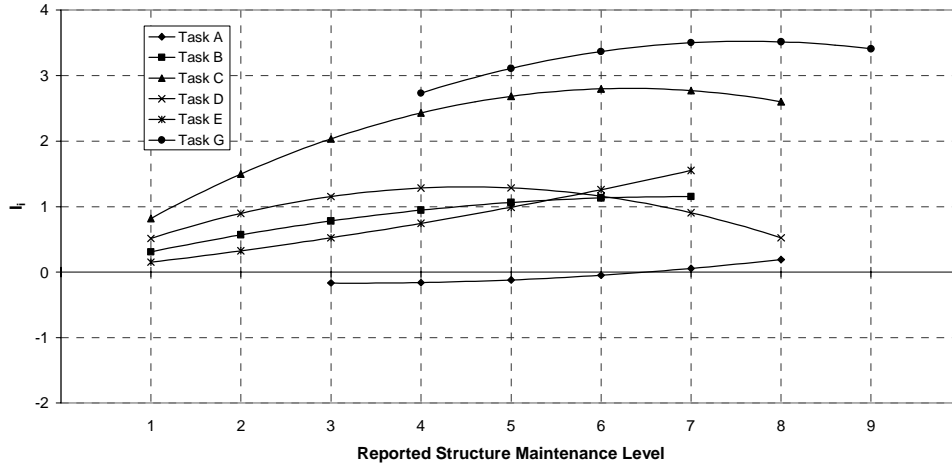


b. Superstructure

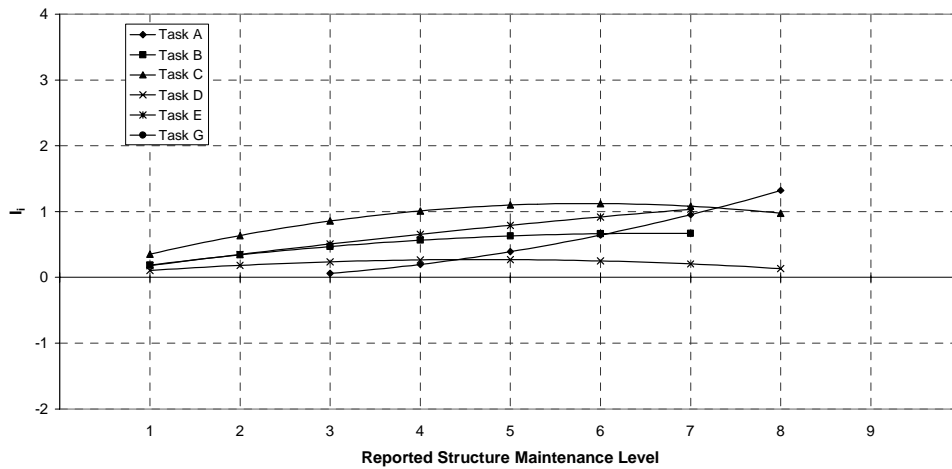


c. Substructure

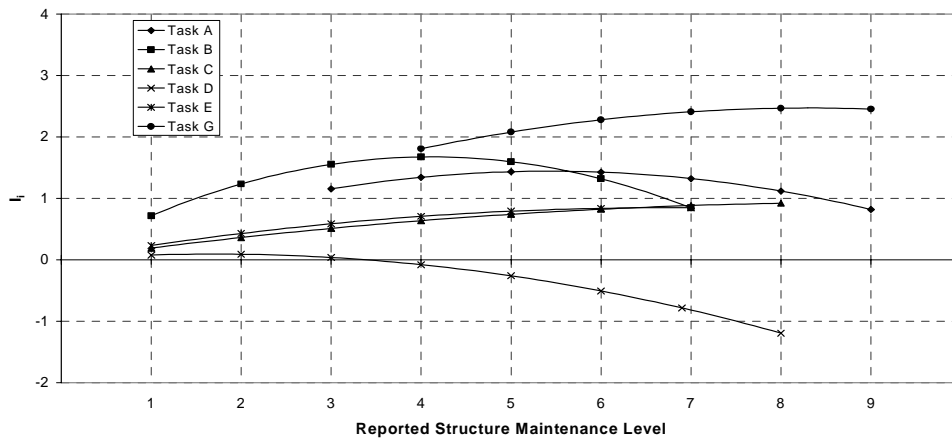
Figure L7. Influence of inspection factor Reported Structure Accessibility Level (1=Very inaccessible, 9=Very accessible) on Condition Ratings.



a. Deck

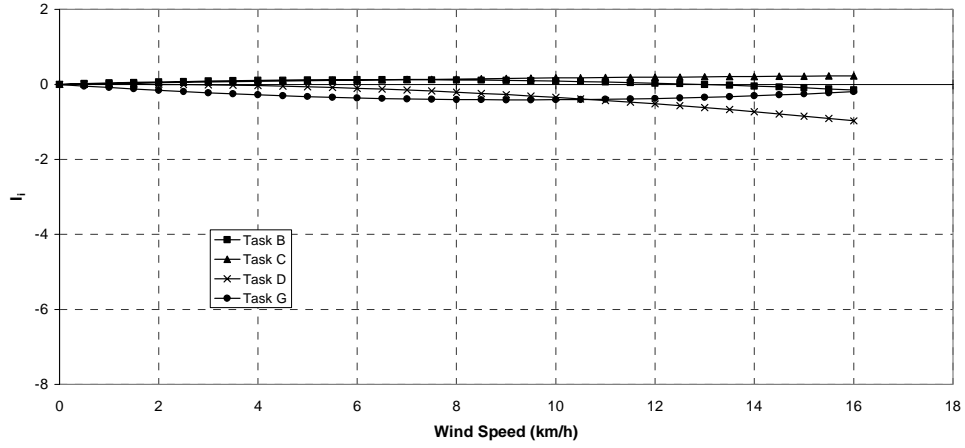


b. Superstructure

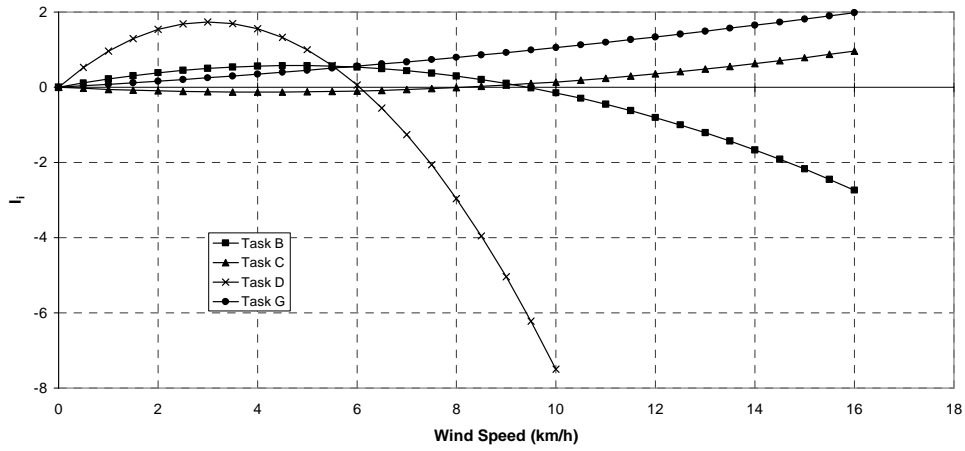


c. Substructure

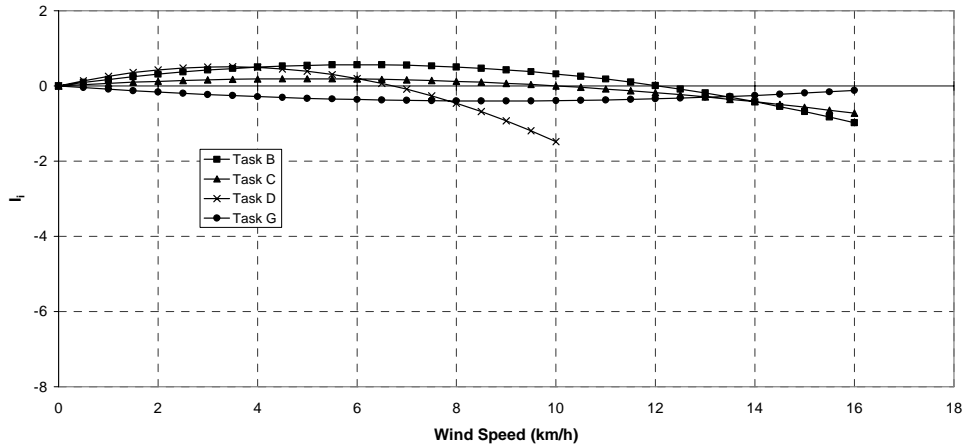
Figure L8. Influence of inspection factor Reported Structure Maintenance Level (1=Very poorly, 9=Very well) on Condition Ratings.



a. Deck

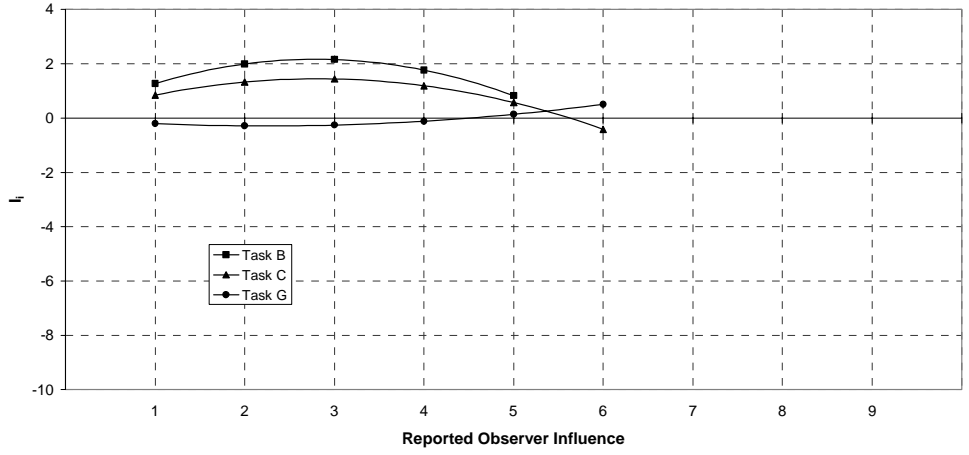


b. Superstructure

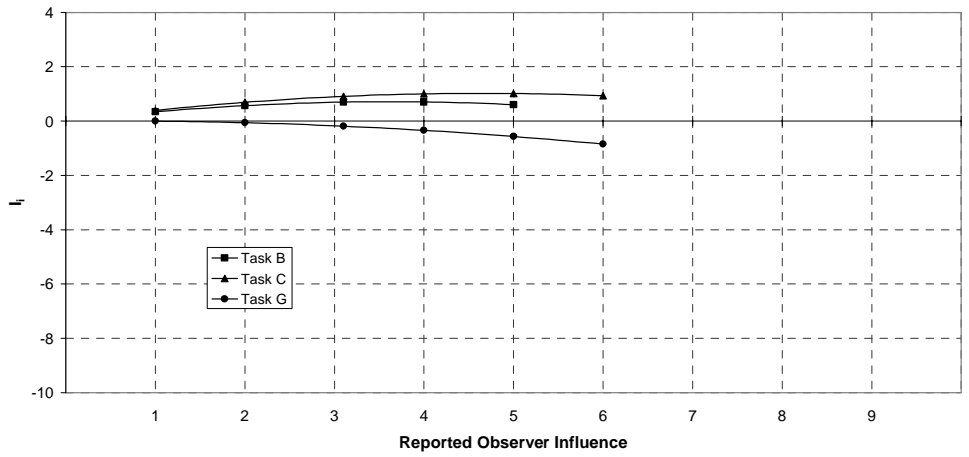


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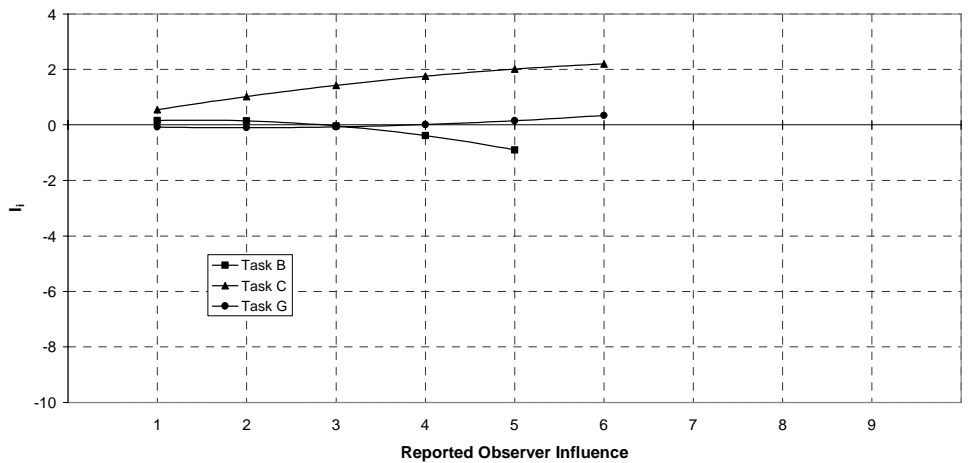
Figure L9. Influence of inspection factor Wind Speed on Condition Ratings.



a. Deck

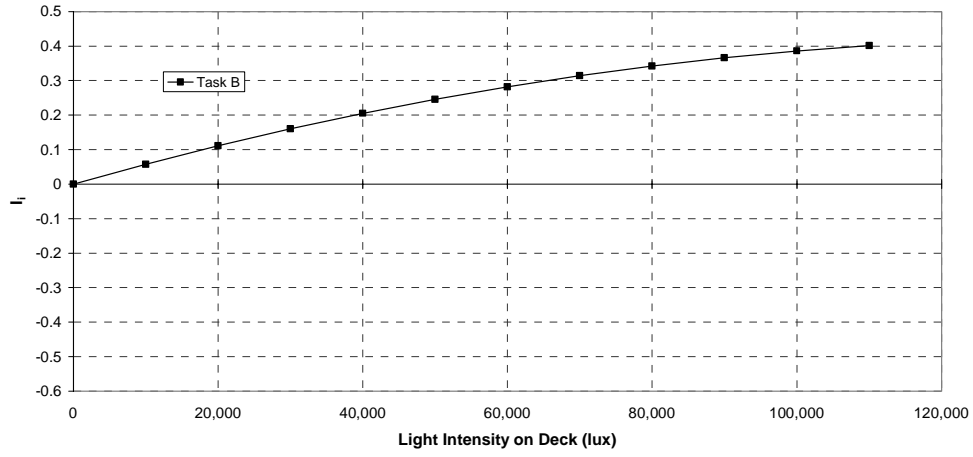


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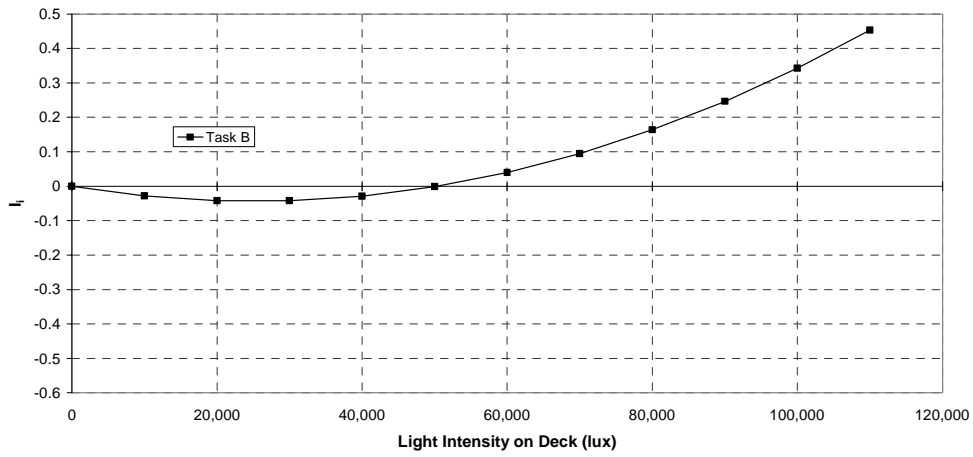


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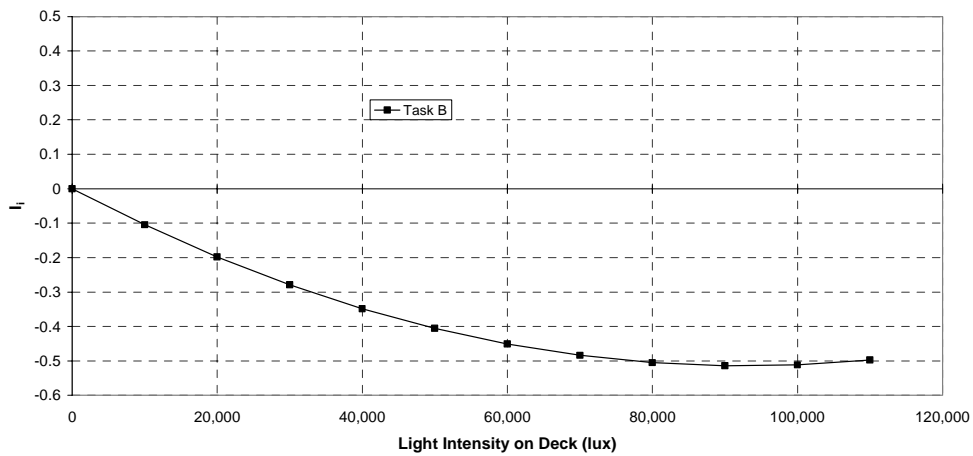
Figure L10. Influence of inspection factor Reported Observer Influence (1=No influence, 9=Great influence) on Condition Ratings.



a. Deck

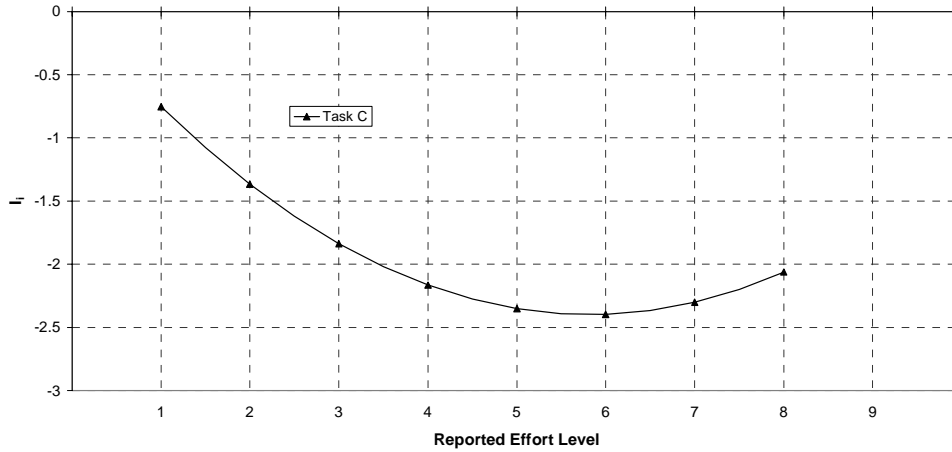


b. Superstructure

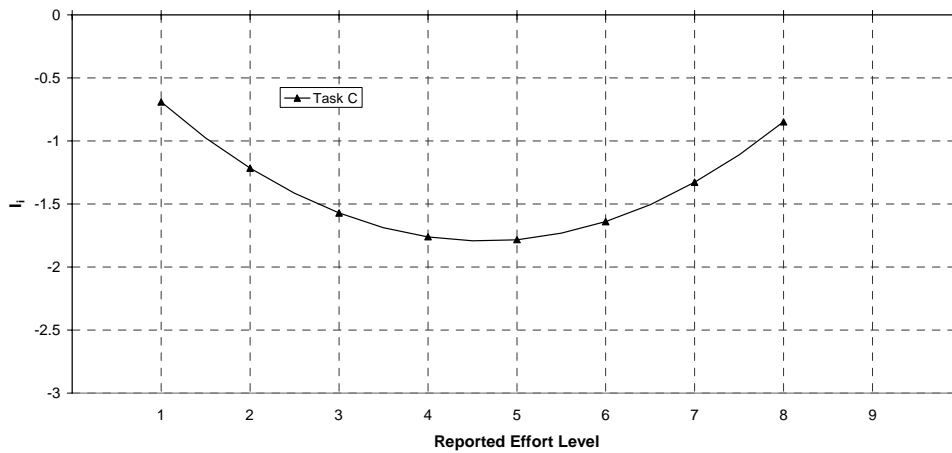


c. Substructure

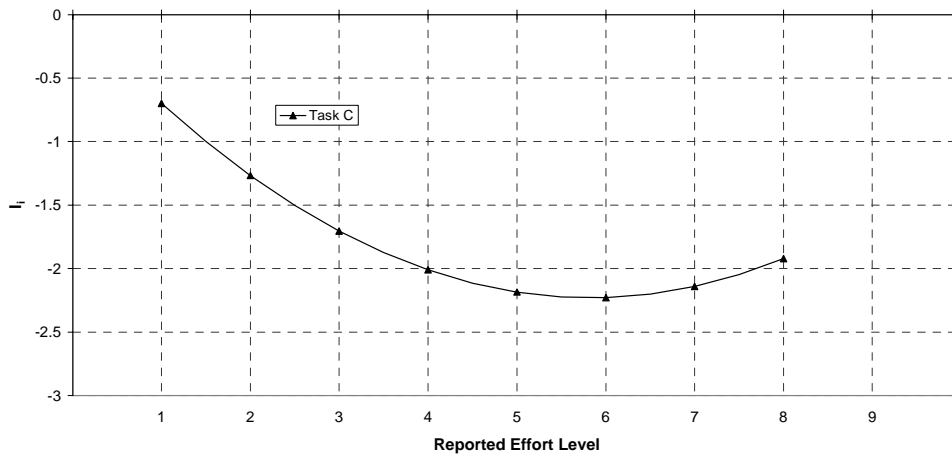
Figure L11. Influence of inspection factor Light Intensity on Deck on Condition Ratings.



a. Deck

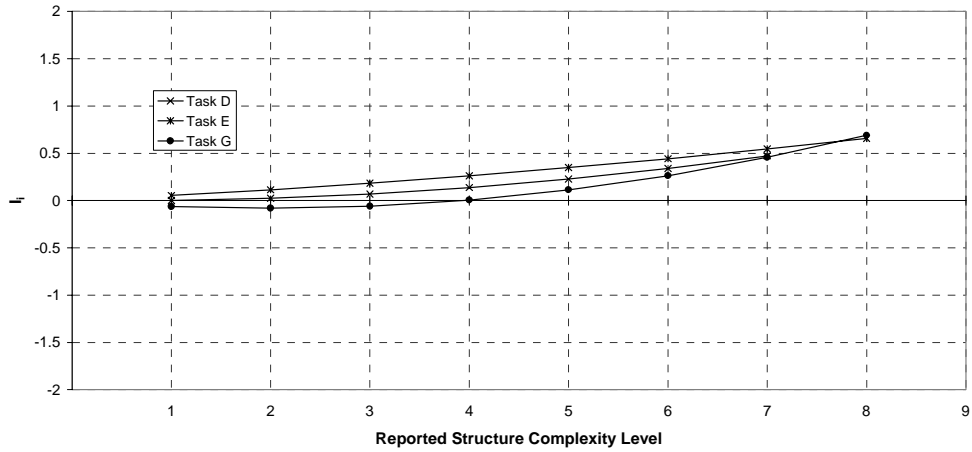


b. Superstructure

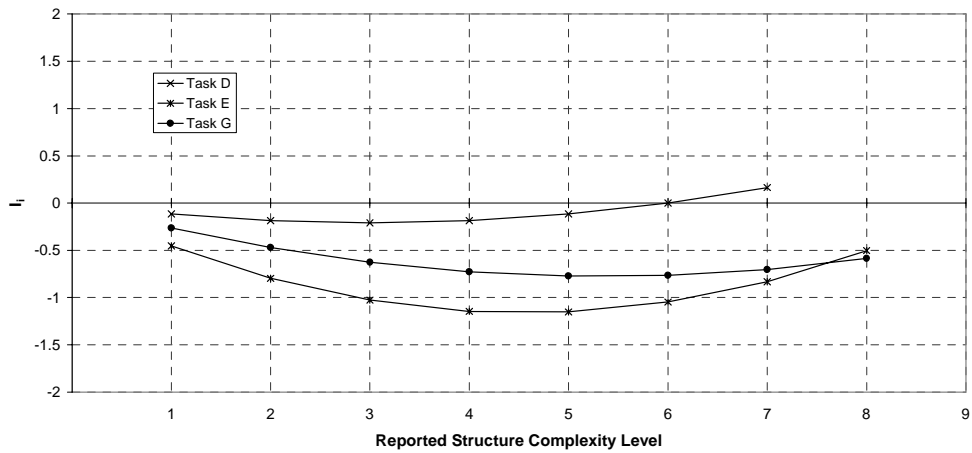


c. Substructure

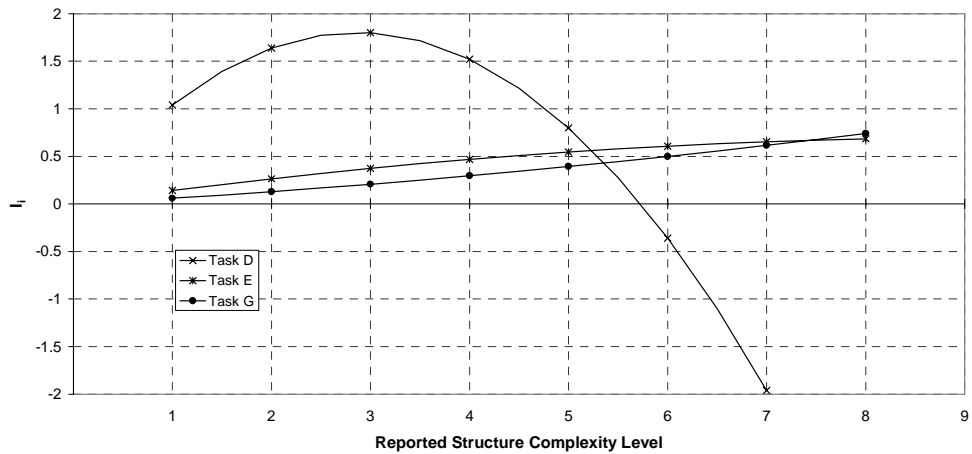
Figure L12. Influence of inspection factor Reported Effort Level (1=Much lower than normal, 9=Much greater than normal) on Condition Ratings.



a. Deck

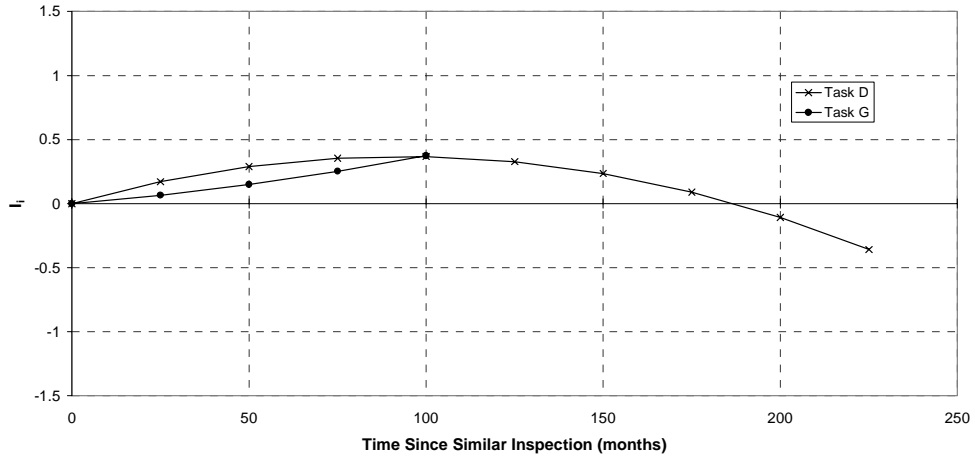


b. Superstructure

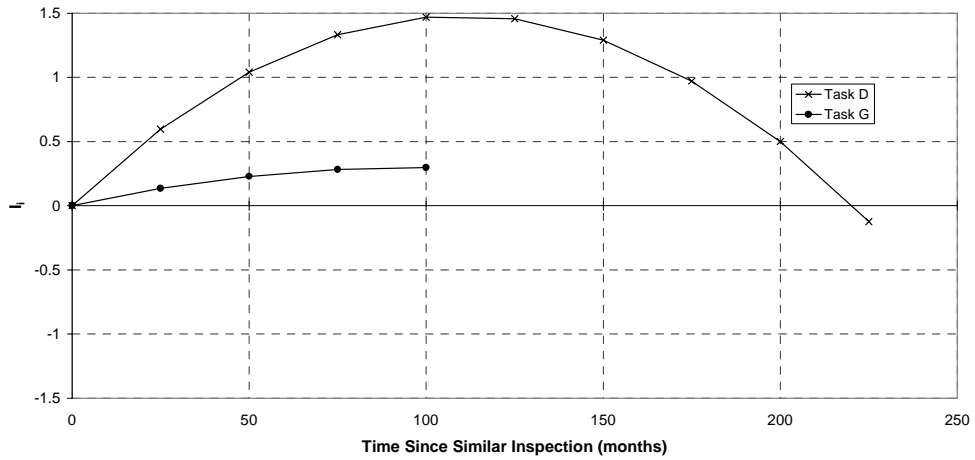


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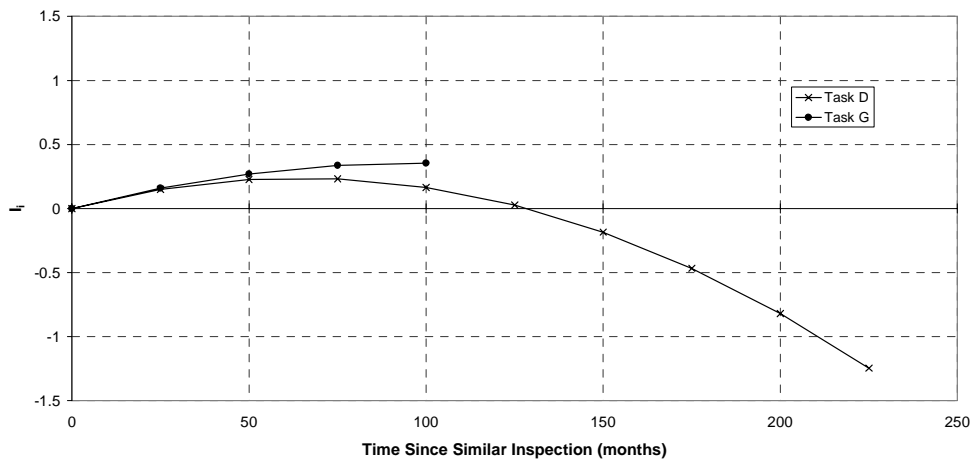
Figure L13. Influence of inspection factor Reported Structure Complexity Level (1=Very simple, 9=Very complex) on Condition Ratings.



a. Deck

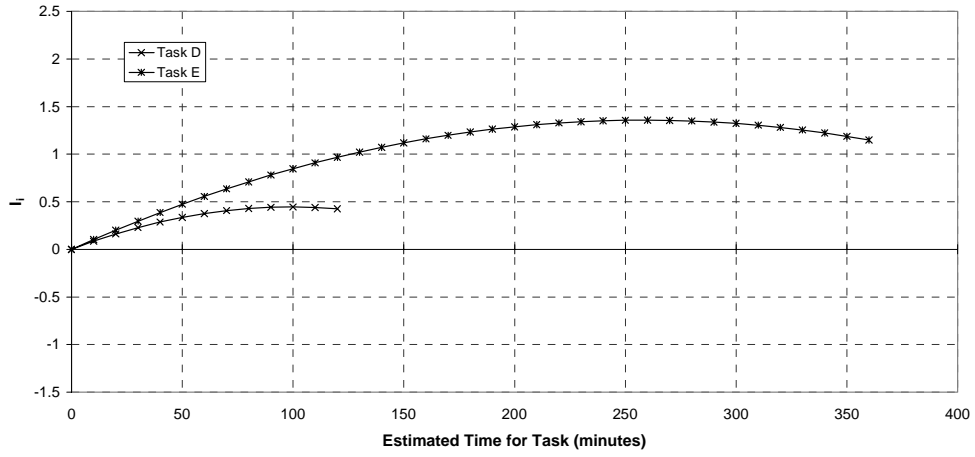


b. Superstructure

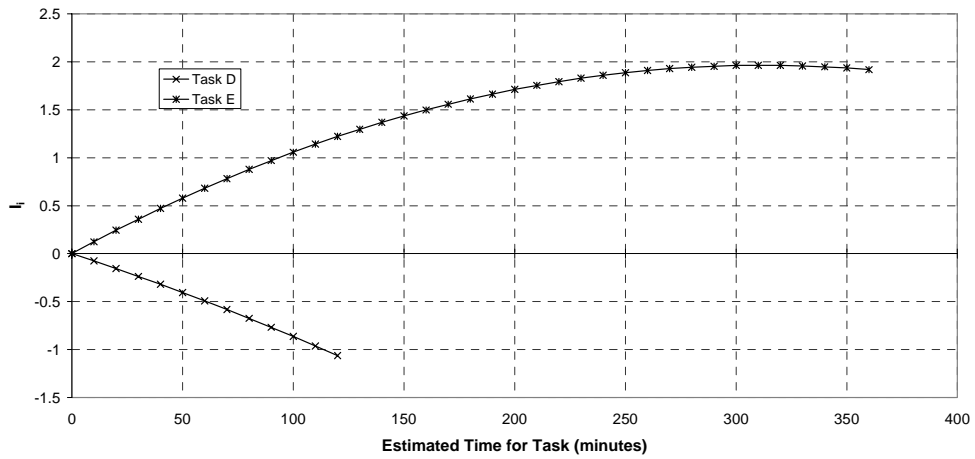


c. Substructure

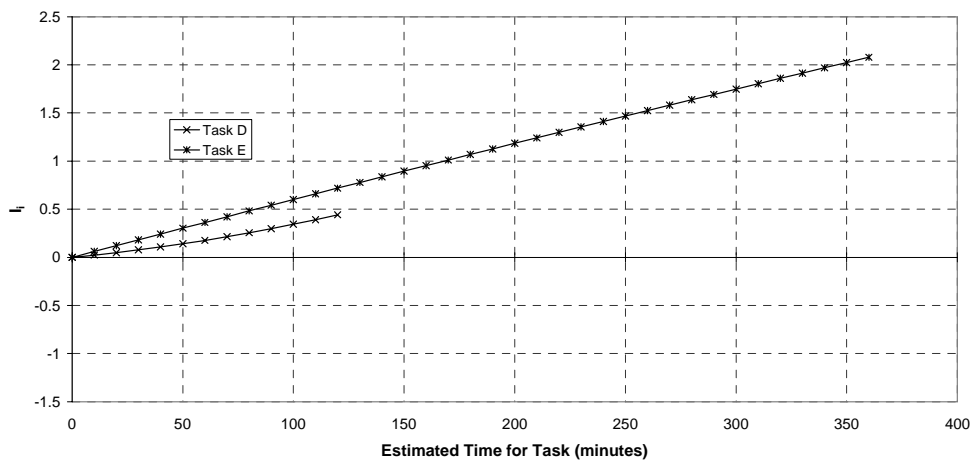
Figure L14. Influence of inspection factor Time Since Similar Inspection on Condition Ratings.



a. Deck

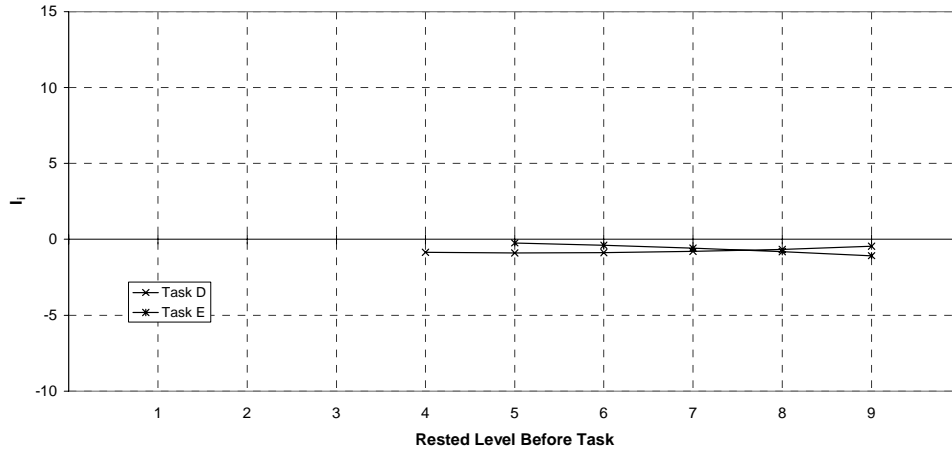


b. Superstructure

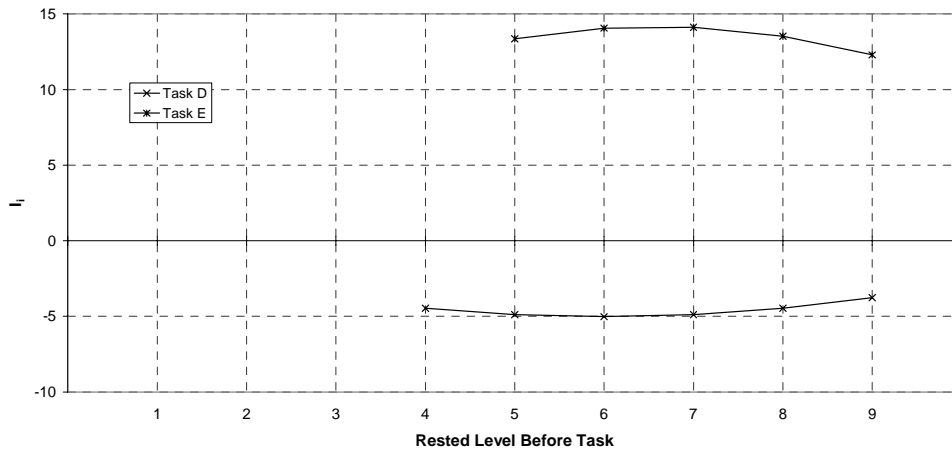


c. Substructure

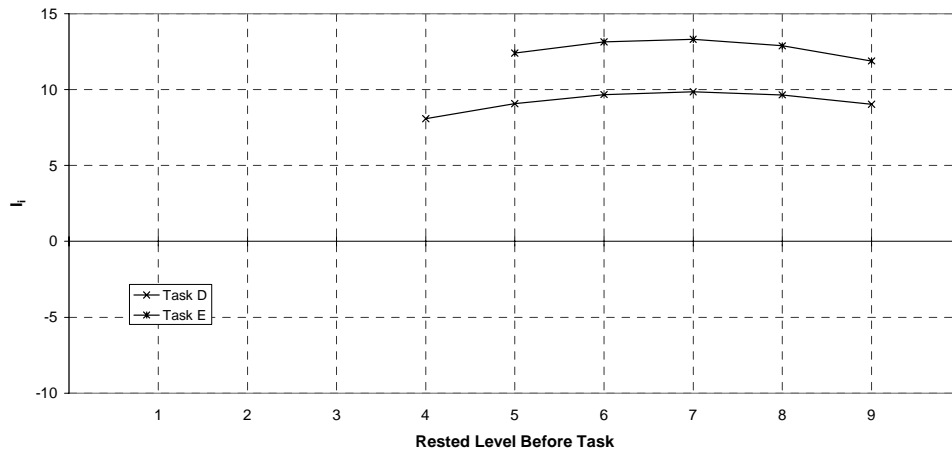
Figure L15. Influence of inspection factor Estimated Time for Task on Condition Ratings.



a. Deck

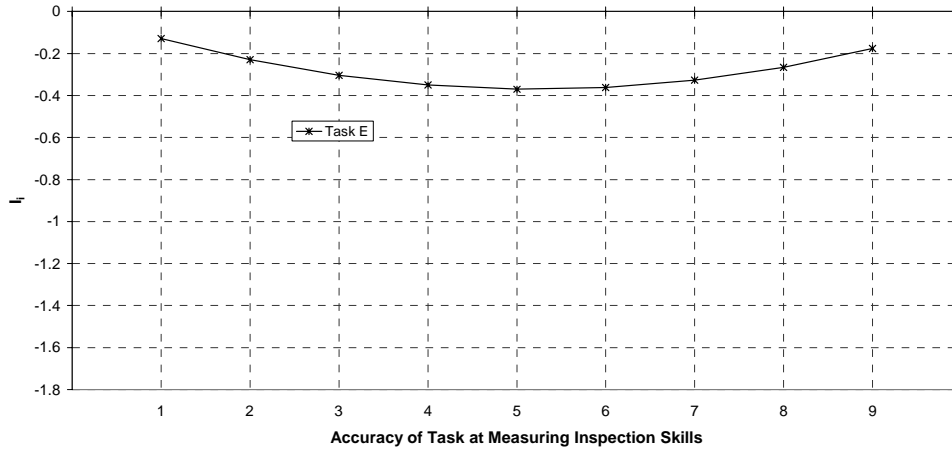


b. Superstructure

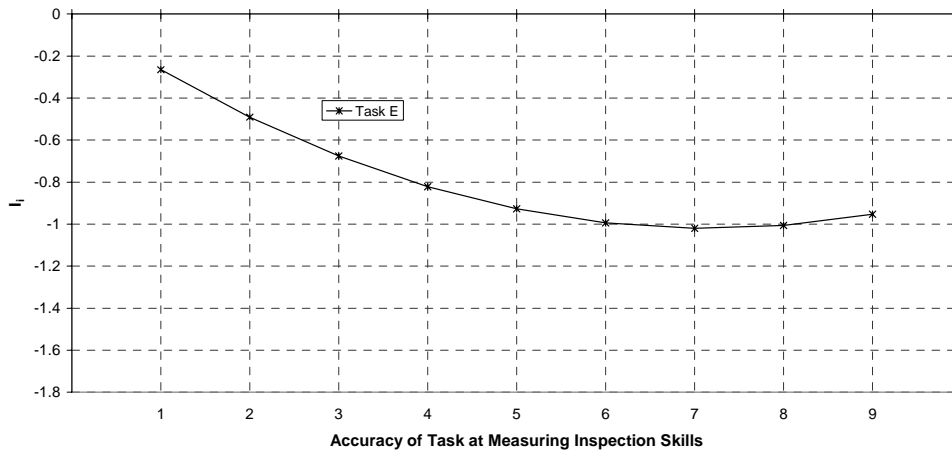


c. Substructure

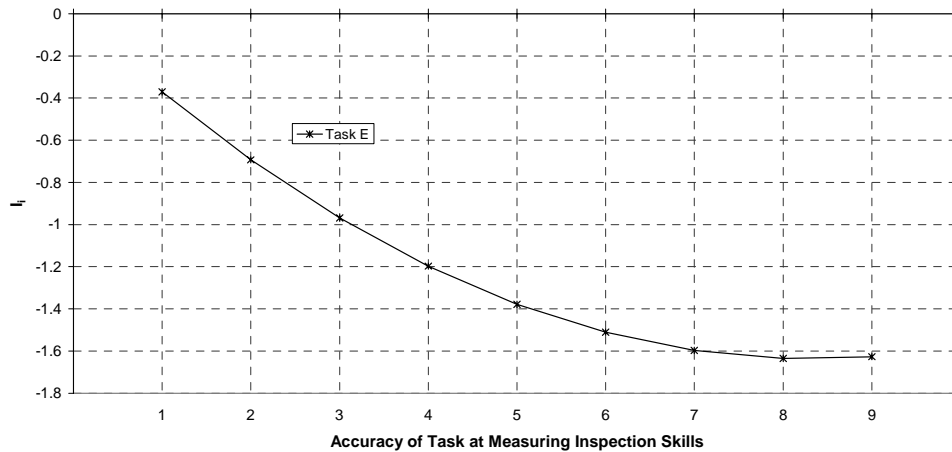
Figure L16. Influence of inspection factor Rested Level Before Task (1=Very tired, 9=Very rested) on Condition Ratings.



a. Deck

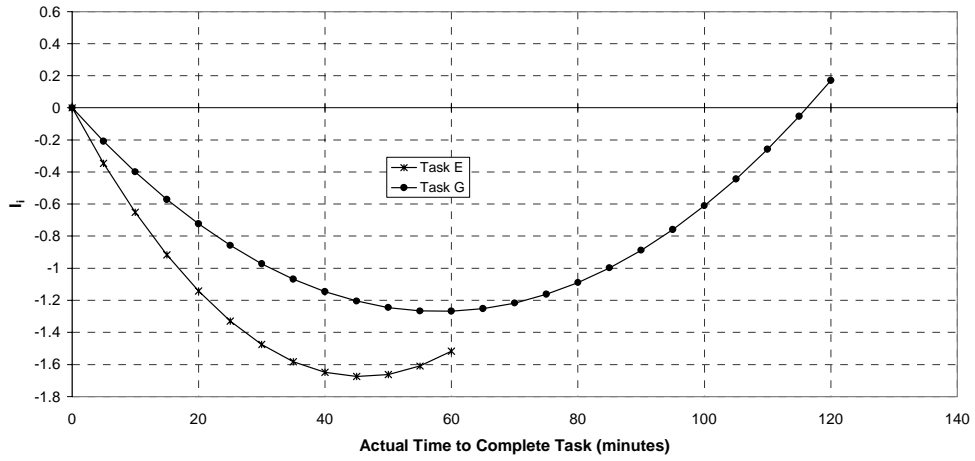


b. Superstructure

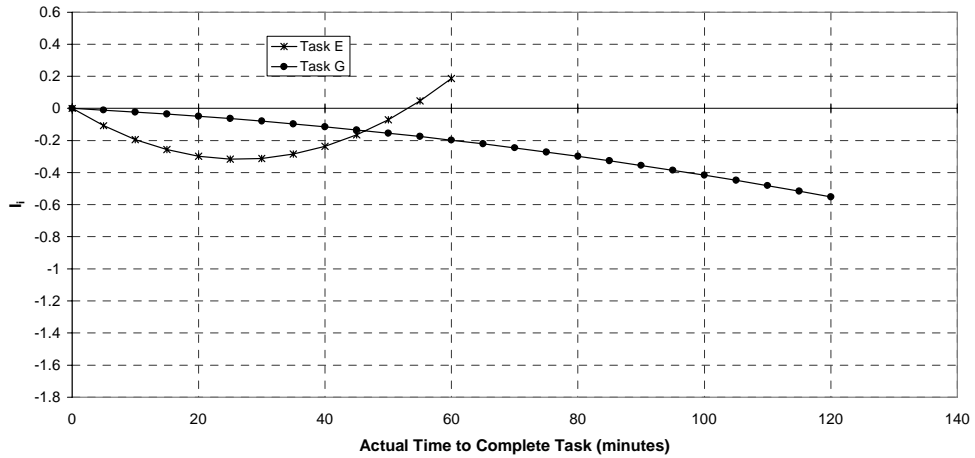


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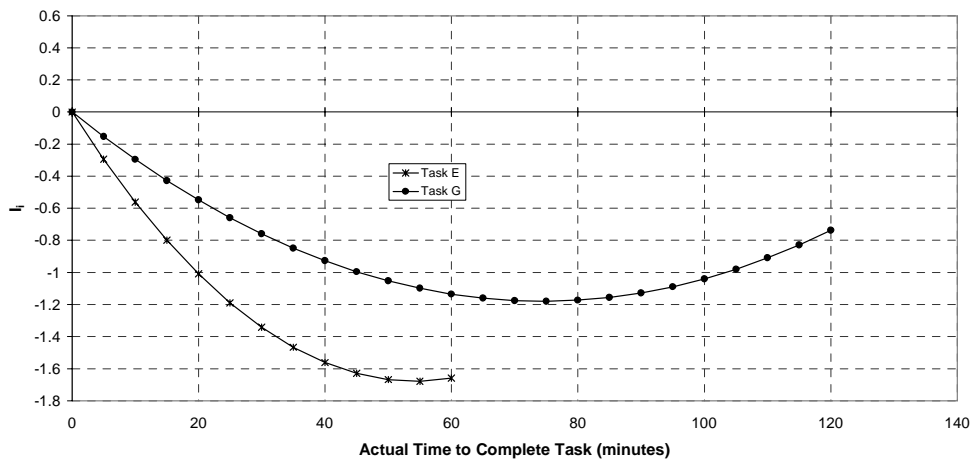
Figure L17. Influence of inspection factor Accuracy of Task at Measuring Inspection Skills (1=Very inaccurate, 9=Very accurate) on Condition Ratings.



a. Deck

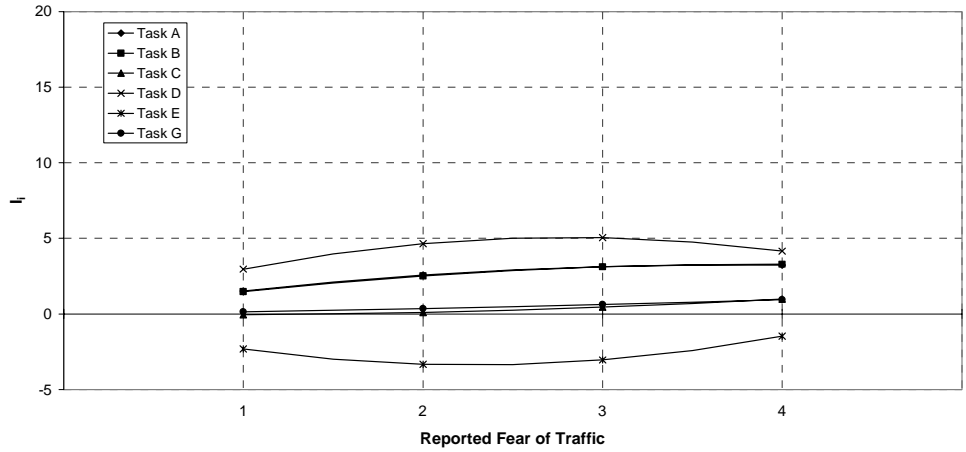


b. Superstructure

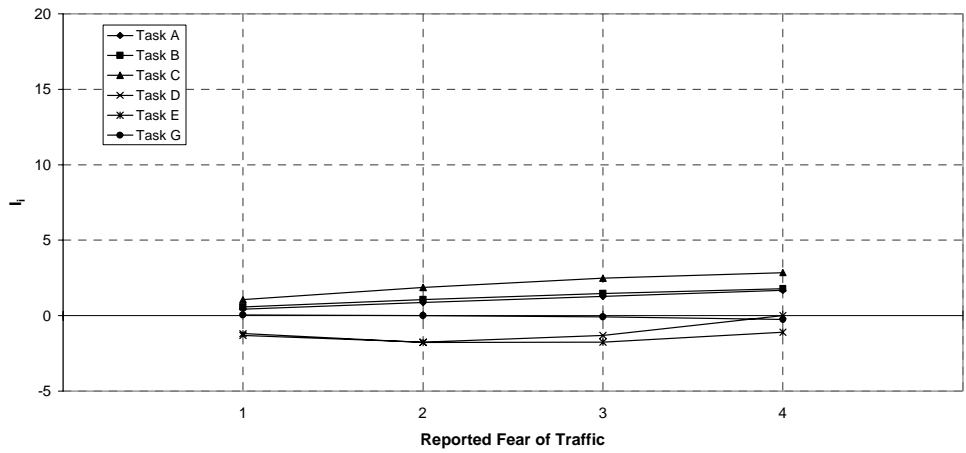


c. Substructure

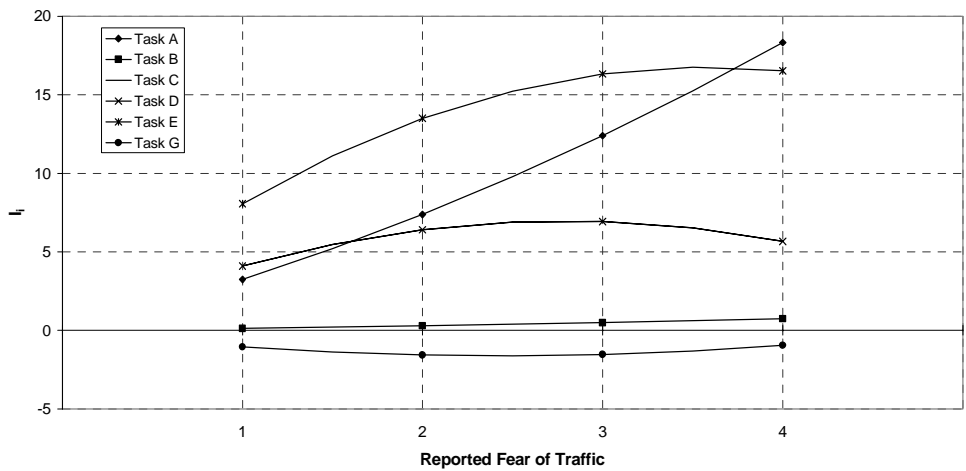
Figure L18. Influence of inspection factor Actual Time to Complete Task on Condition Ratings.



a. Deck

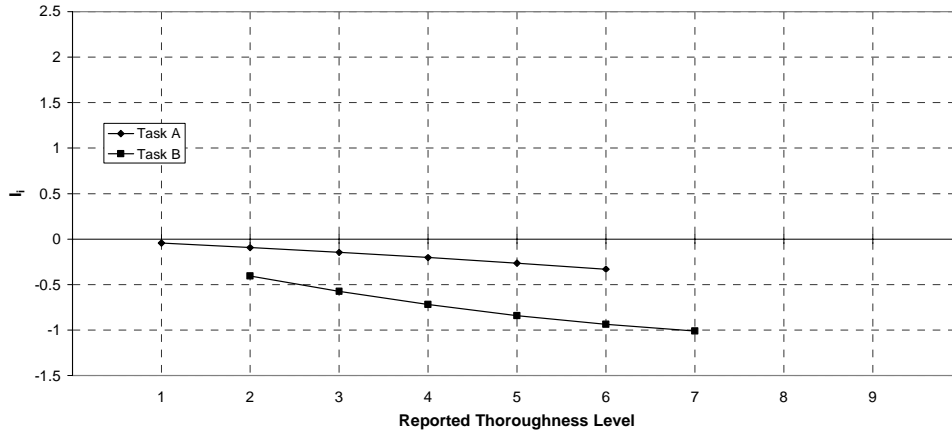


b. Superstructure

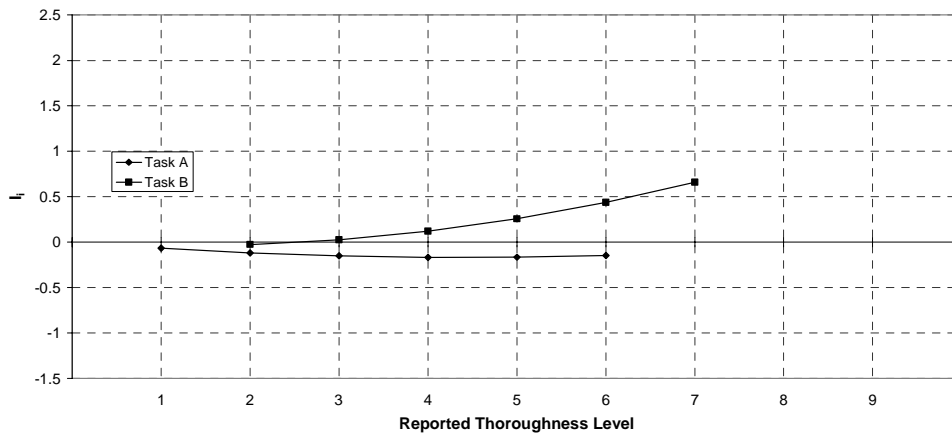


c. Substructure

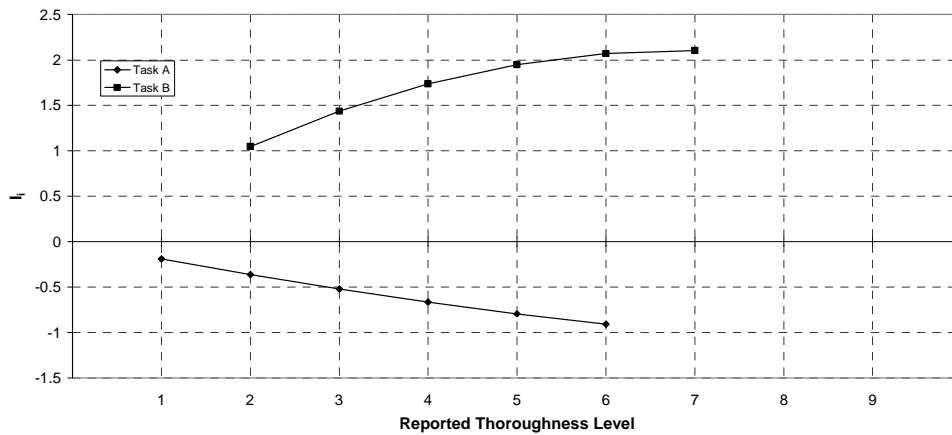
Figure L19. Influence of combined inspector/inspection factor Reported Fear of Traffic (1=Very fearful, 4=No fear) on Condition Ratings.



a. Deck

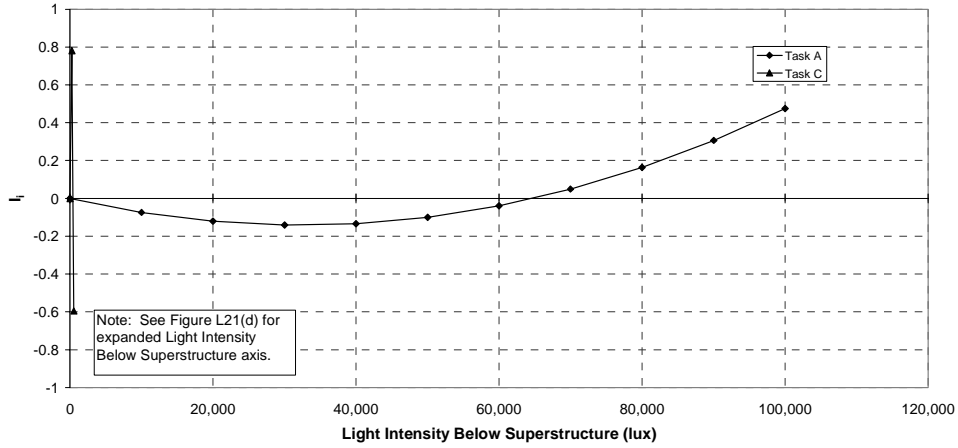


b. Superstructure

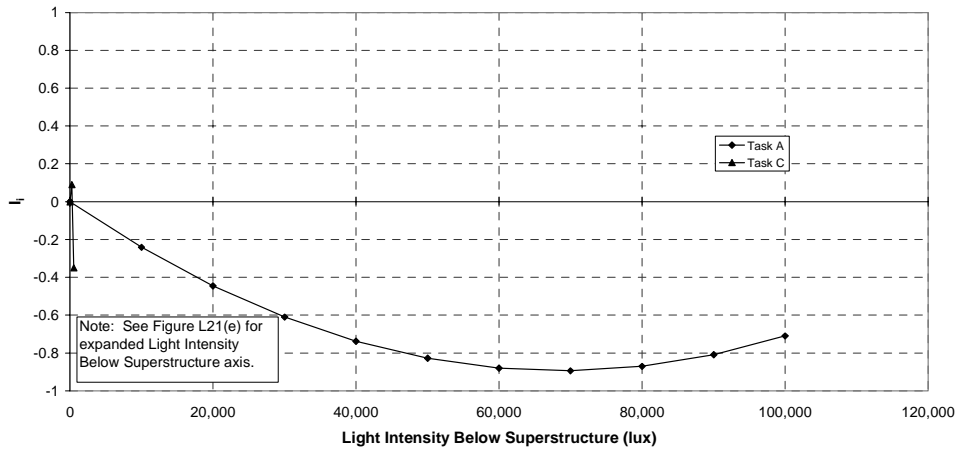


c. Substructure

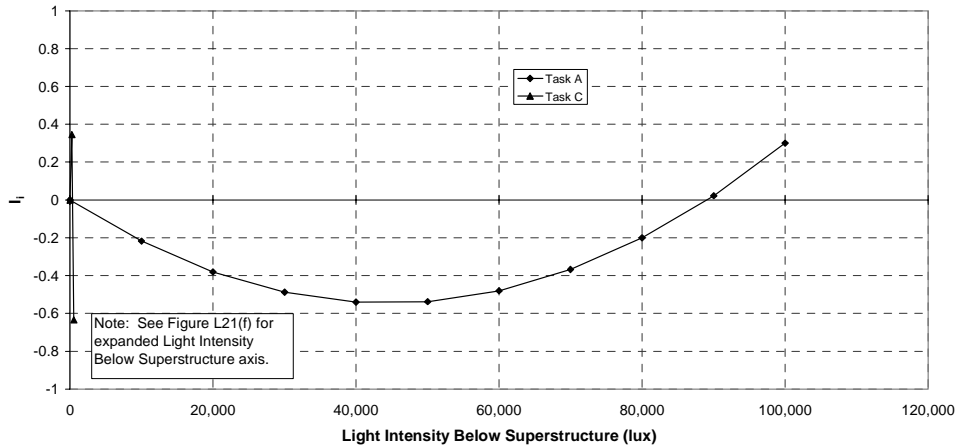
Figure L20. Influence of combined inspector/inspection factor Reported Thoroughness Level (1=Less thorough than normal, 9=More thorough than normal) on Condition Ratings.



a. Deck

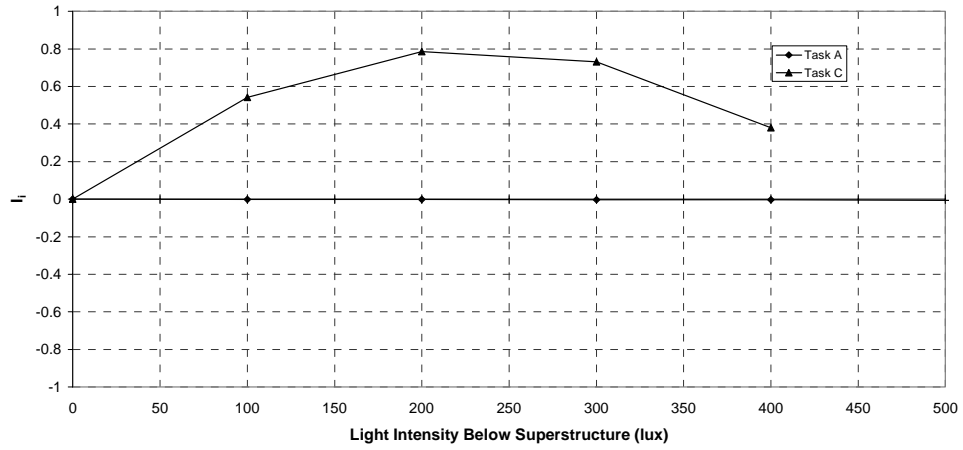


b. Superstructure

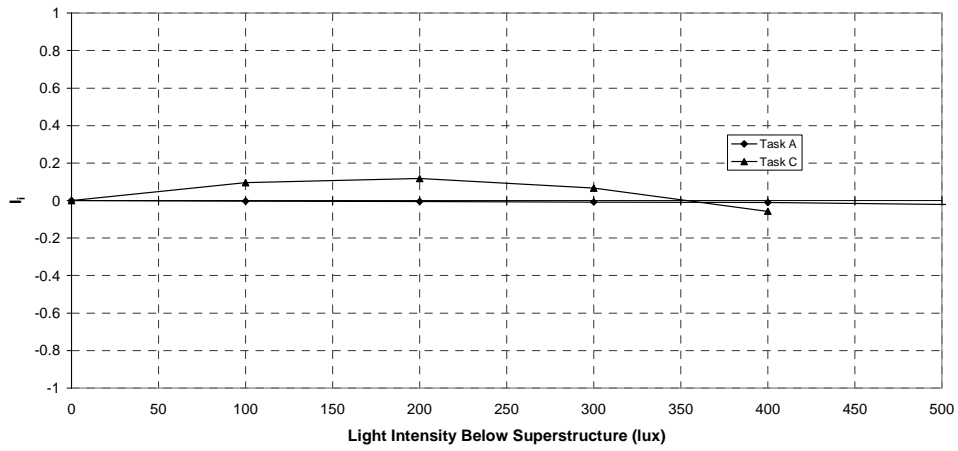


c. Substructure

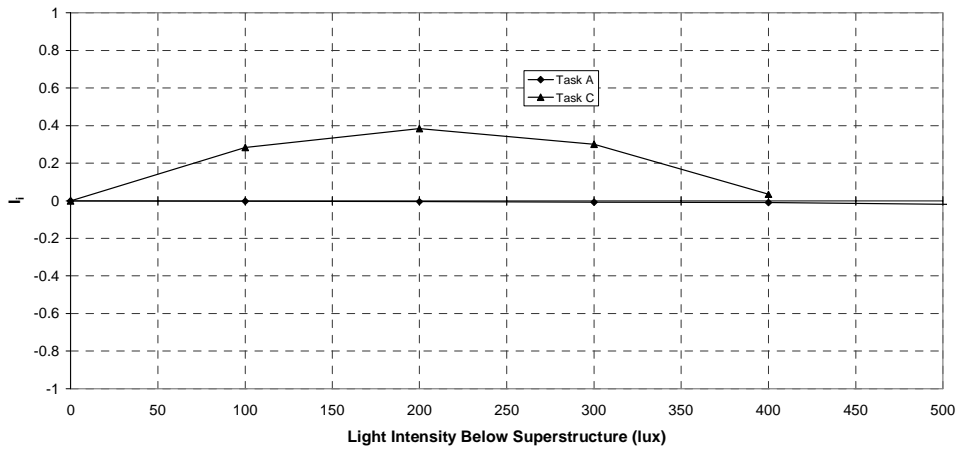
Figure L21. Influence of combined inspector/inspection factor Light Intensity Below Superstructure on Condition Ratings.



d. Deck

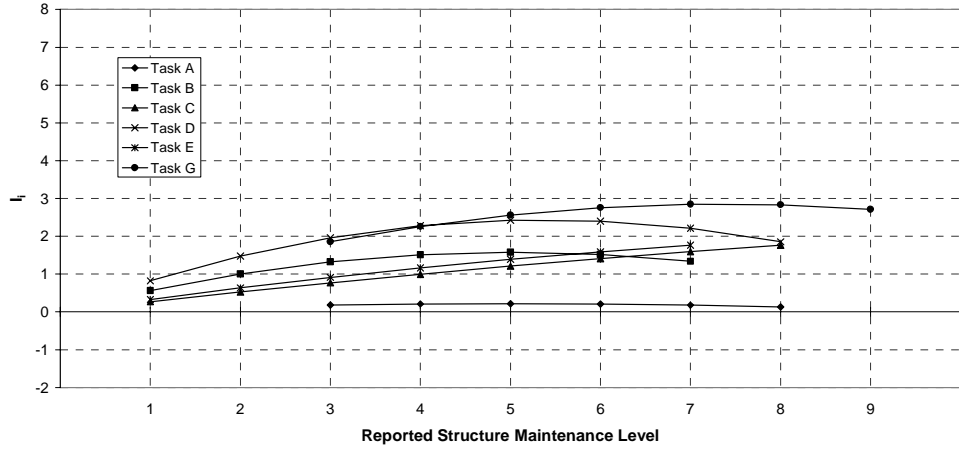


e. Superstructure

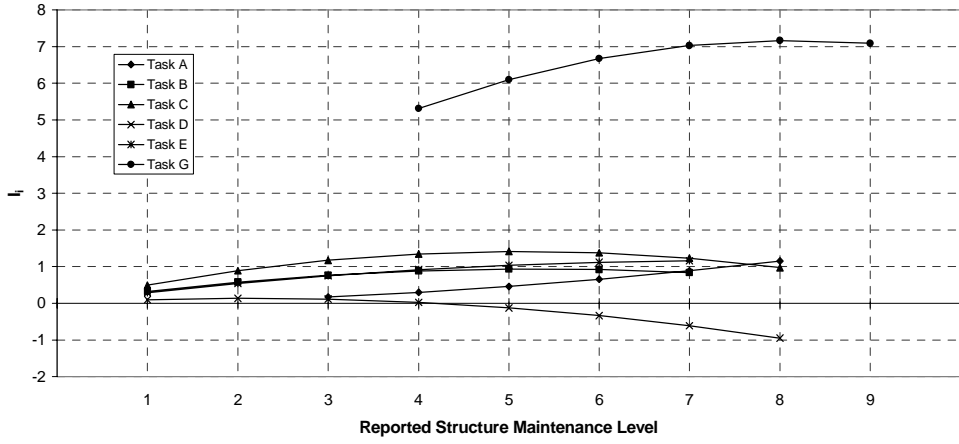


f. Substructure

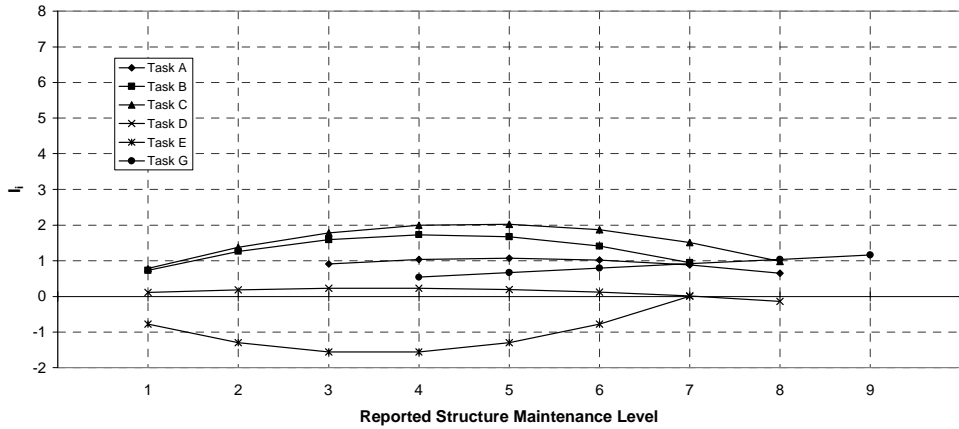
Figure L21. Influence of combined inspector/inspection factor Light Intensity Below Superstructure on Condition Ratings (continued).



a. Deck

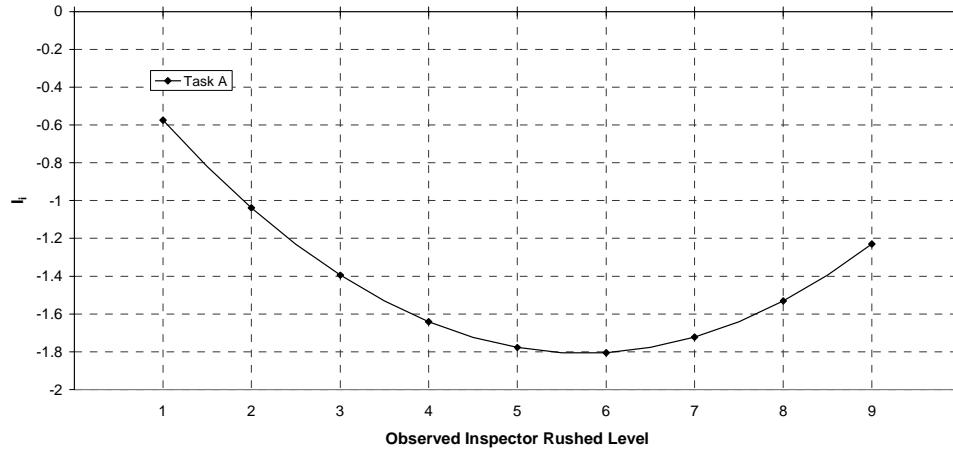


b. Superstructure

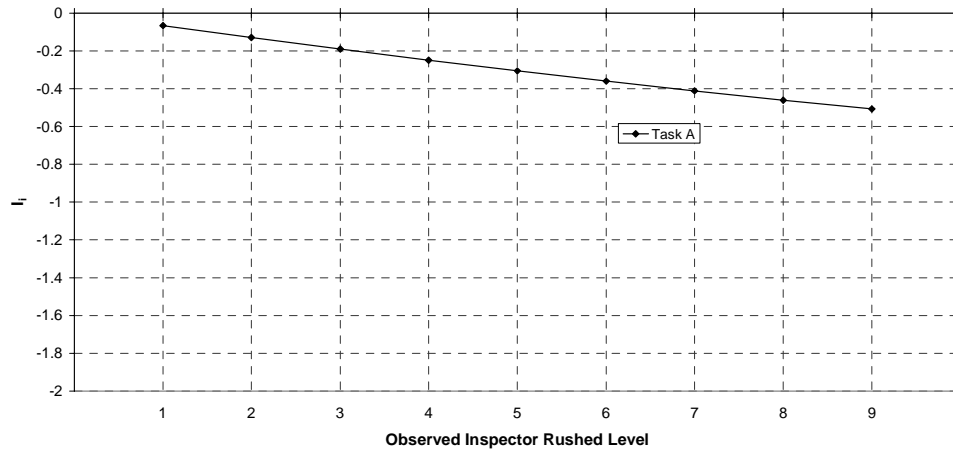


c. Substructure

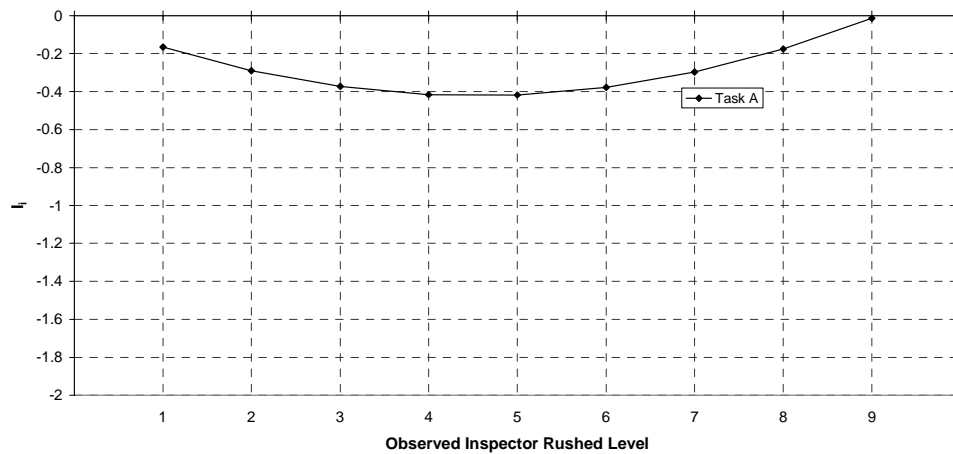
Figure L22. Influence of combined inspector/inspection factor Reported Structure Maintenance Level (1=Very poorly, 9=Very well) on Condition Ratings.



a. Deck

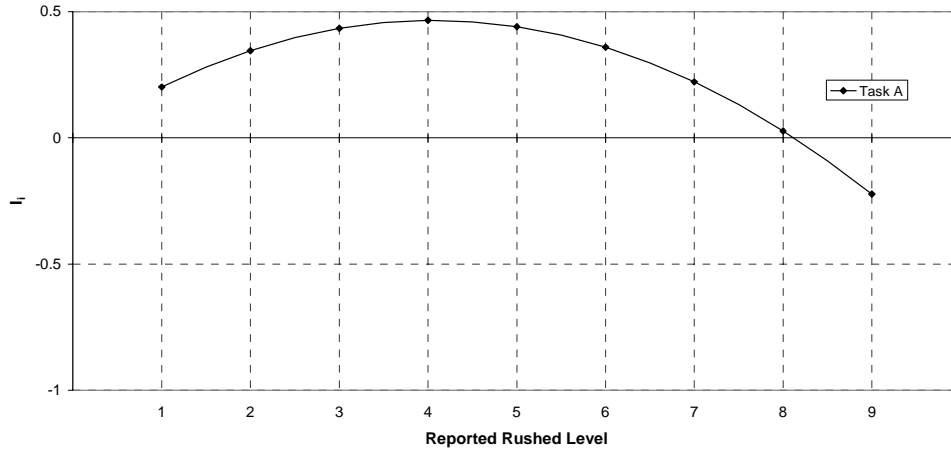


b. Superstructure

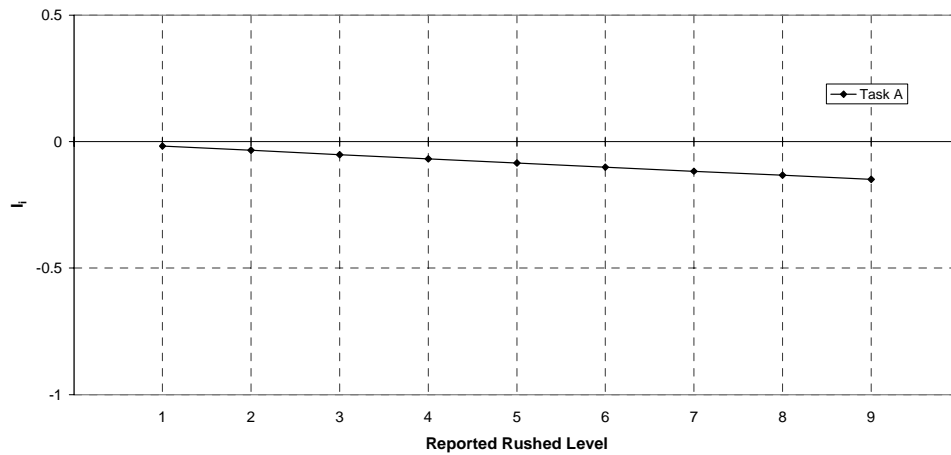


c. Substructure

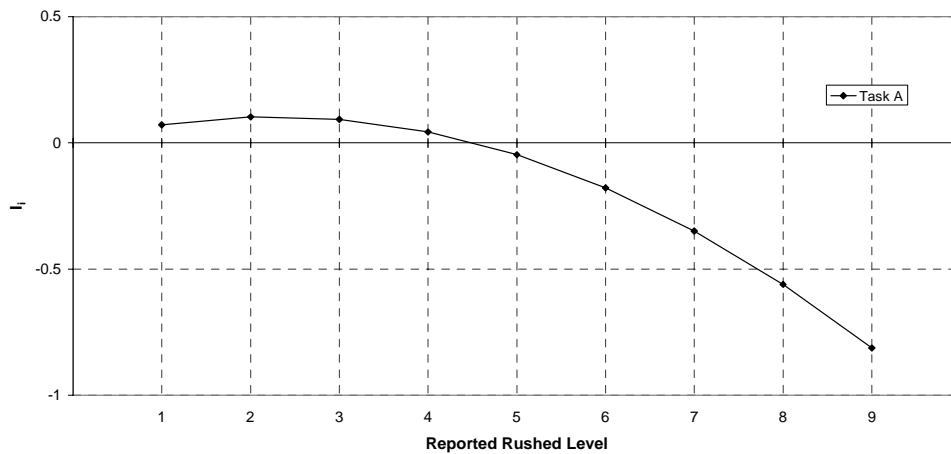
Figure L23. Influence of combined inspector/inspection factor Observed Inspector Rushed Level (1=Not rushed, 9=Very rushed) on Condition Ratings.



a. Deck

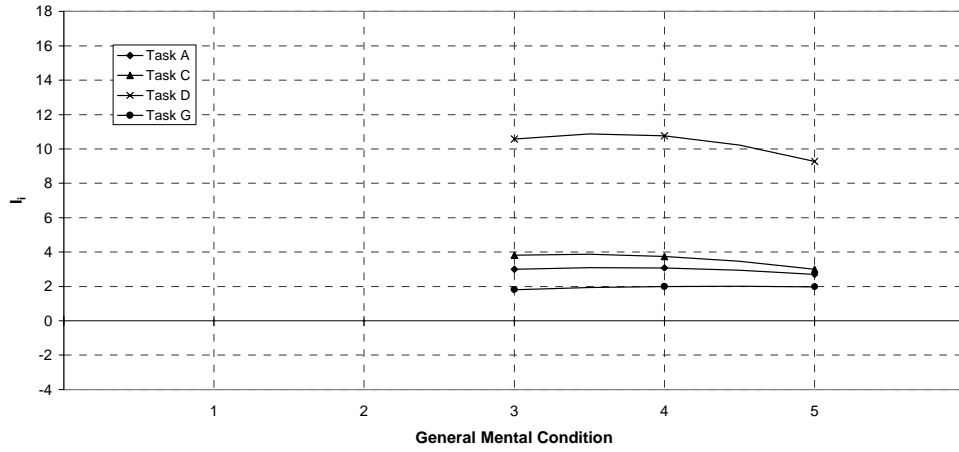


b. Superstructure

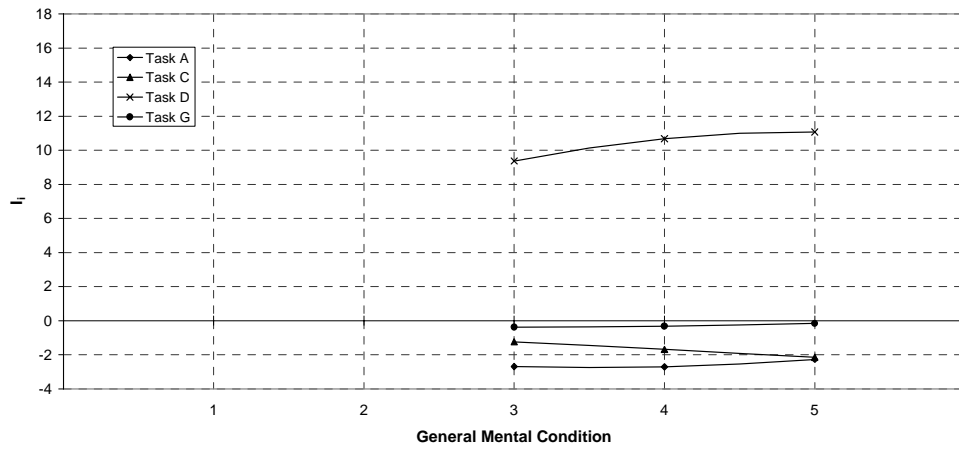


c. Substructure

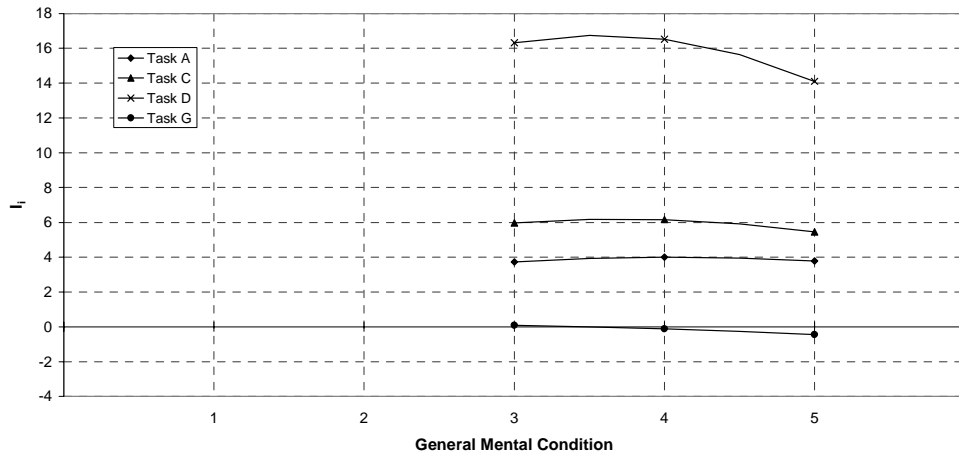
Figure L24. Influence of combined inspector/inspection factor Reported Rushed Level (1=Not rushed, 9=Very rushed) on Condition Ratings.



a. Deck

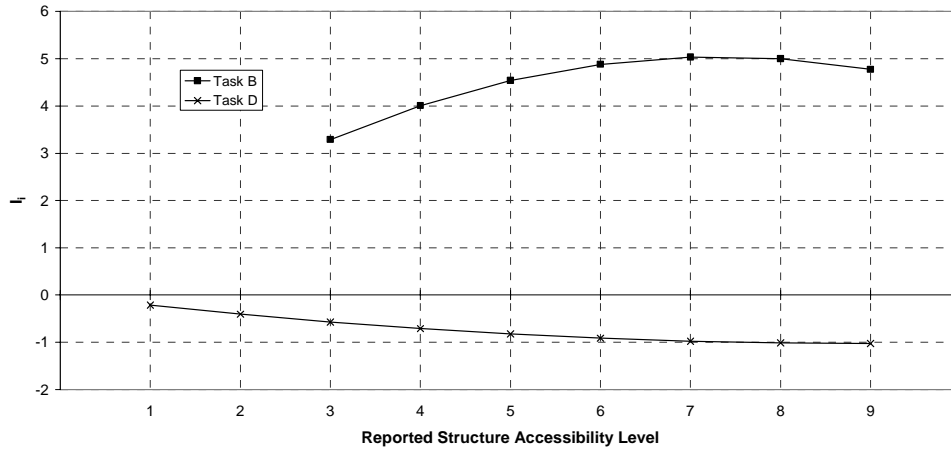


b. Superstructure

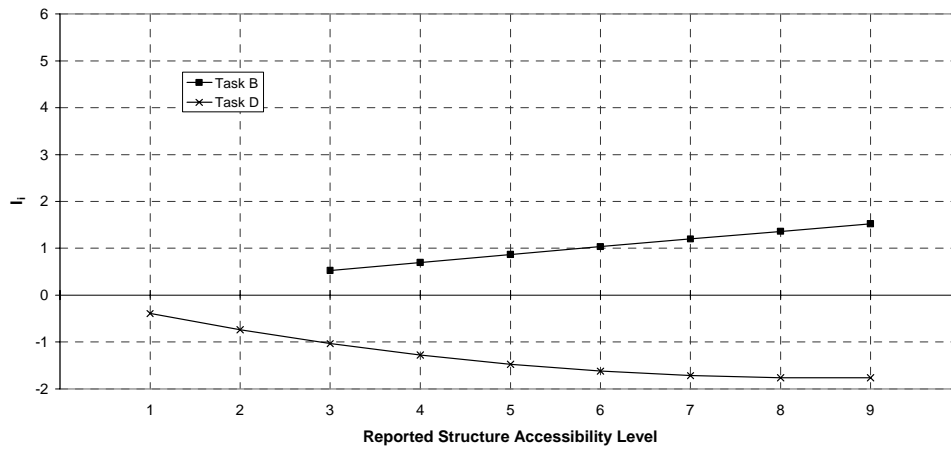


c. Substructure

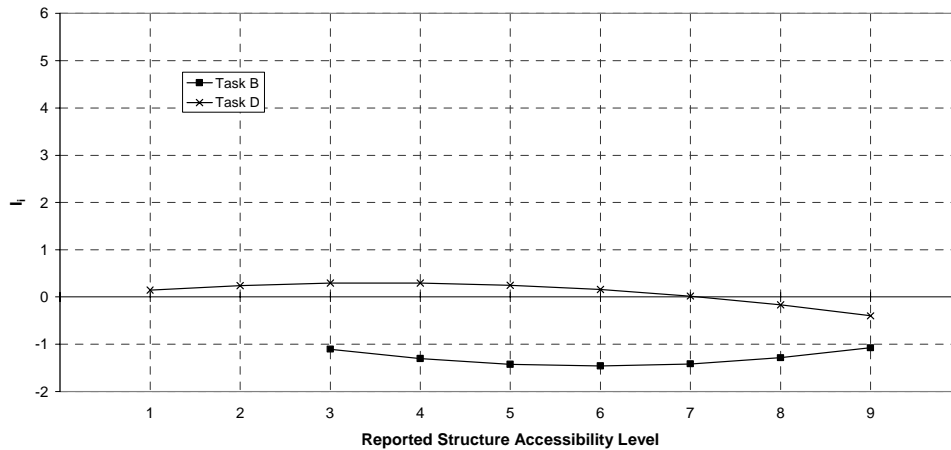
Figure L25. Influence of combined inspector/inspection factor General Mental Condition (1=Poor, 5=Superior) on Condition Ratings.



a. Deck

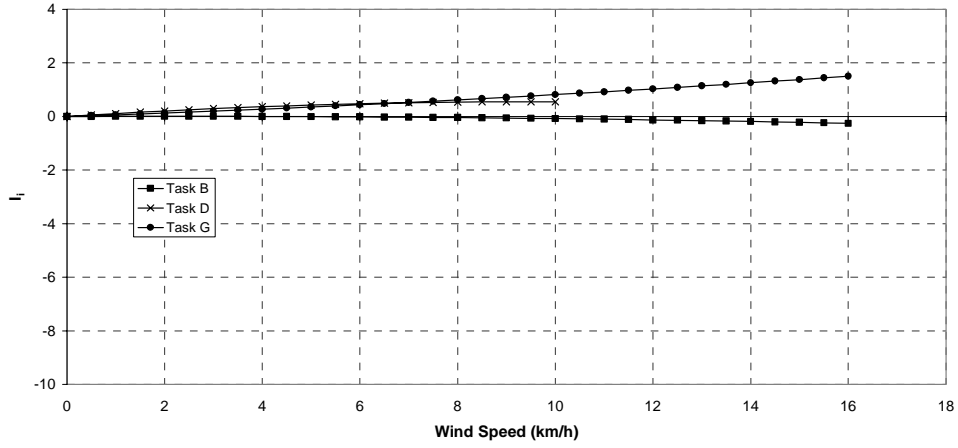


b. Superstructure

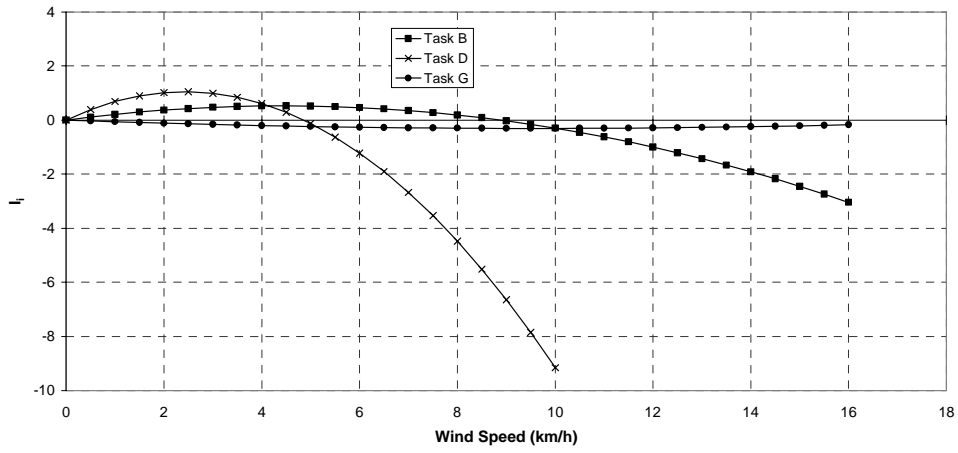


c. Substructure

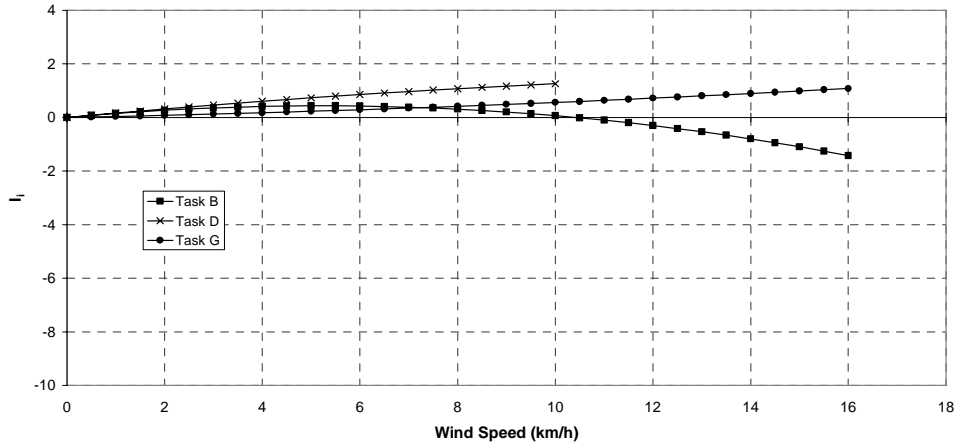
Figure L26. Influence of combined inspector/inspection factor Reported Structure Accessibility Level (1=Very inaccessible, 9=Very accessible) on Condition Ratings.



a. Deck

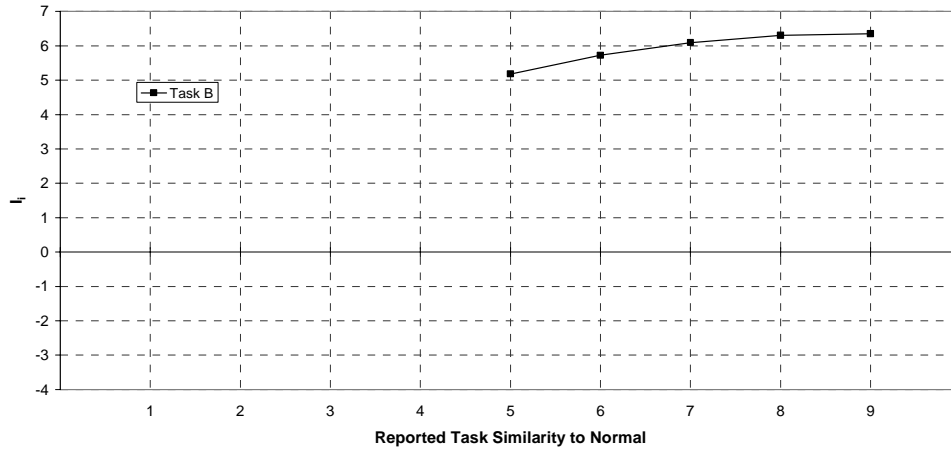


b. Superstructure

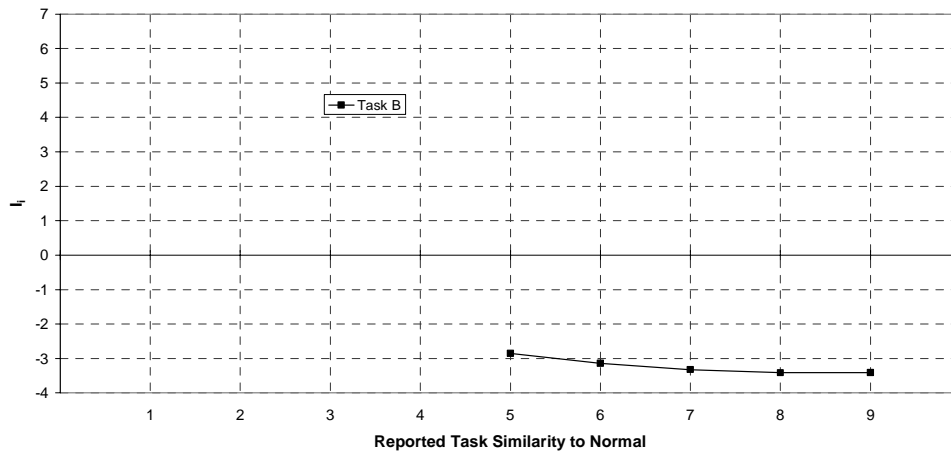


c. Substructure

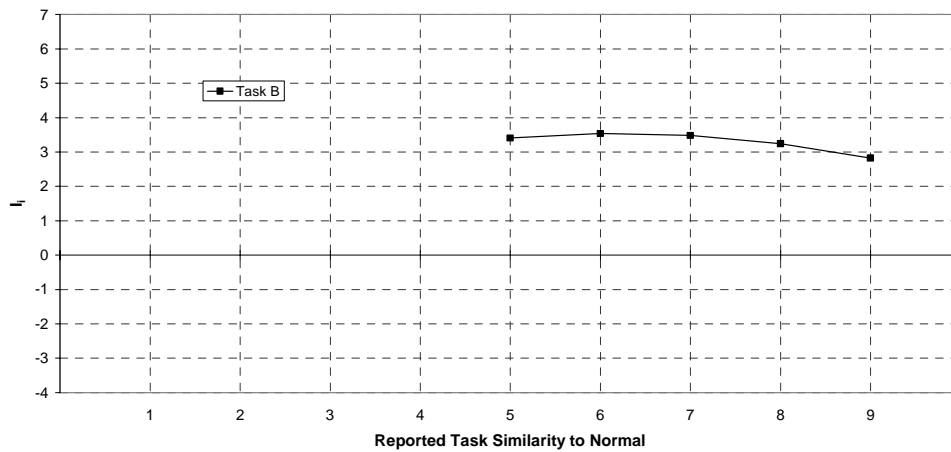
Figure L27. Influence of combined inspector/inspection factor Wind Speed on Condition Ratings.



a. Deck

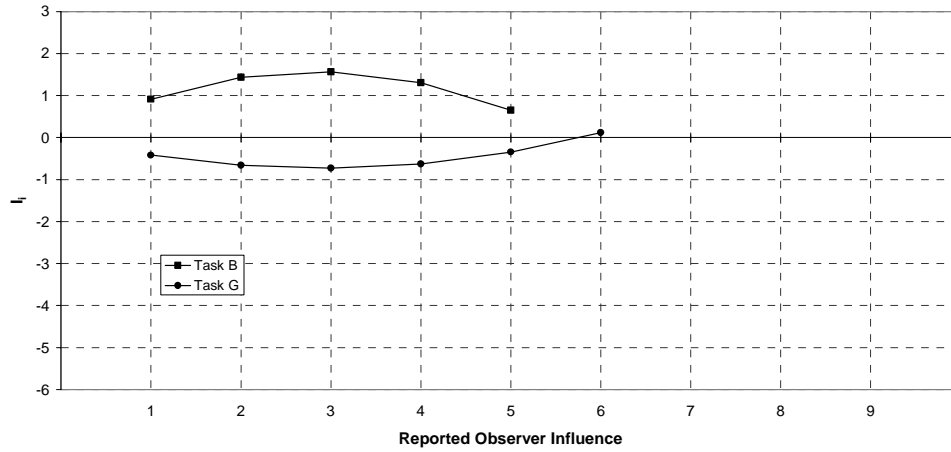


b. Superstructure

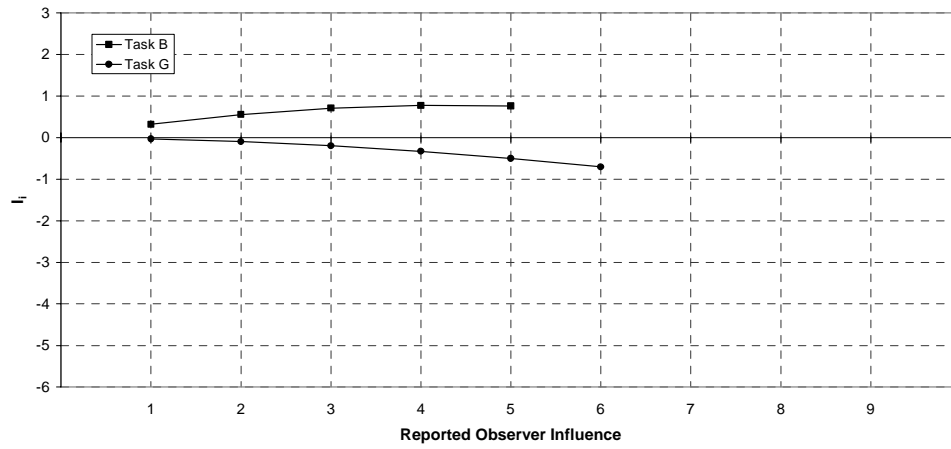


c. Substructure

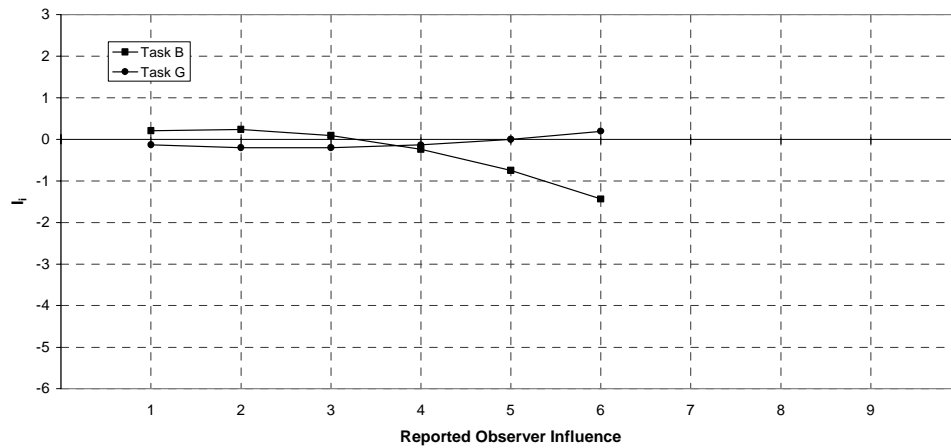
Figure L28. Influence of combined inspector/inspection factor Reported Task Similarity to Normal (1=Not similar, 9=Very similar) on Condition Ratings.



a. Deck

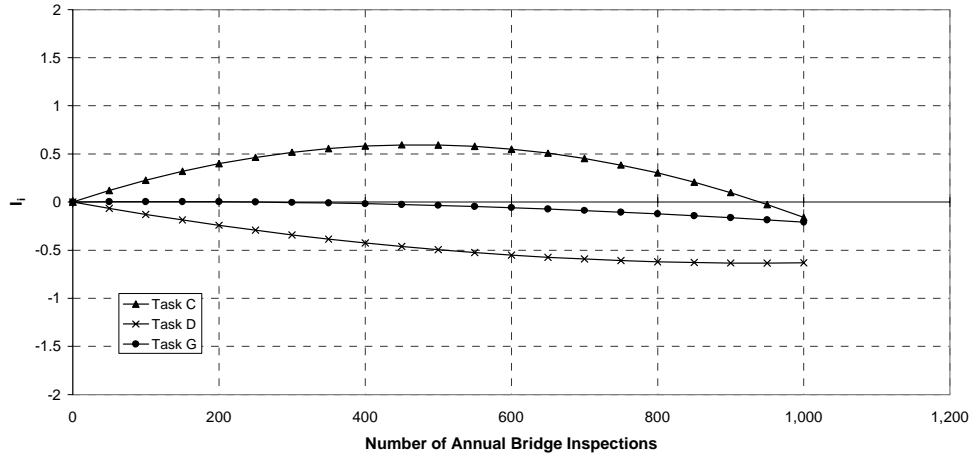


b. Superstructure

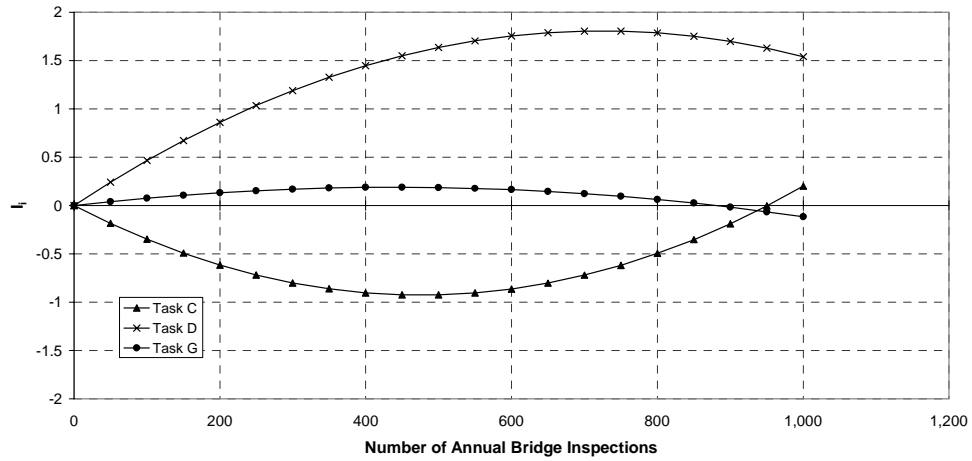


c. Substructure

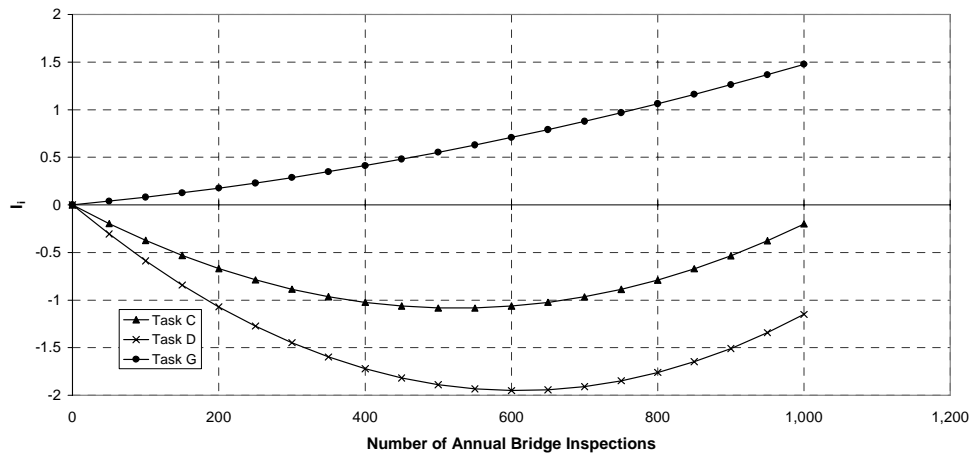
Figure L29. Influence of combined inspector/inspection factor Reported Observer Influence (1=No influence, 9=Great influence) on Condition Ratings.



a. Deck

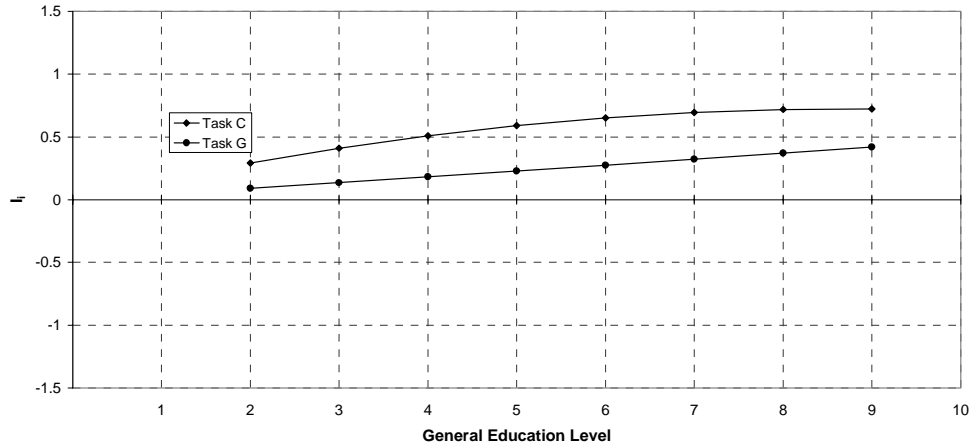


b. Superstructure

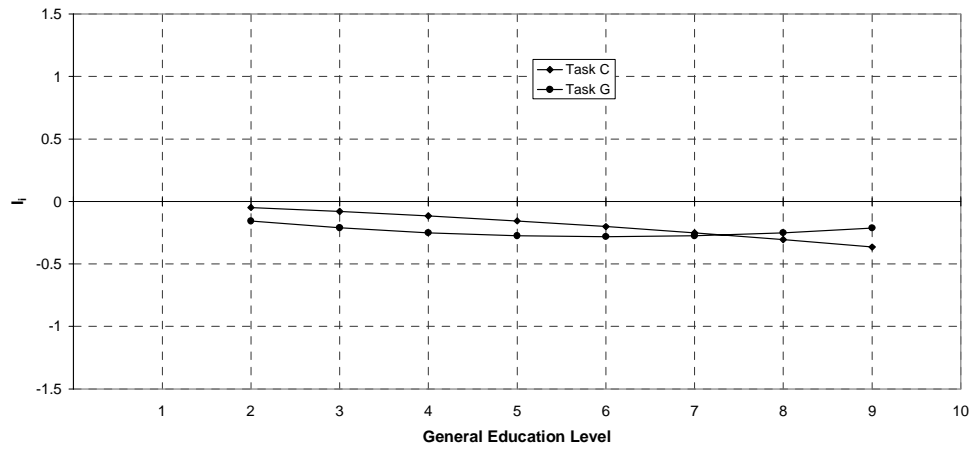


c. Substructure

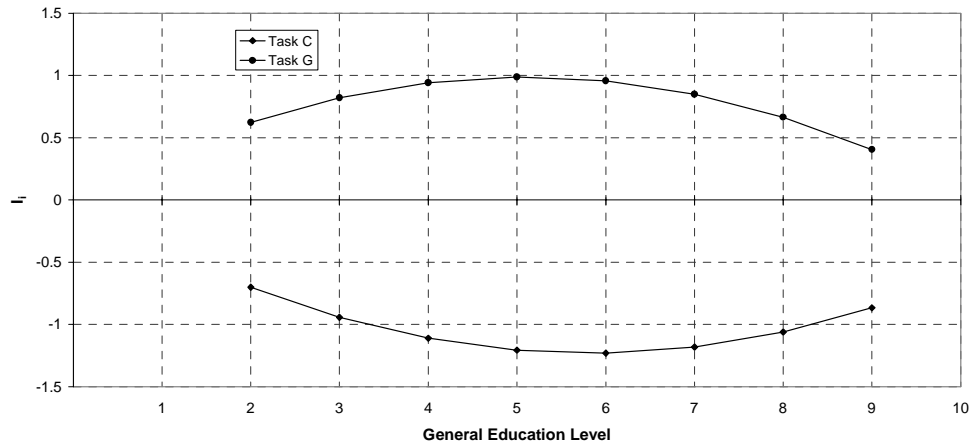
Figure L30. Influence of combined inspector/inspection factor Number of Annual Bridge Inspections on Condition Ratings.



a. Deck

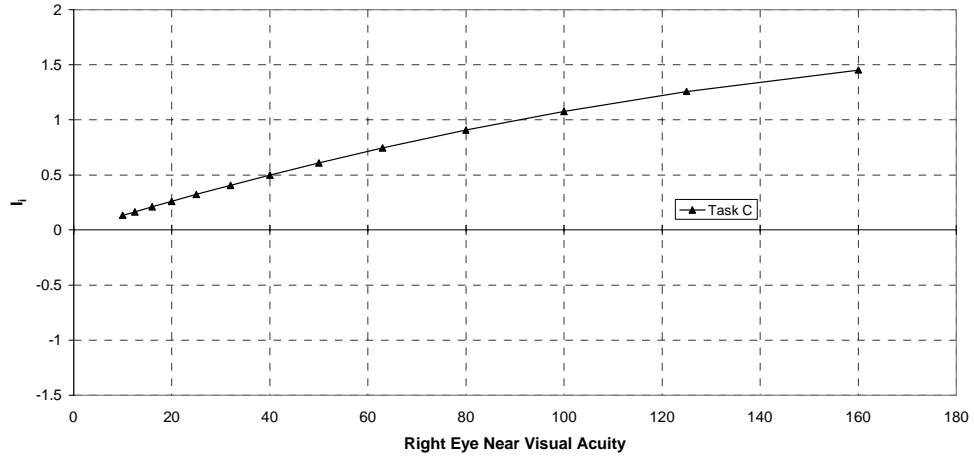


b. Superstructure

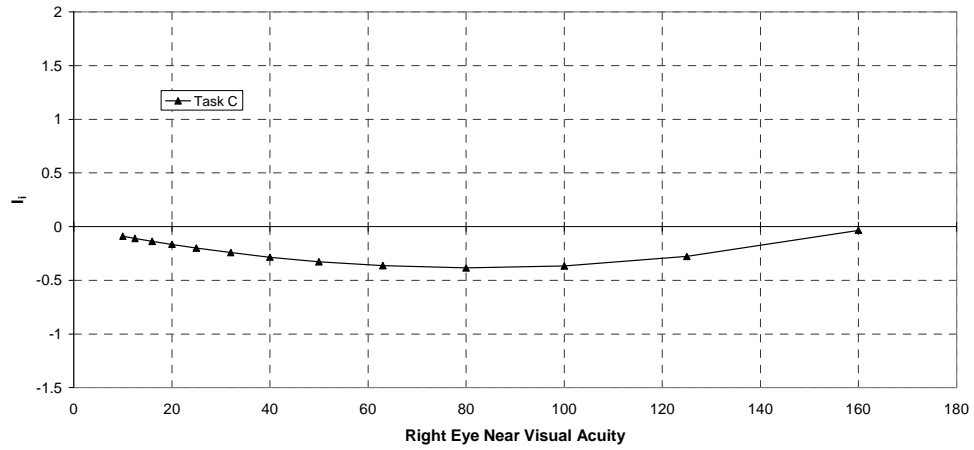


c. Substructure

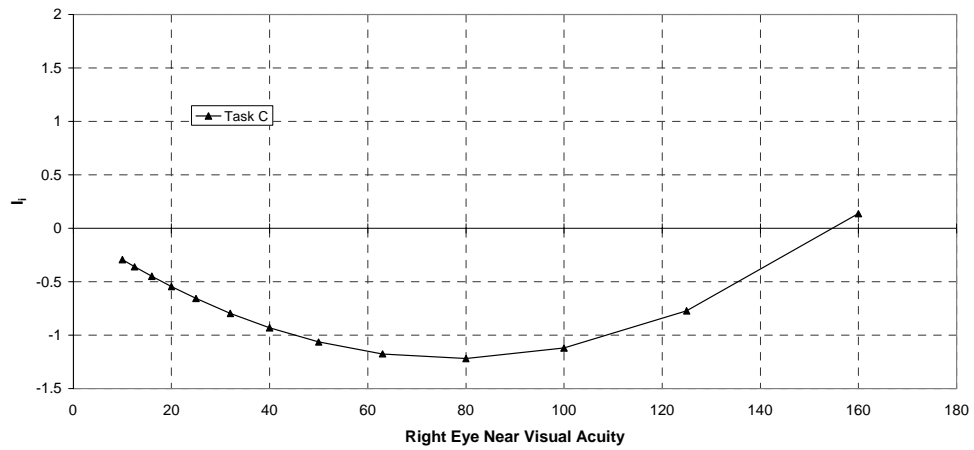
Figure L31. Influence of combined inspector/inspection factor General Education Level (1=Some high school, 10=Terminal degree) on Condition Ratings.



a. Deck

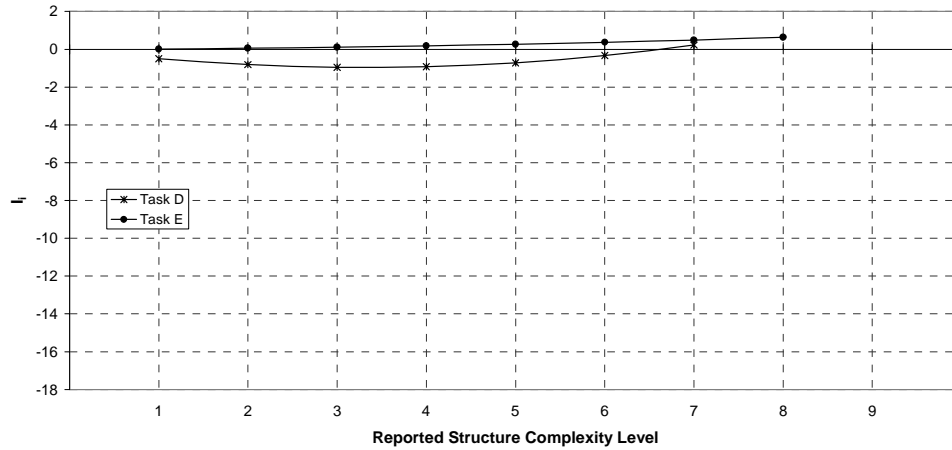


b. Superstructure

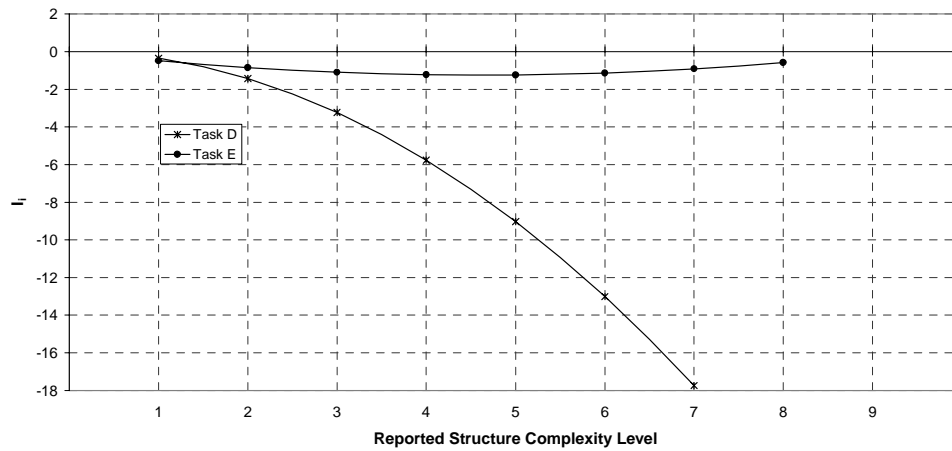


c. Substructure

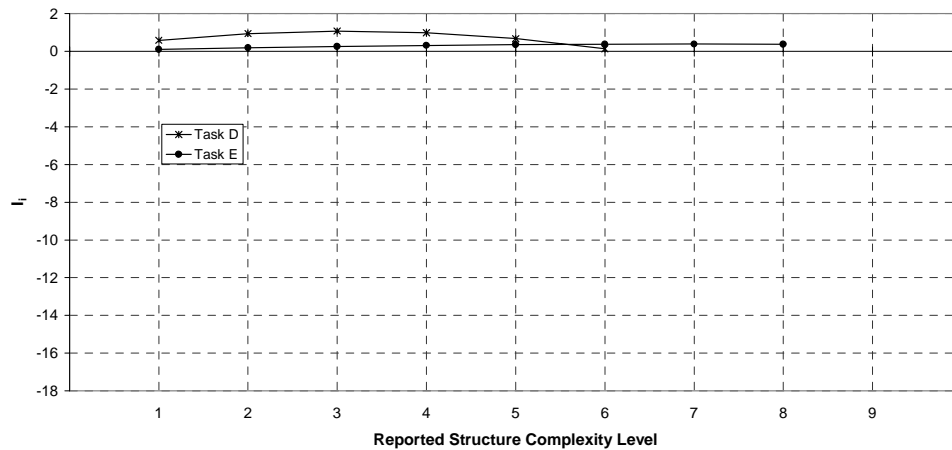
Figure L32. Influence of combined inspector/inspection factor Right Eye Near Visual Acuity on Condition Ratings.



a. Deck

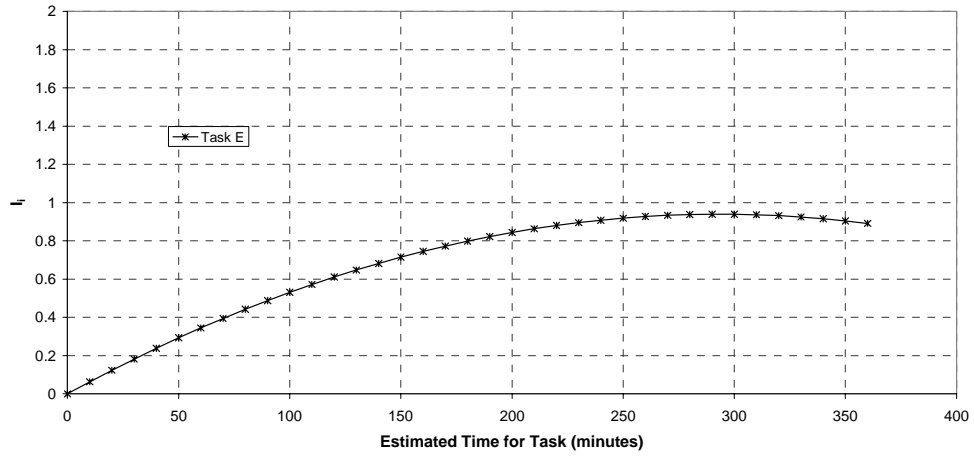


b. Superstructure

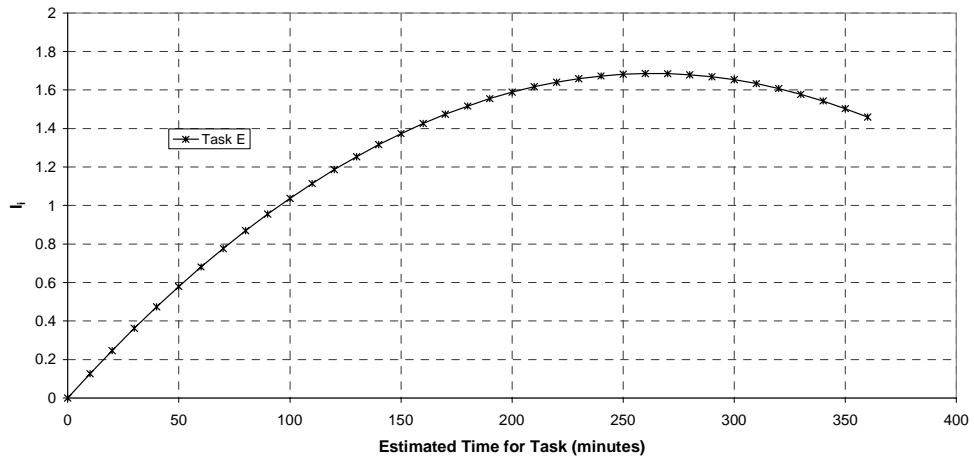


c. Substructure

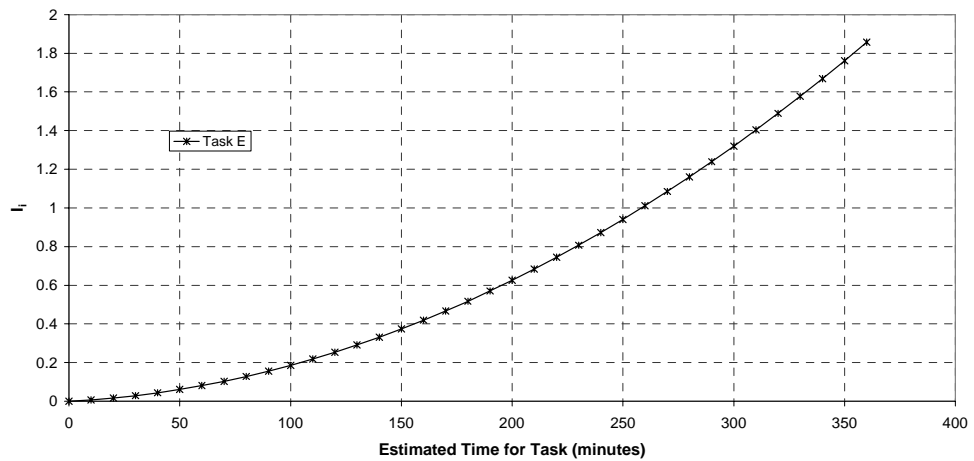
Figure L33. Influence of combined inspector/inspection factor Reported Structure Complexity Level (1=Very simple, 9=Very complex) on Condition Ratings.



a. Deck

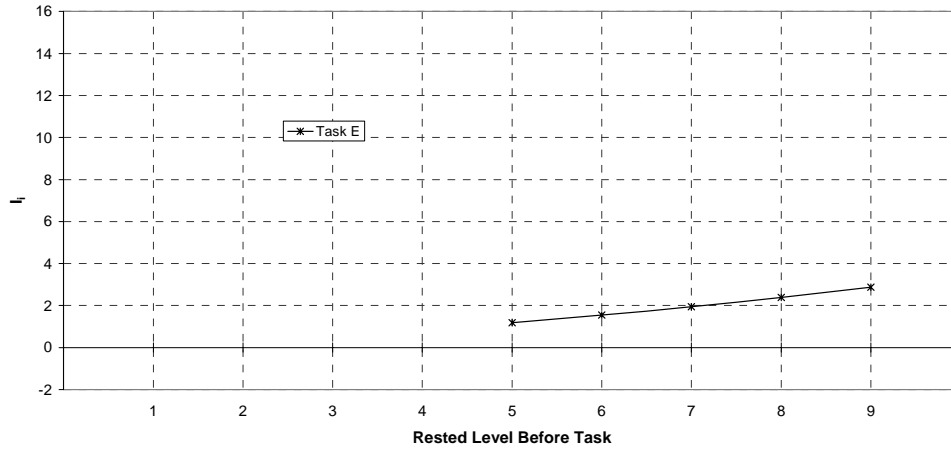


b. Superstructure

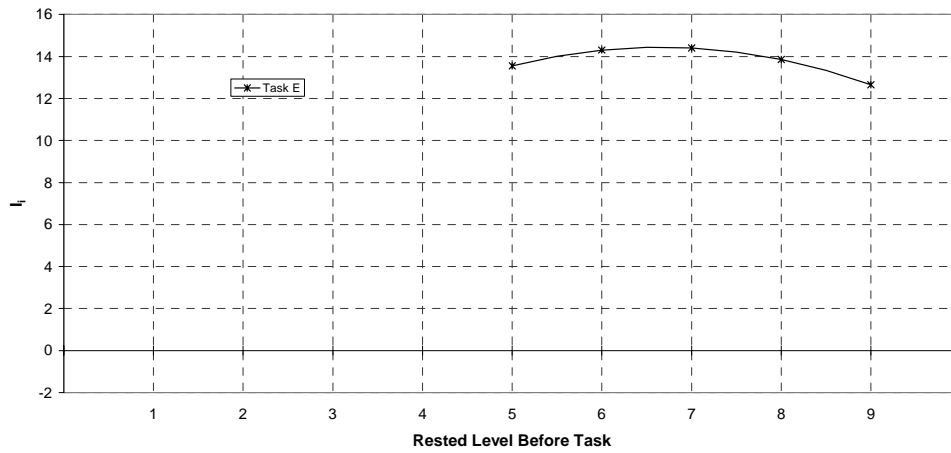


c. Substructure

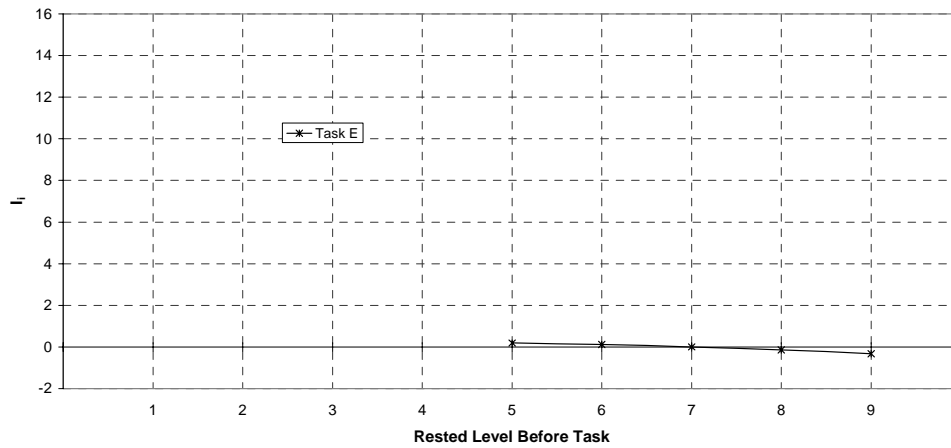
Figure L34. Influence of combined inspector/inspection factor Estimated Time for Task on Condition Ratings.



a. Deck

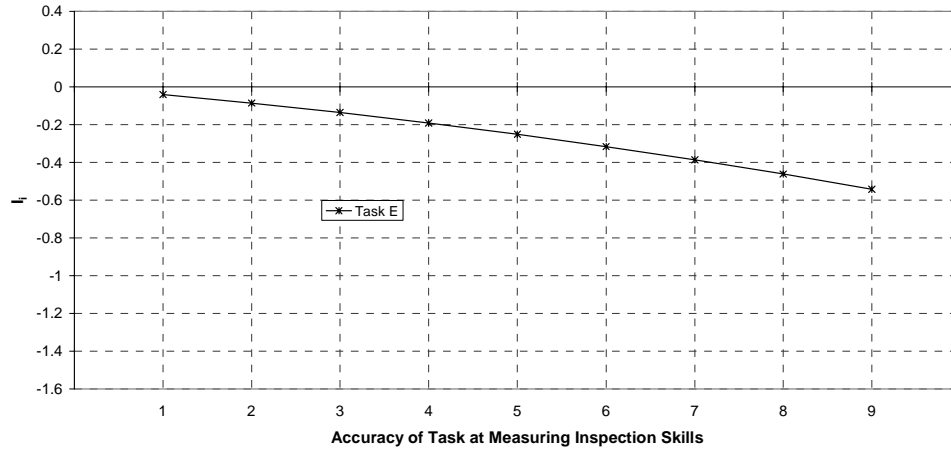


b. Superstructure

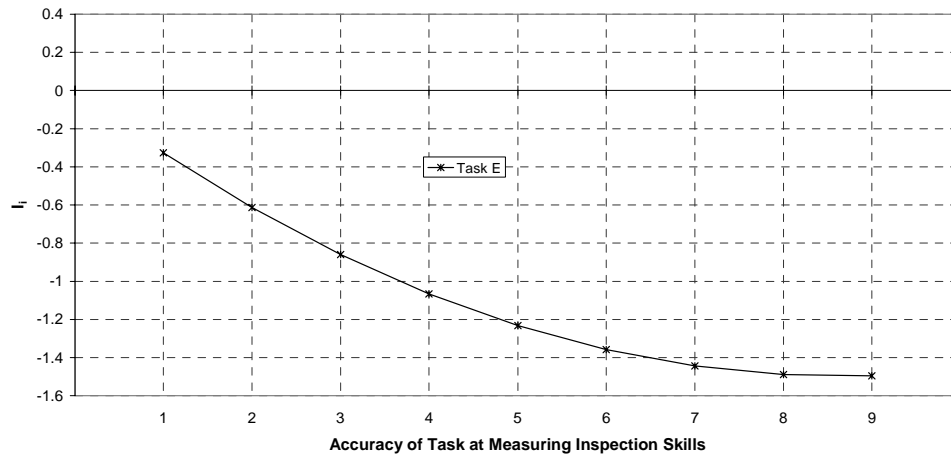


c. Substructure

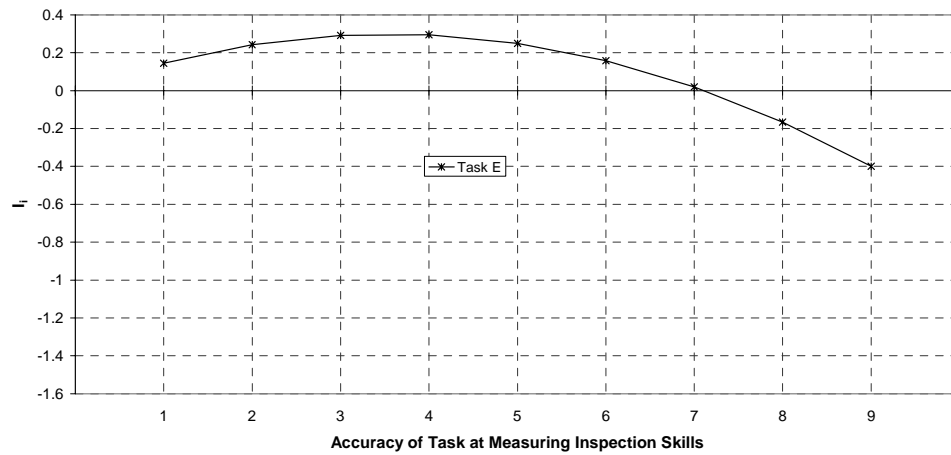
Figure L35. Influence of combined inspector/inspection factor Rested Level Before Task (1=Very tired, 9=Very rested) on Condition Ratings.



a. Deck

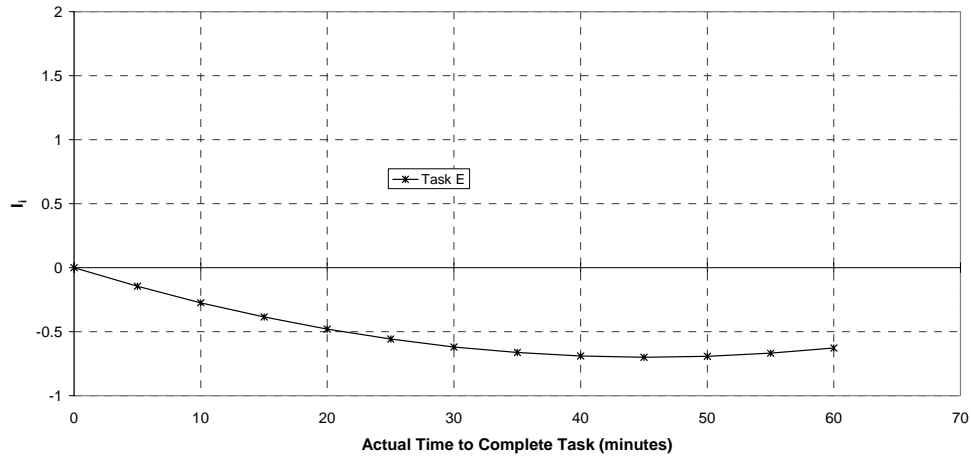


b. Superstructure

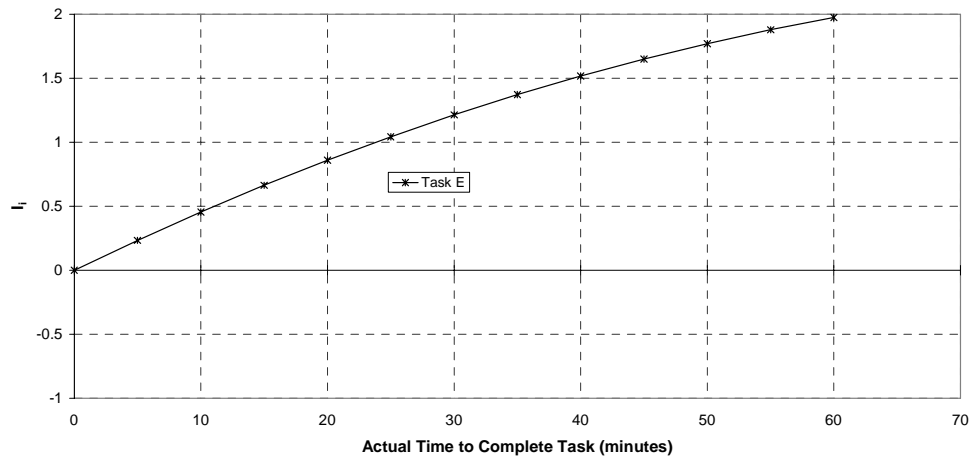


c. Substructure

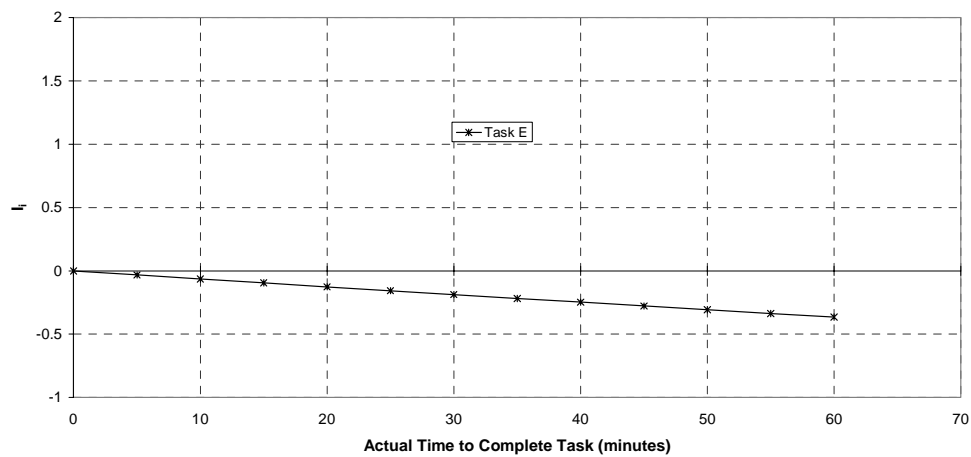
Figure L36. Influence of combined inspector/inspection factor Accuracy of Task at Measuring Inspection Skills (1=Very inaccurate, 9=Very accurate) on Condition Ratings.



a. Deck



b. Superstructure



c. Substructure

Figure L37. Influence of combined inspector/inspection factor Actual Time to Complete Task on Condition Ratings.

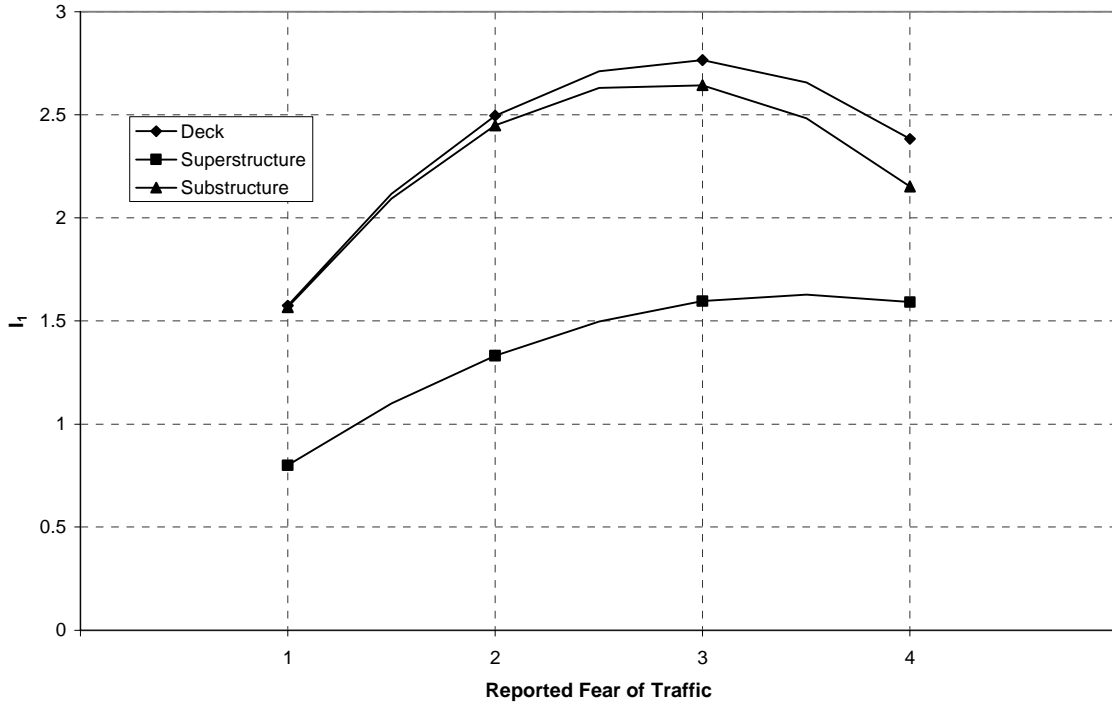


Figure L38. Influence of inspector factor Reported Fear of Traffic (1=Very fearful, 4=No fear) on DFR.

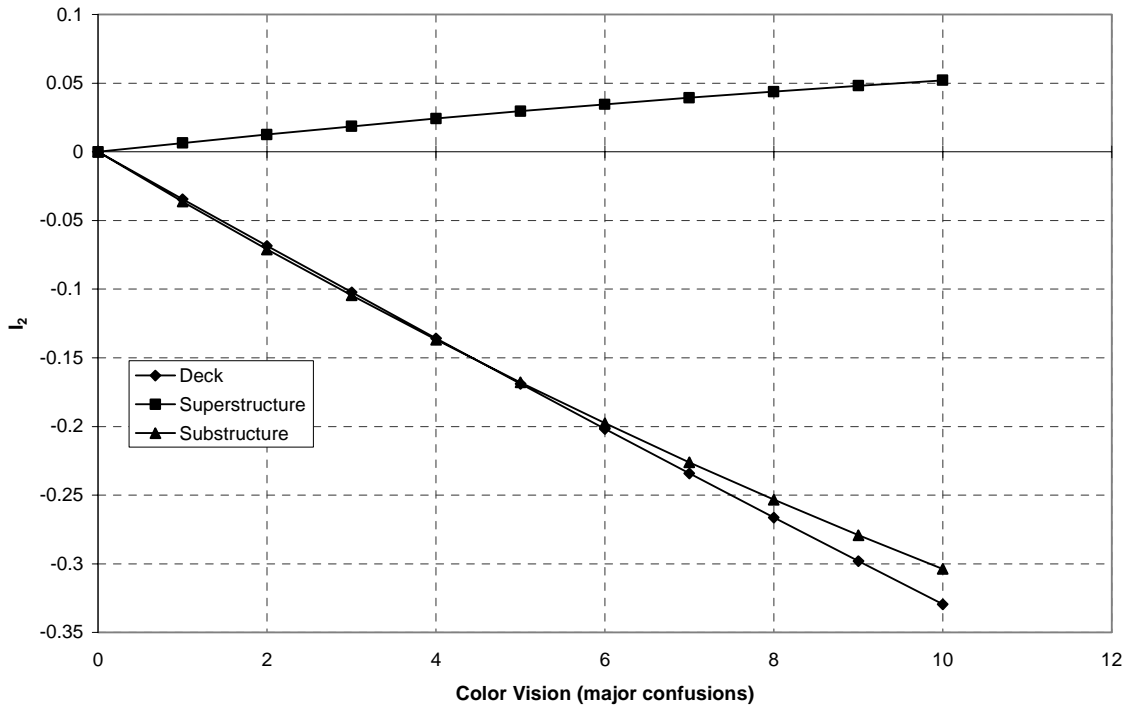


Figure L39. Influence of inspector factor Color Vision (number of major confusions) on DFR.

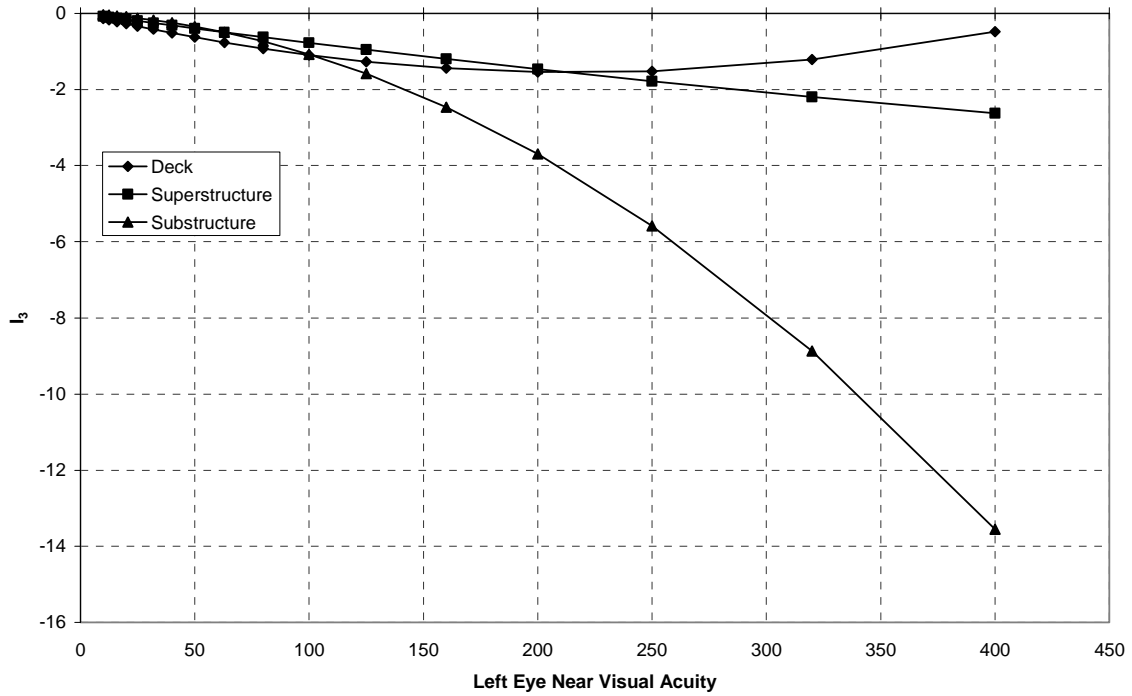


Figure L40. Influence of inspector factor Left Eye Near Visual Acuity on DFR.

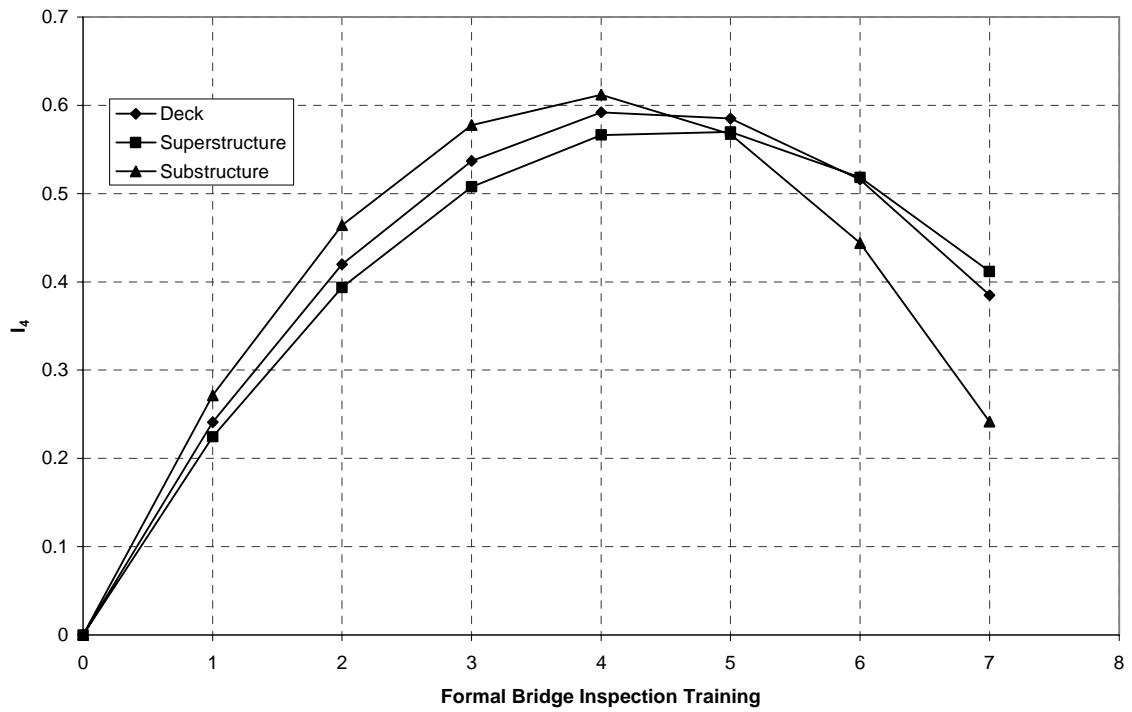


Figure L41. Influence of inspector factor Formal Bridge Inspection Training (number of FHWA training courses) on DFR.

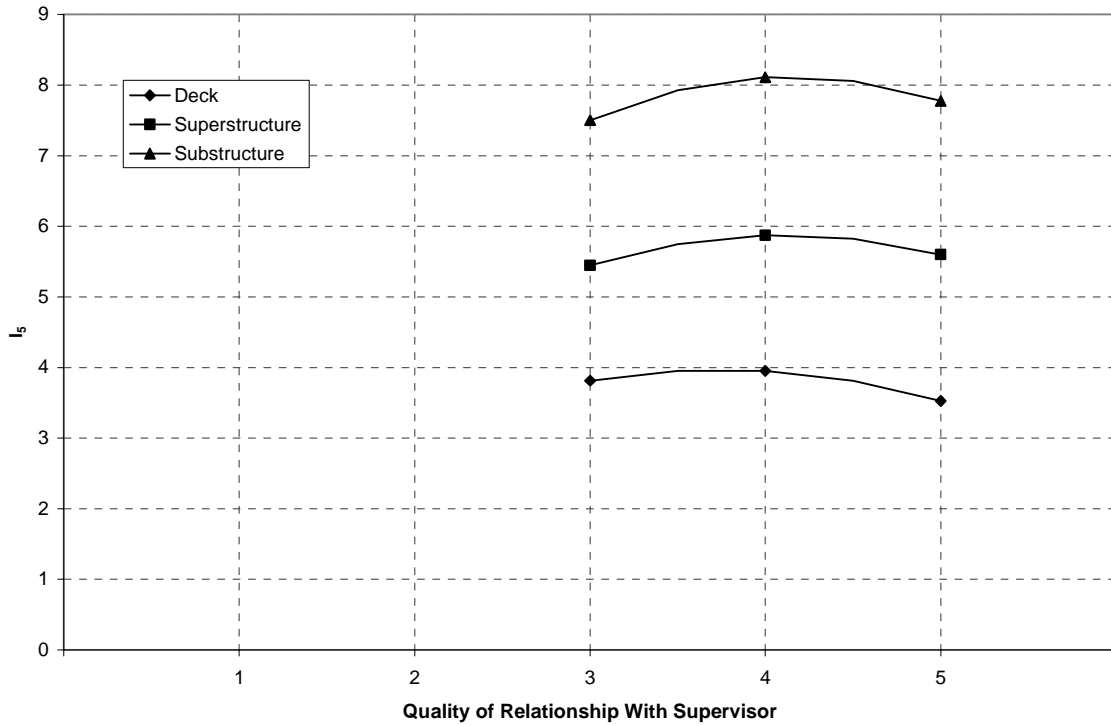


Figure L42. Influence of inspector factor Quality of Relationship With Supervisor (1=Very poor, 5=Very good) on DFR.

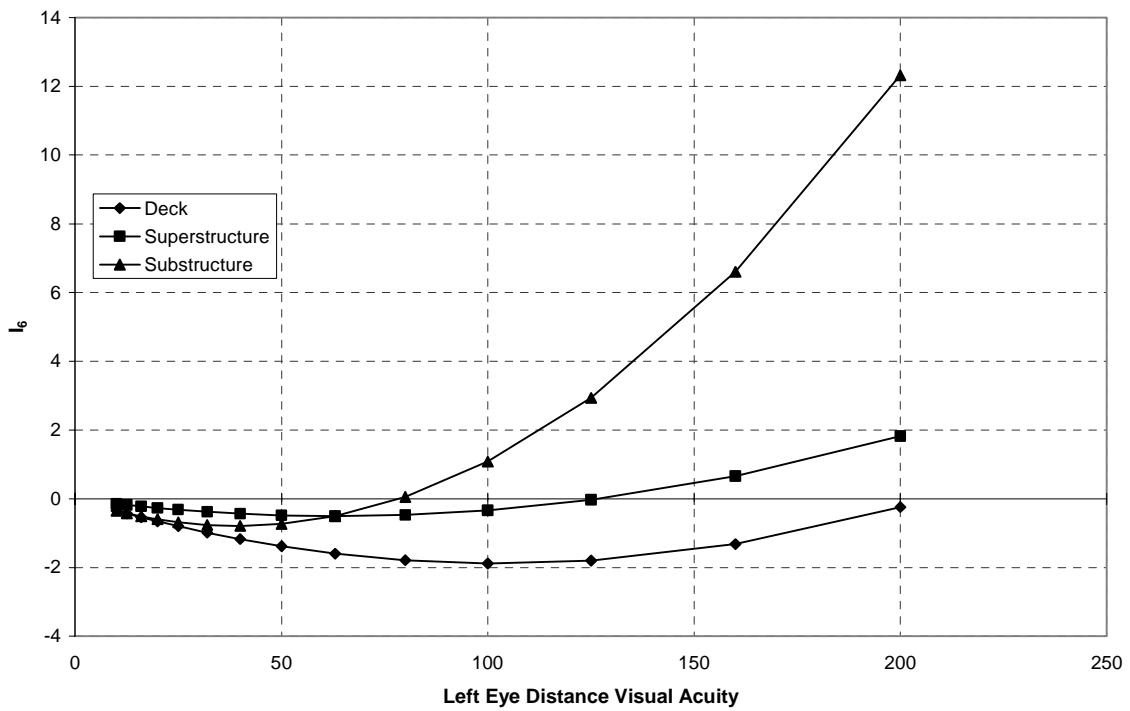


Figure L43. Influence of inspector factor Left Eye Distance Visual Acuity on DFR.

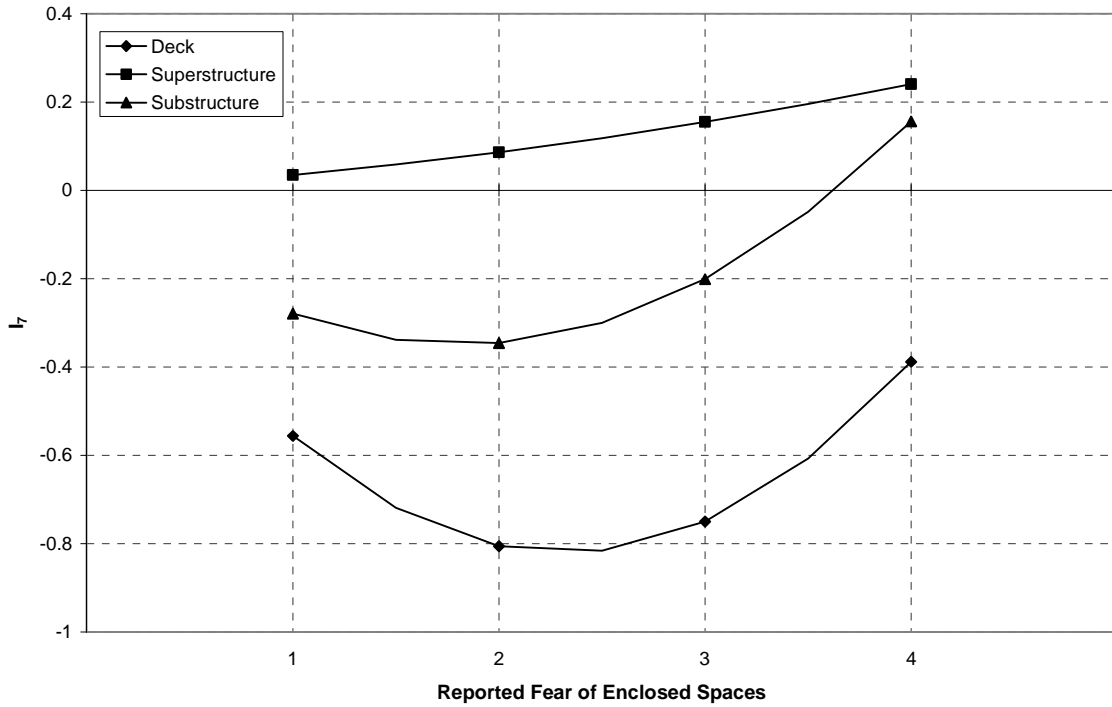


Figure L44. Influence of inspection factor Reported Fear of Enclosed Spaces (1=Very fearful, 4=No fear) on DFR.

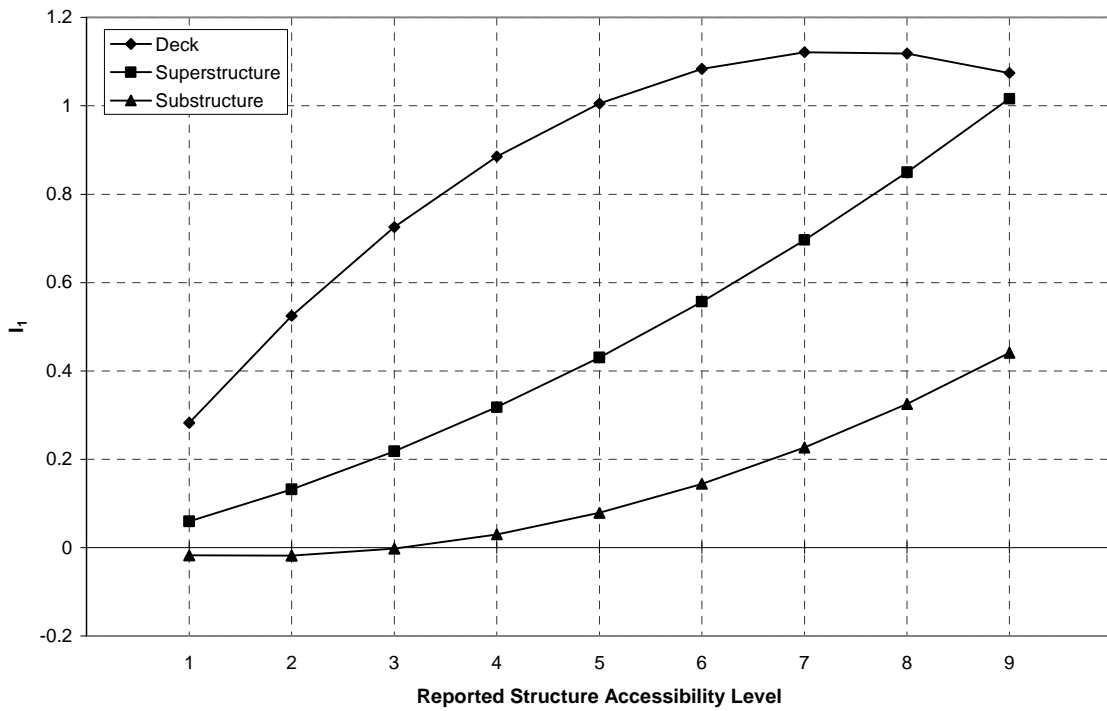


Figure L45. Influence of inspection factor Reported Structure Accessibility Level (1=Very inaccessible, 9=Very accessible) on DFR.

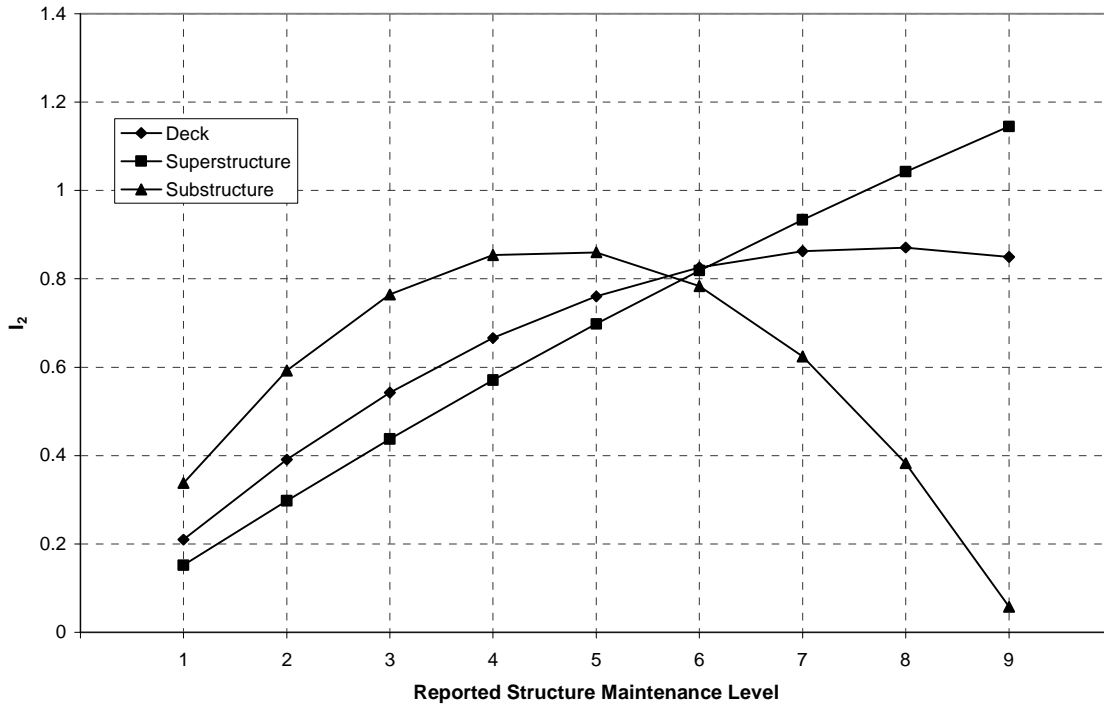


Figure L46. Influence of inspection factor Reported Structure Maintenance Level (1=Very poorly, 9=Very well) on DFR.

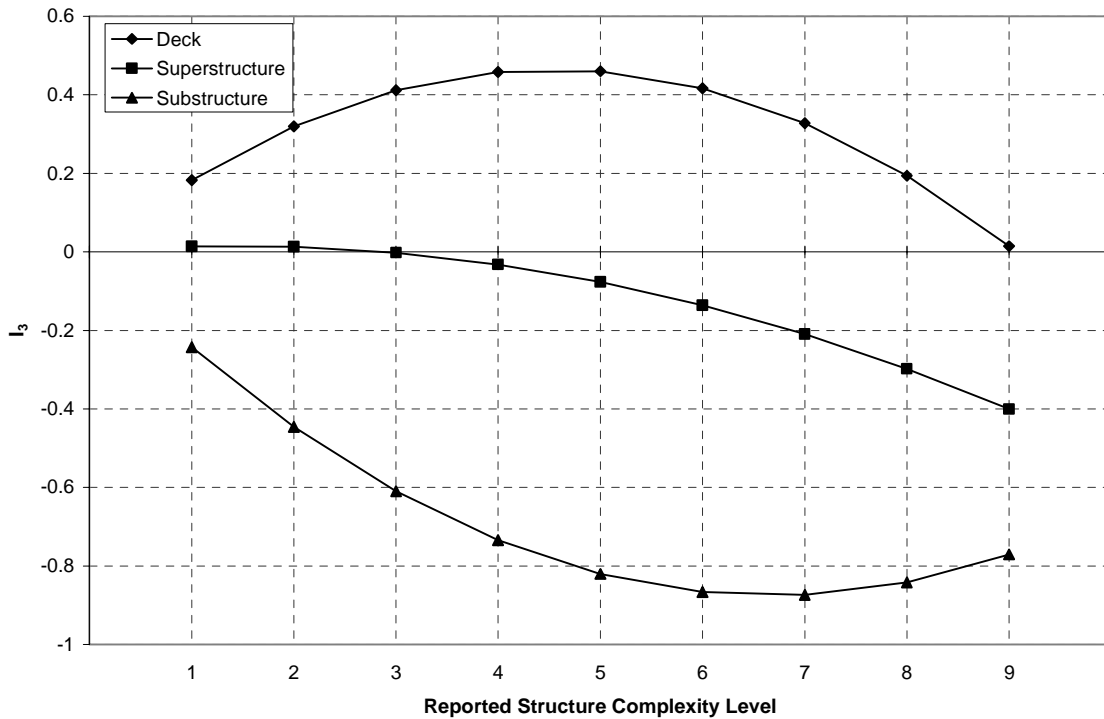


Figure L47. Influence of inspection factor Reported Structure Complexity Level (1=Very simple, 9=Very complex) on DFR.

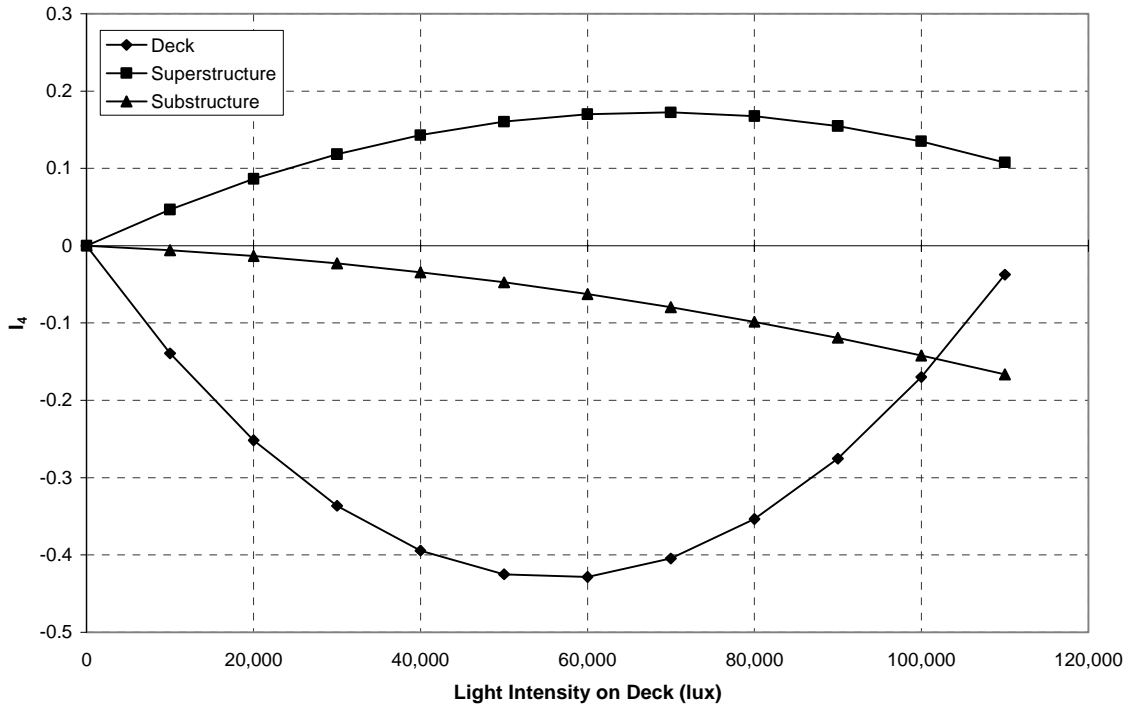


Figure L48. Influence of inspection factor Light Intensity on Deck on DFR.

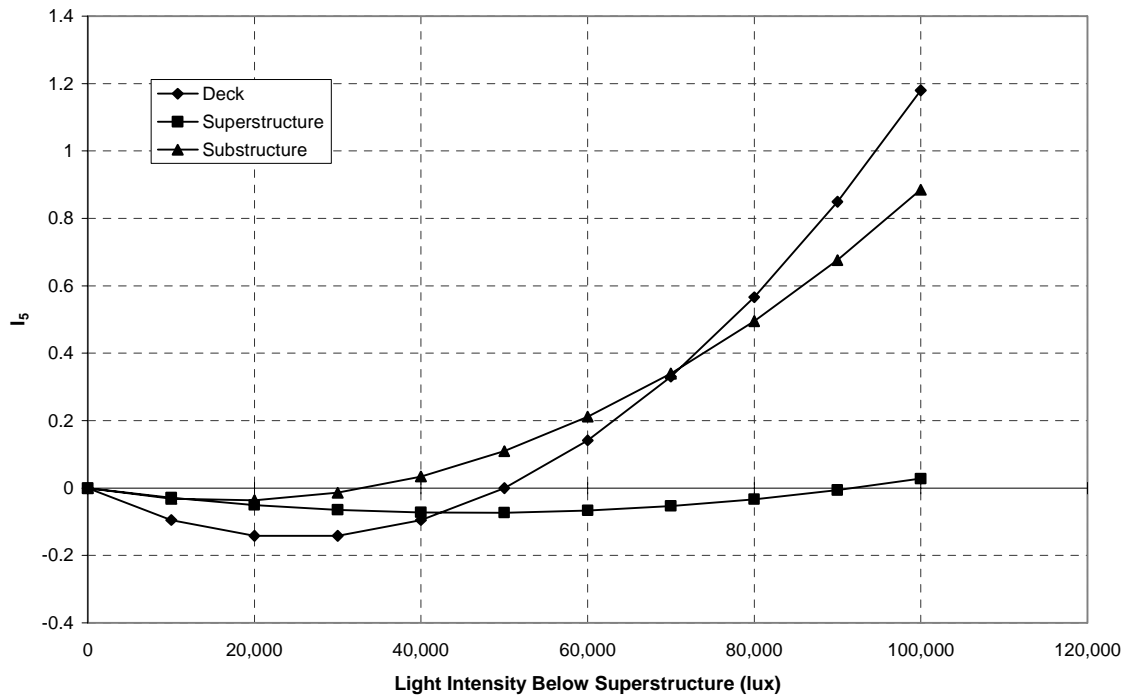


Figure L49. Influence of inspection factor Light Intensity Below Superstructure on DFR.

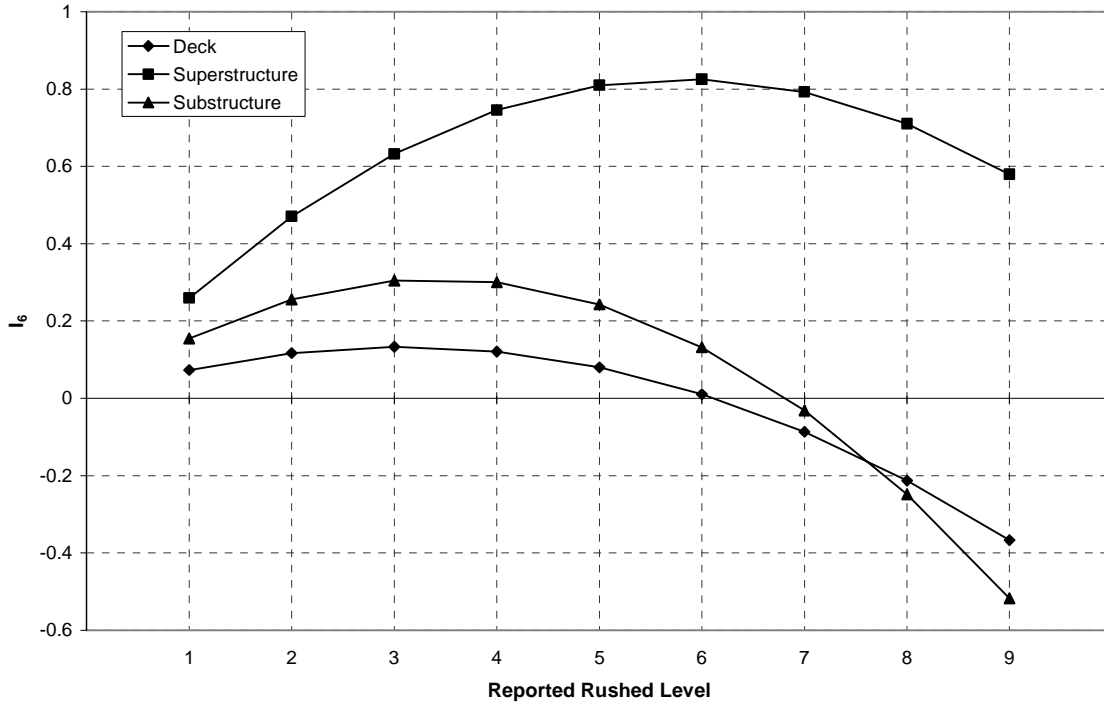


Figure L50. Influence of inspection factor Reported Rushed Level (1=Not rushed, 9=Very rushed) on DFR.

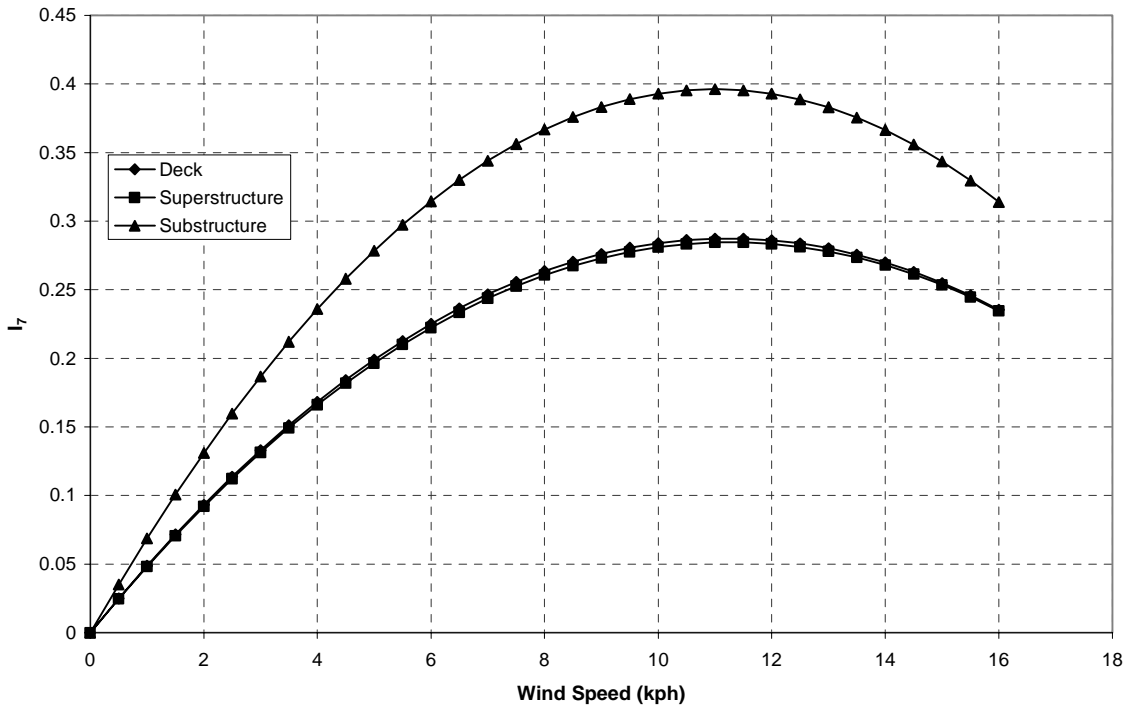


Figure L51. Influence of inspection factor Wind Speed on DFR.

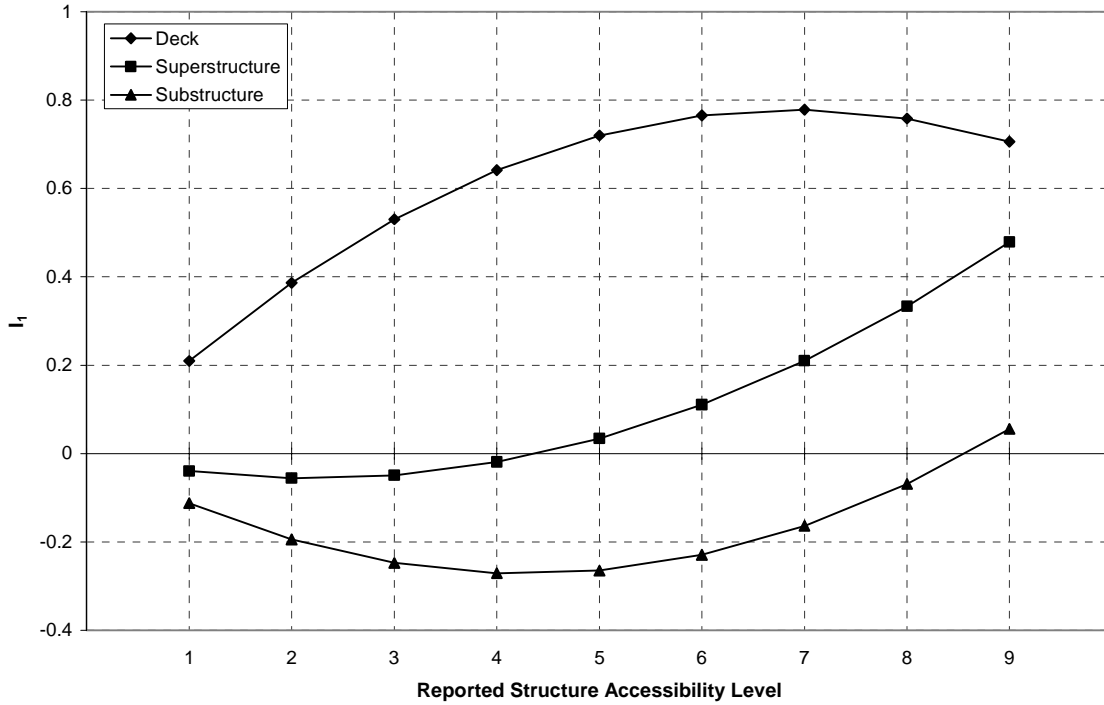


Figure L52. Influence of combined inspector/inspection factor Reported Structure Accessibility Level (1=Very inaccessible, 9=Very accessible) on DFR.

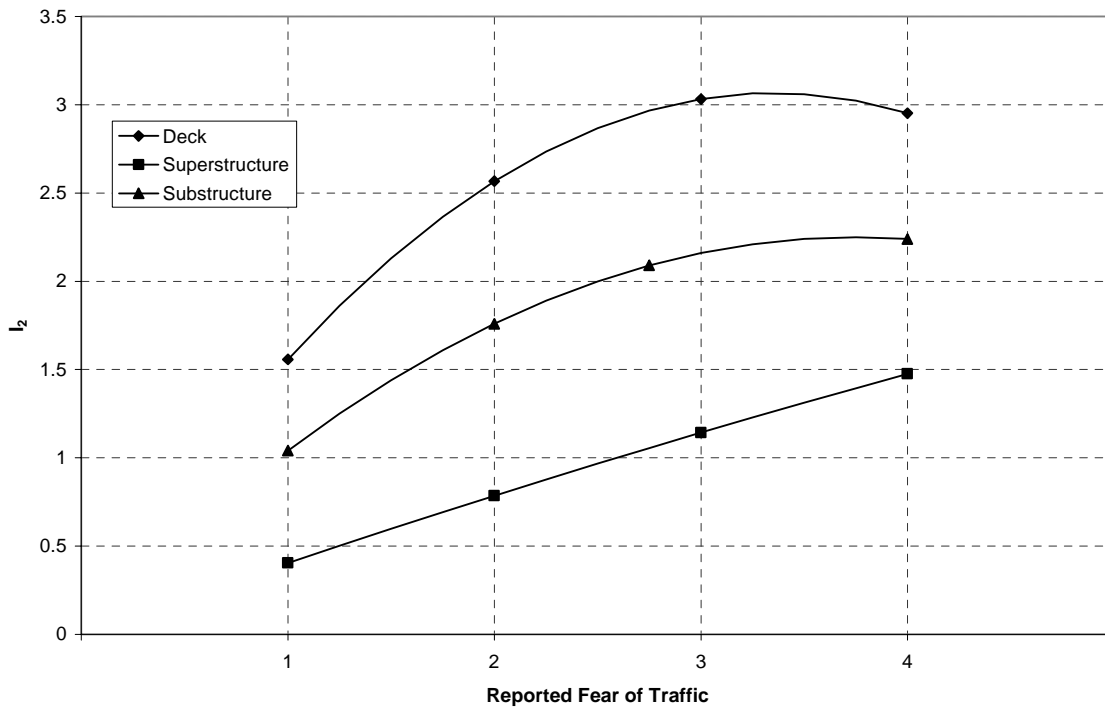


Figure L53. Influence of combined inspector/inspection factor Reported Fear of Traffic (1=Very fearful, 4=No fear) on DFR.

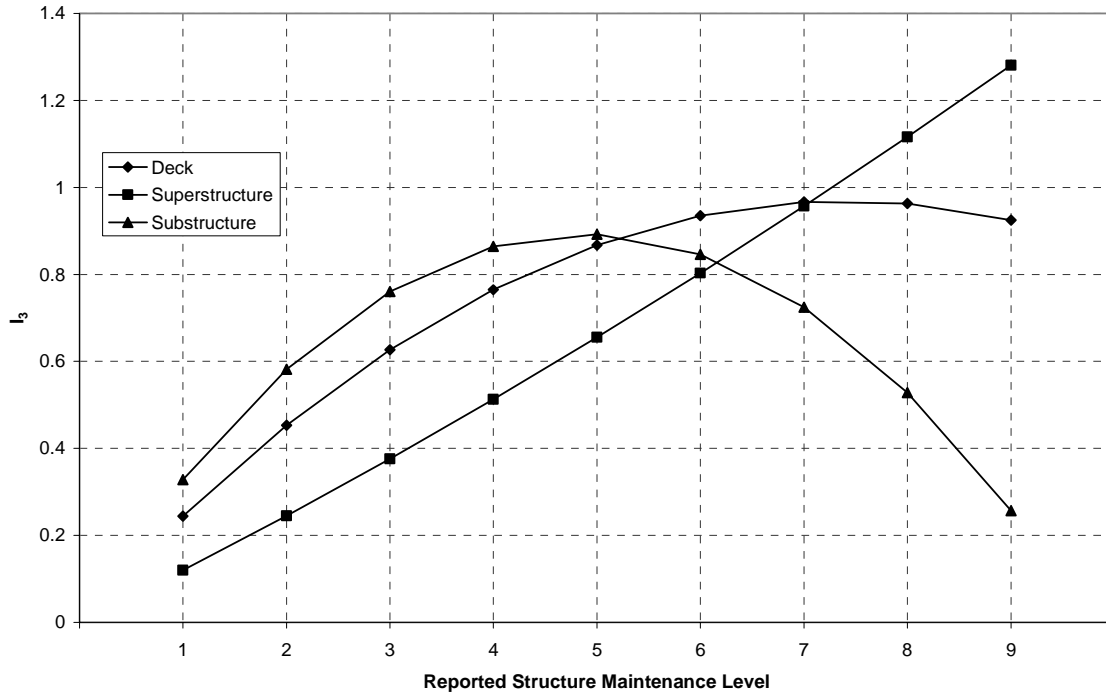


Figure L54. Influence of combined inspector/inspection factor Reported Structure Maintenance Level (1=Very poorly, 9=Very well) on DFR.

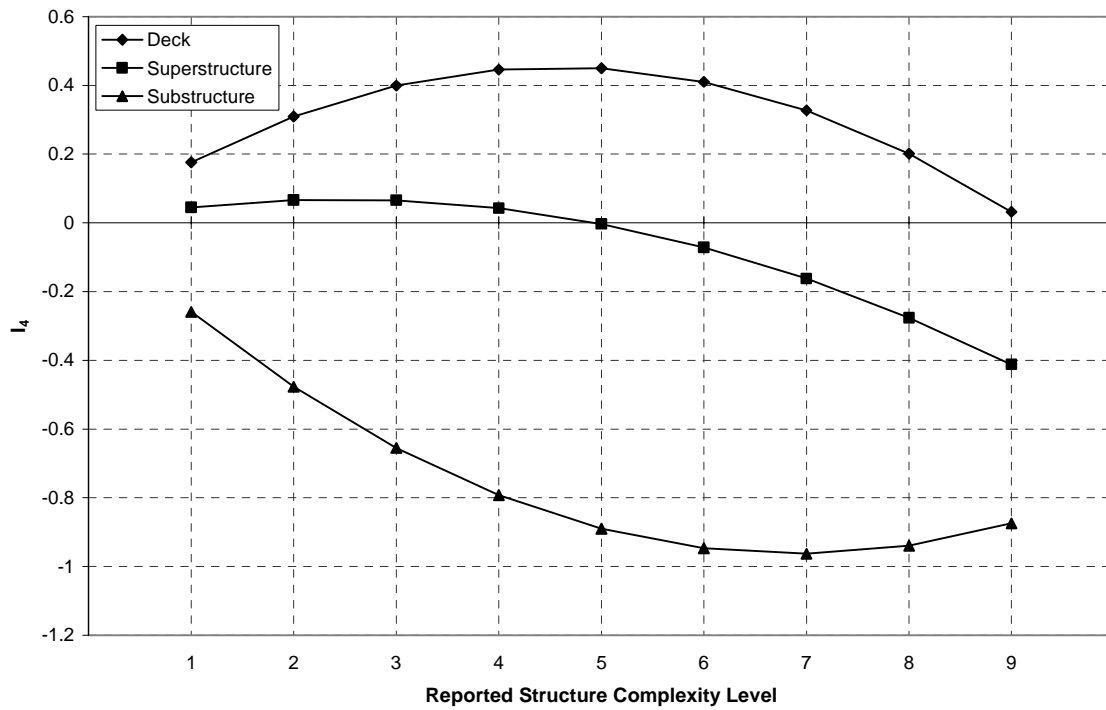


Figure L55. Influence of combined inspector/inspection factor Reported Structure Complexity Level (1=Very simple, 9=Very complex) on DFR.

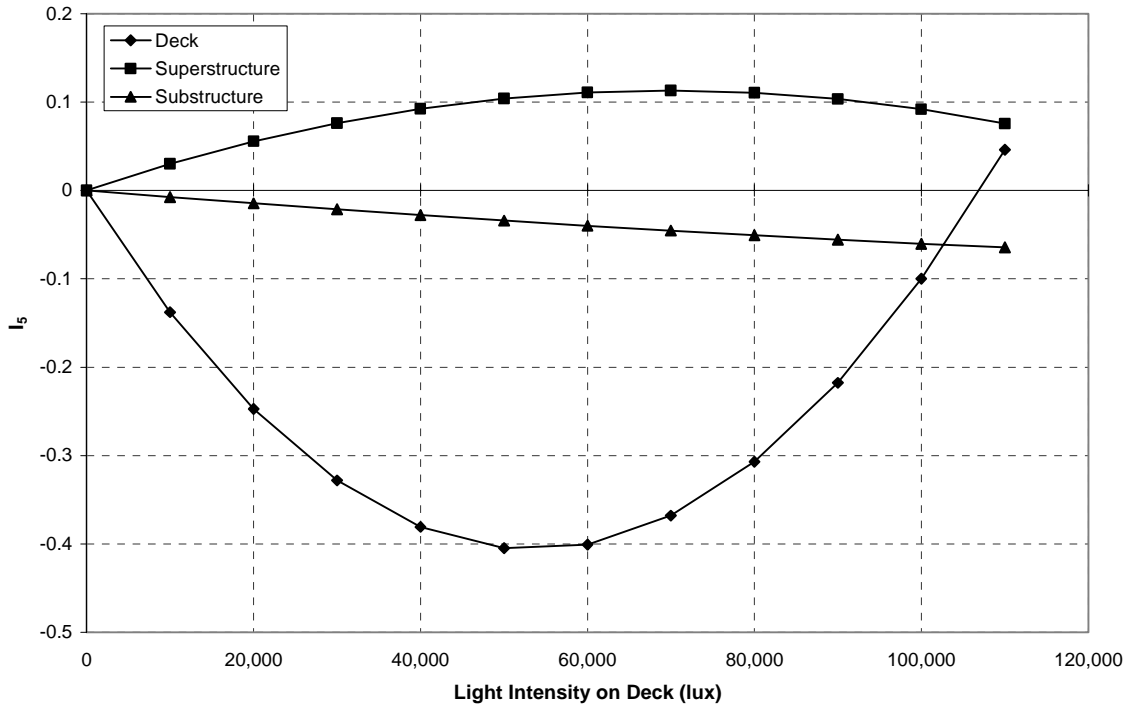


Figure L56. Influence of combined inspector/inspection factor Light Intensity on Deck on DFR.

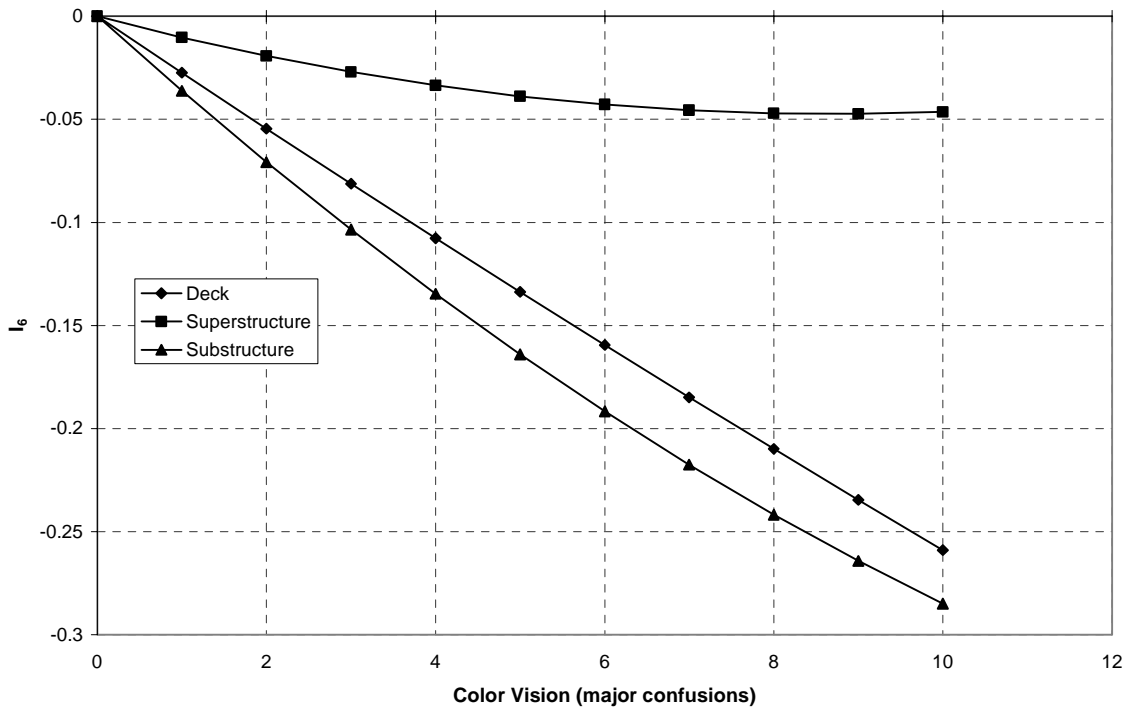


Figure L57. Influence of combined inspector/inspection factor Color Vision (number of major confusions) on DFR.

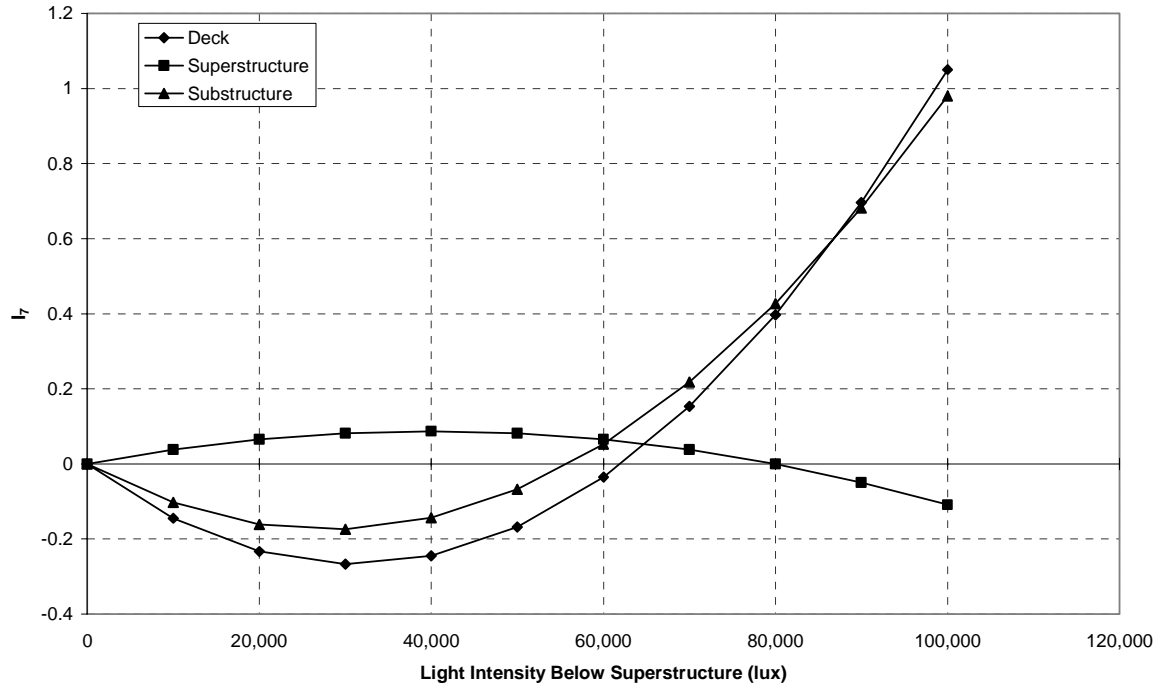


Figure L58. Influence of combined inspector/inspection factor Light Intensity Below Superstructure on DFR.

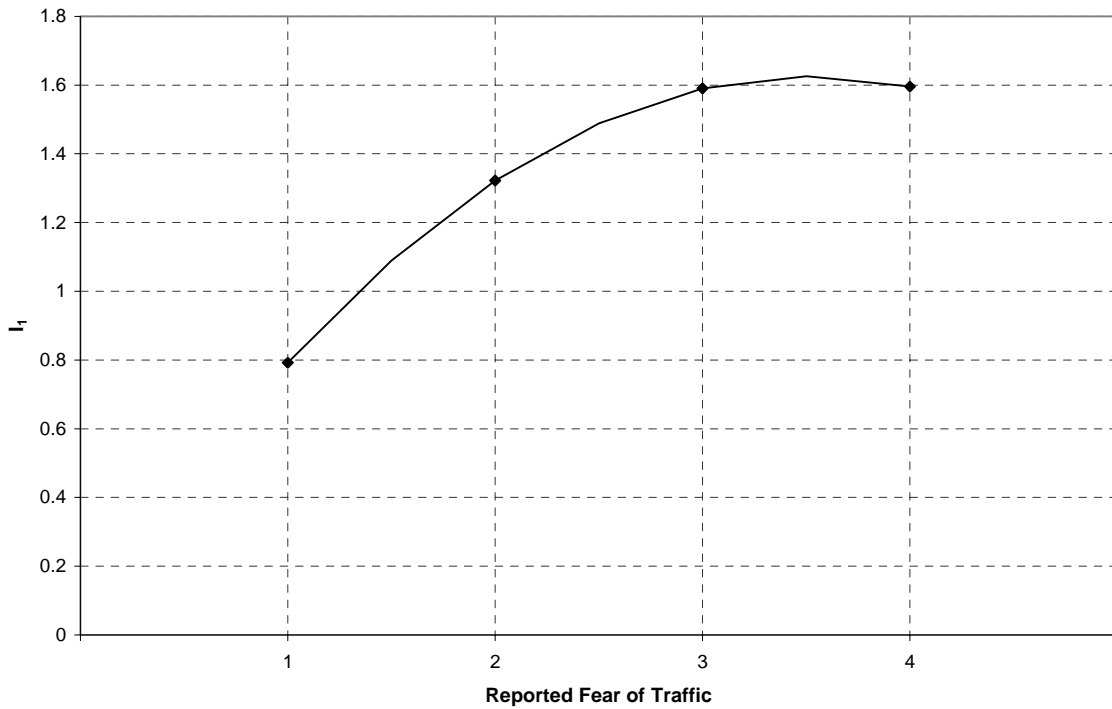


Figure L59. Influence of inspector factor Reported Fear of Traffic (1=Very fearful, 4=No fear) on general DFR.

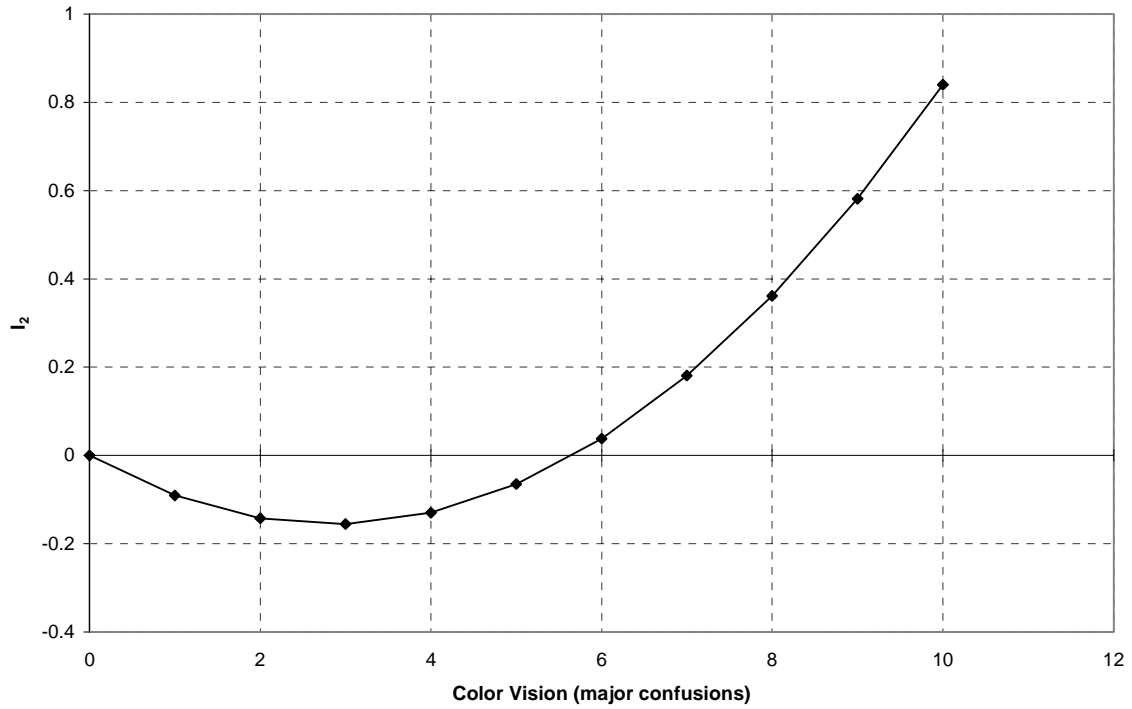


Figure L60. Influence of inspector factor Color Vision (number of major confusions) on general DFR.

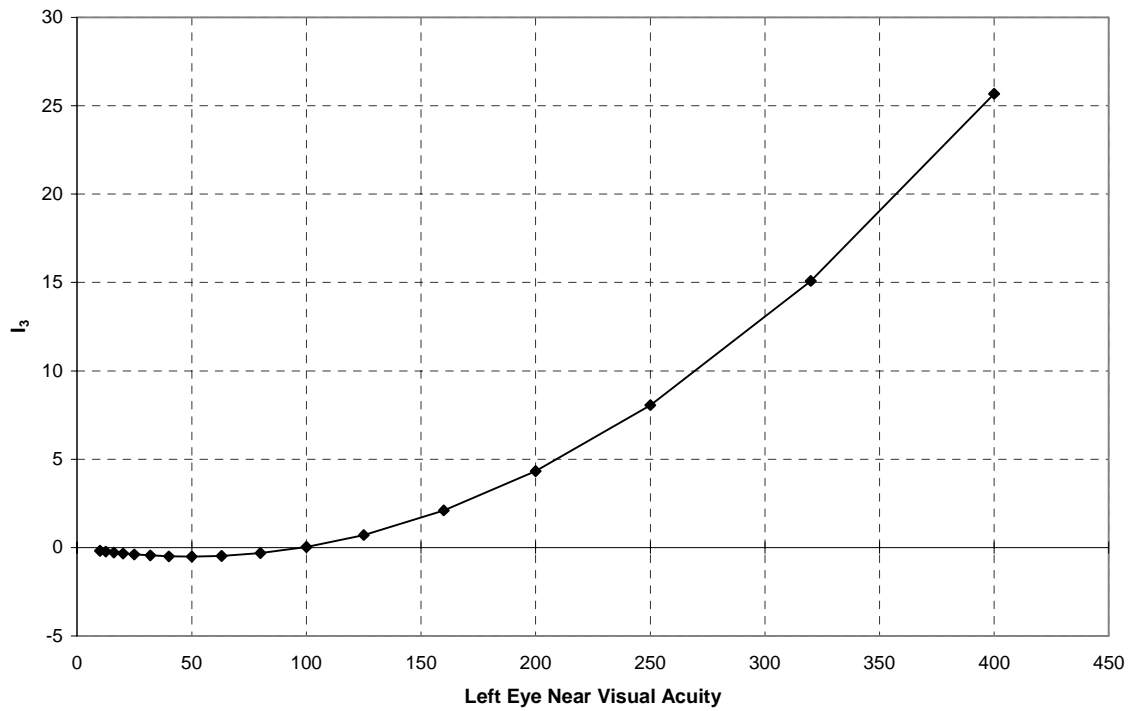


Figure L61. Influence of inspector factor Left Eye Near Visual Acuity on general DFR.

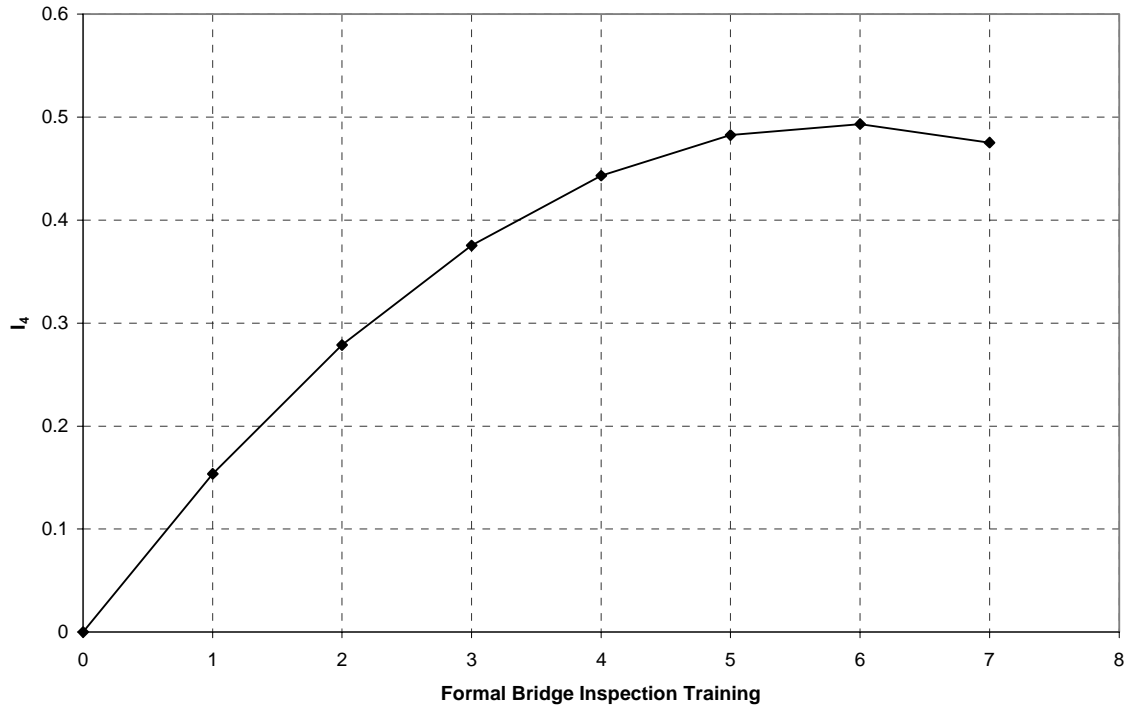


Figure L62. Influence of inspector factor Formal Bridge Inspection Training (number of FHWA training courses) on general DFR.

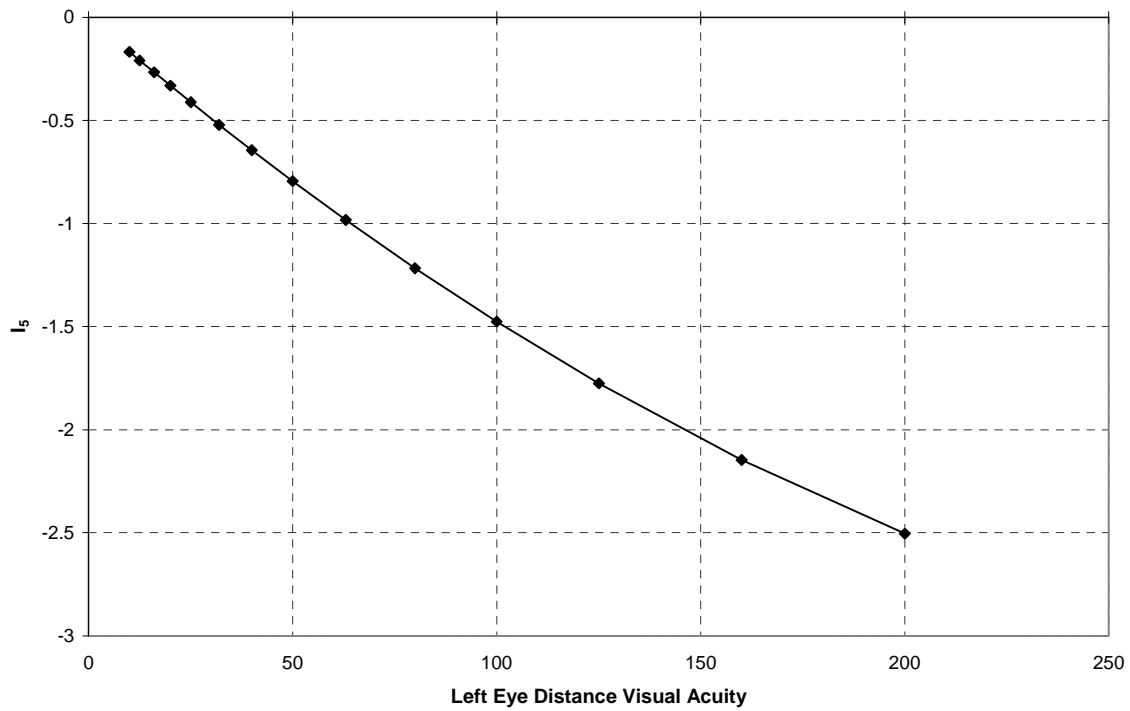


Figure L63. Influence of inspector factor Left Eye Distance Visual Acuity on general DFR.

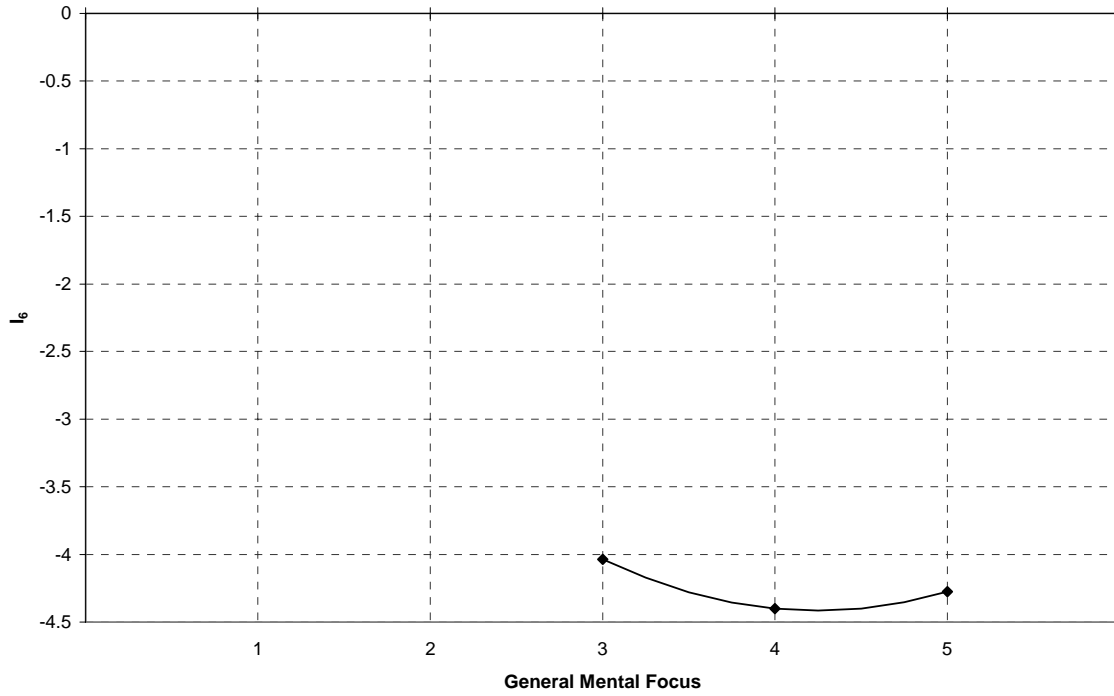


Figure L64. Influence of inspector factor General Mental Focus (1=Poor, 5=Very focused) on general DFR.

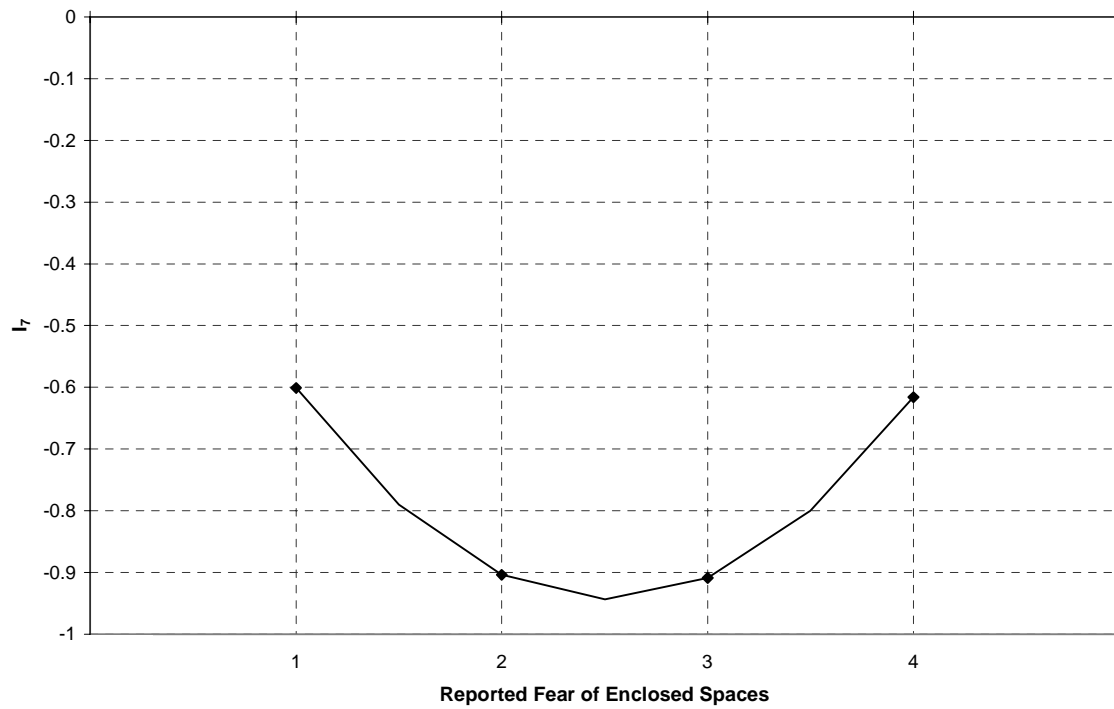


Figure L65. Influence of inspector factor Reported Fear of Enclosed Spaces (1=Very fearful, 4=No fear) on general DFR.

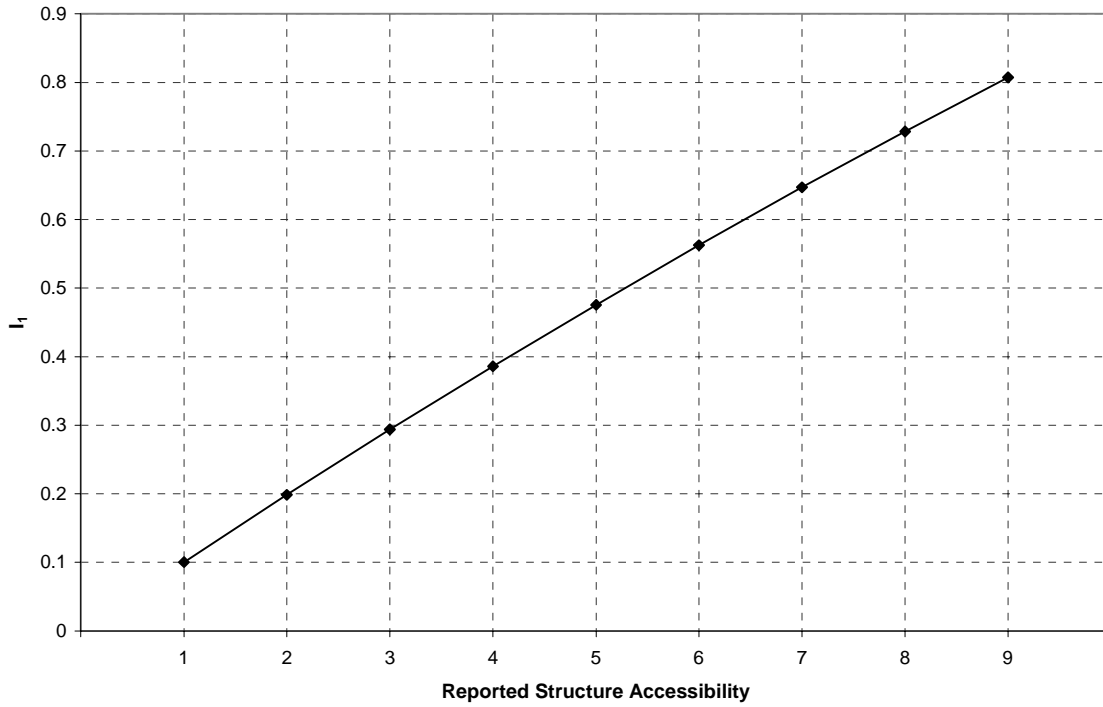


Figure L66. Influence of inspection factor Reported Structure Accessibility (1=Very inaccessible, 9=Very accessible) on general DFR.

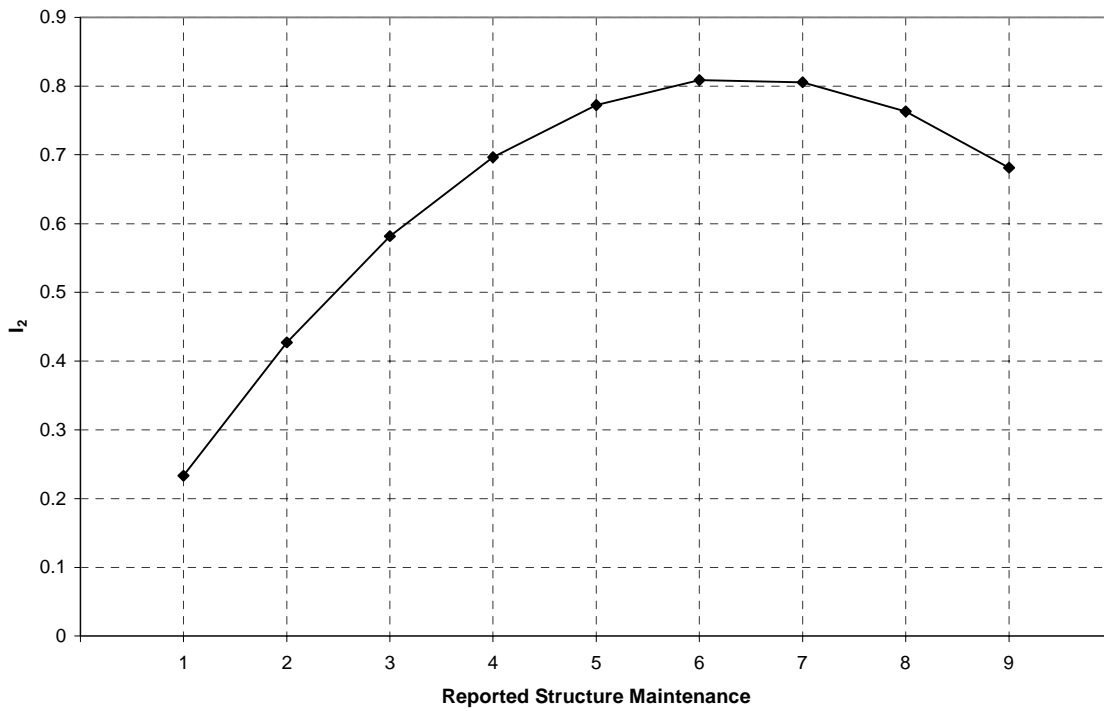


Figure L67. Influence of inspection factor Reported Structure Maintenance (1=Very poorly, 9=Very well) on general DFR.

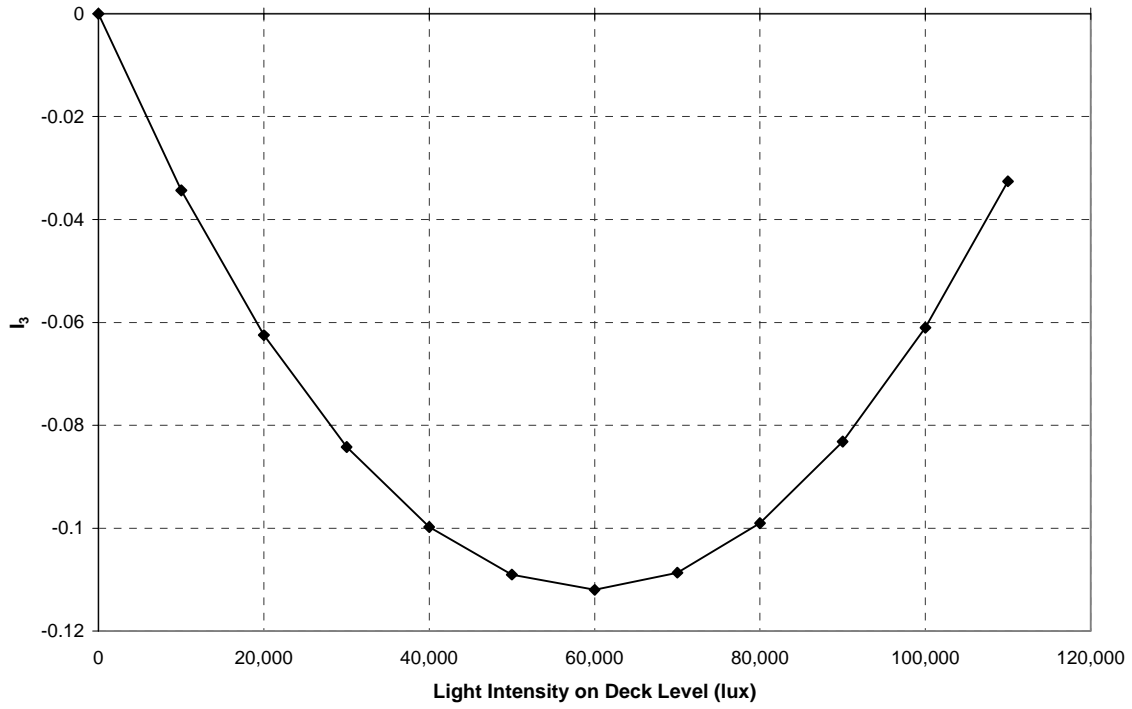


Figure L68. Influence of inspection factor Light Intensity on Deck Level on general DFR.

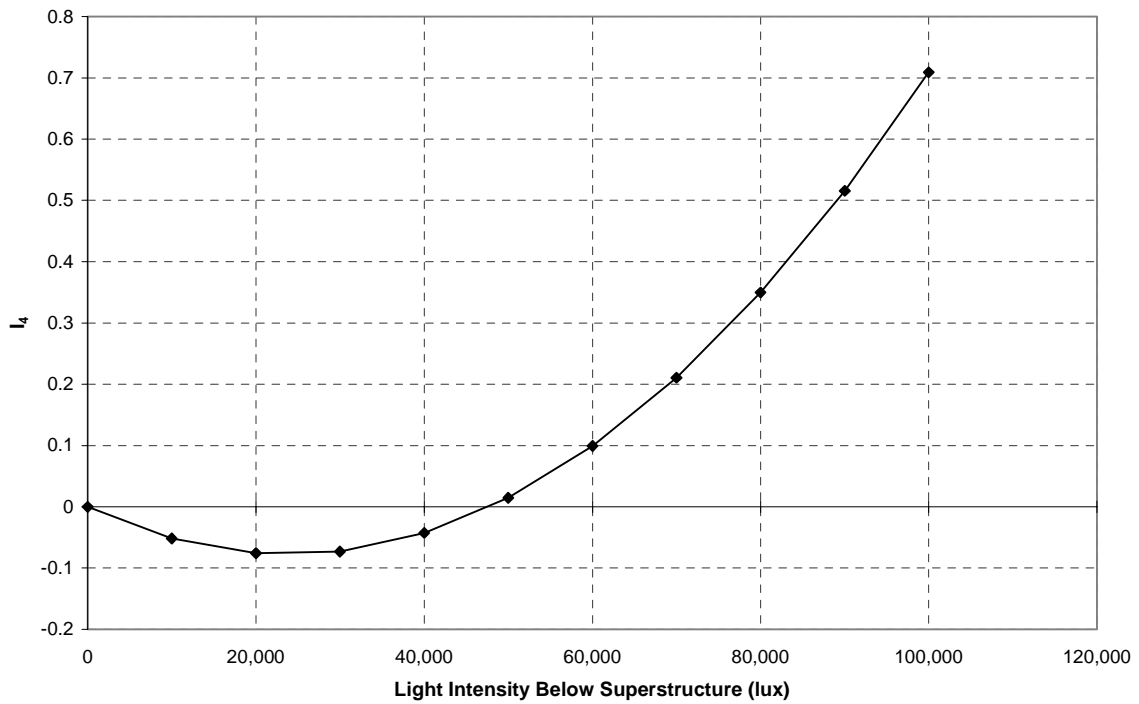


Figure L69. Influence of inspection factor Light Intensity Below Superstructure on general DFR.

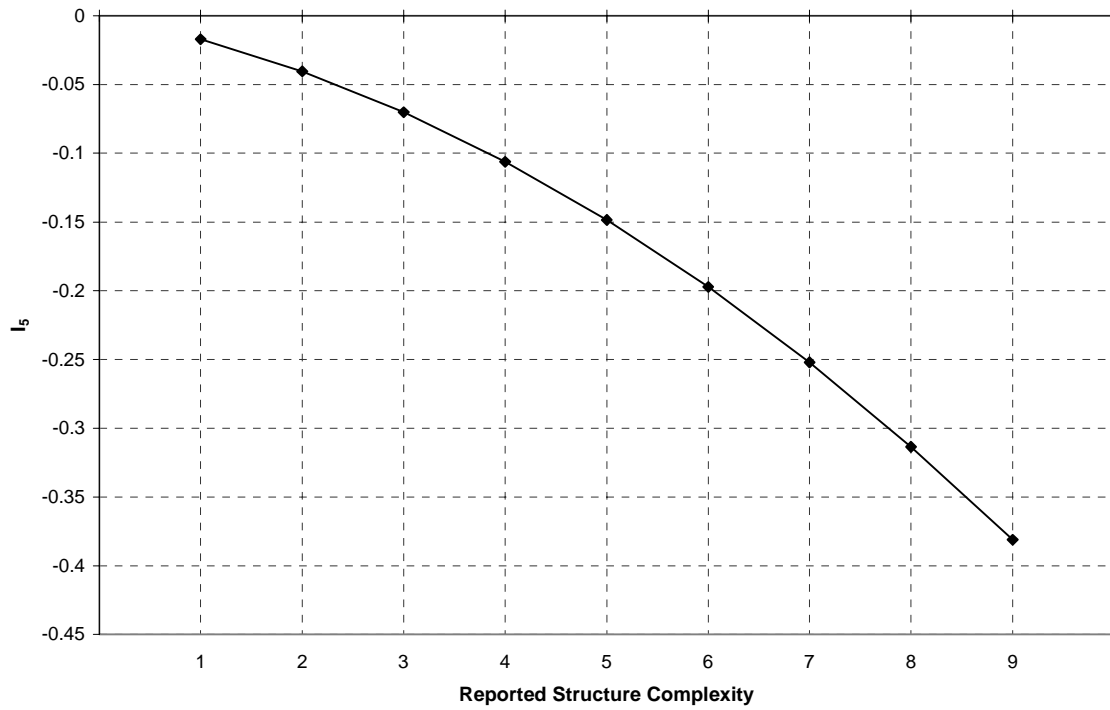


Figure L70. Influence of inspection factor Reported Structure Complexity (1=Very simple, 9=Very complex) on general DFR.

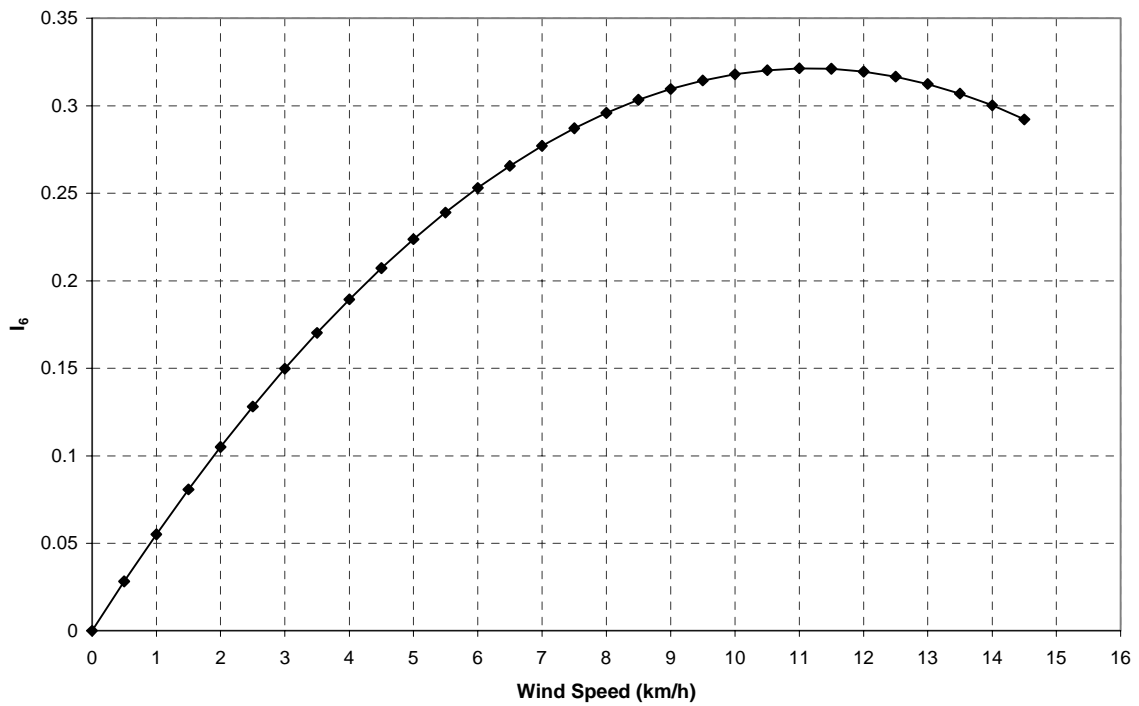


Figure L71. Influence of inspection factor Wind Speed on general DFR.

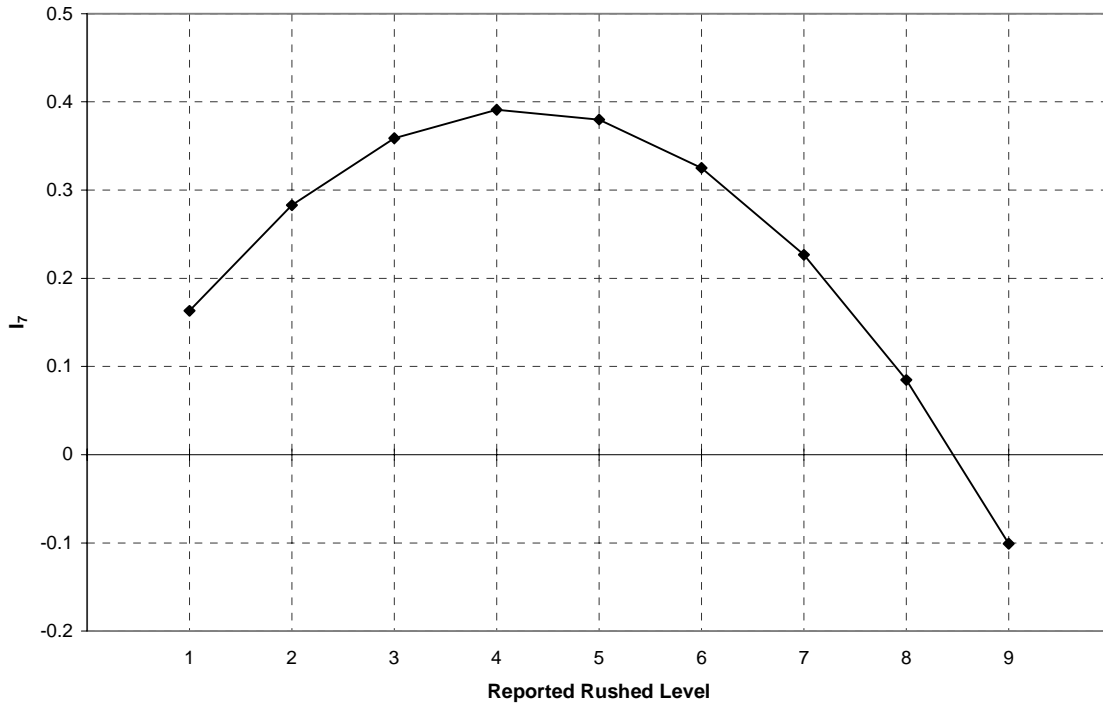


Figure L72. Influence of inspection factor Reported Rushed Level (1=Not rushed, 9=Very rushed) on general DFR.

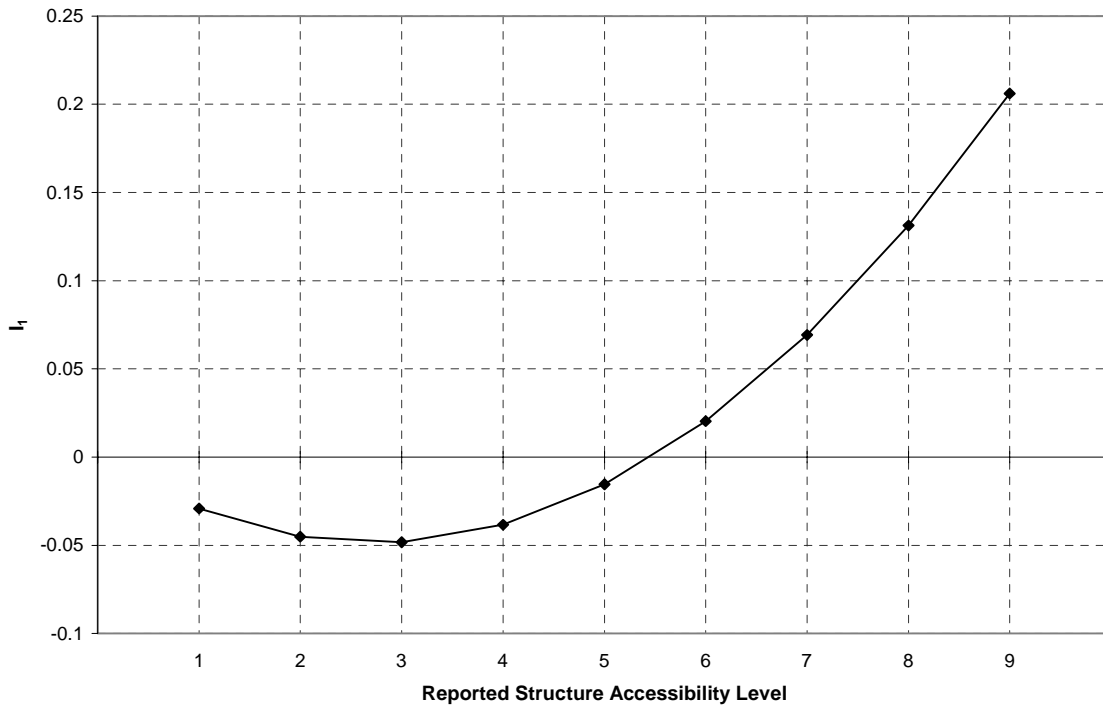


Figure L73. Influence of combined inspector/inspection factor Reported Structure Accessibility Level (1=Very inaccessible, 9=Very accessible) on general DFR.

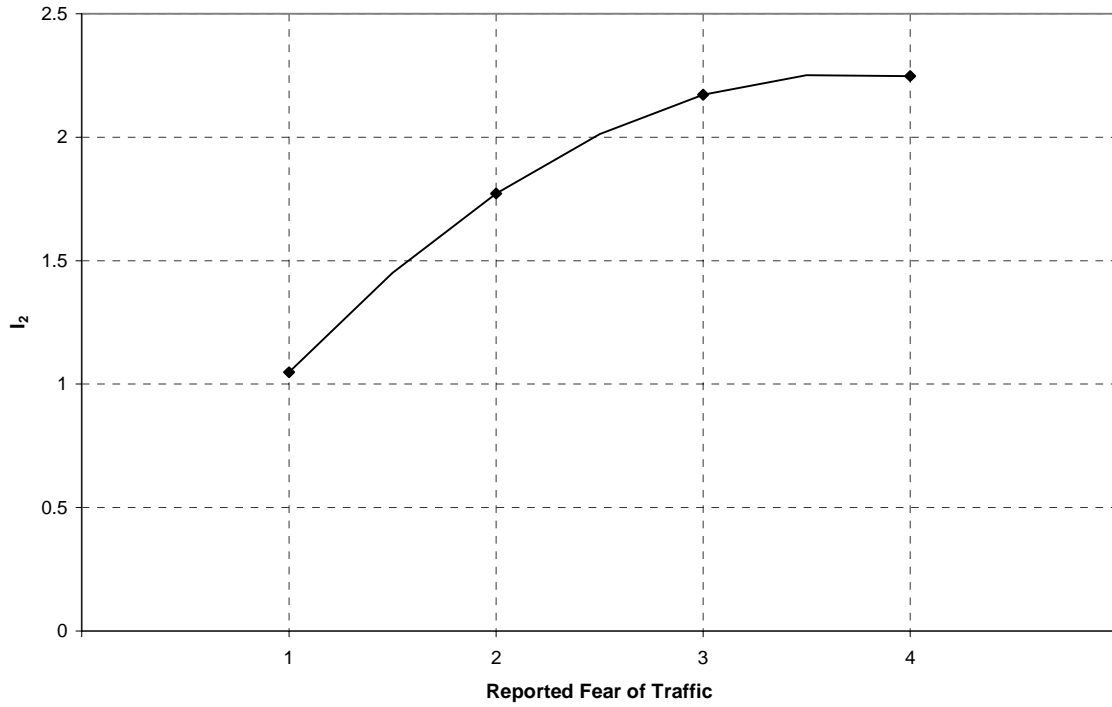


Figure L74. Influence of combined inspector/inspection factor Reported Fear of Traffic (1=Very fearful, 4=No fear) on general DFR.

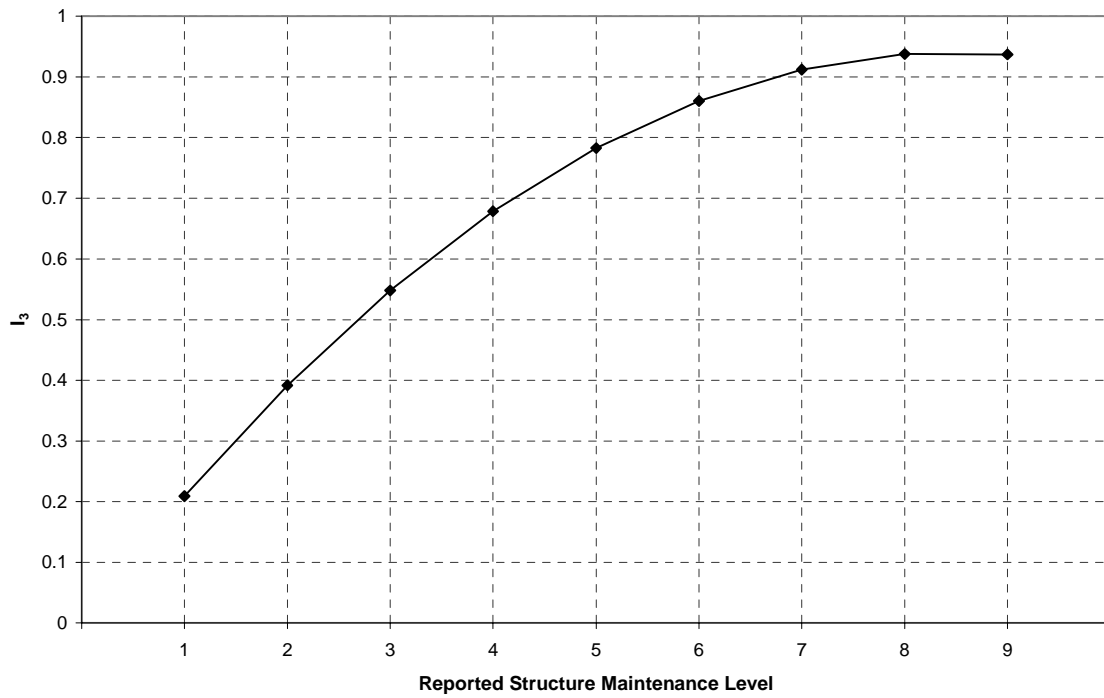


Figure L75. Influence of combined inspector/inspection factor Reported Structure Maintenance Level (1=Very poorly, 9=Very well) on general DFR.

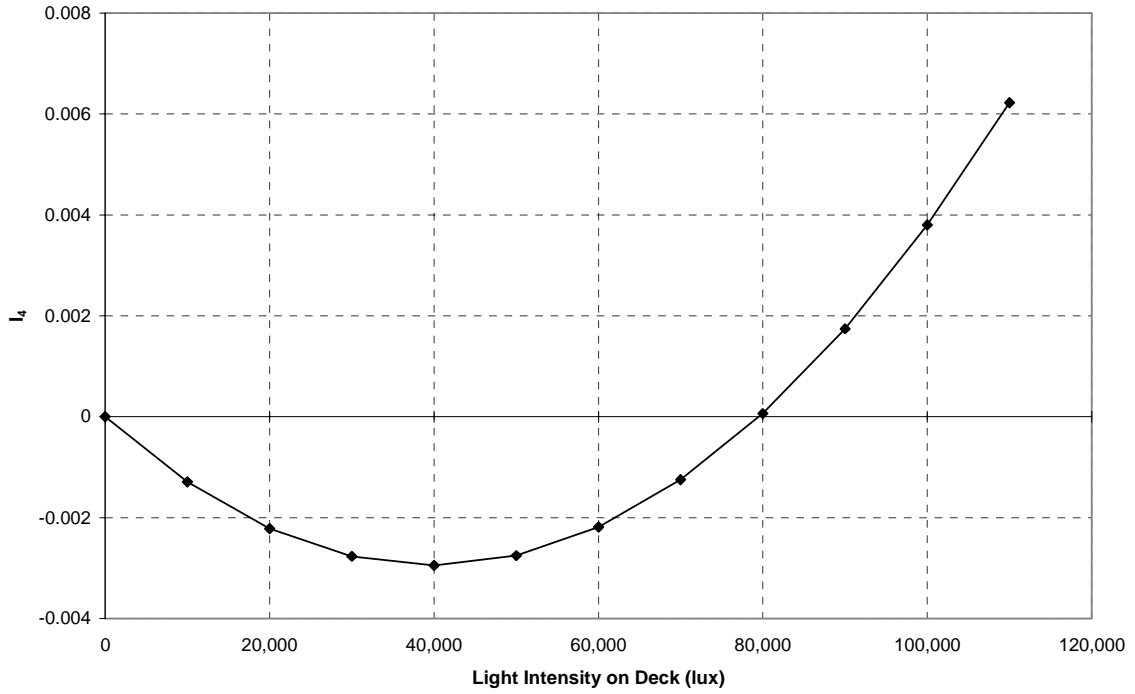


Figure L76. Influence of combined inspector/inspection factor Light Intensity on Deck on general DFR.

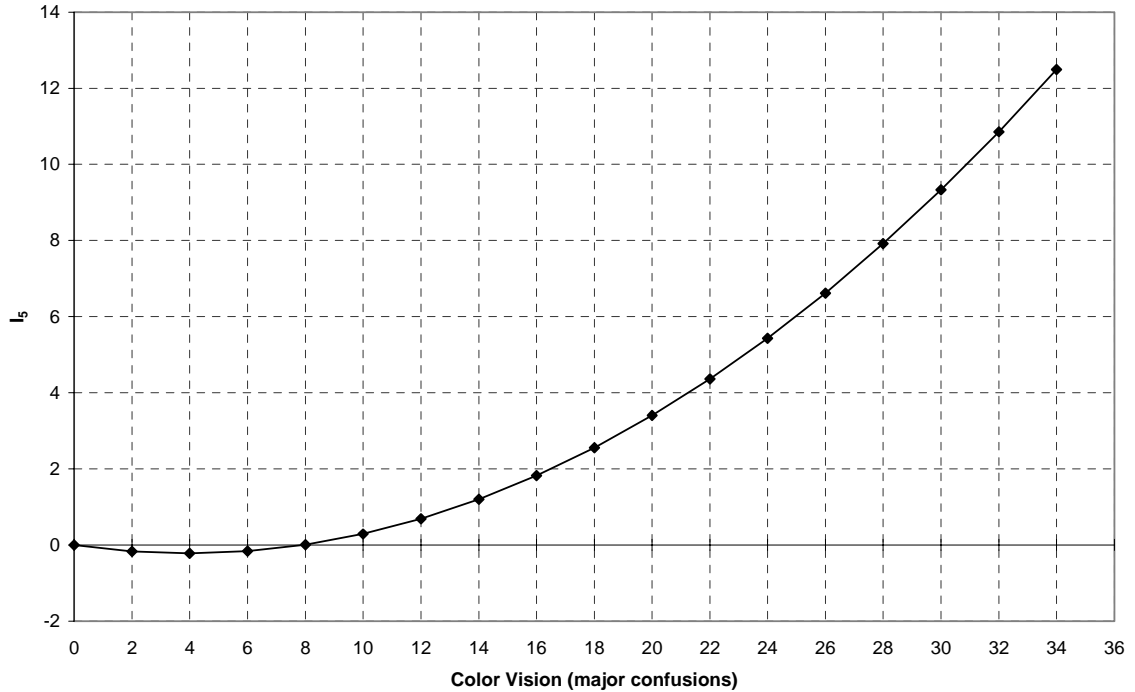


Figure L77. Influence of combined inspector/inspection factor Color Vision (number of major confusions) on general DFR.

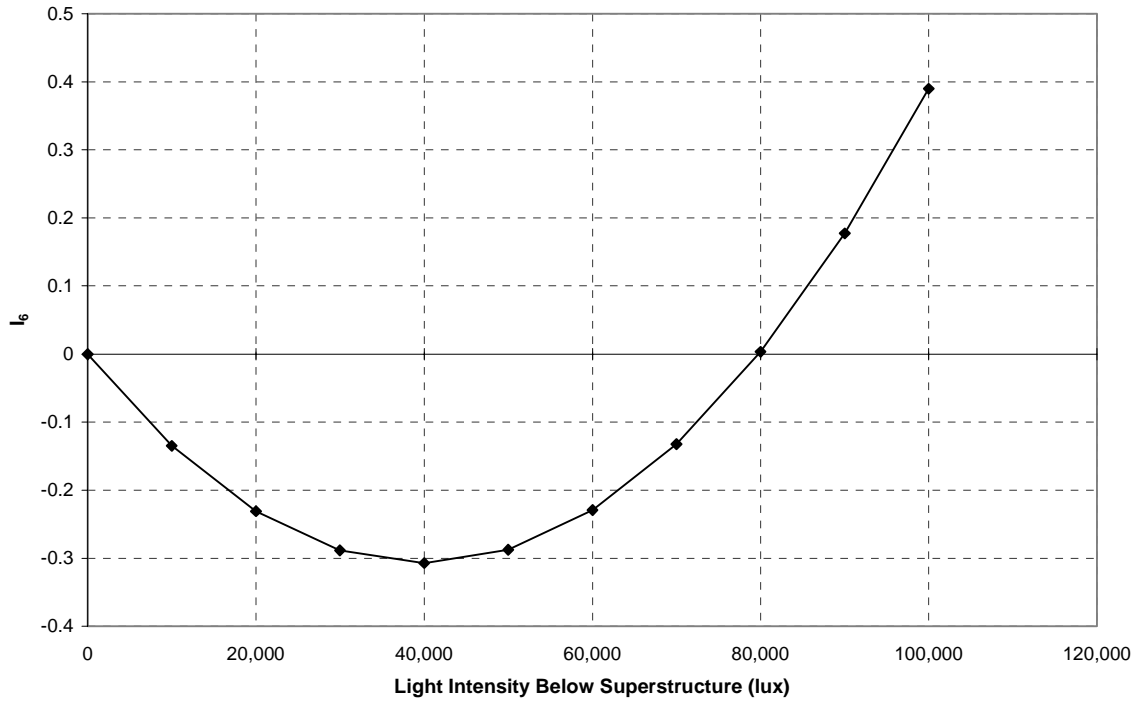


Figure L78. Influence of combined inspector/inspection factor Light Intensity Below Superstructure on general DFR.

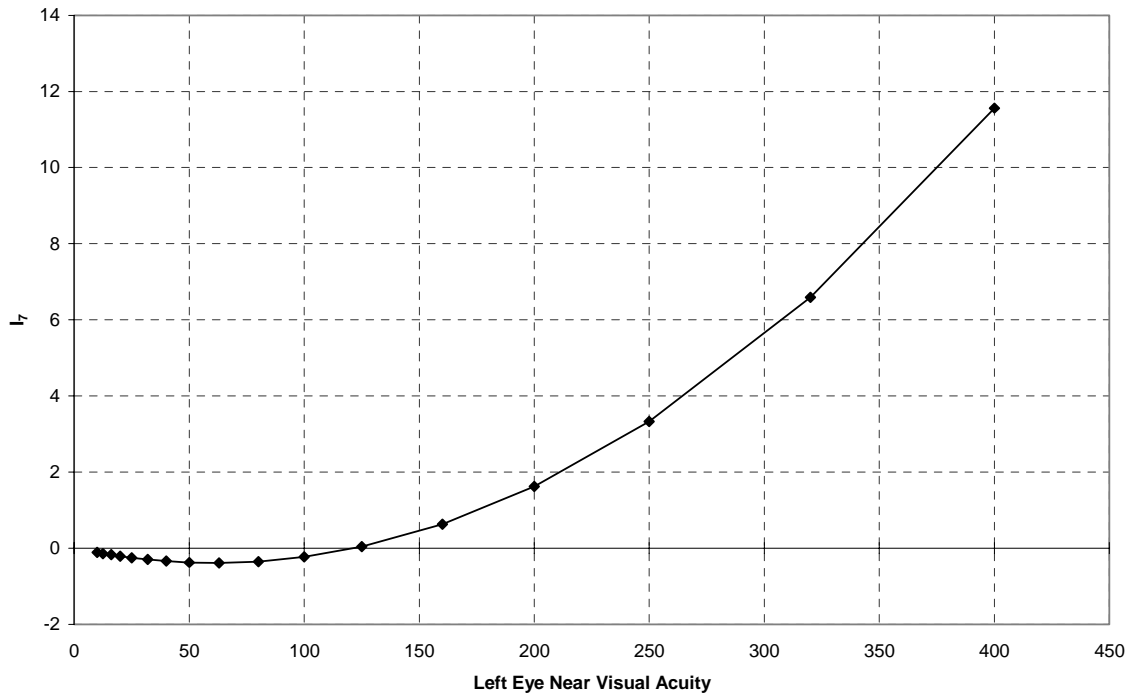


Figure L79. Influence of combined inspector/inspection factor Left Eye Near Visual Acuity on general DFR.