Reliability and Robustness AHP Results

# Engineer 1

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 1.0000 | 3.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 3.0000 |
| 0.3333 | 1.0000 | 0.3333 | 1.0000 |

Weights:  
 [0.30885942 0.2407028 0.30885942 0.14157836]

Max Eigenvalue: 4.1545+0.0000j

Consistency Index (CI): 0.0515+0.0000j

Consistency Ratio (CR): 0.0572+0.0000j

Random Index (RI): 0.9000

# Engineer 2

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 3.0000 | 1.0000 | 1.0000 |
| 0.3333 | 1.0000 | 1.0000 | 5.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 0.2000 | 1.0000 | 1.0000 |

Weights:  
 [0.33389997 0.29679625 0.20952657 0.15977721]

Max Eigenvalue: 4.7727+0.0000j

Consistency Index (CI): 0.2576+0.0000j

Consistency Ratio (CR): 0.2862+0.0000j

Random Index (RI): 0.9000

# Engineer 3

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 3.0000 | 7.0000 |
| 1.0000 | 1.0000 | 7.0000 | 5.0000 |
| 0.3333 | 0.1429 | 1.0000 | 7.0000 |
| 0.1429 | 0.2000 | 0.1429 | 1.0000 |

Weights:  
 [0.34960762 0.4584305 0.14543772 0.04652416]

Max Eigenvalue: 4.4908+0.0000j

Consistency Index (CI): 0.1636+0.0000j

Consistency Ratio (CR): 0.1818+0.0000j

Random Index (RI): 0.9000

# Engineer 4

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |

Weights:  
 [0.25 0.25 0.25 0.25]

Max Eigenvalue: 4.0000

Consistency Index (CI): -0.0000

Consistency Ratio (CR): -0.0000

Random Index (RI): 0.9000

# Engineer 5

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |

Weights:  
 [0.25 0.25 0.25 0.25]

Max Eigenvalue: 4.0000

Consistency Index (CI): -0.0000

Consistency Ratio (CR): -0.0000

Random Index (RI): 0.9000

# Engineer 6

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |

Weights:  
 [0.25 0.25 0.25 0.25]

Max Eigenvalue: 4.0000

Consistency Index (CI): -0.0000

Consistency Ratio (CR): -0.0000

Random Index (RI): 0.9000

# Engineer 7

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 3.0000 | 3.0000 | 1.0000 |
| 0.3333 | 1.0000 | 1.0000 | 3.0000 |
| 0.3333 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 0.3333 | 1.0000 | 1.0000 |

Weights:  
 [0.40506721 0.24582208 0.16272232 0.18638838]

Max Eigenvalue: 4.4859+0.0000j

Consistency Index (CI): 0.1620+0.0000j

Consistency Ratio (CR): 0.1800+0.0000j

Random Index (RI): 0.9000

# Engineer 8

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 0.3333 | 0.2000 | 0.3333 |
| 3.0003 | 1.0000 | 1.0000 | 1.0000 |
| 5.0000 | 1.0000 | 1.0000 | 1.0000 |
| 3.0003 | 1.0000 | 1.0000 | 1.0000 |

Weights:  
 [0.0858263 0.29053859 0.33309653 0.29053859]

Max Eigenvalue: 4.0328+0.0000j

Consistency Index (CI): 0.0109+0.0000j

Consistency Ratio (CR): 0.0121+0.0000j

Random Index (RI): 0.9000

# Engineer 9

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 5.0000 | 1.0000 | 3.0000 |
| 0.2000 | 1.0000 | 5.0000 | 5.0000 |
| 1.0000 | 0.2000 | 1.0000 | 5.0000 |
| 0.3333 | 0.2000 | 0.2000 | 1.0000 |

Weights:  
 [0.44626861 0.30843634 0.18718625 0.05810879]

Max Eigenvalue: 5.2658+0.0000j

Consistency Index (CI): 0.4219+0.0000j

Consistency Ratio (CR): 0.4688+0.0000j

Random Index (RI): 0.9000

# Engineer 10

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |

Weights:  
 [0.25 0.25 0.25 0.25]

Max Eigenvalue: 4.0000

Consistency Index (CI): -0.0000

Consistency Ratio (CR): -0.0000

Random Index (RI): 0.9000

# Engineer 11

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 3.0000 | 1.0000 |
| 1.0000 | 1.0000 | 3.0000 | 1.0000 |
| 0.3333 | 0.3333 | 1.0000 | 3.0000 |
| 1.0000 | 1.0000 | 0.3333 | 1.0000 |

Weights:  
 [0.30381187 0.30381187 0.20728077 0.18509549]

Max Eigenvalue: 4.6560+0.0000j

Consistency Index (CI): 0.2187+0.0000j

Consistency Ratio (CR): 0.2430+0.0000j

Random Index (RI): 0.9000

# Engineer 12

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 5.0000 | 0.1111 | 9.0000 |
| 0.2000 | 1.0000 | 1.0000 | 0.1429 |
| 9.0009 | 1.0000 | 1.0000 | 1.0000 |
| 0.1111 | 6.9979 | 1.0000 | 1.0000 |

Weights:  
 [0.2994451 0.08275201 0.45351404 0.16428885]

Max Eigenvalue: 7.4878+0.0000j

Consistency Index (CI): 1.1626+0.0000j

Consistency Ratio (CR): 1.2918+0.0000j

Random Index (RI): 0.9000

# Engineer 13

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 5.0000 | 5.0000 |
| 1.0000 | 1.0000 | 3.0000 | 5.0000 |
| 0.2000 | 0.3333 | 1.0000 | 5.0000 |
| 0.2000 | 0.2000 | 0.2000 | 1.0000 |

Weights:  
 [0.4308878 0.35978564 0.15158987 0.05773669]

Max Eigenvalue: 4.2640+0.0000j

Consistency Index (CI): 0.0880+0.0000j

Consistency Ratio (CR): 0.0978+0.0000j

Random Index (RI): 0.9000

# Engineer 14

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 3.0000 | 1.0000 | 1.0000 |
| 0.3333 | 1.0000 | 5.0000 | 3.0000 |
| 1.0000 | 0.2000 | 1.0000 | 1.0000 |
| 1.0000 | 0.3333 | 1.0000 | 1.0000 |

Weights:  
 [0.34759457 0.34536899 0.14878465 0.15825179]

Max Eigenvalue: 4.8641+0.0000j

Consistency Index (CI): 0.2880+0.0000j

Consistency Ratio (CR): 0.3200+0.0000j

Random Index (RI): 0.9000

# Engineer 15

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |

Weights:  
 [0.25 0.25 0.25 0.25]

Max Eigenvalue: 4.0000

Consistency Index (CI): -0.0000

Consistency Ratio (CR): -0.0000

Random Index (RI): 0.9000

# Engineer 16

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 5.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 0.2000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |

Weights:  
 [0.378498 0.23042475 0.1606525 0.23042475]

Max Eigenvalue: 4.3398+0.0000j

Consistency Index (CI): 0.1133+0.0000j

Consistency Ratio (CR): 0.1259+0.0000j

Random Index (RI): 0.9000

# Engineer 17

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |

Weights:  
 [0.25 0.25 0.25 0.25]

Max Eigenvalue: 4.0000

Consistency Index (CI): -0.0000

Consistency Ratio (CR): -0.0000

Random Index (RI): 0.9000

# Engineer 18

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |

Weights:  
 [0.25 0.25 0.25 0.25]

Max Eigenvalue: 4.0000

Consistency Index (CI): -0.0000

Consistency Ratio (CR): -0.0000

Random Index (RI): 0.9000

# Engineer 19

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |

Weights:  
 [0.25 0.25 0.25 0.25]

Max Eigenvalue: 4.0000

Consistency Index (CI): -0.0000

Consistency Ratio (CR): -0.0000

Random Index (RI): 0.9000

# Engineer 20

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 5.0000 | 5.0000 | 5.0000 |
| 0.2000 | 1.0000 | 5.0000 | 5.0000 |
| 0.2000 | 0.2000 | 1.0000 | 5.0000 |
| 0.2000 | 0.2000 | 0.2000 | 1.0000 |

Weights:  
 [0.57581917 0.25751416 0.11516383 0.05150283]

Max Eigenvalue: 4.6833+0.0000j

Consistency Index (CI): 0.2278+0.0000j

Consistency Ratio (CR): 0.2531+0.0000j

Random Index (RI): 0.9000

# Engineer 21

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 3.0000 | 5.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 0.3333 | 1.0000 | 1.0000 | 5.0000 |
| 0.2000 | 1.0000 | 0.2000 | 1.0000 |

Weights:  
 [0.42485233 0.22244079 0.25043529 0.10227158]

Max Eigenvalue: 4.4956+0.0000j

Consistency Index (CI): 0.1652+0.0000j

Consistency Ratio (CR): 0.1835+0.0000j

Random Index (RI): 0.9000

# Engineer 22

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 0.1111 | 0.1111 | 0.1429 |
| 9.0009 | 1.0000 | 1.0000 | 9.0000 |
| 9.0009 | 1.0000 | 1.0000 | 9.0000 |
| 6.9979 | 0.1111 | 0.1111 | 1.0000 |

Weights:  
 [0.03151042 0.43889182 0.43889182 0.09070594]

Max Eigenvalue: 4.5063+0.0000j

Consistency Index (CI): 0.1688+0.0000j

Consistency Ratio (CR): 0.1875+0.0000j

Random Index (RI): 0.9000

# Engineer 23

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 3.0000 | 3.0000 |
| 1.0000 | 1.0000 | 3.0000 | 3.0000 |
| 0.3333 | 0.3333 | 1.0000 | 3.0000 |
| 0.3333 | 0.3333 | 0.3333 | 1.0000 |

Weights:  
 [0.36789499 0.36789499 0.16863974 0.09557029]

Max Eigenvalue: 4.1545+0.0000j

Consistency Index (CI): 0.0515+0.0000j

Consistency Ratio (CR): 0.0572+0.0000j

Random Index (RI): 0.9000

# Engineer 24

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 1.0000 | 3.0000 |
| 1.0000 | 1.0000 | 3.0000 | 1.0000 |
| 1.0000 | 0.3333 | 1.0000 | 1.0000 |
| 0.3333 | 1.0000 | 1.0000 | 1.0000 |

Weights:  
 [0.3169873 0.3169873 0.1830127 0.1830127]

Max Eigenvalue: 4.3094+0.0000j

Consistency Index (CI): 0.1031+0.0000j

Consistency Ratio (CR): 0.1146+0.0000j

Random Index (RI): 0.9000

# Engineer 25

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 3.0000 | 3.0000 |
| 1.0000 | 0.3333 | 1.0000 | 3.0000 |
| 1.0000 | 0.3333 | 0.3333 | 1.0000 |

Weights:  
 [0.23205081 0.40192379 0.23205081 0.1339746 ]

Max Eigenvalue: 4.3094+0.0000j

Consistency Index (CI): 0.1031+0.0000j

Consistency Ratio (CR): 0.1146+0.0000j

Random Index (RI): 0.9000

# Engineer 26

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 5.0000 | 3.0000 | 5.0000 |
| 0.2000 | 1.0000 | 5.0000 | 5.0000 |
| 0.3333 | 0.2000 | 1.0000 | 5.0000 |
| 0.2000 | 0.2000 | 0.2000 | 1.0000 |

Weights:  
 [0.54289593 0.27440898 0.13173405 0.05096104]

Max Eigenvalue: 4.7246+0.0000j

Consistency Index (CI): 0.2415+0.0000j

Consistency Ratio (CR): 0.2684+0.0000j

Random Index (RI): 0.9000

# Engineer 27

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 3.0000 | 1.0000 |
| 1.0000 | 1.0000 | 3.0000 | 1.0000 |
| 0.3333 | 0.3333 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |

Weights:  
 [0.30885942 0.30885942 0.14157836 0.2407028 ]

Max Eigenvalue: 4.1545+0.0000j

Consistency Index (CI): 0.0515+0.0000j

Consistency Ratio (CR): 0.0572+0.0000j

Random Index (RI): 0.9000

# Engineer 28

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |

Weights:  
 [0.25 0.25 0.25 0.25]

Max Eigenvalue: 4.0000

Consistency Index (CI): -0.0000

Consistency Ratio (CR): -0.0000

Random Index (RI): 0.9000

# Engineer 29

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 3.0000 | 3.0000 | 1.0000 |
| 0.3333 | 1.0000 | 3.0000 | 3.0000 |
| 0.3333 | 0.3333 | 1.0000 | 3.0000 |
| 1.0000 | 0.3333 | 0.3333 | 1.0000 |

Weights:  
 [0.39791418 0.2845534 0.17319015 0.14434227]

Max Eigenvalue: 4.8138+0.0000j

Consistency Index (CI): 0.2713+0.0000j

Consistency Ratio (CR): 0.3014+0.0000j

Random Index (RI): 0.9000

# Engineer 30

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 0.3333 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 3.0003 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |

Weights:  
 [0.18758109 0.24070113 0.33101664 0.24070113]

Max Eigenvalue: 4.1545+0.0000j

Consistency Index (CI): 0.0515+0.0000j

Consistency Ratio (CR): 0.0572+0.0000j

Random Index (RI): 0.9000

# Engineer 31

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |

Weights:  
 [0.25 0.25 0.25 0.25]

Max Eigenvalue: 4.0000

Consistency Index (CI): -0.0000

Consistency Ratio (CR): -0.0000

Random Index (RI): 0.9000

# Engineer 32

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 0.3333 | 0.3333 | 0.3333 |
| 3.0003 | 1.0000 | 0.1111 | 0.1111 |
| 3.0003 | 9.0009 | 1.0000 | 0.1111 |
| 3.0003 | 9.0009 | 9.0009 | 1.0000 |

Weights:  
 [0.0714199 0.07142347 0.21428112 0.64287551]

Max Eigenvalue: 5.3335+0.0000j

Consistency Index (CI): 0.4445+0.0000j

Consistency Ratio (CR): 0.4939+0.0000j

Random Index (RI): 0.9000

# Engineer 33

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |

Weights:  
 [0.25 0.25 0.25 0.25]

Max Eigenvalue: 4.0000

Consistency Index (CI): -0.0000

Consistency Ratio (CR): -0.0000

Random Index (RI): 0.9000

# Engineer 34

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |

Weights:  
 [0.25 0.25 0.25 0.25]

Max Eigenvalue: 4.0000

Consistency Index (CI): -0.0000

Consistency Ratio (CR): -0.0000

Random Index (RI): 0.9000

# Engineer 35

Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1.0000 | 1.0000 | 1.0000 | 3.0000 |
| 1.0000 | 1.0000 | 0.3333 | 1.0000 |

Weights:  
 [0.2407028 0.2407028 0.33100796 0.18758644]

Max Eigenvalue: 4.1545+0.0000j

Consistency Index (CI): 0.0515+0.0000j

Consistency Ratio (CR): 0.0572+0.0000j

Random Index (RI): 0.9000

# Aggregate Results

Aggregate Pairwise Comparison Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| 1.0000 | 0.9438 | 1.0595 | 1.1532 |
| 1.0595 | 1.0000 | 1.1894 | 1.1532 |
| 0.9438 | 0.8407 | 1.0000 | 1.2946 |
| 0.8672 | 0.8672 | 0.7725 | 1.0000 |

Aggregate Weights:  
 [0.25774335 0.27354492 0.25104571 0.21766602]

Aggregate Max Eigenvalue: 4.0075+0.0000j

Aggregate Consistency Index (CI): 0.0025+0.0000j

Aggregate Consistency Ratio (CR): 0.0028+0.0000j

Aggregate Random Index (RI): 0.9000