

Appendix C

| Questionnaires | Major impact (5) | Moderate impact (4) | Marginal impact (3) | Negligible impact (2) | No impacts (1) |
|--|------------------|---------------------|---------------------|-----------------------|----------------|
| Shortage of required materials | 7 | 7 | 12 | 13 | 2 |
| Delay in materials delivery | 4 | 1 | 14 | 21 | 1 |
| Changes in materials prices | 4 | 9 | 17 | 11 | 0 |
| Changes in materials specifications | 6 | 1 | 6 | 22 | 6 |
| Shortage of required equipment | 7 | 9 | 14 | 10 | 1 |
| Failure of equipment | 4 | 5 | 12 | 17 | 3 |
| Shortage of supporting and shoring installations materials | 6 | 4 | 11 | 12 | 8 |
| Inadequate equipment used for the works | 3 | 1 | 9 | 28 | 0 |
| Shortage of manpower (skilled, semi-skilled, unskilled labor) | 4 | 5 | 10 | 17 | 5 |
| Low skill of manpower | 4 | 2 | 12 | 16 | 7 |
| Lack of motivation among contractor's members | 5 | 0 | 8 | 23 | 5 |
| Shortage of contractor's administrative personnel | 4 | 2 | 6 | 19 | 10 |
| Shortage of technical professionals in the contractor's organization | 4 | 0 | 6 | 22 | 9 |
| Poor communications by the contractor with the parties involved in the project | 5 | 11 | 16 | 8 | 1 |
| Contractor's poor coordination with the parties involved in the project | 5 | 0 | 16 | 19 | 1 |
| Slow preparation of changed orders requested by the contractor | 3 | 0 | 17 | 18 | 3 |
| Ineffective contractor head office involvement in the project | 3 | 0 | 13 | 18 | 7 |
| Delays in mobilization | 3 | 6 | 15 | 17 | 0 |
| Poor controlling of subcontractors by contractor | 4 | 0 | 13 | 18 | 6 |
| Loose safety rules and regulations within the contractor's organization | 2 | 7 | 15 | 17 | 0 |
| Ineffective planning and scheduling of the project by the contractor | 11 | 0 | 14 | 16 | 0 |
| Delays to field survey by the contractor | 3 | 0 | 3 | 21 | 14 |
| Ineffective control of project progress by the contractor | 3 | 0 | 11 | 21 | 6 |
| Inefficient quality control by the contractor | 4 | 3 | 22 | 12 | 0 |
| Poor communication and coordination by contractor with other parties | 13 | 11 | 11 | 5 | 1 |
| Delays in sub-contractors work | 7 | 6 | 17 | 9 | 2 |
| Problems between the contractor and his subcontractors with regard to payments | 4 | 10 | 11 | 16 | 0 |
| Poor qualification of the contractor's | 3 | 0 | 16 | 21 | 1 |

Appendix C

| | | | | | |
|---|----|----|----|----|----|
| technical staff | | | | | |
| Poor site management and supervision by contractor | 6 | 12 | 15 | 7 | 1 |
| Rework due to errors activities during construction | 3 | 2 | 9 | 25 | 2 |
| Lack of experience of owner in construction | 5 | 0 | 9 | 16 | 11 |
| Improper project feasibility study | 7 | 10 | 16 | 8 | 0 |
| Lack of working knowledge | 4 | 1 | 7 | 24 | 5 |
| Slowness in making decisions | 3 | 10 | 19 | 9 | 0 |
| Lack of coordination with contractors | 4 | 7 | 14 | 15 | 1 |
| Contract modifications (replacement and addition of new work to the project and change in specifications) | 2 | 5 | 13 | 16 | 5 |
| Financial problems (delayed payments, financial difficulties, and economic problems) | 4 | 13 | 16 | 8 | 1 |
| Delay in furnishing and delivering the site to the contractor by the owner | 3 | 4 | 6 | 27 | 1 |
| Unrealistic contract duration | 3 | 4 | 4 | 15 | 15 |
| Slow decision making by the owner organization | 3 | 3 | 14 | 19 | 2 |
| Interference by the owner in the construction operations | 2 | 6 | 5 | 20 | 8 |
| Delay in progress payments by the owner | 14 | 15 | 9 | 3 | 0 |
| Poor qualification of consultant engineer's staff assigned to the project | 4 | 5 | 8 | 18 | 6 |
| Delay in the preparation of drawings | 10 | 15 | 9 | 7 | 0 |
| Delay in the approval of contractor submissions by the consultant | 5 | 11 | 14 | 11 | 0 |
| Poor design and delays in design | 5 | 3 | 13 | 19 | 1 |
| Slow response and poor inspection | 3 | 6 | 11 | 20 | 1 |
| Absence of consultant's site staff | 2 | 2 | 14 | 18 | 5 |
| Delayed and slow supervision in making decisions | 15 | 1 | 7 | 16 | 2 |
| Incomplete documents | 3 | 4 | 9 | 17 | 8 |
| Slowness in giving instruction | 3 | 5 | 4 | 16 | 13 |
| Poor communication between the consultant engineer and other parties | 5 | 4 | 19 | 12 | 1 |
| Severe weather conditions on the job site | 6 | 9 | 18 | 8 | 0 |
| Lack of equipment and tools on the market | 4 | 1 | 5 | 23 | 8 |
| Right of way (RoW) problems | 12 | 11 | 11 | 6 | 1 |
| Unstable laws and regulation | 5 | 16 | 14 | 6 | 0 |

Appendix C

| Questionnaires | Major impact (5) | Moderate impact (4) | Margin al impact (3) | Negligible impact (2) | No impacts (1) | Total | Total Number (N) | A* N | RII | Rank |
|----------------|------------------|---------------------|----------------------|-----------------------|----------------|-------|------------------|------|----------|------|
| MRF1 | 35 | 28 | 36 | 26 | 2 | 127 | 41 | 205 | 0.619512 | 17 |
| MRF2 | 20 | 4 | 42 | 42 | 1 | 109 | 41 | 205 | 0.531707 | 29 |
| MRF3 | 20 | 36 | 51 | 22 | 0 | 129 | 41 | 205 | 0.629268 | 15 |
| MRF4 | 30 | 4 | 18 | 44 | 6 | 102 | 41 | 205 | 0.497561 | 38 |
| ERF1 | 35 | 36 | 42 | 20 | 1 | 134 | 41 | 205 | 0.653659 | 9 |
| ERF2 | 20 | 20 | 36 | 34 | 3 | 113 | 41 | 205 | 0.55122 | 25 |
| ERF3 | 30 | 16 | 33 | 24 | 8 | 111 | 41 | 205 | 0.541463 | 28 |
| ERF4 | 15 | 4 | 27 | 56 | 0 | 102 | 41 | 205 | 0.497561 | 38 |
| MPRF1 | 20 | 20 | 30 | 34 | 5 | 109 | 41 | 205 | 0.531707 | 29 |
| MPRF2 | 20 | 8 | 36 | 32 | 7 | 103 | 41 | 205 | 0.502439 | 37 |
| PMRF1 | 25 | 0 | 24 | 46 | 5 | 100 | 41 | 205 | 0.487805 | 43 |
| PMRF2 | 20 | 8 | 18 | 38 | 10 | 94 | 41 | 205 | 0.458537 | 50 |
| PMRF3 | 20 | 0 | 18 | 44 | 9 | 91 | 41 | 205 | 0.443902 | 52 |
| PMRF4 | 25 | 44 | 48 | 16 | 1 | 134 | 41 | 205 | 0.653659 | 9 |
| PMRF5 | 25 | 0 | 48 | 38 | 1 | 112 | 41 | 205 | 0.546341 | 27 |
| PMRF6 | 15 | 0 | 51 | 36 | 3 | 105 | 41 | 205 | 0.512195 | 35 |
| PMRF7 | 15 | 0 | 39 | 36 | 7 | 97 | 41 | 205 | 0.473171 | 46 |
| PMRF8 | 15 | 24 | 45 | 34 | 0 | 118 | 41 | 205 | 0.57561 | 22 |
| PMRF9 | 20 | 0 | 39 | 36 | 6 | 101 | 41 | 205 | 0.492683 | 41 |
| PMRF10 | 10 | 28 | 45 | 34 | 0 | 117 | 41 | 205 | 0.570732 | 23 |
| PMRF11 | 55 | 0 | 42 | 32 | 0 | 129 | 41 | 205 | 0.62926 | 15 |

Appendix C

| | | | | | | | | | | |
|--------|----|----|----|----|----|-----|----|-----|--------------|----|
| | | | | | | | | | 8 | |
| PMRF12 | 15 | 0 | 9 | 42 | 14 | 80 | 41 | 205 | 0.39024 4 | 55 |
| PMRF13 | 15 | 0 | 33 | 42 | 6 | 96 | 41 | 205 | 0.46829 3 | 48 |
| PMRF14 | 20 | 12 | 66 | 24 | 0 | 122 | 41 | 205 | 0.59512 2 | 20 |
| PMRF15 | 65 | 44 | 33 | 10 | 1 | 153 | 41 | 205 | 0.74634 1 | 3 |
| PMRF16 | 35 | 24 | 51 | 18 | 2 | 130 | 41 | 205 | 0.63414 6 | 13 |
| PMRF17 | 20 | 40 | 33 | 32 | 0 | 125 | 41 | 205 | 0.60975 6 | 18 |
| PMRF18 | 15 | 0 | 48 | 42 | 1 | 106 | 41 | 205 | 0.51707 3 | 32 |
| PMRF19 | 30 | 48 | 45 | 14 | 1 | 138 | 41 | 205 | 0.67317 1 | 6 |
| PMRF20 | 15 | 8 | 27 | 50 | 2 | 102 | 41 | 205 | 0.49756 1 | 38 |
| ORF1 | 25 | 0 | 27 | 32 | 11 | 95 | 41 | 205 | 0.46341 5 | 49 |
| ORF2 | 35 | 40 | 48 | 16 | 0 | 139 | 41 | 205 | 0.67804 9 | 5 |
| ORF3 | 20 | 4 | 21 | 48 | 5 | 98 | 41 | 205 | 0.47804 9 | 45 |
| ORF4 | 15 | 40 | 57 | 18 | 0 | 130 | 41 | 205 | 0.63414 6 | 13 |
| ORF5 | 20 | 28 | 42 | 30 | 1 | 121 | 41 | 205 | 0.59024 4 | 21 |
| ORF6 | 10 | 20 | 39 | 32 | 5 | 106 | 41 | 205 | 0.51707 3 | 32 |
| ORF7 | 20 | 52 | 48 | 16 | 1 | 137 | 41 | 205 | 0.66829 3 | 7 |
| ORF8 | 15 | 16 | 18 | 54 | 1 | 104 | 41 | 205 | 0.50731 7 | 36 |
| ORF9 | 15 | 16 | 12 | 30 | 15 | 88 | 41 | 205 | 0.42926 8 | 54 |
| ORF10 | 15 | 12 | 42 | 38 | 2 | 109 | 41 | 205 | 0.53170 7 | 29 |
| ORF11 | 10 | 24 | 15 | 40 | 8 | 97 | 41 | 205 | 0.47317 1 | 46 |
| ORF12 | 70 | 60 | 27 | 6 | 0 | 163 | 41 | 205 | 0.79512 2 | 1 |
| CRF1 | 20 | 20 | 24 | 36 | 6 | 106 | 41 | 205 | 0.51707 3 | 32 |
| CRF2 | 50 | 60 | 27 | 14 | 0 | 151 | 41 | 205 | 0.73658 | 4 |

Appendix C

| | | | | | | | | | | |
|-------|----|----|----|----|----|-----|----|-----|---------|----|
| | | | | | | | | | 5 | |
| CRF3 | 25 | 44 | 42 | 22 | 0 | 133 | 41 | 205 | 0.64878 | 12 |
| | | | | | | | | | 0.56097 | |
| CRF4 | 25 | 12 | 39 | 38 | 1 | 115 | 41 | 205 | 6 | 24 |
| CRF5 | 15 | 24 | 33 | 40 | 1 | 113 | 41 | 205 | 0.55122 | 25 |
| | | | | | | | | | 0.49268 | |
| CRF6 | 10 | 8 | 42 | 36 | 5 | 101 | 41 | 205 | 3 | 41 |
| | | | | | | | | | 0.65365 | |
| CRF7 | 75 | 4 | 21 | 32 | 2 | 134 | 41 | 205 | 9 | 9 |
| | | | | | | | | | 0.48780 | |
| CRF8 | 15 | 16 | 27 | 34 | 8 | 100 | 41 | 205 | 5 | 43 |
| CRF9 | 15 | 20 | 12 | 32 | 13 | 92 | 41 | 205 | 0.44878 | 51 |
| CRF10 | 25 | 16 | 57 | 24 | 1 | 123 | 41 | 205 | 0.6 | 19 |
| | | | | | | | | | 0.66341 | |
| EXF1 | 30 | 36 | 54 | 16 | 0 | 136 | 41 | 205 | 5 | 8 |
| | | | | | | | | | 0.34146 | |
| EXF2 | 20 | 4 | 33 | 12 | 1 | 70 | 41 | 205 | 3 | 56 |
| | | | | | | | | | 0.77073 | |
| EXF3 | 60 | 44 | 42 | 12 | 0 | 158 | 41 | 205 | 2 | 2 |
| | | | | | | | | | 0.43414 | |
| EXF4 | 25 | 64 | 0 | 0 | 0 | 89 | 41 | 205 | 6 | 53 |