

# Hong Kong Perspectives on Integrating Construction Project Teams

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**Abstract:** Targeting integration in construction, the study reported here compares the suitability of various factors and related strategies, in developing suitable contractual and non-contractual protocols for building a Relational Contracting (RC) culture and integrated project teams (IPTs). Results from statistical analyses of 83 questionnaire responses from Hong Kong contractors, consultants, clients and academics are presented. All the factors and strategies used in the survey were found to be significant. Despite slight differences of perceptions among different groups of respondents on the relative usefulness of various individual items, it was observed that trust and trust based operational and contractual arrangements can effectively provide the required incentives for the Hong Kong construction industry to exercise various RC-based working arrangements, through extended attention to 'relational' qualities in team selection, where top management support and client initiative are critical. Factor analysis results suggest the need for consolidated but interrelated approaches, both for propagating RC and building IPTs for RC.

**Keywords:** Contracts, Incentives, Integration, Relational Contracting, Teamworking

## 1. Introduction

For the much desired integration in construction, as in many other countries, the Construction Industry Review Committee report in Hong Kong recommends a wider adoption of partnering and teamworking approaches, where the interests, needs, expectations, constraints and risks of every stakeholder must be given a fair consideration (CIRC 2001). Relational Contracting (RC) principles appear to be appropriate in handling such integration (Macneil 1974). RC principles underpin various approaches such as partnering, alliancing, joint venturing, long term contracting and other collaborative working arrangements and improved risk sharing mechanisms (Rahman and Kumaraswamy 2002). RC principles offer contractual flexibility, supply necessary elements of teambuilding, lubricate transactional barriers, harmonise ongoing contractual relationships, and suggest rationalized selection criteria – in building effective project teams (Rahman and Kumaraswamy 2004a). Moreover, the potential for implementing RC in construction and for RC-based teambuilding protocols, e.g. joint risk management, have also been verified (Rahman and Kumaraswamy, 2004b). Despite such aptness and potential performance gains, industries are apparently hesitant in adopting RC. This is probably due to the perceived uncertainties in unclear responsibility allocations. In particular, public sector clients who hold the major industry share, need to follow specific rules and regulations (Rahman and Kumaraswamy 2004a). It is therefore essential to incorporate RC principles (e.g. trust or trust building elements and non-price based factors) in related documents, through 'less but more effective' regulations, in order to ensure value for money and to build an RC culture in construction (PSIB 2004). A general guideline appears

to be useful for propagating the practice of RC and teambuilding in multi-participant construction projects, targeting a relational integration in various professional, organisational, operational, and regional/ national cultures.

Based on the above and in order to provide appropriate RC based contractual and non-contractual incentives in construction, a study was launched from Hong Kong to identify key factors (1) facilitating and (2) hindering RC in construction, and key factors (3) facilitating and (4) hindering the building of integrated project teams for more effective RC. The study was conducted in five different countries. This paper presents the perceptions of respondents from Hong Kong. Only the extracted summary results are presented here, both for conciseness and to meet space limitations.

## 2. Questionnaire Survey

The detailed methodological approach of the study has been reported elsewhere (Kumaraswamy et al. 2005), also conveying that the questionnaire was developed in Hong Kong on the basis of a broader precursor study on “revitalised procurement strategies”. The individual factors were distilled from the above study and tuned to suit the specific purposes of the present study. In four specific sections, the questionnaire requested the respondents to express their perceived importance on a scale from 0–6 (varying from lowest to highest) on: 24 factors facilitating RC, 28 factors hindering RC, 28 factors facilitating the building of integrated project teams, and 31 factors hindering the building of integrated project teams (see Appendix I). Given the nature of the study, the length of total experience of potential respondents was considered critical. A total of 83 responses were received, with an average total experience of 19.1 years in construction and 4.7 years in RC approaches, respectively (see Table 1).

Table 1: Questionnaire distribution and respondent profile

	Contractor	Consultant	Client	Academics	Total
<i>Questionnaire:</i>					
Distribution	200	100	90	10	400
Usable responses	31	18	32	2	83
Response rate	15.5%	18.0%	35.56%	20.0%	20.75%
<i>Total experience (years):</i>					
Persons responded	26	17	28	2	73
Average experience	18.1	20.9	19.0	18.0	19.1
<i>Experience in RC (years):</i>					
Persons responded	22	13	21	2	58
Average experience	4.1	4.2	4.9	12.5	4.7
<i>Experience in RC (number of projects):</i>					
Person responded	20	14	18	1	53
0 – 5 projects	17	11	12		40
6 – 10 projects	3	2	3	1	9
Over 10 projects		1	3		4
Overall range	0 – 10	0 – 15	1 – 200	10 – 10	0 – 200

Except for academics, the mean scores of different groups of respondents on individual factors were ranked and compared. Statistical t-tests of the Mean at significance level 0.05 were undertaken to establish whether each factor is significantly important. ANOVA was carried out at 95% confidence level to determine whether the three groups of respondents had different perceptions on the relative importance of various factors. Finally, “Factor Analysis” was carried out to narrow down the long list of factors into a smaller number of representative “broad factors” or “components”. For the purpose of this exercise, the “Principal Component” method of extraction was applied, coupled with “Varimax with Kaiser Normalization” method of rotation. “Eigenvalues” for the extracted components of  $\geq 1.0$  were considered, and “factor loadings” of  $\geq 0.30$  were considered to contribute to different components. However, only the key extracts of the results are summarized here, in order to meet the space limitations.

### 3. Survey Results

#### 3.1 Factors facilitating RC

Table 2 shows the perceptions of respondents on 24 factors facilitating RC. It is seen that ‘client’s top management support’ is the most important factor for facilitating RC, followed by ‘top management support of all contracting parties’, ‘mutual trust’, ‘open communication’ and ‘enlightened client’. ‘Effective coordination’, ‘teamworking and can do spirit’, and ‘long term commitment’ rank 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup>, respectively. ‘Clearly defined’ (rank 9) and ‘equitable’ (rank 10) risk allocation is more important than inclusion of key parties in ‘encouraging and motivating risk-reward plans’ (equal rank 17). On the other hand ‘alignment of project objectives of different parties’ (rank 12) is more important than alignment of ‘mutual project and commercial objectives’ (rank 19) and ‘commercial objectives of different parties’ (rank 21). ‘Learning environment in project team organisation’ is the least important factor with a score of 3.81, which is higher than average of the measuring scale (0–6), implying general importance of all the 24 factors. The ranks of individual factors are slightly different within different groups of respondents. But significance levels obtained from the t-Tests showed that all the factors are significant for facilitating RC, both within the total sample and three groups of respondents. Moreover, ANOVA results show that three groups of respondents significantly agree on the importance levels of all the 24 factors.

Table 3 shows the summary of outcomes from “factor analysis” for factors facilitating RC. Five components emerged from this exercise and together they accounted for 65% of the variations. Those are: integrated objectives & risk-reward plan, appropriate risk allocation/sharing, motivated client & encouraging supporting arrangements, trust & trust-based arrangements, and top management support. All the components are seen to feed on factors that contribute to more than one component. As such, 19 (out of 24) factors are seen to contribute to more than one component, and up to three components. Some of the factors are seen to contribute almost equally to more than one component. For example, the factor ‘learning climate in project team organization’ contributes to components 1 and 2 with factor loadings of 0.50 and 0.49 respectively. Moreover, the ‘secondary’ contribution (0.55) of the factor ‘a23: encouraging and motivating risk-reward plans’ is higher than the ‘primary’

contributions of several other factors! All these may suggest a consolidated but interrelated approach for RC.

Table 2. Comparison of Means and ANOVA results of factors facilitating RC

Factors*	Total			Contractor		Consultant		Client		ANOVA
	Mean	Rank	Sig.	Mean	Rank	Mean	Rank	Mean	Rank	
a03	5.24	1	0.000	5.10	1	5.28	2	5.34	1	0.613
a04	5.20	2	0.000	5.03	2	5.22	3	5.31	2	0.470
a07	5.10	3	0.000	4.84	3e	5.33	1	5.16	3	0.240
a06	4.87	4	0.000	4.84	3e	4.94	5e	4.88	4e	0.934
a01	4.81	5	0.000	4.68	7	5.11	4	4.88	4e	0.447
a08	4.76	6	0.000	4.55	9e	4.94	5e	4.84	7	0.213
a10	4.69	7	0.000	4.45	15e	4.72	7	4.88	4e	0.298
a11	4.60	8	0.000	4.77	5e	4.67	8	4.41	11e	0.340
a20	4.57	9	0.000	4.65	8	4.44	17e	4.53	9	0.816
a02	4.53	10e	0.000	4.77	5e	4.61	9	4.38	13e	0.246
a21	4.53	10e	0.000	4.48	13e	4.50	12e	4.59	8	0.924
a15	4.49	12	0.000	4.55	9e	4.56	10e	4.41	11e	0.832
a19	4.47	13	0.000	4.52	12	4.44	17e	4.47	10	0.971
a13	4.46	14	0.000	4.55	9e	4.56	10e	4.28	17	0.555
a22	4.43	15	0.000	4.48	13e	4.50	12e	4.38	13e	0.862
a09	4.37	16	0.000	4.45	15e	4.33	19e	4.31	15e	0.839
a24	4.35	17e	0.000	4.39	19	4.50	12e	4.25	18	0.764
a23	4.35	17e	0.000	4.45	15e	4.50	12e	4.19	21	0.457
a12	4.34	19e	0.000	4.35	20	4.50	12e	4.22	19e	0.666
a17	4.34	19e	0.000	4.42	18	4.17	21e	4.31	15e	0.721
a16	4.24	21	0.000	4.26	22	4.17	21e	4.22	19e	0.961
a05	4.10	22e	0.000	4.29	21	3.83	24	4.06	22	0.377
a14	4.10	22e	0.000	4.16	23	4.33	19e	3.91	24	0.344
a18	3.81	24	0.000	3.61	24	3.89	23	3.97	23	0.455

Notes: \* See Appendix I; e – signifies equal rank, whereas the next rank(s) is/ are omitted.

### 3.2 Factors hindering RC

Table 4 shows the summary of perceptions of respondents on 28 factors for hindering RC. ‘Lack of top management commitment’ is seen to top the list that hinders RC, followed by a lack of ‘trust’ and ‘teamworking attitude’ among all contracting parties, and ‘lack of client’s initiative’. The next four most important factors (ranks 5–8) are: ‘inappropriate procurement/ contract strategy’, ‘improper/ inappropriate risk allocation/ sharing’, ‘price only selection methods’, and ‘ambiguous/ unclear contract clauses/ documents’. ‘Lack of client’s initiative (rank 4) and ‘bureaucratic client organization’ (rank 11), are more important than ‘inappropriate project planning’ (rank 14) and ‘incompatible public sector rules and regulations’ (rank 15). ‘Unwilling participation’ (rank 9) is seen to deter RC more than a ‘lack of confidence among contracting parties’ (rank 16). Similarly, ‘incompatible organizational culture’ (rank 13) is seen to deter RC more than ‘cultural clash’ at individual level (rank 18). Exclusion of major suppliers in any risk-reward plan appears to be the least

important factor with a score of 3.70, which is more than average of the measuring scale. This implies a general importance of all the 28 factors in hindering RC, with some factors more important than others. The significance levels obtained from the one sample t-test show that all the 28 factors are significant, both within total sample and three groups of respondents, except the least important factor within the group of contractors. Although the ranks of individual factors are slightly different within different groups of respondents, ANOVA results show that three groups of respondents significantly agree on the relative importance of all the 28 factors that deter RC.

Table 3: Factor analysis outcomes of factors facilitating RC

Sl. No.	Components	Primary factors*	Secondary factors*	Eigen-values	% of Var. explained (Cumulative)
1	Integrated objectives & risk-reward plan	a11, a12, a16, a17, a18, a23, a24	a02, a05, a09 a15	3.94	16.44 (16.44)
2	Appropriate risk allocation/ sharing	a15, a20, a21, a22	a13, a14, a16, a17, a19, a23, a24	3.66	15.27 (31.77)
3	Motivated client & encouraging supporting arrangements	a01, a02, a06, a13, a14, a19	a08, a12, a18, a22	3.25	13.56 (45.27)
4	Trust & trust-based arrangements	a07, a08, a09, a10	a04, a06, a11, a12, a13, a19	3.15	13.14 (58.41)
5	Top management support	a03, a04, a05	a01	1.81	7.53 (65.94)

Note: \* See Appendix I.

The factor analysis exercise extracted seven components and together they explained over 72% of variations (see Table 5). Those are: incomplete risk-reward scheme; persisting behavioural barriers; lack of trust, commitment & initiative; persisting adversarial setting; improper planning; lack of capability & experience; and commercial pressure and legal liability. It was observed that 20 factors contribute to more than one component, even the factor ‘improper/ inappropriate risk allocation/ sharing’ contributes to four components. It was also observed that (a) secondary contributions from a few factors are higher than the principal contribution from some other factors, and (b) few factors almost equally contribute to more than one component. Thus, like the factors facilitating RC, such multiple roles of different factors clearly indicate an interrelated but consolidated approach of the factors hindering RC as well. Also, two sets of facilitating and hindering factors for RC were seen to play complementary roles.

### ***3.3 Factors facilitating integrated project teams***

Among the 28 factors for facilitating the building of integrated project teams (IPTs) for RC, the results indicate a prioritisation of the pioneering role by clients, with ‘enlightened and enthusiastic client’ topping the list, ‘client’s initiative’ ranking 2, and ‘Knowledgeable client’ ranking 4. ‘Willingness of involved parties’ (rank 3) is also very important. A trust-building

‘corporate strategy’ (rank 5) and ‘early mobilization’ of major contracting parties (rank 6) are critical for building IPTs. Respondents favour building a ‘capable and compatible project team’ (equal rank 7), from among ‘short-listed potential project partners’ (equal rank 11), with less importance on ‘experience in RC approaches’ (rank 26). The priority is on inter-personal relations, present skill-sets, and compatible organisational culture, pointing to the importance on pre-contract relationships among contracting parties (rank 16). However, ‘use of single point responsibility’ is the least important factor, with a score of 3.69. This implies a general importance of all the factors. Significance levels obtained from the one sample t-test show that all the factors are significant, both within total sample and three groups of respondents, except the ‘use of single point responsibility’ within contractors group. The ranks of individual factors within various respondent groups are slightly different, but ANOVA results show that all the three groups of respondents significantly agree on the relative importance of different factors.

Table 4. Comparison of Means and ANOVA results of factors hindering RC

Factor *	Total			Contractor		Consultant		Client		ANOVA
	Mean	Rank	Sig.	Mean	Rank	Mean	Rank	Mean	Rank	
b07	5.14	1	0.000	4.94	1	5.22	2	5.31	1	0.355
b12	4.99	2	0.000	4.71	2	5.33	1	5.03	2	0.154
b11	4.80	3	0.000	4.58	5e	4.83	5	4.91	3	0.400
b08	4.75	4	0.000	4.52	7e	5.17	3	4.72	4	0.137
b02	4.66	5	0.000	4.68	3	4.72	6e	4.63	6	0.950
b03	4.58	6	0.000	4.61	4	4.39	14e	4.66	5	0.727
b04	4.57	7	0.000	4.58	5e	4.50	10e	4.59	7e	0.963
b05	4.48	8	0.000	4.26	12e	4.72	6e	4.59	7e	0.301
b26	4.46	9e	0.000	4.42	9	4.50	10e	4.41	12	0.953
b18	4.46	9e	0.000	4.32	10e	4.56	9	4.47	10e	0.767
b27	4.45	11	0.000	4.52	7e	4.33	17e	4.47	10e	0.892
b09	4.43	12	0.000	4.26	12e	4.94	4	4.28	17	0.076
b14	4.34	13	0.000	4.10	18	4.22	21e	4.56	9	0.180
b01	4.33	14	0.000	4.19	15	4.50	10e	4.34	14	0.598
b28	4.30	15	0.000	4.16	16e	4.61	8	4.19	19	0.444
b19	4.29	16	0.000	3.97	21e	4.50	10e	4.38	13	0.186
b25	4.27	17	0.000	4.32	10e	4.33	17e	4.22	18	0.891
b13	4.25	18e	0.000	4.16	16e	4.22	21e	4.31	15e	0.858
b15	4.25	18e	0.000	4.26	12e	4.06	26e	4.31	15e	0.653
b24	4.05	20	0.000	4.03	19e	4.11	23e	4.03	20e	0.947
b16	4.01	21	0.000	3.97	21e	4.11	23e	4.00	22	0.881
b21	4.00	22	0.000	3.74	24e	4.39	14e	4.03	20e	0.111
b10	3.92	23	0.000	3.71	26	4.39	14e	3.84	23	0.161
b06	3.90	24	0.000	3.77	23	4.28	20	3.78	25e	0.256
b23	3.84	25	0.000	3.74	24e	4.11	23e	3.81	24	0.466
b20	3.76	26e	0.000	3.55	27	4.33	17e	3.69	27	0.052
b17	3.76	26e	0.000	4.03	19e	3.72	28	3.53	28	0.232
b22	3.70	28	0.000	3.42	28	4.06	26e	3.78	25e	0.186

Notes: \* See Appendix I; e – signifies equal rank, whereas the next rank(s) is/ are omitted.

Table 5: Factor analysis outcomes of factors hindering RC

Sl. No.	Components	Primary factors*	Secondary factors*	Eigen-values	% of Var. explained (Cumulative)
1	Incomplete risk-reward scheme	b20, b21, b22, b23	b03, b06, b12, b14, b26	3.73	13.33 (13.33)
2	Persisting behavioural barriers	b03, b13, b14, b15, b16, b19	b02, b10, b11, b17, b18, b22	3.61	12.89 (26.22)
3	Lack of trust, commitment & initiative	b07, b08, b11, b12, b18	b09, b19, b27, b28	3.59	12.84 (39.06)
4	Persisting adversarial setting	b04, b06, b26, b27, b28	b02, b03, b15, b17, b25	3.27	11.66 (50.72)
5	Improper planning	b01, b02, b05	b03, b16, b12	2.36	8.44 (59.16)
6	Lack of capability & experience	b09, b10, b17	b16, b20	2.08	7.43 (66.59)
7	Commercial pressure and legal liability	b24, b25	b06, b23	1.57	5.59 (72.18)

Note: \* See Appendix I.

Factor analysis exercise extracted seven interrelated components and together they explained over 75% of variations. Those are: team selection and mobilization strategy; facilitating responsibility allocation; appropriate preparation for teamwork; enlightened and knowledgeable client; harmonizing the team; corporate strategy and skills; and harmonious participation. 20 factors are seen to contribute to more than one component, with four factors (c15, c20, c05, and c04) contributing to four components, and other four factors (c22, c10, c06, and c11) contributing to three components. Primary and secondary contributions of several (c20, c23, c06, c28 and c11) factors are close. Also, secondary contributions of eight factors (c18, c26, c24, c23, c06, c21, c28, and c11) are either equal or higher than the lowest primary contribution of 0.45 (from c20 to component 1). All these clearly indicate a consolidated but interrelated approach for building IPTs for more effective RC. Thus, two sets of facilitating factors (i.e. facilitating RC and building IPTs for more effective RC) were found to complement each other.

### **3.4 Factors hindering integrated project teams**

Lack of commitment from top management of ‘client’ (d02) and ‘other parties’ (d03) are the topmost two barriers for building IPTs, followed by lack of trust, client’s initiative and unwilling participation. ‘Persistence of master and slave concept’ and ‘price only selection method’ shares the rank 7. Failure to continue ‘open and honest communication’ and ‘share information’ respectively rank 6 and 9. ‘Bureaucratic client organization’ (10th), ‘public sector accountability concerns’ (11th) and ‘stringent/ incompatible public sector rules and regulations’ (12th) are more important than ‘improper planning, design errors and omissions’ (20th). On the other hand, ‘unfair risk-reward plan’ (12th) is more important than ‘absence of any risk-reward plan’ (22nd) and ‘separate/ unrelated risk-reward plans for different parties’ (25th). ‘Lack of relationships’ between different contracting parties (d21–d24) is of lower importance (ranks 26 – 29). ‘Exclusion of (major) suppliers in risk-reward plan’ (d19) is the least important factor with a score of 3.94. This implies a general importance of all the factors

in hindering the building of IPTs. Significance levels obtained from the one sample t-test confirmed that all the factors are significant, both in the total sample and individual groups of respondents. Ranks of various factors are slightly different within three groups of respondents, but ANOVA results showed that they significantly disagree on the relative importance of only one factor: lack of client's knowledge.

Seven interrelated components emerged from the factor analysis exercise and together they explained over 74% of variations. Those are: persisting adversarial setting; lack of integrated risk-reward scheme; persisting regulatory incompatibilities; incomplete relationships/communications; lack of top management commitment; commercial pressure and legal concern; and lack of client's knowledge. On the whole, (a) two sets of facilitating and hindering factors for building IPTs, as well as (b) two sets of hindering factors (i.e. hindering RC and building IPTs) were found complementary.

#### **4. Conclusions**

Integration in construction requires all parties to mobilise their collaborative efforts and maintain harmonious relationships during project execution, in order to ensure value for money and optimise usage of their resources. This may be approached through appropriate contractual and non-contractual protocols. As such, various factors and strategies were identified, in order to ascertain their relative importance and to offer any incentives for designing appropriate RC-based project teams. Data was collected from the Hong Kong construction industry and was statistically analysed. Results led to the following observations:

- All the factors and strategies used in the survey were found to be significant, i.e. 24 factors facilitating RC, 28 factors hindering RC, 28 factors facilitating building IPTs and 31 factors hindering the building of IPTs.
- Although ranks of individual factors vary within different respondent groups, the overall trend was that trust and trust based operational and contractual arrangements can effectively provide the required incentives for the Hong Kong construction industry to exercise various RC-based working arrangements, through extended attention to 'relational' qualities in team selection, where top management support and cliental initiative are critical.
- Except for only one factor (d01: lack of clients knowledge), three groups of respondents (viz. contractors, consultants and clients) significantly agree on the relative importance of all the factors and strategies used in the survey. The survey results may therefore taken to indicate a general consensus of the construction industry in Hong Kong.
- Based on the overall responses, it was noted that both the pairs of facilitating and deterring factors complement each other. Moreover, both the pairs of facilitating and deterring categories of factors exhibit a similar broad trend of importance of the various factors, indicating that RC and teambuilding complement each other.
- The factor analysis exercise extracted five and seven components for factors facilitating and hindering RC, respectively. On the other hand, seven components were extracted from each of the sets of factors facilitating and hindering the building of IPTs for RC, respectively.
- On the whole, results from factor analysis suggest the need for consolidated but interrelated approaches, both for RC culture development and building IPTs for more effective RC.



## References

- CIRC (2001). *Construct for Excellence*, Report of the Construction Industry Review Committee (CIRC), Hong Kong.
- Kumaraswamy, M.M., Rahman, M.M., Ling, F.Y.Y. and Phng, S.T. (2005). *Reconstructing cultures for relational contracting*, ASCE Journal of Construction Engineering and Management, in press.
- Macneil, I.R. (1974). *The many futures of contracts*. Southern California Law Review, Vol. 47, No. 3, pp 691-816.
- PSIB (2004). *Inventory of international reforms in building and construction, Process and System Innovation in Building and Construction (PSIB) Programme*, Government Building Agency, the Netherlands Government, publication number: PSIB017\_S\_04\_2341, Hague, the Netherlands.
- Rahman, M.M. and Kumaraswamy, M.M. (2002). [Joint risk management through transactionally efficient relational contracting.](#) Construction Management and Economics, Vol. 20, No. 1, pp 45-54.
- Rahman, M.M. and Kumaraswamy, M.M. (2004a). *Contracting relationship trends and transitions*. ASCE Journal of Management in Engineering, Vol. 20, No. 4, pp 147-161.
- Rahman, M.M. and Kumaraswamy, M.M. (2004b). *Potential for implementing relational contracting and joint risk management*. ASCE Journal of Management in Engineering, Vol. 20, No. 4, pp 178-179.

## 6. Appendix I

### 6.1 Factors facilitating RC

a01) Enlightened and enthusiastic client, a02) Knowledgeable client (about project processes), a03) Client's top management support, a04) Top management support of all contracting parties, a05) Experience in RC approaches (e.g. partnering, alliancing), a06) Open communication among all contracting parties, a07) Mutual trust among all contracting parties, a08) Effective coordination among all contracting parties, a09) Combined responsibility of all contracting parties, a10) Teamworking & 'can do' spirit of all contracting parties, a11) Long-term commitment to each other: all parties, a12) Adequate resources of all contracting parties, a13) Mutually agreed issue resolution mechanisms, a14) Mutually agreed performance appraisal mechanisms, a15) Alignment of project objectives of different parties, a16) Alignment of commercial objectives of different parties, a17) Alignment of mutual project and commercial objectives, a18) Learning climate/ environment in project team organisation, a19) Positive attitude towards continuous improvement, a20) Clearly defined risk allocation/ sharing arrangements, a21) Equitable risk allocation/ sharing arrangements, a22) Flexible/ adjustable contracts to address uncertainties, a23) Encouraging and motivating risk-reward plans, a24) Inclusion of all key parties in risk-reward plans.

## **6.2 Factors inhibiting RC**

b01) Inappropriate project planning, b02) Inappropriate procurement/ contract strategy, b03) Improper/ inappropriate risk allocation/ sharing b04) 'Price' only' selection methods, b05) Ambiguous/ unclear contract clauses/ documents, b06) Absence of risk-reward plan, b07) Lack of commitment: top management of all contracting parties, b08) Lack of client's initiatives, b09) Lack of contractor's capability, b10) Lack/ absence of scope for innovations, b11) Lack of teamworking attitude among all contracting parties, b12) Lack of trust/ reliability among all contracting parties, b13) Inter-personal/ cultural clash (individual level), b14) Incompatible organisational cultures (corporate level), b15) Inappropriate issue resolution mechanisms, b16) Separate coordination and monitoring plans, b17) Lack of experience in RC approaches (e.g. partnering), b18) Unwilling/ unenthusiastic participation in RC approaches, b19) Lack of confidence among all contracting parties, b20) Exclusion of consultants in risk-reward plan, b21) Exclusion of major sub-contractors in risk-reward plan, b22) Exclusion of major suppliers in risk-reward plan, b23) Unrelated/ separate risk-reward plans for different parties, b24) Potential legal liabilities (in resolving non-contractual issues), b25) Commercial pressures of contracting parties, b26) Win-lose environment among contracting parties, b27) Bureaucratic client organisation, b28) Incompatible public sector rules and regulations.

## **6.3 Factors facilitating building a project based integrated team for more effective RC:**

c01) Enlightened and enthusiastic client, c02) Knowledgeable client (about project processes and RC), c03) Client's initiative, c04) Learning about RC approaches before contracting (all parties), e.g. at a workshop, seminar, or training within the company, c05) Learning working in flexible contract/ teamworking environment before contracting with others (all parties), e.g. through training, c06) Co-operative learning within project organisation, c07) Familiarity/ previous relationships with/ among other parties, c08) Reputation in the industry (each party), c09) Willingness/ enthusiasm of involved parties, c10) Previous experience in RC approaches (each party), c11) Adequate resources and technical skills (each party), c12) Previous performance records on 'hard factors', e.g. time, quality, safety, etc. (each party), c13) Compatible organisational culture of involved parties, c14) Inter-personal relations/ cultural harmony (individual level), c15) Previous performance records on 'soft factors', e.g. joint decision making, joint problem solving, compromises on unclear issues, etc. (each party), c16) Short-listing 'capable' (as in items 11-12) & 'compatible' (as in items 13-15) potential project partners, instead of 'price only' considerations, c17) Disclosing project information to potential partners (as in item 16) at early stages of project for any optional feedback, as appropriate, c18) Seeking specific inputs on constructibility, construction methods, materials, etc. from among potential partners (of item 16), for better project planning, c19) Selecting the best possible "capable and compatible" project team from among potential partners (of item 16), c20) Bringing contractor, major subcontractors and major suppliers into the project team, in appropriate cases, for longer-term interactions to build trust / reliability, c21) More workshops for better interactions to build trust/ reliability, c22) Use of single point responsibility – e.g. only one QS from the contractor representing all contracting parties in the project, instead of different QSs for various contracting parties, c23) Group/ combined responsibility, as against individual responsibility - e.g. responsibility of binding decision making on 'unclear issues' by a pre-selected group comprising one person from each major party, c24) Role of an independent full-time facilitator in building trust, teamworking & 'can do' spirit, and enhancing cooperative learning among contracting parties, c25) Role of

Project Manager (PM) as facilitator as per item 24 above, given that PM has the best understanding and control of the project issues, c26) Requirement for an independent full-time facilitator to supplement PM (Project manager) as per item 24 above, c27) Company training policy to build adaptable individuals for working with diverse partners (each party), c28) Corporate strategy of building trust with potential partners by doing the 'right' things and meeting time & cost targets.

#### ***6.4 Factors inhibiting building a project based integrated team for RC***

d01) Lack of client's knowledge (about project processes and RC), d02) Lack of commitment from top management: client, d03) Lack of commitment from top management: other parties, d04) Lack of client's initiatives, d05) Bureaucratic client organisation, d06) Stringent/ incompatible public sector rules and regulations, d07) Public sector accountability concerns, d08) 'Price' only' selection methods, d09) Commercial pressures on contracting parties, d10) Opportunistic behaviour of one or more contracting parties, d11) Lack of trust/ reliability among contracting parties, d12) Unwilling/ unenthusiastic participation of contracting parties, d13) Inter-personal/ cultural clash (individual level), d14) Incompatible organisational culture (corporate level), d15) Absence of any risk-reward plan, d16) Separate/ unrelated risk-reward plans for different parties, d17) Exclusion of consultants in risk-reward plan, d18) Exclusion of (major) subcontractors in risk-reward plan, d19) Exclusion of (major) suppliers in risk-reward plan, d20) Unfair risk-reward plan, d21) Lack/ absence of contractual relations between client and major subcontractors, although they carry out major parts of work, d22) Lack of any relationships/ communications between client & major suppliers, although information on & timely supply of some critical materials may improve project planning & works progress, d23) Lack of relationships/ communications between consultants & suppliers, although information on source, price, supply time, etc. of some critical materials may improve design, planning & construction, d24) Lack of relationships/ communications between subcontractors and suppliers, d25) Resistance of contracting parties to integrated project culture, d26) Failure to share information among contracting parties, d27) Persistence of 'master' (e.g. client/ prime consultant) and 'slave' concept, d28) Uneven commitment of contracting parties, d29) Discontinuation of open and honest communication, d30) Improper planning, design errors and omissions, d31) Potential legal liabilities (in resolving non-contractual issues).

