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The Government of the Hong Kong Special Administrative Region

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Environment, Transport and Works Bureau
Technical Circular (Works) No. 4/2003

Assessment of Liquidated Damages

Scope

This Circular provides updated guidelines on the assessment of the rate to be prescribed as liquidated damages (LD's) for delay in completion of the Works in all works contracts.

Effective Date

2. This Circular takes immediate effect. For tenders not yet closed and where situation permits, departments should incorporate also the appropriate footnote to be included in the Appendix to the Form of Tender as provided in paragraph 16 by means of a tender addendum.

Effect on Existing Circular

3. This Circular supersedes WBTC No. 7/2001.

General Principle

4. LD's is a sum agreed by the Employer and the Contractor in advance as the amount to be paid by the Contractor as damages if the Contractor breaches the contract by failing to complete the work in time. A provision for LD's is enforceable if the amount fixed is
LD: a genuine pre-estimate, judged at the time the contract is entered into, of the loss likely to arise from the anticipated breach. The Employer does not need to prove actual damages but LD's are not enforceable if imposed as a penalty. Guidelines for distinguishing between liquidated damages and a penalty are stated in the leading case of *Dunlop Pneumatic Tyre Company Limited v New Garage and Motor Company Limited* [1914-15] All ER 739. Reference may also be made to the judgement of the Privy Council in *Philips Hong Kong Limited v The Attorney General of Hong Kong* delivered on 9 February 1993. If the courts find the agreed
Penalty: sum to be "extravagant or unconscionable in amount in comparison with the greatest loss which could conceivably be proved to have followed from the breach" it will be held to be a penalty.

Calculation of Liquidated Damages

5. The LD's to be entered in the Appendix to the Form of Tender should be a genuine pre-estimate of the likely loss to the Employer resulting from delay in completion of the Works, or any Section of the Works, as the case may be. The General Conditions of Contract Clause 52 has been drafted on the basis that if any part of the Works is designated as a Section, the remainder of the Works must also be designated as a Section. If a contract contains Sections, LD's should be calculated for each Section instead of for the whole of the Works.

likely profit + additional cost

6. If it is possible to carry out a cost-benefit analysis, LD's shall be calculated using the daily rate of economic benefit likely to be generated by the project after completion and those additional costs due to the delay in completion of the Works, if any. Where such analysis is not possible, as is usually the case in public sector construction contracts, an amount being a genuine pre-estimate of the likely loss to the Employer may be stipulated as the LD's.

7. In estimating the likely loss to the Employer, there is a widely accepted formula method which includes the following components:

(a) loss of revenue or interest on the capital invested in the project;
(b) supervisory costs during the delay period;
(c) the additional sum payable to the Contractor in respect of fluctuations in the cost of labour and materials; and not applicable if no fluctuation clause
(d) any special damages specific to the particular project.

8. Adopting this, the following empirical formulae may be used to calculate the components of LD's to be specified in the Contract unless an alternative, more accurate assessment can be made.

exclude contingency

(a) Recovery on Capital Invested (Notes 1 & 4)

usually assumed 5%

contract value * (1 - assumed % of outstanding) * lending rate

$$\text{Daily LD's} = \frac{(C + E) * (1\text{-}V) * P}{365}$$

(b) Site Supervisory Costs (Notes 2 & 4)

estimated lump sum supervisory cost

usually assumed 8% of contract value

$$\text{Daily LD's} = \frac{S}{T}$$

(c) Fluctuation (Note 3)

$$\text{Daily LD's} = \frac{V * C * T * F}{2 * D * 365}$$

Where C = the contract value of the Works (including preliminary items and the Provisional Sum for price fluctuations (if any) but excluding the payment for site safety, Contingency Sum and daywork) or, as the case may be, the contract value of the Section (including a share of preliminary items and the Provisional Sum for price fluctuations).

D = the assumed delay in days for the completion of the Works, or the delay in completion of a Section.

E = the estimated lump sum cost for providing professional and site supervisory staff.

F = the assumed annual change in the Price Fluctuation Factor applicable to the Contract.

P = the assumed lending rate (% per annum) during the course of the Contract.

S = the estimated lump sum site supervisory costs.

T = the time in days for completion of the Works, or time for completion of a Section.

V = the assumed value of outstanding works in percentage of C at time for completion.

The following guidelines are provided for reference:

(i) D may be determined by reference to department's record of similar or equivalent contracts completed in the past 5 years;

(ii) E and S vary with the size and complexity of the project as well as the prevailing level of charge for professional service. They should exclude contingent sums such as allowance for supervisory costs during extended contract periods;

(iii) the average annual change in the Price Fluctuation Factor pertaining to the contract based on the past 5-year record may be taken as F;

(iv) the quoted best lending rate (% per annum) of the Hong Kong Monetary Authority recorded in the latest issue of the Hong Kong Monthly Digest of Statistics published by the Census and Statistics Department, Hong Kong may be taken as P; and

(v) V should be determined based on the value of D, the construction sequence and the rates for the works.

Note 1. If it is possible to carry out a cost-benefit analysis, such as the estimated daily revenue expected from the facility on completion, this sum should replace that derived by formula at paragraph 8(a).

2 The formula at paragraph 8(b) applies where site supervisory costs are likely to continue at a constant rate during the period of delay. See also paragraph 13.

3. Daily LD's at paragraph 8(c) only apply to contracts to which price fluctuations apply.

4. For term contracts, it is not possible to estimate a lump sum value for E & S applicable to all works orders. The following formulae may be used in lieu of that in paragraph 8(a) and 8(b):

(a) Recovery on Capital Invested (alternative version for term contracts)

$$\text{Daily LD's} = \frac{(1 + E_1) * (1-V) * C * P}{365}$$

(b) Site Supervisory Costs (alternative version for term contracts)

$$\text{Daily LD's} = \frac{C * S_1}{T}$$

Where E_1 = the estimated cost for providing professional and site supervisory staff in percentage of C.

S_1 = the estimated site supervisory costs in percentage of C.

Special damages

heading

9. There may be situations where the Employer will suffer some special losses as a result of a project not being completed on time. For example, where a contract is on the critical path any delay may result in an ultimate 1 delay to the completion of another contract (e.g. a separate demolition or piling contract can delay the completion of the whole project). The Employer will suffer a loss on the following contract(s) if delayed by the late completion of the contract in respect of which the calculation is being made. LD's for special damages cannot be imposed if there is a float period between contracts, because there cannot be any genuine pre-estimate of the special damages. However, in many cases contracts are programmed so that there is no float. This should be confirmed before a calculation is made.

10. There may be other categories of loss caused by delay in meeting key dates. For example, there may be a special 2 loss of running a less cost efficient facility until the replacement facility is available; the opening of a school or offices may depend on the completion of a road access; or the loss of interest on capital invested in an adjoining sewage treatment plant which cannot be commissioned until the sewer tunnel is completed.

11. There may also be occasions where Government 3 is liable to a third party for losses caused by delay in completion of the Works. For example, Government undertakes the site formation of a leased land and is liable to damages for delay. Another example is that Government may have to 4 pay its consultants additional fees and expenses arising from delay in completion of the Works.

12. If any such special damages can be identified at the project planning stage, it is essential that the rationale behind the calculation (but not the calculation itself), is clearly stated in the tender documents as a Special Condition of Tender and the appropriate sum representing the special damages included as part of the genuine pre-estimate of loss in the event of late completion of the Works or, as the case may be, the relevant Section.

min amount after proportional reduction for sectional completion

Minimum Amount of Liquidated Damages

13. The amount of LD's is subject to proportional reduction under General Conditions of Contract Clause 52(2), due to the completion or handing over of a part of the Works or part of a Section in advance of the whole. Under certain circumstances, this proportional reduction may not reflect the real effect of delay. For example, a partial completion of the Works would not help in reducing the special damages. Also, in practice, there is a limit on the minimum size of the site supervisory staff beyond that no further reduction is possible. Under such circumstances, a SCC specifying the minimum amount of LD's should be incorporated in the contract as follows:

> "General Conditions of Contract Clause 52 is amended by adding the following as sub-clause (5):
>
> (5) Notwithstanding the proviso to General Conditions of Contract Clause 52(2) the resulting rate per day of liquidated damages for the Works or any Section after reduction in accordance with that sub-clause shall not be less than the minimum rate per day of liquidated damages for the Works or, as the case may be, the relevant Section as stated in the Appendix to the Form of Tender."

and the sum calculated in respect of the special damages and the minimum supervisory staff costs shall be inserted in the Appendix to the Form of Tender as the "Minimum amount of liquidated damages (per day)".

14. It should be noted that the concept of minimum site staff establishment may not be applicable to Sections, other than the last Section, as the supervision can be carried out by the supervisory staff for the remaining Sections. However, there are exceptions. For instance, if a Section of the Works is geographically or technically separated, entailing the need to deploy staff purely for that Section of the Works. Another example is where some of the staff could be released on completion of a major Section, leaving some minor works such as landscaping works as the last Section to be completed.

Lowering the daily rate of LD's

15. Contractually, there is no impediment to setting LD's at a level below the genuine pre-estimate of the Employer's loss as calculated under paragraphs 5 to 12 above. If the daily rate of LD's is likely to be more than a contractor can reasonably bear, the procuring department may consider lowering the rate to a commercially acceptable level and seek the endorsement of the Environment, Transport and Works Bureau on the proposed rate of LD's on a case by case basis. Where such a rate is lower than the genuine pre-estimated loss, the approval of the Secretary for Financial Services and the Treasury must be sought before incorporating such a rate in the tender documentation.

LD's in the Tender Documentation

16. As the rate of LD's is to a certain extent related to the contract value of the Works or the Section, departments shall stipulate the rate of LD's in the Appendix to the Form of Tender as a function of the Contract Sum or the contract value of the Section. (e.g. $A*Y_1 + B$ where Y_1 is the Contract Sum or the total sum of a Bill in the Bills of Quantities and A & B are some numerical values determined in accordance with paragraphs 8 to 12. See also the example given in Appendix B.) The following SCT shall be incorporated in the tender documents and the department shall notify the tenderer of the rate of LD's so calculated before tender acceptance and a copy of such notice shall be incorporated in the contract documents forming part of the contract.

> "The tenderer shall note that the liquidated damages set out in the Appendix to the Form of Tender are sums that are to be worked out by substituting Y_1 with the Contract Sum." (Or, in the case of Sections, Y_1 with the total sum of Bill [ ] and Bill [ ] in the Bills of Quantities, Y_2 with the total sum of Bill [ ] in the Bills of Quantities and Y_3 with the value of the Adjustment Item in the Bills of Quantities etc.)

In addition, to deal with possible anomalies which may arise as a result of negative pricing by tenderers, appropriate footnote (depending on whether or not there is minimum LD's for the Works/Section) should be added to the relevant LD's provisions in the Appendix to the Form of Tender along the following lines:

(a) Where there is no minimum LD's

"The value of the formula within the square brackets shall be taken as zero for the purpose of computation of the daily rate of liquidated damages if and when the sum is worked out to be a negative value by substituting each of *[specify those indeterminate items] [as appropriate,]** with its corresponding value in the priced Bills of Quantities."

[Note*: *Consider inclusion of the words "as appropriate," if the Works are divided into Sections and the footnote is used in relation to two or more Sections with no minimum LD's.*]

or

(b) Where there is minimum LD's

"The value of the formula within the square bracket shall be taken as *[specify the amount of the applicable daily rate of minimum LD's]* for the purpose of computation of the daily rate of liquidated damages if and when the sum is worked out to be less than *[specify the amount of the applicable daily rate of minimum LD's]* by substituting each of *[specify those indeterminate items]* with its corresponding value in the priced Bills of Quantities."

An example of the LD's provisions in the Appendix to the Form of Tender is at Appendix C.

Independent Check

17. It is important that those responsible for calculating LD's ensure that the calculations are logical and free from error. In all cases, the full implications of the contract must be considered in applying the formulae at paragraph 8. In this respect, LD's calculations should always be subject to an independent check by a senior professional officer. Calculations from which LD's are derived must be set out clearly and kept on file for future reference.

18. A pro-forma which may be useful as a guide in the calculation of LD's is at Appendix A. A worked example is at Appendix B. The summary statement only but not the calculations shall be included in the Appendix to the Form of Tender.

Check Before Tender Invitation

19. The formula to be entered into the Appendix to the Form of Tender for determining the rate of LD's (hereinafter referred to "the Formula") should be reviewed immediately before tender invitation, with reference to the latest available information.

Keep In View During the Tender Period

20. Should there be changes to the scope of the Works or the special damages before the tender closing date, the Formula should be adjusted by means of a tender addendum.

Check before the Issue of the Letter of Acceptance

21. As a provision for liquidated damages is enforceable only if the rate fixed is a genuine pre-estimate of the Employer's loss judged at the time of entering into the contract, there is a need to review the Formula immediately before a tender is accepted. If the Formula no longer represents a valid estimate of the likely loss to the Employer (e.g. the original assumption concerning the float period between contracts is found to be invalid or the special damages have changed due to changed circumstances), the procuring department should take the following action :

(a) If the rate of LD's calculated in accordance with the Formula is higher than the latest estimate of the likely loss, the procuring department should negotiate with the tenderer(s) to amend the rate of LD's in accordance with the tender negotiation procedures stipulated in the SPRs.

(b) If the rate of LD's calculated in accordance with the Formula is lower than the latest estimate of the likely loss, the procuring department should follow the procedures in sub-paragraph (a) above to revise the rate of LD's. If as a result of negotiation the revised rate of LD's is at a level below the genuine pre-estimated loss i.e. the latest estimated loss in this case, the procuring department must seek ETWB's endorsement and the approval of Secretary for Financial Services and the Treasury.

Post-contract Variation by ways of Supplemental Agreements

22. It is necessary to revisit the LD's provision where any change is made to the scope of the Works or Section(s) by way of supplemental agreements. Consideration has to be made as to whether the rate originally fixed for the LD's remains appropriate for the Works or Section(s) where the scope of work comprised in the original Works or Section(s) is altered. If special damages have been included, whether such damages are affected by the change.

Record

23. Full record of any review of LD's together with all related calculations should be kept on file.

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Suggested format
for calculation of Liquidated Damages

Title of Contract _____

Contract No. _____ Date _____

Estimated final contract sum (including contingencies) $ _____

SECTION _____

Value of Section (C) (include preliminaries but exclude contingencies)	= $		
Time for Completion of Section (T)	=		days
Interest Rate (P)	=		%
Assumed delay in completion of the Section (D)	=		Days
Value of outstanding work at time for completion (V)	=		%
Cost of professional service and site supervision (E)/(E_1)	=		
Site supervisory costs (S)/(S_1)	=		
Annual change in the Price Fluctuation Factor (F)	=		%

(a) Recovery on capital invested

[(C+E) * (1-V) * P ÷ 365] **OR** = $

[(1+E_1)*(1-V)*C*P÷ 365]

OR

Daily rate of economic benefit = $

(b) Site Supervisory Costs

(i) [S ÷ T] **OR** C *S_1 ÷ T = $

(ii) Minimum site Supervisory Costs = $

(c) Fluctuations V * C * T * F ÷ (2 * D * 365) (if any) = $

(d) Special damages (if any) = $

Total LD's (a + b(i) + c + d) = $ _____ per day

Minimum amount of liquidated damages = $ _____ per day
(b(ii) and (d) if applicable)

WORKED EXAMPLE

Contract for a service reservoir with an access road which requires early completion. There will be no special damages if the project is not completed on time. In the Bills of Quantities, Bill 1(Y_1) covers the preliminaries, Bill 2(Y_2) the access road and Bills 3 & 4(Y_3) the remainder of the Works. The preliminaries for the access road is 0.2 * Y_1. The contingency sums for the access road and remainder of the works are $ 0.1M and $ 0.2M respectively

Section A (Access Road)

Value of Section A (C)	=	$0.2 * Y_1 + Y_2 - 0.1M$
Time for completion of Section A (T)	=	350 days
Lending Rate (P)	=	10%
Delay in completion of the Section (D)	=	88 days
Outstanding work at time for completion (V)	=	20%
Cost of professional service and site supervision (E)	=	3M
Site supervisory costs (S)	=	2M
Annual change in the Price Fluctuation Factor (F)	=	6.1%

(a) Recovery on capital invested = $0.8 * (0.2 * Y_1 + Y_2 - 0.1M + 3M) * 10\% \div 365$

= $2.192 * 10^{-4} * (0.2 * Y_1 + Y_2 + 2.9M)$

(b)(i) Site supervisory costs = $2M \div 350 = 5714$

(ii) Minimum site supervisory costs = zero

(c) Fluctuations = $0.2*(0.2*Y_1+Y_2-0.1M) *350* 0.061 \div (2* 88 * 365)$

= $6.647 * 10^{-5} * (0.2 * Y_1 + Y_2 - 0.1M)$

(d) Special damages = zero

Total LD's (a+b(i)+c+d) = $0.571 * 10^{-4} * Y_1 + 2.857 * 10^{-4} * Y_2 + 6356$

Section B (remainder of the Works)

Value of Section B(C)	=	$(0.8 * Y_1 + Y_3 - 0.2M)$
Time for Completion of Section B (T)	=	400 days
Lending Rate (P)	=	10%
Delay in completion of the Section (D)	=	100 days
Outstanding work at time for completion (V)	=	20%
Cost of professional service and site supervision (E)	=	12M
Site supervisory costs (S)	=	8M
Annual change in the Price Fluctuation Factor	=	6.1%

(a) Recovery on capital invested = $0.8 * (0.8 * Y_1 + Y_3 - 0.2M + 12M) * 10\% \div 365$

= $2.192 * 10^{-4} * (0.8 * Y_1 + Y_3 + 11.8M)$

(b)(i) Site supervisory costs = $8M \div 400 = 20{,}000$

(ii) Minimum site supervisory costs = (to be calculated based on the minimum establishment, say $15,000 for this example)

(c) Fluctuations = $0.2 * (0.8 * Y_1 + Y_3 - 0.2M) * 400 * 0.061 \div (2 * 100 * 365)$

= $6.685 * 10^{-5} * (0.8 * Y_1 + Y_3 - 0.2M)$

(d) Special damages = zero

Total LD's (a + b(i)+c +d) = $2.288 * 10^{-4} * Y_1 + 2.861 * 10^{-4} * Y_3 + 22573$

Summary statement of liquidated damages:

Liquidated damages for Section A = $\$(0.571 * 10^{-4} * Y_1 + 2.857 * 10^{-4} * Y_2 + 6356)$ per day

Liquidated damages for Section B = $\$(2.288 * 10^{-4} * Y_1 + 2.861 * 10^{-4} * Y_3 + 22573)$ per day

Minimum liquidated damages for Section A = N/A

Minimum liquidated damages for Section B = $15,000 per day

APPENDIX TO FORM OF TENDER

52 Liquidated Damages

Summary statement of liquidated damages:

Section A	HK$[$0.571 * 10^{-4} * Y_1 + 2.857 * 10^{-4} * Y_2 + 6356$]$^{\#}$ per day
Section B	HK$[$2.288 * 10^{-4} * Y_1 + 2.861 * 10^{-4} * Y_3 + 22573$]$^{\#\#}$ per day
Section B minimum liquidated damages	HK$15,000 per day

In the above summary statement of liquidated damages:

Y_1 = Total sum of Bill No. 1 in the Bills of Quantities

Y_2 = Total sum of Bill No. 2 in the Bills of Quantities

Y_3 = Total sum of Bill No. 3 and Bill No. 4 in the Bills of Quantities

[#] The value of the formula within the square brackets shall be taken as zero for the purpose of computation of the daily rate of liquidated damages if and when the sum is worked out to be a negative value by substituting each of Y_1 and Y_2 with its corresponding value in the priced Bills of Quantities.

[##] The value of the formula within the square brackets shall be taken as HK$15,000 per day for the purpose of computation of the daily rate of liquidated damages if and when the sum is worked out to be less than HK$15,000 per day by substituting each of Y_1 and Y_3 with its corresponding value in the priced Bills of Quantities.