

Demolition Works Measures for Public Safety

Introduction

To ensure public safety, the control of demolition works is governed by the Buildings Ordinance, Building (Administration) Regulations and Building (Demolition Works) Regulations, which impose requirements for :

- (a) application for approval of plans for demolition works;
- (b) application for consent to commence the works;
- (c) site safety supervision;
- (d) appointment of Technically Competent Person to supervise demolition works and operator of powered mechanical plant or equipment; and
- (e) certification of completion of works.

2. This practice note sets out the procedures to be followed by authorized persons (AP) and registered structural engineers (RSE) in meeting these requirements. Some points for practical application are also clarified.

Demolition Proposals

3. All demolition proposals should be submitted for formal approval as prescribed under Regulation 8(3) and (4) of the Building (Administration) Regulations. When preparing plans for demolition works, reference should be made to the Code of Practice for Demolition of Buildings 2004 (the Code) issued by the Buildings Department (BD) for guidance for complying with the Buildings Ordinance and its related regulations. The Building Authority (BA) may refuse to approve under section 16(1)(a) and (e) of the Buildings Ordinance any demolition proposal which does not contain all the plans and documents prescribed in the regulations.

4. The BA will exercise his discretion to refuse an application for consent to the commencement of demolition works under section 16(3)(a) and (b) of the Buildings Ordinance where his approval to the demolition plans for the works has not been given.

/ Precautionary

Precautionary and Protective Measures

5. Notwithstanding the need to include the precautionary and protective measures for the demolition works on the plans submitted for approval, the following measures, which at the time of their erection do not affect the structure of any building, may be erected without the consent of the BA :

- a) protective wire nettings;
- b) dust screens of plastic or tarpaulin sheets;
- c) scaffolds and intermediate catchfans;
- d) hoarding, covered walkway, gantry and catch platforms;
- e) shoring & propping for stabilising buildings under demolition or adjoining buildings.

Site Safety Supervision Plan

6. A supervision plan as defined under section 2(1) of the Buildings Ordinance is required to be lodged with the BA by an AP prior to or at the time of application for consent to commence demolition works except for works which satisfy all of the criteria set out in paragraph 11 of the Technical Memorandum for Supervision Plans. The supervision plan should be prepared in accordance with the recommendations in the Code of Practice for Site Safety Supervision issued by BD. Under section 16(3)(bc) of the Buildings Ordinance, the BA may refuse to give his consent to the commencement of demolition works where an AP has not lodged a supervision plan for the works.

Execution and Supervision of Demolition Works

7. AP, RSE and Registered Specialist Contractor (RSC) are required to observe the requirements on the provision of a full time site engineer for demolition of complex structures, debris management system, and other execution and supervision particulars as stipulated in the Code.

8. Where a site engineer is required to be appointed, he/she shall be directly responsible to the RSC. Any subsequent change of the site engineer shall be reported to the AP/RSE and the BA by the RSC.

Video Record of Demolition Works

9. Video camera to record the entire demolition process should be provided by the RSC for all types of demolition sites. The video camera(s) should be installed at strategic location(s) agreed by the AP/RSE and be securely protected from being tampered with so that the entire demolition process including the movement of debris and the overall sequence of demolition can be recorded for reference and review purposes. While the exact number of cameras is to be determined by the AP/RSE, there should be at least one video camera for each site. The location of the video camera(s) should be shown in the demolition plan.

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10. The video records should be kept by the RSC for at least 14 days.

Appointment of Operator of Powered Mechanical Plant or Equipment

11. The use of powered mechanical plant or equipment for demolition works carries risks and particular care should be taken. In certain circumstances, it may even be unsafe and should not be allowed, for example, the use of a crane and hammer in a densely populated area. To ensure public safety, the operator of powered mechanical plant or equipment used in demolition work shall meet the requirements as specified in Regulation 9(3) of the Building (Demolition Works) Regulations.

12. For the purpose of Building (Demolition Works) Regulation 9(3)(b), an operator should have completed a training course in "Demolition of Building Course for Plant Operators" organised by the Construction Industry Training Authority (CITA) and obtained the relevant certificate. Equivalent training and certificate issued by a recognised examining body may also be favourably considered by the BA for meeting the requirement.

13. An application for consent to the commencement of demolition works must be accompanied by the personal particulars, qualifications and experience of the operators of any powered mechanical plant or equipment proposed to be used in the demolition works in accordance with Regulation 31 of the Building (Administration) Regulations. The information to be submitted should include the operators' names in Chinese and English, Hong Kong identity card numbers, dates of birth, addresses and telephone numbers. The BA may refuse the consent application under section 16(3)(b) of the Buildings Ordinance where such particulars have not been submitted.

14. The BA will vet the particulars of the plant operators and advise the AP on the suitability of the operators as soon as possible, having regard to their qualifications, experience and training.

15. Where there is a change in the appointment of the operator, the BA should also be notified within 7 days of the change and provided with the personal particulars, qualifications and experience of the new operator.

Danger from Fire or Explosion

16. Dangerous and hazardous materials left by the previous occupants may cause risk of fire or explosion through the leakage or accumulation of gas or vapour due to demolition operations. RSCs for demolition works should be asked to ensure all flammable goods are removed from site and any remaining flammable goods are stored in proper storage facilities. All parties are drawn to the attention of the provisions of Building (Demolition Works) Regulation 6.

/Demolition

Demolition of Dangerous Buildings

17. In addition to the normal procedures under the Building (Demolition Works) Regulations, some special arrangements specifically apply to the demolition of dangerous buildings under the BA's order. The following notes are given for guidance and are not intended to be exhaustive :

(a) Closure

Immediately after a closure order has been issued and the building vacated, the premises should be secured against unauthorized entry. Otherwise, the BA has the authority to secure the building and charge the costs to the owner. An AP, the owner or anyone affected by the closure who wishes to gain entry to the building subsequently, should apply to the Existing Buildings Division (EBD), BD for a permit.

(b) Shoring

All shores are preferably in structural steel of Grade 250 or above and to comply with the current edition of Code of Practice for the Structural Use of Steel or equivalent. The position of dead shores should first be discussed with EBD. Raking shores or more permanent forms of support for party walls and any common structures should also be suitably designed and constructed. Plans should be submitted for agreement prior to their erection.

In the construction of shores, attention must particularly be given to the connection details between the steel shoring and the party wall.

Temporary shoring should be removed after the demolition works have been completed but, where necessary, should be replaced by a more permanent form of support.

(c) Pedestrian Passageways

Matters relating to pedestrian passageways associated with demolition works are dealt with in PNAP 75.

(d) Joint Demolition

Where several adjacent buildings are to be demolished, an AP appointed in respect of one should not arrange to commence demolition works until the demolition of all buildings can proceed simultaneously. Any consequential delays should be notified to EBD early, so that co-ordination by the parties concerned may be put in hand.

/(e)

(e) Party Walls

In most cases, exposed party walls which remain to enclose existing buildings will require raking or flying shores (**Appendix A**) from the site of the demolished building. In many cases, an order requiring such works may be issued by the BA. Where a party wall is next to a framed building, any such order served may require demolition of the party wall and provision of new enclosure to the framed building.

Where conditions permit, the BA may be prepared to consider alternative permanent measures, to be proposed by the AP in charge. Early discussion will avoid delays.

Party walls that will remain should be regularly inspected as demolition proceeds and repairs (including rendering, facing up cut brickwork and removing old wood joist ends) should be carried out concurrently with the demolition works or in special circumstances, as soon as possible.

(f) Default

Where works have not commenced or have not been carried out within the period specified in the order, the BA may cause the works to be carried out and then recover the costs together with plus supervision charges from the owner. The AP appointed should advise his client accordingly and attend to all matters without delay.

(g) Liaison

It is the duty of the AP to advise the BA of any unexpected weaknesses in adjacent buildings, structures and ground revealed by demolition works. He should immediately discuss with EBD any such problems encountered.

Street Name Signs on Buildings

18. To ensure efficient replacement of street name plates, AP are requested to inform the Director of Highways of any case where street name plates are affixed to buildings to be demolished : Buildings Ordinance section 32 refers.

Public Drainage System

19. To ensure proper updating of drainage records and better control of drainage connections, AP are requested to inform the Drainage Services Department (Hong Kong and Islands Division/Mainland South Division/Mainland North Division, as appropriate) once the Registered General Building Contractor (RGBC) or RSC has completed the sealing of drains : Building (Demolition Works) Regulation 3(2)(b) refers.

/Safety

Safety and Convenience of Third Parties

20. Proper protection and safe passage for the public must be provided at all times by the erection and maintenance of suitable hoardings, covered walkways and gantry, and catch platform.

21. Every effort must be made to minimize any nuisance to the public arising from dust, noise and vibration.

Design of hoarding, covered walkway and gantry, and catch platform

22. Reference could be made to Chapter 3 of Code of Practice for Demolition of Buildings 2004 for the general design requirements of hoarding, covered walkway and gantry, and catch platform. The deck of the catch platform shall be designed to support a uniformly distributed load of 5.0 kPa or a point load of 20 KN acting on an effective area of 300mm x 300mm. Being a temporary structure, a wind load of 0.67 kPa (i.e. 37% of the design wind pressure of 1.82 kPa as given in the Code of Practice on Wind Effects in Hong Kong 2004) could be adopted for checking the stability of these structures.

23. A design example of a gantry with single bay hoarding on each side is given in Appendix B for reference. If the catch platform which shall have a minimum 2000mm distance from the existing building line encroaches into the 500mm (minimum) recess from the carriageway, the catch platform shall be raised to allow 5500mm headroom over the carriageway. For narrow service lanes (width 3.5 m or less) which are generally shielded from wind, a single deck design with the deck functioning as a catch platform fully capable of resisting the superimposed design loads is considered acceptable because of the relatively lower risks associated with these areas. A single deck design for narrow service lanes is also given in Appendix B for reference. Structural justification may not be required if the parameters as adopted in the design examples are strictly followed.

24. Site constraints such as the presence of congested underground utilities and narrow pedestrian walkways may sometimes prohibit the construction of footings and counterweight, or render the sole reliance on counterweight for maintaining stability uneconomical. Under such circumstances, AP/RSE are encouraged to consider more economical designs with recyclable materials as alternatives to the examples given in Appendix B. Such alternatives may include the adoption of a rigorous analysis and/or the provision of tie forces at upper levels in securing the stability of the structure, thus reducing counterweight and/or some structural members' sizes.

Certification on Completion of Demolition Works

25. Within 14 days of the completion of any demolition works, the AP and the RSE shall certify the completion of works in the specified form BA 14A for demolition works. The specified form can be downloaded from BD's website.

/Withdrawal

Withdrawal of PNAP 268

26. With the incorporation of the content of PNAP 268 in the Code of Practice for Demolition of Buildings 2004, PNAP 268 is hereby withdrawn.

(Marco M H WU)
Building Authority

Ref. : BD GP/BREG/DW/1 (III)
BD GP/BORD/27
GC/4/16/1 (GEO file)

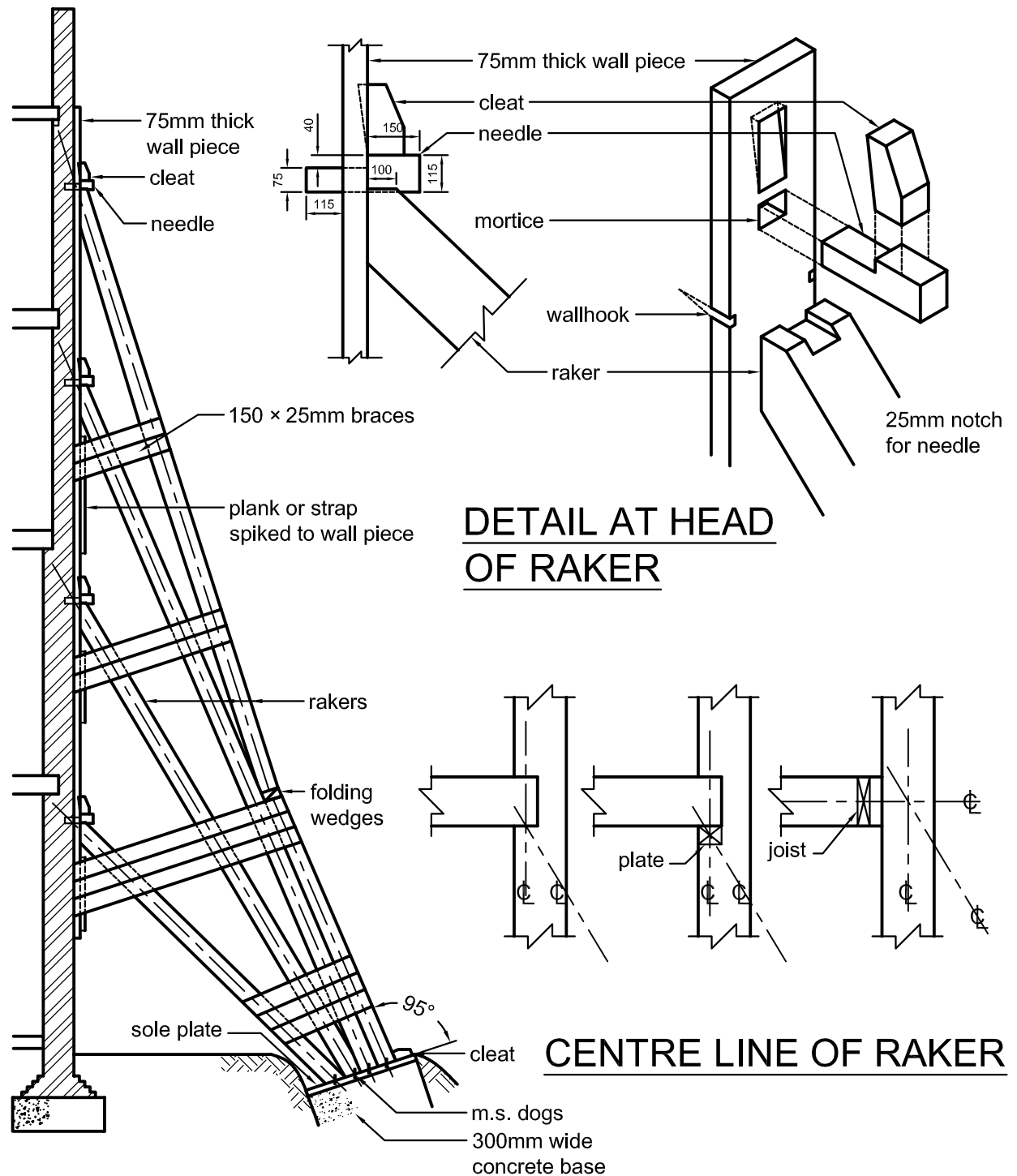
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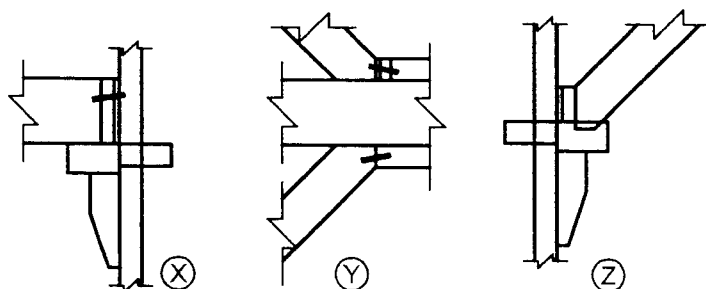
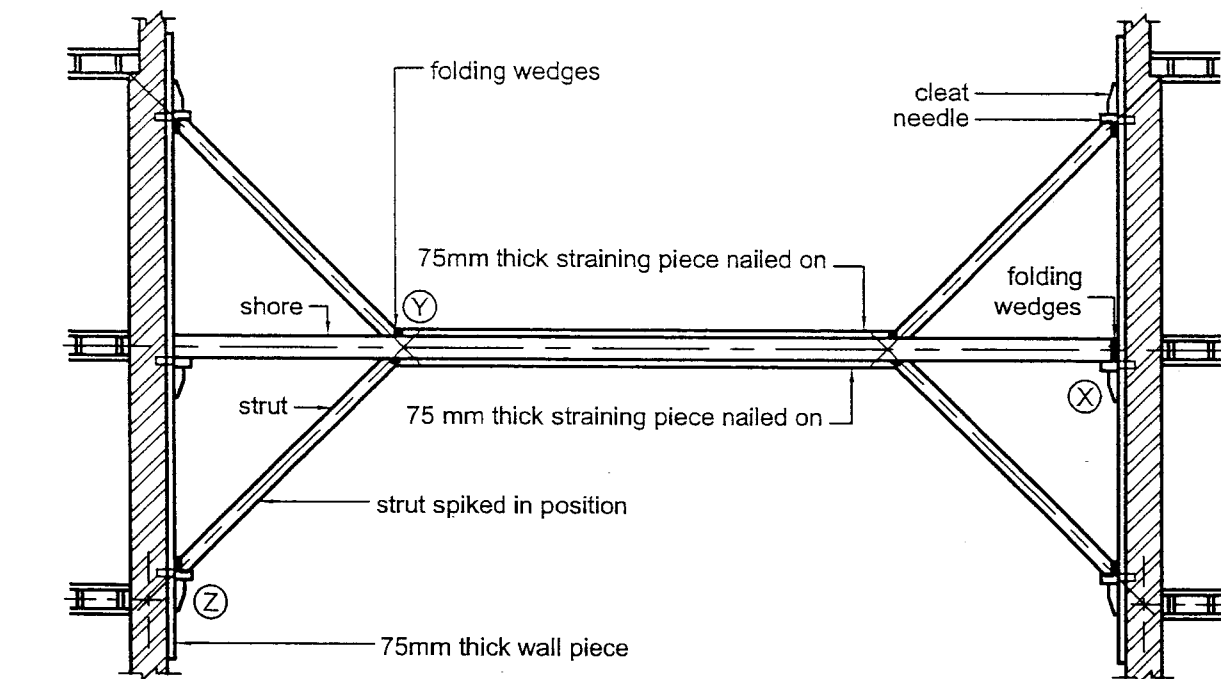
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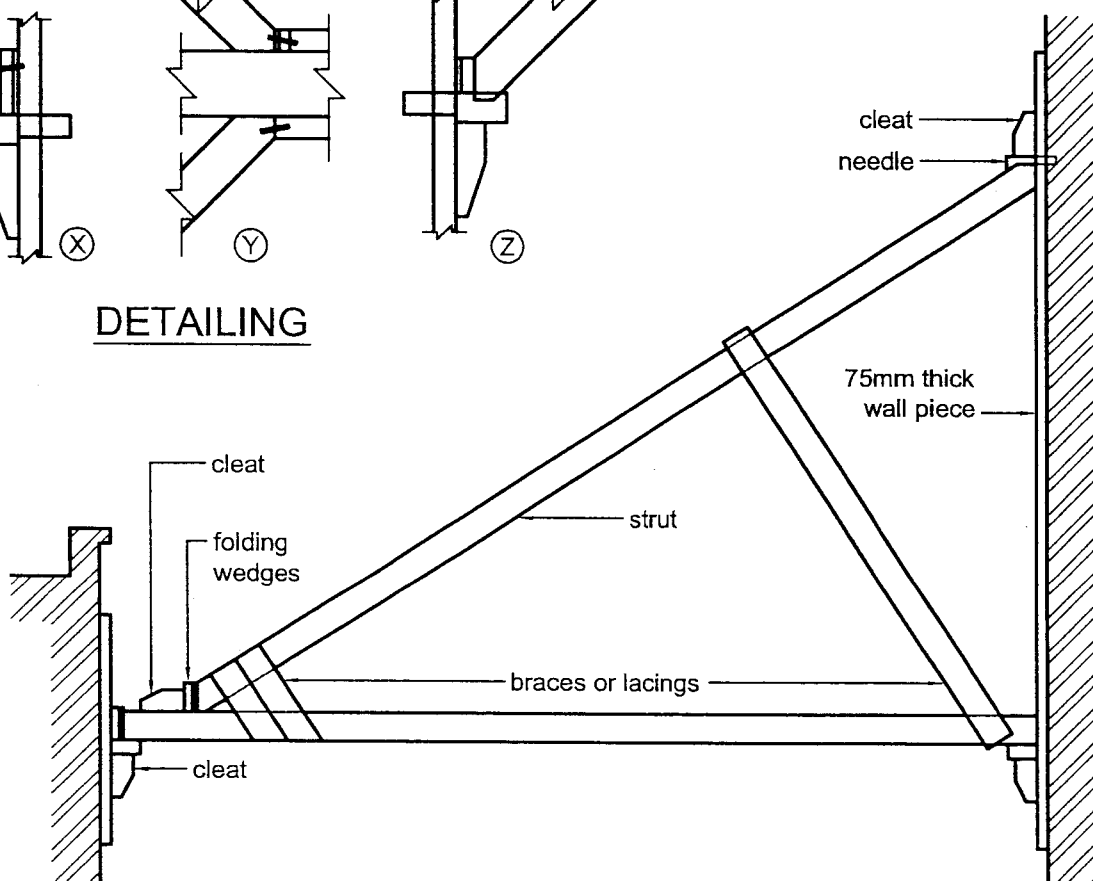
RAKING SHORES

NOTES: SPACING OF RAKING SHORES NOT TO EXCEED 5m

| HEIGHT OF WALL | NO. OF RAKERS PER SET | SIZE OF RAKERS |
|----------------|-----------------------|----------------|
| 6m | 2 | 150 × 150 |
| 9m | 3 | 150 × 150 |
| 12m | 4 | 175 × 175 |
| 15m | 5 | 200 × 200 |



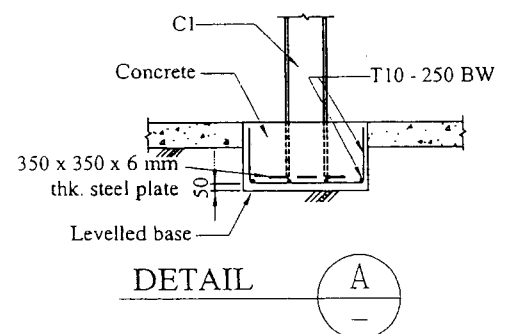
DETAILING



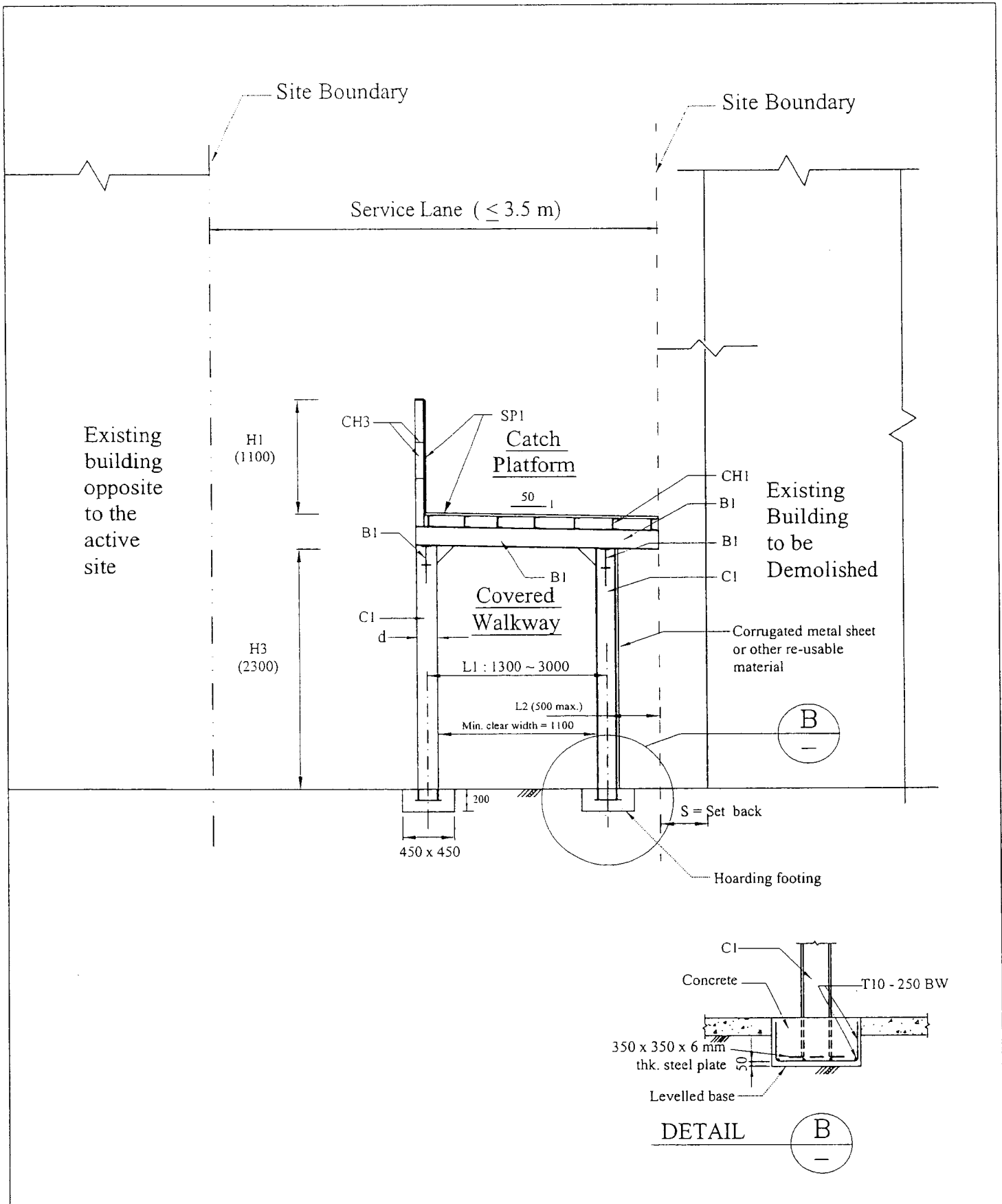
FLYING SHORES

NOTES: SPACING OF FLYING SHORES TO BE 3m - 5m

| SIZE OF MEMBERS | | |
|-----------------|---------------|---|
| | SPAN UP TO 5m | SPAN 5m - 11m |
| FLYING SHORES | 125 × 125 | 150 × 150 TO 225 × 225 (e.g. for 6m — 175 × 175) |
| RAKING STRUTS | 125 × 125 | 125 × 125 TO 200 × 200 |



(see page 5 for design assumptions and structural member schedule)

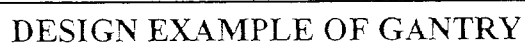


**DESIGN EXAMPLE OF SINGLE DECK DESIGN
FOR SERVICE LANE ≤ 3.5 m WIDTH**

(see page 5 for design assumptions and structural member schedule)



(see page 5 for design assumptions and structural member schedule)



(see page 5 for design assumptions and structural member schedule)

Design example:

| | | | |
|--|---|-----------------------------------|---------------------|
| L1 (m) | $1.3 \leq L1 < 1.6$ | $1.6 \leq L1 < 2.3$ | $2.3 \leq L1 < 3.0$ |
| L2 (m) | 0.5 or less | | |
| H1 (m) | 1.1 | | |
| H2 (m) | 0.9 or less | | |
| H3 (m) | 2.3 | | |
| S (m) | Any value | | |
| Hoarding/Covered Walkway Footing Size: L x W x D (mm) Rebar size, spacing and location | 450 x 450 x 200 deep T10 @ 250 B W | | |
| Gantry Footing Size: L x W x D (mm) Rebar size, spacing and location | 800 x 800 x 200 deep T10 @ 250 B W | | |
| Counterweight Size: Lu x Wu x Hu (mm) Rebar size, spacing and location | 2400 x 200 x 600 T10 @ 300 B F | 2400 x 200 x 340 T10 @ 300 B F | Not required |
| C1 | 152 x 152 x 23 UC | | |
| B1 | 152 x 89 x 16 UB | | |
| B2 | 305 x 102 x 28 UB | | |
| B3 | 127 x 76 x 13 UB | | |
| CH1 | 127 x 64 x 14.9 Channel @ 300 c/c | | |
| CH2 | 102 x 51 x 10.42 Channel | | |
| CH3 | 127 x 64 x 14.9 Channel | | |
| CH4 | 76 x 38 x 6.7 Channel @ 600 c/c | | |
| SP1 | 6mm steel plate of mild steel grade or equivalent | | |
| SP2 | 3mm steel plate of mild steel grade or equivalent | | |
| Stiffener Plate | 6mm steel plate of mild steel grade or equivalent | | |
| Base plate | 6mm steel plate of mild steel grade or equivalent | | |

Design assumptions

- (a) All structural steelwork shall be grade 250 and design complies with Structural Use of Steel in Hong Kong, 1987.
- (b) All connections between steel members shall be 6mm fillet weld leg length all round.
- (c) Wind load is based on 0.67 kPa, i.e. 37% of the design wind pressure of 1.82 kPa.
- (d) Safe bearing pressure of soil underneath pavement is 100 kPa (or 125 kPa with wind condition).
- (e) No overhang of the catch platform on the side of carriageway.
- (f) 6m bay width of gantry is adopted.
- (g) 2.4m bay width of hoarding/covered walkway is adopted.

Design assumptions and structural member schedule