

Practice Notes For Construction Managers
PNCM 2: Bamboo Scaffolding - First Issue, April 2003

(Index under: Temporary Works)

Contents

| | <u>Page</u> |
|---|--------------------|
| 1. Scope of this Practice Note/Introduction | 1 |
| 2. Definition of Bamboo Scaffolding | 1 |
| 3. Terminology | 1 |
| 4. Statutory Ordinance, Regulations and Codes of Practice | 1 |
| 5. Statutory Forms | 1 |
| 6. Selection of Subcontractor | 2 |
| 7. Planning and Design | 2 |
| 8. Erection | 2 |
| 9. Addition and Alteration | 3 |
| 10. Inspection and Maintenance | 3 |
| 11. Dismantling | 3 |
| 12. Technical Requirements for Bamboo Scaffolding | 3 |
| 13. Safety Requirements | 4 |
| 14. Common Malpractice and Mistakes | 6 |
| 15. Emergency Preparedness / Crisis Management | 6 |
| 16. Responsibility of Construction Manager | 7 |
| 17. Flow Chart | 7 |
| 18. References | 7 |
| Appendix I | 8 |
| Appendix II | 9 |

COPYRIGHT

All rights reserved. No part of this publication or its subsequent issues and amendments may be reproduced in any form or by any means without the prior written permission of Hong Kong Institute of Construction Managers.

DISCLAIMER

These Practice Notes, its subsequent issues and amendments are for the reference and private use of members of HKICM only. While every precaution has been taken to ensure accuracy, neither Hong Kong Institute of Construction Managers nor Members of the Editorial Board would accept responsibility for any claims, losses or expenses arising out of its use.

PRACTICE NOTES FOR CONSTRUCTION MANAGERS

PNCM 2: BAMBOO SCAFFOLDING

1. Scope of this Practice Note/Introduction

This PNCM 2 covers the usual good practice of a construction manager in carrying out his/her professional duties as related to “bamboo scaffolding” under normal circumstances. It is not to be used for any other purpose. It covers the essential aspects on the planning and erection of “Bamboo Scaffolding”.

2. Definition of Bamboo Scaffolding

“Bamboo Scaffolding” is any temporary bamboo structure that is used for the purpose of scaffolding by works contractor in construction site of average difficulty.

3. Specific Terms

- **Competent Examiner**
- **Trained Worker**
- **Double-row Scaffold**
- **Catch Fan**
- **Working Platform**
- **Special Scaffold**
- **Monitoring**
- **Putlogs**
- **Green Card**

4. Statutory Ordinance, Regulations and Codes of Practice

- **Factories and Industrial Undertaking Ordinance (Cap. 59)**
- **Occupational Safety and Health Ordinance (Cap.509)**
- **Construction Sites (Safety) Regulation**
- **Code of Practice for Bamboo Scaffolding Safety**
- **Practice Notes for Registered Contractor**

5. Statutory Forms

- **Form 5 – Inspection by a competent person**

6. Selection of Subcontractor

Selection criteria should include that the selected subcontractor is competent and capable to make adequate provisions for safety and health and a good plan for scaffolding work.

During the process of selection, the subcontractor should be required to submit an outline-scaffolding plan to demonstrate the intended safe system of work.

The appointed subcontractor is required to finalize a detailed scaffolding plan that complies the ultimate service requirement on the basis of the outline scaffolding plan. The plan should spell out the ways and methods to execute the work safely and effectively in accordance with the current statutory requirements.

7. Planning and Design

- **The first task shall be the identification of all kinds of explicit and implicit risks and hazards of the site and the scaffold system**
- **The design shall be proposed, checked and approved before the erection, addition and alteration of any bamboo scaffolding.**
- **The design, method statement, erection, addition and alteration shall be mutually compatible and consistent.**
- **The system shall be designed to withstand (i) dead load (ii) construction and working loads (iii) wind loads (iv) other loads**
- **The estimate of wind loads shall be based on “The Code of Practice on Wind Effects, Hong Kong”**
- **For complex system, the design shall be carried out by a competent professional engineer.**
- **There shall be an approved and adopted safety plan and quality plan respectively for the scaffolding.**
- **The approved Method Statement shall cover “responsibilities, sequencing, stability, detailed work method, safety features, contingency arrangement, etc.”**
- **The design data, assumptions, presumed site environment, assumed ground support shall all be verified and monitored on site.**

8. Erection

- **The Scaffold shall be erected in accordance with Design, Drawing, Specification, Method Statement, etc.**
- **All substandard materials shall not be used and shall be removed from site.**
- **The erection shall be properly done by trained workers and be properly supervised by competent examiner / supervisor.**
- **The completed system shall be properly inspected and certified prior to any use for the intended function and usage.**

9. Addition and Alteration

- No addition or alteration to the existing system shall be commenced without prior planning, design, approval, and arrangement for supervision.
- Any addition or alteration shall be properly done, supervised and certified.

10. Inspection and Maintenance

- Inspection shall be carried out for material delivered to site, selection, erection, addition, supervision, etc.
- Inspection shall be performed before and after the onset of typhoon, strong wind, heavy rainfall and flooding.
- The existing system shall be inspected and maintained regularly on weekly basis or at higher frequency if necessary.

11. Dismantling

- The dismantling shall comply with the safety and quality principles adopted for the demolition/removal of “building works/structures.

12. Technical Requirements for Bamboo Scaffolding

a. Preparation

- ✧ The subcontractor of bamboo scaffolding shall submit a method statement for the design, erection, maintenance and dismantling of bamboo scaffolding prior to each stage of work. The design shall consider the wind load, dead load and live load imposed on the bamboo scaffold.
- ✧ A specific safety meeting shall be held to discuss the method statement for erection of bamboo scaffold issued by the subcontractor.
- ✧ Prepare a risk assessment by project team to identify the potential hazards and control measures for the erection of bamboo scaffold.

b. Specifications

- ✧ Double-row Scaffold (雙棚架)
Only double-row bamboo scaffold is allowed to use for working at height.
- ✧ Nylon Mesh (尼龍網)
The perimeter of bamboo scaffold shall be covered by nylon mesh against falling objects. The lapping of nylon mesh should be at least 100mm wide.
- ✧ Access and Egress (通道)
Suitable means of access shall be provided from the building or ground level to the scaffold such as gangway, stairs and ladder etc.
- ✧ Catch Fan (斜棚)
Sloping catch fan shall be erected at a level close to the first floor and at not more than 15 metres vertical intervals to give minimum horizontal protection coverage of 1500mm. Large catch fan shall be erected at specific location to protect the public and/ or workers underneath.
- ✧ Platform of Catch Fan or Receptacle (運身橋)
A suitable receptacle, which covered with galvanized zinc sheet, should be provided within each catch-fan to tap falling objects.
- ✧ Steel Bracket (狗臂架)

Steel brackets shall be provided for supporting the standard of scaffold at about six floor intervals. The horizontal distance between steel brackets is about 3 metres.

✧ **Putlogs (拉孟)**

Mild steel bars or similar materials are required to tie any structure to maintain the bamboo scaffold in its position on every floor. The distance of adjacent putlogs is about 3 to 4 metres.

✧ **Working Platform (工作台)**

Every working platform shall be of at least 400mm wide and be closely boarded by planks. The edges of working platform shall be protected by not less than 2 horizontal bamboo members of the scaffold at intervals between 750mm to 900mm and suitable toe-boards with not less than 200mm high.

✧ **Special Scaffold (特別棚架)**

All scaffolds of height excess 15 metres shall be designed by Engineer. The Engineer shall be responsible for the design of special scaffolds.

✧ **Competent Examiner (合資格人士)**

They should complete a formal training in bamboo scaffolding work or hold trade test certificate on bamboo scaffolding and have at least 10 years of relevant experience.

✧ **Trained Worker (已受訓工人)**

They should complete a formal training in bamboo scaffolding work or hold trade test certificate on bamboo scaffolding and have at least 3 years of relevant experience.

13. Safety Requirements

- ✧ **The storage of materials shall be maintained in secure and stable condition.**
- ✧ **The lifting of materials shall be carried out by experienced riggers.**
- ✧ **Sound materials shall be used for erection of bamboo scaffold.**
- ✧ **All hand tools shall be inspected by scaffolders prior to use.**
- ✧ **No overloading or shock load on the scaffold was allowed.**
- ✧ **Debris and waste materials shall be cleared away from the scaffold/ platform at regular intervals.**
- ✧ **The winch, which was used for dismantling of bamboo scaffold, shall be examined and inspected in accordance with the Factories & Industrial Undertaking (Lifting Appliances and Lifting Gear) Regulation.**

Inspection and Maintenance

- ✧ **To appoint a competent person to carry out routine inspection for bamboo scaffolds. The appointment of competent person shall be made in writing.**
- ✧ **The results of inspection shall be filled in Approved Form – Form 5 under the Construction Sites (Safety) Regulation.**
- ✧ **The inspection of bamboo scaffold shall be carried out before first use, for every 14 days, any alternation of scaffold and after adverse weather.**
- ✧ **Copies of the inspection report (Form 5) shall be submitted to the Safety Officer /Site Agent and be kept in site office for record.**

Dismantling of Bamboo Scaffold

- ✧ **The subcontractor shall establish method statement for dismantling of bamboo scaffold before the work.**
- ✧ **A specific safety meeting shall be held to discuss the method statement for dismantling of bamboo scaffold.**
- ✧ **Prepare a risk assessment by project team to identify the potential hazards and control measures for the dismantling of bamboo scaffold.**

Personal Protective Equipment

- ✧ **All bamboo scaffolder shall use fall arresting device while erection or dismantling of bamboo scaffold, it included safety harness, fall arrested independent lifeline, etc.**
- ✧ **All personal protective equipment shall be complied with the international standards or be approved by the Commissioner of Labour.**
- ✧ **The independent lifelines shall be securely installed to anchorage point.**
- ✧ **All equipment shall be inspected before every use to ensure it in good working order.**

Safety Training

- ✧ **All workers shall held valid Green Card and attend safety induction training.**
- ✧ **All scaffolders shall be trained to familiar the construction method for erection and dismantling of bamboo scaffold.**
- ✧ **Appropriate safety training shall be arranged to all scaffolders for the use of fall arresting devices.**
- ✧ **Specific safety training shall be arranged for handling of materials, e.g. manual handling operation.**

Monitoring

- ✧ **The Area Foreman shall monitor the erection, dismantling, and the use of scaffold during daily inspection whenever necessary. He shall stop unsafe acts and misuse of the scaffold and report outstanding matters to Site Agent and/ or Safety Officer. He shall also arrange remedial actions to rectify the irregularities.**
- ✧ **When faults or irregularities are found in the course of inspection, the competent person shall inform the Project Manager, Site Agent and/ or Safety Officer immediately and shall record the details of irregularities and corrective actions required on the Form 5.**
- ✧ **The Safety Officer shall carry out routine safety inspection to identify hazards and made recommendations for bamboo scaffolds and monitor any remedial actions have been taken to rectify irregularities. He shall check & retain the approved form of bamboo scaffold (Form 5).**

14. Common Malpractice and Mistakes

- **Fail to up-dated the Form 5 every fortnight.**
- **Under-estimate the importance of the technical requirement of CP.**
- **Fail to enforce the use of PPE while erection and / or dismantling of bamboo scaffolding.**
- **Tiles are cut by workers of other trade as being considered obstructing their works.**
- **Fail to provide working platform and / or configuration not up to standard.**
- **Fail to submit Engineer's design for bamboo scaffolding of height more than 15m.**
- **Workers working directly above or below another work team without separation.**

15. Emergency Preparedness / Crisis Management

- a) **Bamboo / Ties cut by workers of other trades.**
After reported by F or GF, the CM should request the CP to check immediately.
- b) **Bamboo scaffolding fell down**
 - a) **Identify any victims under the scaffolding.**
 - b) **Call the police and direct the traffic flow.**
 - c) **Ask CP/CW to dismantle and tie back to avoid further damage.**
 - d) **SM/SO/SS to report the status and investigate the cause of the accident/incident.**
 - e) **To report to the top-management if any penalty to the guilty party is to be imposed.**

16. Responsibility of Construction Manager

- **To ensure that the design was properly done and checked by competent person**
- **To ensure that there are adequate resources (human resources, materials, plants, equipments, documents, etc.) on site before the commencement of any works**
- **To ensure that the safety officer/supervisor have performed their relevant duty properly**
- **To ensure that the safety measures on site have been properly checked and are found adequate**
- **To ensure that all materials delivered to site shall comply with specification and disapproved materials are genuinely removed from site.**
- **To ensure that the erection, addition, alteration and dismantling are supervised and properly done by trained workers in accordance with the Drawing and the Method Statement.**
- **To ensure that the scaffold system will be and have been properly maintained.**
- **To ensure that all common malpractice & mistakes have been avoided.**
- **To ensure that emergency measures and crisis management will be properly implemented.**

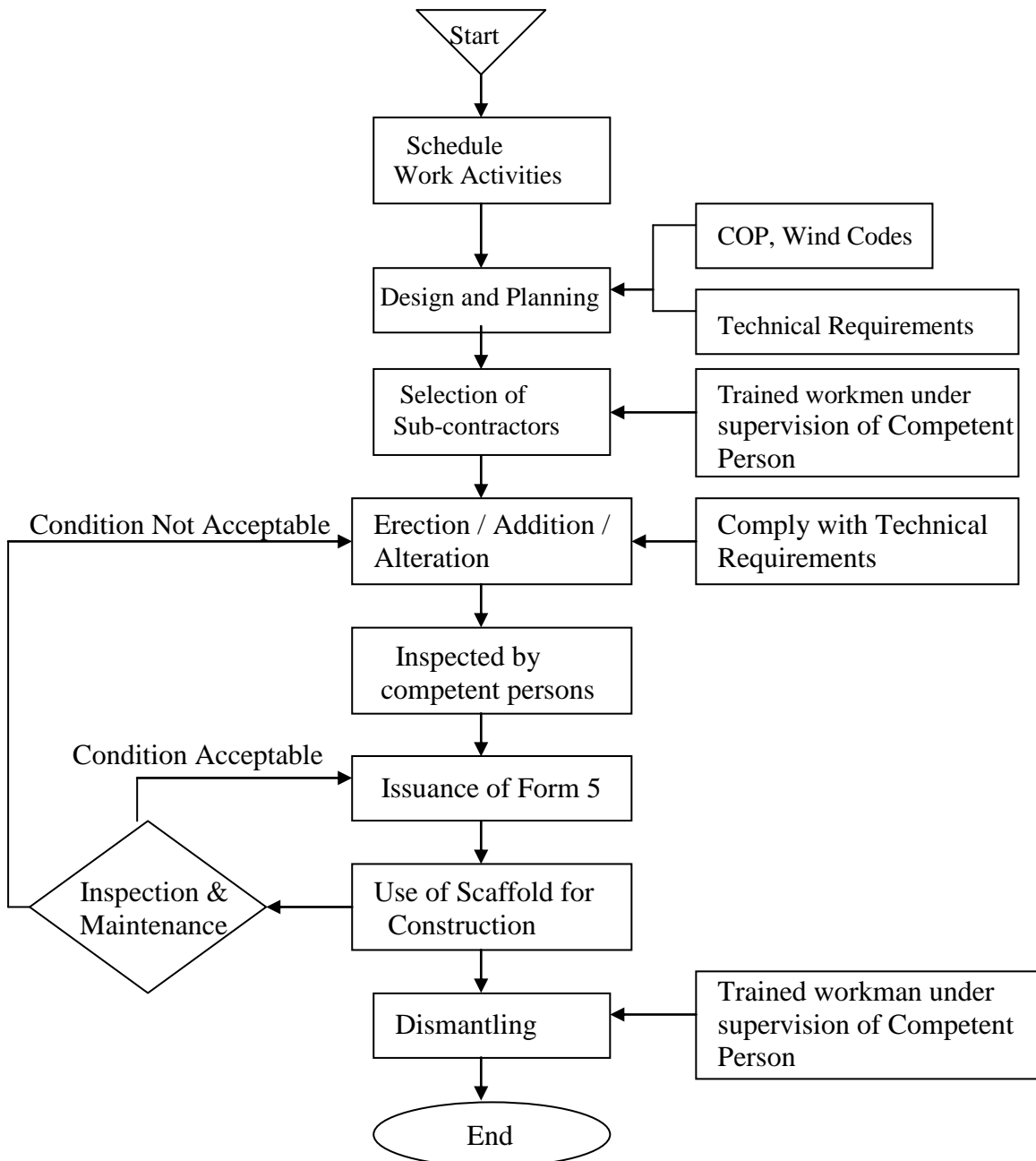
17. Flow Chart
See Appendix I

18. References
See Appendix II

First Issue April 03
Grouping Legend:
Index under: Bamboo Scaffolding

Appendix I

Flow Chart for Construction Management of Bamboo Scaffold System



Appendix II

References

Regulation

- Construction Site (Safety) Regulation section 38A, 38B, 38C, 38D, 38E, 38F, 38H, 38I, 48, 49, 52 & Third Schedule to the CSSR.

Ordinance

- Factories & Industrial Undertaking Ordinance, Chapter 59 Section 6A, 6B & 7A
- Occupational Safety and Health Ordinance Section 9 & 10

Code of Practice

- Code of Practice for Bamboo Scaffolding Safety of the Labour Department (03.2001)
- Code of Practice for Bamboo Scaffolding Safety of the Labour Department (1995) – Revoked by Item 1 in 2002

Practice Note

- Practice Note for Registered Contractors No. 26 & 28 of Building Department

Statutory Form

- Scaffolding Inspection Form 5 under Regulation 38 F of the Construction Sites (Safety) Regulations

Letter

- Letter of Commissioner for Labour dated December 24, 2002

In-house Safety Rule

- If any