## COMPENDIUM OF TYPICAL HAZARDS ASSOCIATED WITH PRE-CASTING CONCRETE AND THEIR CONTROL MEASURES IN THE CONSTRUCTION INDUSTRY

### PRE-CASTING CONCRETE

<table>
<thead>
<tr>
<th>No.</th>
<th>Hazards</th>
<th>Possible Control Measures</th>
<th>Useful Tips / Links</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Falling from height</td>
<td>• Provide proper access and work platform with edge protection</td>
<td>Refer to Technical Advisory on Falls from Heights (ProBE) by MOM¹</td>
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<tr>
<td></td>
<td>Refer to Technical</td>
<td>• Provide, check and use adequate and appropriate PPE</td>
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<td></td>
<td>Advisory on Falls from Heights (ProBE) by MOM¹</td>
<td>• Ensure that debris does not accumulate at the work area or on access ways such as scaffolds</td>
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<tr>
<td>1.2</td>
<td>Slip or trip due to poor housekeeping</td>
<td>• Practice good housekeeping</td>
<td></td>
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<td></td>
<td></td>
<td>• Conduct regular safety inspection</td>
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<tr>
<td>2.1</td>
<td>Toppling of Crane</td>
<td>• Display safe working load prominently on the crane</td>
<td></td>
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¹ MOM: Ministry of Manpower
| 2.2 | Struck by falling objects such as concrete bracket | • Provide, check and use steel plates to ensure stable grounds  
| | | • Ensure that there is effective communication between signalman and crane operator (e.g. by use of walkie-talkie)  
| | | • Implement a regular inspection and maintenance programme for all lifting equipment  
| | • Employ certified rigger and signalman to carry out lifting operations  
| | • Conduct immediate supervision of lifting operations  
| | • Implement Permit-to-Work system  
| | See Appendix Figure 1  
| | See Appendix Figure 2  
| | Refer to Circular on Riggers and Signalmen Attire in Construction and Building Sites²  
| 3. | Hot Work |  
| 3.1 | Fire and explosion caused by flammables | • Keep combustible and flammable materials away from the hot work area  
| | | • Install flashback arrestor on the gas cylinders  
| | | • Implement hot work permit system  
| | | • Keep fire-fighting equipment ready and at close proximity  
| | See Appendix Figure 3  
| | See Appendix Figure 4  
| 4. | Preparation of Mould |  

4.1 Cut by sharp edges of the mould
   - Re-design mould to eliminate sharp edges
   - Provide and use gloves when handling the mould

4.2 Hands caught in between moving parts of the machine
   - Install blinking lights or sirens to indicate the movements of the machine
   - Implement safe work procedures

4.3 Rashes from contact with the mould oil
   - Provide and use adequate and appropriate hand protection e.g. impervious gloves

5. Setting up the Mould

5.1 Cut be re-bar during installation into the mould
   - Place re-bar cap on end of re-bar
   - Implement safe work procedures
   - Provide and use adequate and appropriate PPE

5.2 Sprains and strains from handling and pulling of heavy objects
   - Use mechanical aids for heavy objects
   - Conduct training and supervision for proper lifting and posture
   - Implement job rotation

6. Casting of Concrete

Refer to Guidelines on Manual Handling by MOM³
| 6.1 | Skin rashes from contact with the cement | • Provide and use adequate and appropriate hand protection (e.g. impervious gloves) |
| 6.2 | Excessive noise exposure | • Implement hearing conservation programme  
• Conduct annual audiometric examinations  
• Provide, maintain and use adequate and appropriate hearing protection |
| 6.3 | Cement splashing into eyes | • Provide, check and use safety goggles |
| 6.4 | Falling from height (if the mould is more than 2m high) | • Construct a proper and stable working platform  
• Provide, maintain and use adequate and appropriate PPE |

### 7. De-moulding

| 7.1 | Cuts during the removal of tie-backs and securing points of the mould | • Provide and use adequate and appropriate hand protection |
| 7.2 | Struck by falling mould parts during the removal of the tie-backs and securing points of the mould | • Barricade the area and display warning signs  
• Conduct regular in-house inspections  
• Provide and use adequate and appropriate PPE |

See Appendix Figure 8

| 7.3 | Fall of load due to lifting lug overloading or | • Ensure proper design  
• Follow proper sequence of de-moulding |
insufficient curing
• Provide adequate supervision of work process

1 To access the resource go to www.mom.gov.sg/maintainging_safe_and_healthy_workplace.html → ‘Programme-based Engagement (ProBE)’ → ‘Work @ Heights ProBE’ → ‘Compliance Assistance – Technical Advisory’
2 To access the resource go to www.mom.gov.sg/building_capabilities.html → ‘Managing Workplace Hazards’ → ‘Machinery/Equipment’ → ‘Circulars’ → ‘Riggers and Signalmen Attire in Construction and Building Sites’
3 To access the resource go to www.mom.gov.sg/building_capabilities.html → ‘Managing Workplace Hazards’ → ‘Ergonomics’ → ‘Manual Handling’
Figure 1: Steel Plates for Crane Access

Return to section 2.1
Figure 2: Inspection and Maintenance Programme

Return to section 2.1
Figure 3: Flashback Arrestor

Return to section 3.1
Figure 4: Fire-fighting Equipment on Standby

Return to section 3.1
Figure 5: Provide Appropriate Gloves for Handling the Moulds

Return to section 4.1
Figure 6: Re-bar End Caps

Return to section 5.1
Figure 7: Example of Mechanical Aid for Transporting Heavy Objects

Return to section 5.2
Figure 8: Barrication and Display of Warning Signs

Return to section 7.2
Contents of the resource are originated from the Risk Assessment workshops organized by the Singapore Contractors Association Limited with the support of the Occupational Safety and Health Division of the Ministry of Manpower.

This material is not intended to be an exhaustive list of hazards and control measures for the above activities. Companies are to conduct risk assessment on the work activities specific to their workplaces by identifying the hazards, evaluating the risk and determining suitable control measures where appropriate. References should be made to the relevant regulations and code of practices when in doubt.