مركز أبوظبي للسلامة والصحة المهنية
ABU DHABI OCCUPATIONAL SAFETY AND HEALTH CENTER

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Abu Dhabi Occupational Safety and Health System Framework

(OSHAD-SF)

Code of Practice

CoP 40.0 – False Work (Formwork)

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Important Note:

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(إعادة نشر الوثيقة لاستمرار التطبيق بإشراف مركز أبوظبي للصحة العامة)

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1. Introduction

(a) This Code of Practice (CoP) applies to all employers within the Emirate of Abu Dhabi. This CoP is designed to incorporate requirements set by Abu Dhabi Occupational Safety and Health Center (OSHAD) and Sector Regulatory Authorities in the Emirate of Abu Dhabi.

(b) This CoP establishes the requirements and standards so that the risks associated with false-work are assessed, that control measures are implemented in accordance with the hierarchy of controls and ensures measures are taken to prevent injury, illness and disease to persons who might be exposed to risks arising from those activities.

(c) This CoP applies to the overall management of false-work and to the obligations and requirements of employers, designers, consultants, contractors and employees.

(d) False-work is defined as any temporary structure used to support a permanent structure during its erection and until it becomes self-supporting, it includes the form or mould into which concrete is poured, often referred to as ‘Formwork’.

(e) This definition also applies not only to in-situ concrete construction, but also precast concrete structures, structural steel, steel erection, and items as brick arches and any construction method where the permanent structure may have a period of instability requiring support during the erection process.

(f) This includes false-work which is installed to support structural elements such as in-situ slabs and is designed to take the load of the supported structural element and its own weight in addition to other loads arising from wind and normal casting operations.

2. Training and Competency

(a) Employers shall ensure that OSH training complies with the requirements of:

(i) *OSHAD-SF– Element 5 – Training and Competency;*

(ii) *OSHAD-SF – Mechanism 7.0 – OSH Professional Entity Registration; and*

(iii) *OSHAD-SF – Mechanism 8.0 –OSH Practitioner Registration.*

(b) In accordance with *OSHAD-SF – Element 1 – Roles, Responsibilities and Self-Regulation* Section 3.2.5.employers shall ensure employees required to implement the requirements of this CoP are trained in false-work erection and understand the risks associated with using the equipment and materials and the control measures are implemented by the employer.

(c) Employers shall ensure all employees involved in erecting false-work to provide support to structures under construction are trained to recognise and respond to hazards associated with this type of work.

(d) Training shall be tailored to the specific requirements of the jobsite and include any unique issues and requirements.

(e) Employers shall ensure an overall training programme is provided for both employees and supervisors which shall include the following with regards to false-work:

(i) reasonably foreseeable hazards and risks;

(ii) site rules and prohibited activities;

(iii) safe methods of working; and

(iv) personal protective equipment.

(f) Employers shall maintain a record of the required training that contains the following information:

(i) name and ID number;

(ii) Emirates ID number;

(iii) subject(s) of training;

(iv) date(s) of training; and

(v) person(s) providing the training.

3. Requirements

3.1 Roles and Responsibilities

3.1.1 Employers

(a) Employers shall undertake their roles and responsibilities in accordance with the general requirements of *OSHAD-SF – Element 1 – Roles, Responsibilities and Self-Regulation* Section 3.2.5.

(b) Employers shall undertake their specific roles and responsibilities in accordance with the following:

(i) all false-work erection is appropriately planned, organized and appropriately supervised;

(ii) those involved in false-work erection are trained and competent;

(iii) the place where false-work erection is carried out is safe;

(iv) false-work equipment and materials are appropriately inspected;

(v) inform the Principal Contractor and any other relevant parties of the selected method for false-work erection and the equipment to be used;

(vi) obtain all necessary work permits and authorizations and provide all necessary notifications concerning the work;

(vii) nominate a person to implement the control measures and to supervise the work at all times. This person shall be competent in the type of false-work erection needed for the particular project and experienced in the implementation of safe work control measures; and

(viii) when it has been confirmed that the permanent structure has attained appropriate strength, issue formal permission to dismantle the false-work.

3.1.2 Principal Contractors

(a) In the case of the Building and Construction Sector, Principal Contractors shall undertake their roles and responsibilities in accordance with the general requirements of *OSHAD-SF – CoP 53.0 – OSH Management during Construction Work.*

(b) Principal Contractors shall undertake their specific roles and responsibilities in accordance with the following:

(i) ensure that employers have all available descriptions of the site, including design drawings, site surveys, plans of services and information on the nature and location of hazardous materials, the nature of building materials and the building or structure's relationship to surrounding properties; and

(ii) all relevant authorities and utility service providers are notified and all necessary approvals are obtained before work commences.

3.1.3 Designers

(a) Designers shall undertake their roles and responsibilities in accordance with the general requirements of OSHAD-SF – *CoP 20.0 – Safety in Design (Construction)*.

(b) Designers shall undertake their specific roles and responsibilities in accordance with the following:

(i) consideration of the risks to environment, health and safety during construction, maintenance and subsequent demolition and that the design specifications incorporate particular requirements for false-work erection to be carried out safely; and

(ii) in the case of false-work used to support in-situ reinforced concrete, specifications are provided as part of the design on the concrete strength to be reached before the false-work can be safely removed.

3.1.4 Employees

(a) Employees shall undertake their roles and responsibilities in accordance with the general requirements of *OSHAD-SF – Element 1 – Roles, Responsibilities and Self-Regulation* Section 3.2.7.

(b) Employees shall undertake their specific roles and responsibilities in accordance with the following:

(i) following information provided by the employer regarding false-work erection;

(ii) observing false-work erection control measures and operating procedures prescribed by the employer, including the observation of warning signs; and

(iii) use PPE in accordance with the employer's instructions whilst erecting false-work., consistent with *OSHAD-SF – CoP 2.0 – Personal Protective Equipment*.

3.2 Planning and Assessment

3.2.1 Assessment

(a) Employers shall ensure the following:

(i) an assessment of the various risks is undertaken and systems of work are established which are safe to all parties involved or affected including the public;

(ii) that effective control measures are implemented in order to manage false-work activities safely and without risk to health;

(iii) that for the Building and Construction Sector the management of false-work requirements are included in the Pre-Tender Safety and Health Plan in accordance with OSHAD-SF – *CoP 53.0 – OSH Management during Construction Work*; and

(iv) that associated safe systems of work, and site rules are included in the Safety and Health Construction Management Plan (OSH-CMP) in the case of the Building and Construction Sector in accordance with *OSHAD –SF – CoP 53.0 – OSH Management during Construction Work*.

(b) Employers shall ensure prior to the construction of any false-work that a risk assessment is undertaken to ensure control measures are identified to prevent or minimise exposure to health and safety risks. Refer to *OSHAD-SF– Element 2 – Risk Management.*

(c) Employers shall ensure the risk assessment considers the following hazards associated with erecting false-work which may include:

(i) persons falling during the erection of false-work;

(ii) poor erection of false-work;

(iii) poor quality materials;

(iv) collapse of false-work during erection or under load;

(v) bursting of shuttering when concrete is poured;

(vi) collapse of structural concrete where false-work is removed;

(vii) manual handling of concrete shuttering and reinforcement bars;

(viii) being struck by a concrete skip suspended by a crane;

(ix) silica dust from scrabbling operations;

(x) hand abrasions to those tying steel reinforcement bars;

(xi) manual handling and ergonomic considerations for steel fixers; and

(xii) cement burns from wet concrete.

3.2.2 Design and Planning

(a) Employers shall ensure the planning for false-work erection is commenced at the initial design stage with designers taking into account the need for, and the practicality of, safe methods of working during false-work in accordance with the general requirements of *(OSHAD-SF) – CoP 20.0 – Safety In Design (Construction)*.

(b) Employers shall consider the following during the design process:

(i) stability of the false-work at all stages of erection;

(ii) the effect of the false-work erection sequence on stability and where this is critical, the sequence shall be stipulated; and

(iii) provision of safe access to work at height areas and provision of safe working places for those involved in false-work erection.

(c) Design specifications shall incorporate particular requirements and essential information for the scheme to be planned and erected safely and include:

(i) whether the false-work design is provided as a standard or a bespoke design;

(ii) in the case of a bespoke design detailed loading calculations shall be prepared for the specific design of the false-work;

(iii) the estimation of loads to be supported by false-work;

(iv) the weight of the permanent structure and other factors are to be included in the calculation of loads to be applied to false-work;

(v) the loading sequence to prevent the build-up of stresses in individual members of the false-work support structure;

(vi) elimination of the possibility of moment reversal and uplift on supports, the designer of false-work shall consider the following:

1. sequence of pouring;
2. method of pouring (continuous or in bays placed on different days);
3. type of applied vibration method applied;
4. magnitude of final permanent deflections in relation to progressive construction above the first supported member (in the case of medium and high rise construction); and
5. method and sequence of designed and specified post-tensioning (where applicable).

(vii) causes of dynamic loads which include:

1. dumping concrete on false-work from skips;
2. shock loads resulting from steel or precast elements;
3. surge loads reaching to false-work from concrete pump pipelines;
4. vibration duration and method;
5. moving loads such as placing plant, dumpers, and erection cranes supported on false-work; and
6. openings in false-work to allow for access and service risers.

(viii) any modification of the loading program after designing false-work shall only be carried out after consultation with the false-work designer and it is the responsibility of the site team to notify the designer of any changes.

3.2.3 Documented Safe Systems of Work

(a) In accordance with *OSHAD-SF – Element 1 – Roles, Responsibilities and Self-Regulation* Section 3.2.5 employers shall ensure documented safe systems of work are developed and implemented which include:

(i) details of the false-work erection methodology in accordance with the design drawings;

(ii) information on the false-work erection sequence to ensure the structural integrity of the false-work during erection;

(iii) details of inspections and checks that will be made prior to false-work components being used;

(iv) personal protective equipment requirements, considering standards and requirements that apply to construction generally, and to false-work erection specifically in accordance with *OSHAD-SF – CoP 2.0 – Personal Protective Equipment;*

(v) cranes and lifting gear requirements considering the standards and requirements that apply to construction work generally, and to false-work erection specifically in accordance *with OSHAD-SF – CoP 34.0 – Safe Use of Lifting Equipment and Lifting Accessories;*

(vi) details of permit to load requirements and engineering checks required for false-work that will provide temporary support for poured concrete; and

(vii) details of permit to strike requirements once the poured concrete has reached it design strength to allow the false-work to be removed.

(b) Documented safe systems of work shall:

(i) be distributed to all those concerned with supervision of false-work erection;

(ii) communicated in a comprehensible way to those involved in the erection of false-work;

(iii) detail procedures to ensure false-work erection is monitored to check actual work sequences do not deviate from planned work sequences; and

(iv) be reviewed and updated as necessary so that they remain current.

3.3 Erection and Construction

3.3.1 General Requirements

(a) Employers shall ensure the following during the erection and construction of false-work:

(i) erection of false-work shall not proceed unless all appropriate materials and equipment are readily available on site that it is reasonable practicable to be expected to be required for use during that working day;

(ii) to ensure correct false-work erection control measure are followed, all persons in charge of erecting, inspection and checking activities shall receive copies of the following:

1. design drawings and specifications;
2. required standard details; and
3. checklists to ensure that all stages are executed appropriately.

(iii) all materials and components to be used in the erection of false-work shall be inspected by a competent person prior to use to ensure they are fit for purpose and meet false-work design criteria;

(iv) any timber to be used shall comply with the following:

1. type, grade, and size shall be in accordance with the design drawings and specifications;
2. no presence of defects, shakes, splits, winds, loose or large knots and crushed or damaged areas are allowed; and
3. no protruding nails or fixings from previous use are allowed.

(v) where proprietary false-work systems are used, the manufacturer's instructions shall be available on site and followed during the erection sequence;

(vi) the bases of all upright supports used in false-work shall be positioned on a firm level surface (never directly onto sand or soil);

(vii) during the erection of false-work appropriately boarded working platforms shall be provided to ensure work can be carried out safely, employees are not permitted to climb and work directly from false-work components;

(viii) when primary and secondary bearing timbers are being placed, work shall be carried out from below the working level using an appropriately boarded working platform;

(ix) take steps to prevent employees having contact of concrete; and

(x) control measures in accordance with *OSHAD-SF – CoP 23.0 – Working at Heights* shall be implemented when false-work decking is constructed.

3.3.2 Steel Fixing Work

(a) Employers shall ensure the following during the undertaking of steel fixing work:

(i) wherever reasonably practicable mechanical means will be used to move steel reinforcement around the site;

(ii) where manual handling of steel reinforcement is necessary employers shall ensure the requirements of OSHAD-SF – *CoP 14.0 – Manual Handling and Ergonomics* are complied with;

(iii) the false-work deck is not to be overloaded with steel reinforcement; and

(iv) bundles of steel reinforcement shall be placed in designated storage areas on the false-work deck in accordance with the engineers load calculations.

3.3.3 Loading False-Work

(a) Employers shall ensure the following prior to loading false-work with concrete:

(i) no concrete placing work shall take place until a competent engineer has inspected the false-work and signed the false-work off in accordance with the design drawing or specification;

(ii) a 'Permit to Load' shall be issued by the employer clearly stating that the false-work is completed to a satisfactory level and meets the design requirements;

(iii) immediately prior to the placement of concrete the employer shall carry out a final inspection of the false-work ensuring all components are secure and screw-jacks (where used) are tightly in place;

(iv) concrete shall be placed progressively never allowing a large accumulation in one area where overloading could occur; and

(v) all employees shall be made aware of the permit to load requirements and instructed not to place concrete until instructed by supervision.

3.3.4 Striking False-Work

(a) Employers shall ensure the following prior to striking false-work:

(i) prior to striking any false-work employers shall ensure that the concrete has reached its required design strength;

(ii) concrete strength is checked in accordance with engineering requirements (normally concrete cube tests carried out by a testing laboratory);

(iii) once the employer is satisfied that the concrete has attained the required strength a permit will be issued to strike the false-work;

(iv) all employees shall be made aware of the permit to strike requirements and instructed not to strike false-work until instructed by supervision;

(v) during the striking of false-work an exclusion zone shall be established to prevent unauthorized access to the striking area;

(vi) striking work shall be carried out in a controlled and progressive manner;

(vii) timbers shall be de-nailed as work progresses; and

(viii) timber sheets used to form concrete shall not be left in place once the false-work has been struck and shall be removed progressively with the false-work.

3.4 Special Precautions for Permanent False-work

(a) Where false-work is employed to permanently support structural elements such as pre-cast slabs, employers shall ensure:

(i) it is designed to take the load of the supported structural element and its own weight in addition to other loads arising from wind and normal casting operations; and

(ii) with pre cast elements:

1. the top and bottom surfaces shall be marked appropriately for identification;
2. the lifting system shall be arranged in a way to avoid collision and consequential breaking of pre-cast elements; and
3. lateral supports shall be provided before releasing pre cast elements from the sling, especially in the case of beams with a width to depth ratio exceeding 1:3.

3.5 Inspection and Maintenance

3.5.1 General Requirements

(a) Employers shall ensure the following:

(i) all false-work plant and equipment shall be inspected prior to each use by a competent person;

(ii) damaged or incomplete plant and equipment shall be removed from service for repair or disposal;

(iii) where a working platform is constructed on false-work it shall be treated as a place of work and be subject to a daily visual inspection by a competent person; and

(iv) false-work decks used by carpenters and steel fixers shall be subject to daily visual inspections and weekly formal documented inspection.

3.5.2 Maintenance of False-Work

(a) Employers shall ensure the following:

(i) maintenance of false-work and associated component shall only be carried out in accordance with the manufacturers recommendations;

(ii) repairs and modifications are to be in accordance with the manufacturers guidelines;

(iii) no unauthorized repairs are to be made on false-work components; and

(iv) structural repairs requiring welding or riveting are to be checked and approved by a competent engineer.

4. References

- *OSHAD-SF – Element 1 – Roles, Responsibilities and Self-Regulation*
- *OSHAD-SF – Element 2 – Risk Management*
- *OSHAD-SF – Element 9 – Compliance and Management Review*
- *OSHAD-SF – CoP 2.0 – Personal Protective Equipment*
- *OSHAD-SF– CoP 14.0 – Manual Handling and Ergonomics*
- *OSHAD-SF – CoP 20.0 – Safety in Design(Construction)*
- *OSHAD-SF – CoP 21.0 – Permit to Work*
- *OSHAD-SF – CoP 23.0 – Working at Heights*
- *OSHAD-SF – CoP 34.0 – Safe Use of Lifting Equipment and Lifting Accessories*
- *OSHAD-SF – CoP 53.0 – OSH Management During Construction Work*

5. Document Amendment Record

Version	Revision Date	Description of Amendment	Page/s Affected
3.0	1st July 2016	Change of Logo	All
		Change from AD EHS Center to OSHAD	throughout
		Change of document title: AD EHSMS RF to OSHAD-SF	Throughout
		Acknowledgements deleted	2/3
		Preface Deleted	4
		EHS changes to OSH	throughout