



# Engineering Standard

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SAES-M-100

4 June 2013

Saudi Aramco Building Code

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Document Responsibility: Onshore Structures Standards Committee

## Saudi Aramco DeskTop Standards

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## A Scope

The 2009 International Building Code (IBC) of the International Code Council (ICC) in its entirety, with all amendments, errata, and supplements thereto, shall constitute the Saudi Aramco Building Code (SABC) except as modified by this Standard. The provisions of the SABC, hereinafter referred to as “this Code,” shall apply to the design, construction, alteration, moving, demolition, repair and use of Saudi Aramco (SA) buildings.

Saudi Aramco buildings include buildings within Saudi Aramco facilities, on Saudi Aramco capital project sites, and at locations covered under a Saudi Aramco Land Use Permit, including newly installed, relocated or renovated buildings at contractor camps/parks.

For buildings with special functions, additional requirements can be found in the standards listed in the [Special Appendix II](#) of this code. [SAES B-014](#), [SAES-B-017](#) and [SAES-B-019](#) standards are only required to be followed for buildings and facilities included in the scope of [SAES-B-014](#), Section 1. Where a conflict occurs between applicable B Series standards and SAES-M-100, the B Series standards shall apply.

## B Conflicts and Deviations

B.1 Any conflicts between this standard and any other applicable Saudi Aramco Engineering Standards (SAES), Materials System Specifications (SAMSS), Standard Drawings (SASD) or industry standards, codes and forms shall be resolved in writing by the Company or Buyer Representative through the Manager, Consulting Services Department of Saudi Aramco.

B.2 Direct all requests to deviate from this standard in writing to the Company or Buyer Representative, who shall follow internal company procedure [SAEP-302](#) and forward such requests to the Manager, Consulting Services Department of Saudi Aramco.

## C References

The selection of material and equipment and the design, construction, maintenance and repair of equipment and facilities covered by this Standard shall comply with the latest edition of the references listed below, unless otherwise noted.

### C.1 Saudi Aramco References

Saudi Aramco Engineering Procedures

[SAEP-302](#)

*Instructions for Obtaining a Waiver of a Mandatory  
Saudi Aramco Engineering Requirement*

[SAEP-1150](#)

*Inspection Coverage on Projects*

Saudi Aramco Engineering Standards

[SAES-A-104](#)

*Wastewater Treatment, Reuse and Disposal*

[SAES-A-109](#)

*Site Planning for Prayer Shelters*

[SAES-A-112](#)

*Meteorological and Seismic Design Data*

[SAES-A-113](#)

*Geotechnical Engineering Requirements*

[SAES-A-114](#)

*Excavation and Backfill*

[SAES-A-204](#)

*Preparation of Structural Calculations*

[SAES-B-009](#)

*Fire Protection and Safety Requirements for  
Offshore Production Facilities*

[SAES-B-014](#)

*Safety Requirements for Plant and Operations  
Support Buildings*

[SAES-B-017](#)

*Fire Water System Design*

[SAES-B-019](#)

*Portable, Mobile and Special Fixed Firefighting  
Equipment*

[SAES-B-055](#)

*Plant Layout*

[SAES-B-067](#)

*Safety Identification and Safety Colors*

[SAES-B-069](#)

*Emergency Eyewashes and Showers*

[SAES-H-001](#)

*Coating Selection and Application Requirements for  
Industrial Plants and Equipment*

[SAES-H-100](#)

*Coating Materials & Application Requirements for  
Industrial Facilities*

[SAES-H-101](#)

*Approved Protective Coating Systems for Industrial  
Plants & Equipment*

[SAES-J-502](#)

*Analyzer Shelters*

[SAES-J-801](#)

*Control Buildings*

[SAES-K-001](#)

*Heating, Ventilation and Air Conditioning (HVAC)*

[SAES-K-100](#)

*Saudi Aramco Mechanical (HVAC) Code*

[SAES-L-105](#)

*Piping Material Specifications*

[SAES-M-001](#)

*Structural Design Criteria for Non-Building  
Structures*

[SAES-M-009](#)

*Design Criteria for Blast Resistant Buildings*

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<a href="#"><u>SAES-N-004</u></a>	<i>Design and Installation of Building Thermal Envelop</i>
<a href="#"><u>SAES-P-100</u></a>	<i>Basic Power System Design Criteria</i>
<a href="#"><u>SAES-P-103</u></a>	<i>UPS and DC Systems</i>
<a href="#"><u>SAES-P-119</u></a>	<i>Onshore Substations</i>
<a href="#"><u>SAES-P-123</u></a>	<i>Lighting</i>
<a href="#"><u>SAES-Q-001</u></a>	<i>Criteria for Design and Construction of Concrete Structures</i>
<a href="#"><u>SAES-Q-005</u></a>	<i>Concrete Foundations</i>
<a href="#"><u>SAES-Q-007</u></a>	<i>Foundations and Supporting Structures for Heavy Machinery</i>
<a href="#"><u>SAES-Q-009</u></a>	<i>Concrete Retaining Walls</i>
<a href="#"><u>SAES-Q-012</u></a>	<i>Criteria for Design and Construction of Precast and Prestressed Concrete Structures</i>
<a href="#"><u>SAES-R-004</u></a>	<i>Building Architectural Finishes Requirement</i>
<a href="#"><u>SAES-S-040</u></a>	<i>Saudi Aramco Water Systems</i>
<a href="#"><u>SAES-S-050</u></a>	<i>Sprinkler and Standpipe Systems in Buildings</i>
<a href="#"><u>SAES-S-060</u></a>	<i>Saudi Aramco Plumbing Code</i>
<a href="#"><u>SAES-W-011</u></a>	<i>Welding Requirements for On-Plot Piping</i>

#### Saudi Aramco Materials System Specifications

<a href="#"><u>09-SAMSS-088</u></a>	<i>Aggregates for Concrete</i>
<a href="#"><u>09-SAMSS-097</u></a>	<i>Ready-Mixed Portland Cement Concrete</i>
<a href="#"><u>12-SAMSS-007</u></a>	<i>Fabrication of Structural and Miscellaneous Steel</i>
<a href="#"><u>12-SAMSS-008</u></a>	<i>Erection of Structural and Miscellaneous Steel</i>
<a href="#"><u>12-SAMSS-014</u></a>	<i>Pre-engineered Metal Buildings</i>

#### Saudi Aramco Standard Drawing

<a href="#"><u>AA-036322</u></a> Rev. 08	<i>Anchor Bolt Details – Inch and Metric Sizes</i>
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#### Saudi Aramco Library Drawings

<a href="#"><u>DA-950151</u></a> to <a href="#"><u>DA-950163</u></a>	<i>Standard Substation Building Drawings</i>
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#### Saudi Aramco Inspection Requirement

<i>Form 175</i>	<i>Inspection Requirements</i>
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Saudi Aramco Best Practice

[SABP-K-001](#)      *Energy-Efficient Buildings*

Saudi Aramco General Instructions

*GI-0007.030*      *Inspection and Testing Requirements for  
Elevating/Lifting Equipment*

*GI-0400.001*      *Quality Management Roles & Responsibilities*

C.2 Saudi Arabian Standards Organization

*SASO SSA-184*      *Methods of Test for Bricks & Blocks Made of Burnt  
Clay*

*SASO SSA-185*      *Bricks Made from Burnt Clay*

*SASO SSA-186*      *Hollow Bricks from Burnt Clay for Walls*

C.3 Industry Codes and Standards

American National Standards Institute

*ASME/ANSI A17.1*      *Safety Code for Elevators and Escalators*

*ASME/ANSI A18.1*      *Safety Standard for Platform Lifts and Stairway  
Chairlifts*

*ICC/ANSI-A117.1*      *Accessible and Usable Buildings and Facilities  
(2003)*

*ANSI/BHMA A156.10*      *Power Operated Pedestrian Doors*

*ANSI/BHMA A156.19*      *Power Assist and Low Energy Power Operated  
Doors*

American Society for Testing and Materials

*ASTM E119*      *Standard Test Method for Fire Test of Building  
Construction and Materials*

International Code Council (ICC)

*2009 IBC*      *The International Building Code*

**D Modifications to International Building Code (2009 IBC)**

The following part, chapter and section numbers refer to the 2009 International Building Code (Second Printing, May 2009), which is part of this SAES. The text of each paragraph below is an addition, modification, exception or deletion as noted.

## CHAPTER 1 - ADMINISTRATION

- Sec. 101.1 Title
- (Modification) Modify this section to read: “These regulations shall be known as the Building Code of Saudi Aramco,” hereinafter referred to as “this code.”
- Sec. 101.2.1 Appendices
- (Modification) Delete this section in its entirety and substitute:
- The only following appendices shall apply:
- |            |  |
|------------|--|
| APPENDIX C | GROUP U-AGRICULTURAL BUILDINGS           |
| APPENDIX E | SUPPLEMENTARY ACCESSIBILITY REQUIREMENTS |
| APPENDIX F | RODENT PROOFING                          |
| APPENDIX G | FLOOD-RESISTANT CONSTRUCTION             |
| APPENDIX H | SIGNS                                    |
| APPENDIX I | PATIO COVERS                             |
| APPENDIX J | GRADING                                  |
| APPENDIX K | ADMINISTRATIVE PROVISIONS                |
- Sec. 101.4.1 Gas
- (Modification) Replace “International Fuel Gas Code” with [“SAES-S-060.”](#)
- Sec. 101.4.2 Mechanical
- (Modification) Replace “International Mechanical Code” with [“SAES-K-100.”](#)
- Sec. 101.4.3 Plumbing
- (Modification) Replace “International Plumbing Code” with [“SAES-S-060.”](#)
- (Deletion) Delete the last sentence.
- Sec. 101.4.4 Property Maintenance
- (Deletion) Delete in its entirety.
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Sec. 101.4.5 Fire Prevention (delete “property maintenance”)

(Modification) The provisions of the International Fire Code (IFC) with Appendices B, D, F, H, I and J shall apply to matters affecting or relating to structures, processes and premises from the hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices; from conditions hazardous to life, property or public welfare in the occupancy of structures or premises; and from the construction, extension, repair, alteration or removal of fire suppression and alarm systems or fire hazards in the structure or on the premises from occupancy or operation. Fire hydrants shall be spaced a maximum of 90 meters (300 feet) from each other along the travel path of the adjoining roadway available for use by fire apparatus. A fire hydrant capable of meeting the system demand must be located within 30 meters (100 feet) of any required fire department connection installed in a new building. The provisions of the IFC are modified as stated in amendments to IBC Chapter 9 sections in SAES-M-100.

Sec. 101.4.5.1 Fire Water Lines

(Addition) The minimum water supply line size serving fire hydrants shall be 6 inches (152 mm). Looped or gridded water mains shall be used. Dead-end lines serving fire hydrants shall not be greater than 68 feet (20.7 meters). All water supply systems used for fire water or fire protection systems shall be hydraulically calculated with results for volume flow rates and velocities, and residual pressures at each system node and most remote hydrant locations. The minimum residual pressure at all points in the system is 20 psig (138 kPa). Fire flow velocities in water mains shall be between 10 ft/sec (3.1 m/sec) and 15 ft/sec (4.6 m/sec) at the required fire flow rate.

(Exception) Remote sites located without the availability of fire department response by personnel and vehicles shall be provided with a water distribution system capable of supporting firefighting efforts without the use of fire engines. A primary and a standby NFPA 20 fire pump shall be required for the water system, with a capacity of 100% of fire water demand for both pumps. At least one fire pump shall be a diesel engine driven pump. The minimum residual pressure at 94.6 L/s (1,500 gpm) at all points in the system is 138 kPa (20 psig). The minimum residual pressure at 63.1 L/s (1,000 gpm) at all points in the system is 359 kPa (52 psig). The system shall meet both of these constraints, which will



typically require a maximum 552 kPa (80 psi), 94.6 L/s (1,500 gpm) fire pump capacity. A dedicated water supply for fire water shall provide a minimum of 681 m<sup>3</sup> (180,000 gallons/24,060 ft<sup>3</sup>) of firewater capacity. A combined fire/raw water system may be used according to [SAES-S-040](#) and [SAES-L-105](#) (PVC or other material pipe as permitted), but the domestic demand pressure shall be maintained between 276 kPa (40 psig) and 552 kPa (80 psig). This exception is limited to remote sites with buildings without fire sprinkler protection or fire wall separation that are limited to a maximum size of 334 square meters (3,600 square feet) for combustible construction and 548 square meters (5,900 square feet) for non-combustible Type II construction. This exception is limited to remote sites with buildings with NFPA 13 or 13R fire sprinkler protection limited to a maximum size of 4,784 square meters (51,500 square feet) for combustible construction and 7,776 square meters (83,700 square feet) for non-combustible Type II construction.

Sec. 101.4.5.2 Certification of Construction Documents

(Addition) Fire protection and alarm system construction documents shall bear the seal of the responsible registered professional engineer (PE) or charter engineer (CE), who shall have at least five years of experience in the design of fire detection and alarm systems. Submit PE or CE stamped documents or an approved independent, third-party review letter referencing these plans with a PE or CE stamp to LPD and FrPD.

Sec. 101.4.6 Energy

(Modification) Delete this section in its entirety and substitute the following:

Refer to Chapter 13 - Energy Efficiency.

Sec. 102 Applicability

(Addition) Add the following paragraph “Any requirement necessary for the strength or stability of an existing or proposed new building or structure, or for the safety of the occupants thereof, not specifically covered by this code, shall be directed to the Manager, Consulting Services Department.”

Any requirement necessary to provide for the additional egress and fire safety of buildings not specifically covered by this code, shall

- be directed to the Manager, Loss Prevention Department.
- Sec. 103 Department of Building Safety  
(Deletion) Delete this section in its entirety.
- Sec. 104.1 General  
(Modification) Delete this section in its entirety and substitute the following:  
  
The administration of this Code including interpretations, clarifications and waiving requirements of its provisions is vested in the Manager, Consulting Services Department or the Manager of the Loss Prevention Department or his duly authorized representative. A table is contained in [Special Appendix I](#) indicating which Saudi Aramco department is responsible for each section of this Code. This table can be used as a guide for questions on specific sections of this standard or to determine which department is responsible for waivers.
- Sec. 104.2 Applications and Permits  
(Modification) Delete “and issue permits” and “for which such permits have been issued” from this section.
- Sec. 104.4 (Addition) Add the following: “The Manager, Inspection Department or his duly authorized representative has the responsibility to enforce the implementation of this code during construction and report any non-compliance conditions.”
- Sec. 104.6 Right of Entry  
(Deletion) Delete in its entirety.
- Sec. 104.8 Liability  
(Deletion) Delete in its entirety.
- Sec. 104.10 Modifications  
(Modification) Delete in its entirety and substitute the following:  
  
Procedures for waiving requirements of this code shall be in accordance with the provisions of [SAEP-302](#).
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Sec. 105	Permits  (Deletion) Delete in its entirety.
Sec. 106.2	Issuance of certificate of occupancy.  (Deletion) Delete in its entirety.
Sec. 107.1	General  (Deletion) At the end of the first sentence, delete "... with each permit application."
Sec. 107.2.1.1	Design Coordination  (Addition) Design firms shall submit a coordinated and comprehensive design. The design architects and engineers from the responsible disciplines shall communicate and coordinate all design details and show them accurately and clearly on the individual discipline construction document plans and specifications (e.g., reflected ceiling plans). Electrical conduits and cable trays, fire sprinkler systems, fire alarm devices, structural members, HVAC ducts, etc., shall be coordinated to avoid interferences.
Sec. 107.2.6	Accessibility  (Addition) The construction documents shall show in sufficient detail the location, construction, size and type of all portions of the accessibility systems in compliance with the provisions of this code, where a building or portion is required to be accessible.
Sec. 107.3.4.1.1	Designer Qualification  (Addition) All building architectural and fire protection plans submitted to Saudi Aramco shall first be approved and certified by a design professional employed by the firm in responsible charge of the design. Designers shall possess current International Code Council (ICC) certification in the applicable discipline(s) or be certified by a means approved by Saudi Aramco.
Sec. 109	Fees  (Deletion) Delete this section and all subsections.
Sec. 110	Inspections

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Sec. 110.1	General	<p>(Modification) Delete entire paragraph and substitute the following paragraphs:</p> <p>All inspections necessary for the application of this code is the responsibility of the Manager, Inspection Department or his representative.</p> <p>General inspections shall be made as required to ascertain compliance with this Code, and shall include, but not be limited to, specific inspections listed in this Code.</p>
Sec. 110.3	Required Inspections	<p>(Modification) Revise this paragraph to read: “The Inspection Department or its duly representative shall make the following inspections and shall either accept that portion of the construction as completed or shall notify the responsible project agency of failure to comply with this Code.”</p> <p>(Addition) Contractors responsible for design, procurement and construction of buildings are required to implement the Inspection document “Schedule Q” which identifies the specific Saudi Aramco quality system elements.</p>
Sec. 110.3.1	Footing and Foundation Inspection	<p>(Exception) In the last sentence, replace “ASTM C94” with “<a href="#">09-SAMSS-097</a>.”</p>
Sec. 110.5	Inspection Requests	<p>(Modification) Delete in its entirety and substitute the following: “The responsible project agency shall advise in writing the Inspection Department or their duly designated representatives of any required inspection. Request for Inspection (RFI) should be prepared and submitted to the Inspection Department within the time constraint specified in <a href="#">SAEP-1150</a>.”</p>
Sec. 111.1	Use and Occupancy	<p>(Modification) Change the first sentence to read: “No building or structure shall be used or occupied, and no change in the existing occupancy classification of a building or structure or portion</p>

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thereof shall be made until the Loss Prevention Department has reviewed and approved the occupancy.”

(Modification) Change the second sentence to read: “This shall not be construed as an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction.”

Sec. 111.2

Certificate Issued

(Deletion) Delete in its entirety.

Sec. 111.3

Temporary Occupancy

(Deletion) Delete in its entirety.

Sec. 112.1

Connection of Service Utilities

(Modification) Delete “for which a permit is required” and replace the word “released” by “approved.”

Sec. 113

Board of Appeals

(Deletion) Delete in its entirety.

Sec. 114

Violations

(Deletion) Delete in its entirety.

Sec. 115

Stop Work Orders

(Deletion) Delete in its entirety.

Sec. 116.2

Record

(Modification) Delete this section in its entirety and substitute “When an unsafe condition is revealed by an inspection, the inspector shall immediately file with the Project Agency a full and true report of such inspection and such unsafe condition.”

Sec. 116.3

Notice

(Deletion) Delete this section in its entirety.

Sec. 116.4

Method of service

(Deletion) Delete this section in its entirety.

Sec. 116.5

Restoration

(Modification) Modify the first sentence to read as follows:

“The structure or equipment determined to be unsafe is permitted to be restored to a safe condition approved by the Loss Prevention and Consulting Services Departments.”

CHAPTER 2 - DEFINITIONS

Sec. 202

(Modification) Modify the definition of “Approved” as follows:

“Acceptable to the Building Official, who will render the final interpretation based on SAES-M-100 requirements. The Proponent is to render the final approval based on the interpretation provided by the Building Official.”

(Deletion) Delete definition of “Approved Fabricator.”

(Addition) Add the term “Battery Room” as defined in [SAES-P-103](#).

(Modification) Wherever the term “Building Official” is used in this Code, it shall mean the following:

The Manager of the Consulting Services Department or the Loss Prevention Department for the administration, interpretation and waiving requirements of this code. Duly authorized representatives may administer and interpret requirements of this code.

(Modification) Delete definition of “Listed” and substitute with “Equipment, materials, products or services included in a list published by an independent internationally recognized testing organization (e.g., UL, FM, etc.) acceptable to the code official and concerned with evaluation of products or services produced by other companies, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or services meets identified standards or has been independently tested and found suitable for a specific purpose. A CE label shall not be considered a listed or labeled product.”

Inspection Department and Project Agency for the enforcement of this code as outlined by GI-0400.001.

(Modification) Delete the definition of “Owner” and substitute with: “Saudi Aramco.”

(Modification) Throughout the document replace the words “Night Clubs” with “Coffee Shops,” “churches” with “mosques” and “dance halls” with “social events hall.”

(Modification) Substitute the definition for “Building” with: “Any enclosed structure used or intended for supporting or sheltering any use or occupancy, such as a house, office building, maintenance shop, warehouse, etc.”

### CHAPTER 3- USE AND OCCUPANCY CLASSIFICATION

Sec. 303.1 (Modification) Delete the words “Night clubs, Taverns and bars” on the breakdown of Group A-2 occupancy.

Delete also “(not including food or drink consumption)” mentioned after “Dance halls” on the breakdown of Group A-3 occupancy.

Delete also the word “Funeral parlors” from the breakdown of Group A-3 occupancy.

Delete “Places of religious worship” and replace with “Mosques and musallas”

Sec. 307.1 High-hazard Group H

(Modification) Delete “6. Liquor stores and distributors without bulk storage.”

### CHAPTER 4 – SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY

Sec. 406.1.4 Separation

(Modification) Delete Exception 1 and substitute “The private garage shall be separated from the dwelling unit and its attic area by means of minimum 5/8-inch (15.9 mm) type “X” gypsum board applied to the garage side. Where the separation is horizontal the gypsum board shall be attached to framing members spaced no more than 16 inches (406 mm) on center and the structure supporting the separation shall also be protected by not less than 5/8-inch (15.9 mm) type “X” gypsum board or equivalent. Door openings between the garage and the dwelling unit shall be equipped with a self-closing, self-latching solid wood door not less

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than 1-<sup>3</sup>/<sub>8</sub> inch (34.9 mm) thickness, solid or honeycomb core steel door not less than 1-<sup>3</sup>/<sub>8</sub> inches (34.9 mm) thick, or doors in compliance with Section 715.4.3. Penetrations in the required separation shall be in conformance with item #2 below or Section 713. Openings from a garage directly into a room used for sleeping purposes shall not be permitted.”

Sec. 413.2

Attic, Under-Floor and Concealed Spaces

(Modification) Delete the first exception. Delete the text of this section and replace it with, “Attic, under-floor and concealed spaces used for storage shall be protected with a minimum one-hour fire-resistance rated construction. Openings, joints and penetrations shall be protected as required by Chapter 7. This requirement does not apply to accessory-use storage rooms on a floor or mezzanine level.”

Sec. 424

Information Technology Equipment and Telecommunications Facilities

Sec. 424.1

General

(Addition) In addition to other applicable requirements in this code, information technology equipment and telecommunications facilities shall be constructed according to NFPA 75 for information technology equipment or NFPA 76 for telecommunications facilities.

Sec. 424.1.1

Scope

(Addition) This standard covers buildings within the scope of [SAES-B-014](#). The requirements of NFPA 75 shall apply for the protection of information technology equipment and information technology equipment areas. The requirements for NFPA 76 shall apply for telecommunications facilities 46.5 square meters (500 square feet) or bigger, where telecommunications services such as telephone (landline, wireless) transmission, data transmission, internet transmission, voice-over internet protocol (VoIP) transmission, and video transmission are rendered.

CHAPTER 5 – GENERAL BUILDING HEIGHTS AND AREAS

Table 503

Table 503

(Addition) Add a footnote “e” to state, “Type of construction used shall follow all Kingdom of Saudi Arabia, Minister of Interior

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directives (e.g., Letter #29-T-1318 dated 23-October-1989 or 23-3-1410) prohibiting the use of combustibile construction (Types III, IV and V) for schools, hospitals, outpatient clinics and warehouses”. Add subscript “e” to the column headings for Type III, IV and V construction.

## CHAPTER 7 – FIRE AND SMOKE PROTECTION FEATURES

### Sec. 701.2 Firestopping Contractor Qualifications

(Addition) Approved, international recognized firestopping and sprayed fire-resistant materials (SFRM) manufacturers and suppliers shall train, authorize, support and certify all contractor personnel installing firestopping or sprayed fire-resistant materials (SFRM) materials. Contractor personnel not meeting these requirements shall not be permitted to install firestopping or sprayed fire-resistant materials (SFRM) materials. Each firestopped penetration and SFRM protected structural member shall be individually tagged and documented in a permanent log book for the entire building. The firestop penetration tag and log shall identify the fire protection rating, conditions and dimensions of the penetration and system used, with space provided for re-entry documentation. The SFRM tag shall identify the structural member, location, SFRM material and thickness, and the fire protection rating.

### Sec. 703.1.1 Fire Test Standards

(Addition) Fire tests in this section and chapter refer to ASTM E119 or UL 263, which are appropriate for cellulosic fuel fires. Fire tests according to ISO 834, BS 476 or DIN 4102 are also approved fire tests, in lieu of ASTM E119 or UL 263 for cellulosic fire scenarios. Fire scenarios involving hydrocarbon pool fire exposures shall utilize fire protection methods according to UL 1709 or ASTM E1529, in lieu of ASTM E119 or UL 263 fire tests. Jet fire scenario exposures shall be based on OTI 95 634 or equivalent fire test data. Refer to [SAES-B-009](#) for offshore and [SAES-B-014](#) for onshore plant facilities.

### Section 708.14.2.1 Pressurization Requirements

(Modification) Delete this section and substitute “Elevator hoistways shall be pressurized to maintain a minimum pressure requirements in Table 5.2.1.1, 2006 NFPA 92A and the maximum pressure differential that still allows for elevator door opening and closing

without malfunctioning, with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all elevator cars at the floor of recall and all hoistway doors on the floor of recall open and all other hoistway doors closed. The opening and closing of hoistway doors must be demonstrated during this test. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet.”

Sec. 709.3

Fire – Resistance Rating

(Modification) Delete Exceptions 1 and 2 in their entirety.

Sec. 712.3

Fire – Resistance Rating

(Modification) Delete the Exception in its entirety

Table 715.4

Table 715.4

(Modification) In the “Fire partition” row and “required assembly rating” column, delete the two “0.5” numbers and replace them with “1”.

## CHAPTER 9 - FIRE-PROTECTION SYSTEMS

Sec. 901.2

(Addition) When approved by the Loss Prevention Department, details of new fire protection installations and details of changes, additions, modifications of any existing “Approved” fire protection installations shall be reviewed and approved by the Fire Protection Department.

Sec. 901.2.1

(Addition) Approved locations of fire protection and alarm equipment

The locations for designed and installed key components of new and renovated fire protection and alarm systems shall be approved by the Fire Protection Department. Key components include, but are not limited to main fire sprinkler and standpipe riser rooms, fire pump rooms, fire department connections, fire command centers, fire alarm control panels, annunciator panels, graphic maps, releasing panels for fire suppression systems and emergency access key boxes.

Sec. 901.8

Valve Signage

(Addition) Add this new section, “Fire protection valves shall be marked with a metal tag attached with a chain indicating an

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identification number, the function of the valve and its normal position (open or closed).”

Sec. 903.1

General

(Additions) The following additional requirements for sprinkler systems shall apply:

An approved, international recognized fire sprinkler manufacturer and supplier shall train, authorize, support and certify all contractor personnel installing fire sprinkler systems. Contractor personnel not meeting these requirements shall not be permitted to install fire sprinkler systems. All new and replacement system components shall be UL listed and/or FM Approved.

Pipe or tubing, fittings and valves shall be in accordance with [SAES-S-050](#) (Sprinkler and Standpipe Systems in Buildings).

Welding methods and procedures shall be in accordance with [SAES-W-011](#) (Welding Requirements for On-Plot Piping).

Sec. 903.2.1.2(1)

(Modification) Delete the fire area size of “5,000” and replace it with “12,000”.

Sec. 903.2.1.2(2)

(Modification) Delete the occupant load factor of “100” and replace it with “300”.

Sec. 903.2.6

Group I

(Addition) Add the text to this section, “An automatic sprinkler system shall be provided throughout existing Group I-2 fire areas. The sprinkler system shall be provided throughout the floor where the Group I-2 occupancy is located, and all floors between the Group I-2 occupancy and the level of exit discharge.”

Sec. 903.2.8

Group R

(Addition) Add the exception to this section.

“**Exception:** An approved automatic sprinkler system shall not be required if all the following conditions are met:

1. Every sleeping room has a side-swinging, hinged, egress door opening directly to the outside of the building at finished ground level or a second floor exterior balcony with two means of egress stairs.

2. Dwelling unit egress doors swing outward to the exterior of the building.
3. Buildings are built with Type II, non-combustible construction.
4. Interior ceiling and wall finishes and insulation have a Class A Flame Spread Index and a maximum 450 Smoke-Developed Index rating.
5. The building is protected by a NFPA 72, 9<sup>th</sup> Edition/UL 864 listed, addressable, analog fire alarm system with Class A wiring and full area detection and:
  - Smoke detectors are UL 268 listed, connected to a monitoring panel and have sounder bases or UL 464 listed, audible horns for notification.
  - Alarm, supervisory and trouble signals are received by an on-site master fire alarm control panel and are monitored at all times by on-site, qualified safety personnel capable of and responsible for responding to and mitigating a fire emergency and system faults or failures.”

Sec. 903.3.8 Piping Materials and Coatings

(Addition) Add this new section, “Fire protection piping and equipment shall be painted safety red according to [SAES-B-067](#).”

Sec. 903.4.1 Monitoring

(Modification) Add this text to the end of the section, “Sprinkler systems shall be monitored as required by Section 907.1.3.1.”

Sec. 903.4.2 Alarms

(Modifications) In the first sentence add the words “and visual” after the word “audible.”

Sec. 903.5 Testing and Maintenance

(Additions) Add the following statement “The testing of the sprinkler system shall be witnessed by representatives from Loss Prevention and Fire Protection Departments. The installer or maintenance people shall notify the concerned departments 48 hours in advance of any testing.”

Sec. 905.2

Installation of Standpipe Systems

(Addition) the following additions apply:

(Exception) Pipe, tube, fittings and valves used in standpipe and combined systems shall conform to the requirements of [SAES-S-050](#).

(Addition) Add the following: “Hose stations shall be in accordance with [SAES-B-017](#) and [SAES-B-019](#).”

“Hose connection shall be within easy reach of a person standing on the floor and in no case shall be over 1.5 m (5 ft) from the floor.”

“Valves of approved indicating type shall be provided at the main riser for controlling branch lines for Class II services supplying more than one hose station.”

Sec. 905.3.1

Height

(Addition) Add the Exception 6, “**Exception 6.** In buildings outside the scope of [SAES-B-014](#) equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, Class I manual-wet standpipes are allowed according to NFPA 14, Sections 5.4.1 and 5.4.2. All piping connecting the fire department connections to the fire sprinkler and standpipe systems, and all standpipe system piping shall be a minimum of 6 inches in nominal diameter. Hydraulic calculations are required to show standpipe demand will be met according to NFPA 14 by a fire apparatus pumping the required standpipe flow rate demand at 1,207 kPa (175 psi) at any required fire department connection. A fire hydrant capable of meeting the system demand must be located within 30.5 meters (100 feet) of any required fire department connection and one fire department connection inlet shall be provided for every 946 lpm (250 gpm) demand.”

Sec. 905.12

Existing Buildings

(Addition) Add this new section, “Where required by Chapter 46 of the International Fire Code, existing structures shall be equipped with standpipes installed in accordance with Section 905.”

Sec. 906.1

Where required

(Deletion) Delete the exception to (1).

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Sec. 906.2 General requirements

(Modification) after “NFPA 10” add the following, “, except as modified by this section.”

Sec. 906.3 Size and Distribution

(Modification) Add the following text. “Light and ordinary hazard areas shall be protected with 4.5 kg (10 pound) agent capacity (4A:60B:C or 4A:80B:C rated), ABC multi-purpose, stored pressure, dry chemical extinguishers. Telecommunication and electrical rooms shall have a 4.5 kg (10 pound) agent capacity (10B:C), carbon dioxide stored pressure extinguishers placed outside and within three meters (10 feet) of the door to the room. [SAES-B-019](#) shall be followed for buildings and facilities included in the scope of [SAES-B-014](#), Section 1.

(Exception) Existing fire extinguisher installations complying with previous versions of [SAES-B-019](#) shall be acceptable until the existing fire extinguishers require hydrostatic testing for inspection testing and maintenance. If a hydrostatic test is required for an existing fire extinguisher, the existing extinguisher shall be removed from service and replaced with an extinguisher as required by this code. Only one extinguisher required by this code is required where previous versions of [SAES-B-019](#) required a combination of both water and carbon dioxide extinguishers.

Table 906.3(1) Fire Extinguishers for Class A Fire Hazards

(Modification) Delete the “2-A” Minimum Rated Single Extinguisher ratings for Light and Ordinary Hazards and replace them with “4-A”. Delete the “4-A” Minimum Rated Single Extinguisher ratings for Extra Hazard and replace them with “10-A”. Delete the “75 feet” Maximum Travel Distance to Extinguisher for Extra Hazard and replace with “15.2 m (50 feet)”. Delete footnotes (a) and (c) in the table. Place a superscript (a) next to the “Maximum Travel Distance to Extinguisher” in the first column. Replace footnote (a) with the following text.  
“A 22.9 meter (75-foot) travel distance results in a placement of extinguishers that are 32.3 meters (106 feet) apart as measured by a straight line. A 15.25 meter (50-foot) travel distance results in a placement of extinguishers that are 21.5 meters (70 feet) apart as measured by a straight line.”

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Section 906.3.2	Class B Fire Hazards	(Modification) after “NFPA 10” add the following, “, except as modified by this section.”
Table 906.3(2)	Flammable or Combustible Liquids with Depths less than or Equal to 6 mm (0.25-inch)	(Modification) Delete the Basic Minimum Extinguisher Ratings for the 15.25 meter (50-foot) travel distances and replace them with 60-B for Light and Ordinary Hazards, and 120-B for Extra Hazard.
Sec. 907.1.3	Equipment	(Modification) Add this line at the end of the section, “All system components shall be UL listed and/or FM Approved.”
Sec. 907.1.3.1	System Requirements	(Addition) Add this section, “All fire alarm systems shall be designed and installed with the following features: (1) addressable, analog equipment and operation, (2) Class A signaling line and notification appliance circuits, (3) UL 1971 listed, public-mode visual notification appliances and UL 464 listed, temporal-three audible notification appliances, (4) listed and compliant with UL 864 ninth edition, and (5) monitored by the area security control center (SCC) or a supervising station where available.”  (Exception) “Unless concurred by the Chief Fire Prevention Engineer for very small fire alarm systems for buildings located in remote locations.”
Sec. 907.5.2.3	Visible Alarms	(Modification) Add this section, “Visible alarm notification appliances shall be UL 1971 listed and located according to NFPA 72 Public Mode, and ICC/ANSI A117.1 requirements.”
Sec. 908.1	Group H Occupancies	(Modification) Delete this section and add, “Emergency alarms for the detection and notification of an emergency condition in Group H and Saudi Aramco plant occupancies shall be provided as required in Chapter 27 (IBC) and Section 414.7 (IFC). Emergency alarm systems shall comply with <a href="#">SAES-B-014</a> , for buildings within the scope of <a href="#">SAES-B-014</a> , Section 1.”

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- Sec. 909.4.3      Wind Effect
- (Modification) Delete this section and add, “The design shall consider the adverse effects of wind. Such consideration shall be consistent with the wind-loading provisions shall be consistent with NFPA 92A and 92B, and ASHRAE standards.”
- Sec. 909.6.1      Minimum Pressure Difference
- (Modification) Delete this section and add, “The minimum pressure difference across a smoke barrier shall be 0.05-inch water gage (0.124 kPa) in fully sprinklered buildings. In buildings permitted to be other than fully sprinklered, the smoke control system shall be designed to minimum pressure requirements in Table 5.2.1.1, 2006 NFPA 92A.”
- Sec. 909.19      System Acceptance
- (Modifications) In the first sentence change “issued a certificate of occupancy” to read “occupied.”
- In exception line 2 change “issue a temporary certificate of occupancy” to read “give permission to occupy.”
- Sec. 909.20.5      Stair Pressurization Alternative
- (Modification) Delete this section and add, “Where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the vestibule is not required, provided that interior exit stairways are pressurized to a minimum pressure requirements in Table 5.2.1.1, 2006 NFPA 92A and a maximum of 87 Pa (0.35 inches of water) in the shaft relative to the building measured with all stairway doors closed under maximum anticipated conditions of stack effect and wind effect.”
- Sec. 912.1.1      Fire Department Connection
- (Addition) Add this new section, “A single fire department connection shall normally be provided on a building when required by NFPA standards. When more than one fire department connection (FDC) exists on a building, all FDCs shall be interconnected by 152 mm (6-inch) piping to allow all building water-based, suppression systems to be supplied from any one FDC.”
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Sec. 912.2	Location	(Modification) Add this line at the end of the section, “A fire hydrant capable of meeting the system demand must be located within 30.5 meters (100 feet) of any required fire department connection installed in a new building.”
CHAPTER 10 - MEANS OF EGRESS		
Sec. 1006.3	Illumination Emergency Power	(Addition) Add the following item to the second paragraph. Lighting requirements in accordance with <a href="#">SAES-P-123</a> .
Sec. 1008.1.9.3	Locks and Latches	(Modification) Delete Exceptions 3, 4 and 5 in their entirety.
Sec. 1011.2	Illumination	(Modification) Delete this section and add “Exit signs shall be internally illuminated. Externally illuminated exit signs are prohibited.”
Sec. 1011.5	Externally Illuminated Exit Signs	(Modification) Delete the word “externally” from the heading and from the first sentence.
Sec. 1011.5.1	Graphics	(Modification) Add the text “Graphics on exit signs shall be in both English and Arabic for the word EXIT, with Arabic above English.”
Sec. 1011.5.2	Exit Sign Illumination	(Deletion) Delete this section.
Table 1018.1	Corridor Fire-Resistance Rating	(Modification) Delete the number “0.5” in the table for a Group R occupancy with a sprinkler system and replace it with “1”.
Table 1018.1	Corridor Fire-Resistance Rating	(Modification) Add a new footnote “f” to state, Corridors in Type III and V, combustible construction that do not support

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installation of smoke and fire dampers shall comply with exceptions to Section 716.5.4 or be constructed in a manner that permits the installation of dampers.

Sec. 1023.4

Termination

(Modification) Delete this section and replace it with “Exit passageways shall terminate at an exit discharge or a public way. Deadends within exit passageways shall comply with Section 1018.4.”

CHAPTER 11 - ACCESSIBILITY

Sec. 1103.2.6

Construction Sites

(Modification) Delete this section and add, “Structures, sites and equipment directly associated with the actual process of construction including, but not limited to, scaffolding, bridging, materials hoists, materials storage or construction trailers are not required to be accessible. Buildings associated with construction camps, drilling and workover operations, laydown yards or maintenance operations are not required to be accessible.”

Sec. 1103.2.15

Saudi Aramco Remote Locations and Plant Facilities

(Addition) Buildings in remote locations and buildings within the scope of [SAES-B-014](#), Section 1 shall not be required to comply with Chapter 11. Remote locations shall be defined as areas that do not have a related Saudi Aramco family camp or are not within a developed local community.

Sec. 1107.6.2.1

Apartment Houses, Monasteries and Convents

(Modification) Delete the words monasteries and convents.

Sec. 1107.6.2.2

Group R-2 other than Apartment Houses, Monasteries and Convents

(Modification) Delete the words monasteries and convents.

Sec. 1109.2.1.8

Signage

(Addition) A “Family or Disabled Assisted-Use Toilet (or bathing room)” sign shall be posted on or near the door in both English and Arabic, with Arabic above English.

Sec. 1110.1 Signs

(Modification) Delete Item 6, delete the word “unisex” and add “family and disabled assisted use”.

CHAPTER 12- INTERIOR ENVIRONMENT

Sec. 1203.1 General

(Modification) Change the section to read: “Buildings and structures enclosing spaces intended for human occupancy shall be provided with ventilation in accordance with Section 1203.4, the *Saudi Aramco Mechanical (HVAC) Code* ([SAES-K-100](#)) and [SAES-K-001](#). In the case of conflicts, the stricter requirement applies.”

Sec. 1208.3 Room Area

(Modification) Add this sentence to the end of the section. “Contractor and construction camp residential buildings and dwelling units are not required to have at least one room not less than 13.9 square meters (120 square feet).”

CHAPTER 13 - ENERGY EFFICIENCY

Sec. 1301.1.1 Criteria

(Modification) Delete this section in its entirety and substitute the following:

- ◆ Energy efficiency requirements of Saudi Aramco buildings are stated in [SAES-N-004](#).
- ◆ SAES-K-001 “Design and Installation of Heating, Ventilating and Air Conditioning Systems”
- ◆ SAES-P-123 “Lighting”
- ◆ SAES-R-004 “Building Architectural Design and Finishes Requirements”
- ◆ SAES-S-060 “Saudi Aramco Plumbing Code”

*Commentary Note:*

[SABP-K-001](#), *Energy-Efficient Buildings may also be used as a general reference for energy efficiency of buildings.*

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## CHAPTER 15 - ROOF ASSEMBLIES AND ROOFTOP STRUCTURES

### Sec. 1501.1 Scope

(Addition) Add the following to this section: “The preferred roof systems for new flat roofs with a slope of less than 13 mm (½ inch) vertical to 305 mm (12 inches) horizontal are: a) Inverted, loose laid and ballasted single-ply membrane system; b) Fully adhered and mechanically fixed single ply membrane systems; c) Loose laid ballasted single ply membrane systems. Acceptable systems are 1.52 mm (0.060”) thick EPDM (Ethylene Propylene Diene Monomer) or 5 mm (0.2”) Modified Bitumen membrane systems, or 1.52 mm TPO (Thermoplastic PolyOlefin) or PVC (PolyVinyl Chloride) membrane. If PVC and TPO membrane is exposed, thickness shall be 2.0 mm reinforced & UV resistant.

Other flat roof systems can only be used with written approval by the Supervisor, Civil Engineering Unit, Mechanical & Civil Engineering Division, Consulting Services Department.

Ballasted roofs shall have a separation layer installed below the gravel ballast. Ballasted roofs shall have a minimum of 19 mm (¾”) washed gravel placed to a minimum thickness of 50 mm (2”).

All completed flat roofs shall be subjected to a flood test for a period of no less than 24 hours. Roof flood tests shall be carried out in a manner acceptable to the Company Representative and the Saudi Aramco Inspection Department Representative.”

### Sec. 1503.4 Roof Drainage

(Modifications) Change the section to read: “Design and installation of roof drainage systems shall comply with Section 1503 and the following:

Primary and secondary roof drain systems shall be based on the 100-year hourly rainfall rate. Secondary roof drain systems shall have the end point of discharge separate from the primary system. The flow through the primary system shall not be considered when sizing the secondary roof drain system. Scuppers used for secondary drainage shall be sized to prevent the depth of ponding water from exceeding that for which the roof was designed. Scuppers shall not have an opening dimension of less than 4 inches.”

Sec. 1507.4.2 Deck Slope

(Modification) Change case 2 to read: 2. The minimum slope for lapped, non-soldered seam metal roofs with applied lap sealant shall be one unit vertical in 12 units horizontal. Lap sealants shall be applied in accordance with the approved manufacturer's installation instructions.

(Addition) Add the following sentence to case 3: The minimum slope for standing seam of roof systems with panel lap splices perpendicular to the roof slope shall be one-half unit vertical in 12 units horizontal.

CHAPTER 16 - STRUCTURAL DESIGN

Sec. 1601.1 Scope

(Addition) All structural calculations shall be prepared in accordance with [SAES-A-204](#).

Sec. 1604.3.1 Deflections

(Addition) Add the following paragraph 1604.3.1.1:

Sec. 1604.3.1.1 The analysis and criteria for vibration serviceability due to human activity shall comply with AISC Design Guide No. 11: "Floor Vibrations Due to Human Activity", and shall be applied to any construction type and material (steel, concrete, masonry, etc.)

Sec. 1604.3.3 Steel

(Addition) Add the following at the end of the sentence: "and AISC Design Guide No. 3: Serviceability Design Considerations for Steel Buildings", as applicable.

Sec. 1609.3 Basic Wind Speed

(Modifications) Delete in its entirety and substitute:  
"The minimum basic wind speed for determining design wind pressure shall be in accordance with [SAES-A-112](#)."

Sec. 1609.4 Exposure

(Addition) Add the following: "Exposure Factors shall be as defined in [SAES-A-112](#)."

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Sec. 1610.1	General	(Addition) Add the following: “Concrete retaining walls shall be in accordance with the requirements of <a href="#">SAES-Q-009</a> .”
Sec. 1611.1	Design Rain Loads	(Modification) Modify the last sentence to read as follows: “The design rainfall shall be based on the 100-year, one hour rainfall rate from <a href="#">SAES-A-112</a> .”
Sec. 1612.2	Definitions	<p><b>Base Flood Elevation</b></p> <p>(Modification) Delete the definition in its entirety and substitute the following: “The elevation of the base flood, including wave height as defined in the project proposal, if applicable.”</p> <p><b>Design Flood</b></p> <p>(Modification) Delete the area number 2 and substitute the following: “2. Area designated as a flood hazard area as defined in the project proposal, if applicable.”</p> <p><b>Design Flood Elevation</b></p> <p>(Modification) Delete the definition in its entirety and substitute the following: “The elevation of the “design flood,” including wave height shall be as defined in the project proposal, if applicable.”</p> <p><b>Flood Hazard Area</b></p> <p>(Deletion) Delete the definition of “Flood Hazard Area.”</p>
Sec. 1612.3	Establishment of flood hazard areas	(Modification) Delete this section in its entirety and substitute the following: “Flood prone areas and the base flood elevation shall be defined in the project proposal, if applicable.”
Sec. 1613.5.1	In the second paragraph of this section, delete “Figures 1613.5 (1) through (14)” and substitute “ <a href="#">SAES-A-112</a> “	

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## CHAPTER 17 - STRUCTURAL TESTS AND SPECIAL INSPECTIONS

### Sec. 1704.1 General

(Modification) Revise to read: “The inspections listed in Section 1704 shall be performed in addition to inspections required by Section 109, when directed by the Manager, Inspection Dept.”

### Sec. 1704.4 Concrete Construction

(Deletion) Delete exceptions 1 through 5.

## CHAPTER 18 - SOILS AND FOUNDATIONS

### Sec. 1801.2 Design

(Addition) add “[SAES-A-114](#)” at the end of the section.

### Sec. 1803 Geotechnical Investigations

(Modification) Delete in its entirety and substitute “Foundation and Soil Investigations: A site specific geotechnical investigation is required for all structures, including existing foundations which undergo a change in loading conditions, and foundations, per the requirements of [SAES-A-113](#).”

### Sec. 1804.2 Placement of Backfill

(Modification) Delete in its entirety and substitute “Refer to [SAES-A-114](#) for backfill requirements.”

### Sec. 1804.5 Compacted Fill Material

(Modification) Delete in its entirety and substitute “Refer to [SAES-A-114](#) for compacted fill requirements.”

### Sec. 1806 Presumptive Load-Bearing Values of Soils

(Deletion) Delete in its entirety and substitute “The allowable load bearing values shall be determined by the geotechnical investigation when required by [SAES-A-113](#). If geotechnical investigation is not required, the net applied bearing pressure on the footing shall not exceed 100 kPa (2000 psf).”

### Sec. 1807.1.3 Rubble Stone Foundation Walls

(Deletion) Delete in its entirety.

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- Sec. 1807.1.4      Wood Foundations  
(Deletion) Delete in it's entirely.
- Sec. 1807.2      Retaining Walls  
(Modification) Add "in accordance with [SAES-Q-009](#) and" after "designed" in the first sentence.
- Sec. 1808.1      General  
(Modification) Add "and [SAES-Q-005](#)" to the end of the first sentence.
- Sec. 1808.4      Vibratory Loads  
(Modification) Add "For heavy machinery, refer to [SAES-Q-007](#)" to the end of the first sentence.
- Sec. 1808.6.3      Removal of Expansive Soil  
(Modification) Delete "Section 1804.5" and substitute "[SAES-A-114](#)."
- Sec. 1807.5      Alternate Setback and Clearance  
(Modification) Delete "Section 1803.5.10" and substitute "[SAES-A-113](#)."
- Sec. 1808.8      Concrete Footings  
(Modification) Add "and [SAES-Q-005](#) and [SAES-Q-001](#)" to the end of the sentence.
- Sec. 1808.8.1      Concrete or Grout Strength and Mix Proportioning  
(Modification) Add "but in no case less than 28,000 kPa (4,000 psi)."
- Sec. 1809.1      Footings  
(Modification) Add "and [SAES-Q-005](#)" to the end of the first sentence.
- Sec. 1809.2      Supporting Soils  
Delete "Section 1804.5" and substitute "[SAES-A-114](#)."
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Sec. 1809.4	Depth of Footings	(Deletion) Delete “below the undisturbed ground surface shall be 12 inches (305 mm)” and substitute “below the existing or finished grade surface shall be 600 mm.”
Sec. 1809.9	Masonry-Unit Footings	(Exception) Add “Use of masonry-unit footings shall be limited to one-story temporary light-frame structures.”
Sec. 1809.12	Timber Footings	(Deletion) Delete in its entirety.
Sec. 1810.1.1	Geotechnical Investigation	Delete “Section 1803” and substitute “ <a href="#">SAES-A-113</a> .”
Sec. 1810.3.2.1	Concrete	(Modification) Delete this section in its entirety and substitute “The design and specification for construction of all plain and cast-in-place concrete structures shall be in accordance with <a href="#">SAES-Q-001</a> and <a href="#">09-SAMSS-097</a> .”
Sec. 1810.3.2.4	Timber piles	(Modification) Delete Section 1810.3.2.4 through Section 1810.3.2.4.1
Sec. 1810.3.2.8	Justification of Higher Allowable Stresses	Delete “Section 1803” and substitute “ <a href="#">SAES-A-113</a> .”
Sec. 1810.3.3.1.4	Allowable Frictional Resistance	Delete “Section 1803” and substitute “ <a href="#">SAES-A-113</a> .”
Sec. 1810.4.1.5	Defective Timber Piles	Delete this section in its entirety.
Sec. 1810.4.4	Pre-excavation	Delete this section in its entirety and replace with “The use of jetting, augering or other methods of pre-excavation

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shall not be permitted.”

## CHAPTER 19 - CONCRETE

(Modification) Delete Chapter 19 in its entirety and substitute:  
The design and specification for construction of all plain and cast-in-place concrete structures shall be in accordance with [SAES-Q-001](#) and [09-SAMSS-097](#), except as amended and referenced below:

### Sec. 19.1 Section 1910 - Minimum Slab Provision

(Modification) Delete section 1910.1 in its entirety and substitute:  
“The minimum thickness of concrete floor slabs supported directly on the ground shall be 100 mm (4 inches).”

## CHAPTER 21 – MASONRY

### Sec. 2101.1 Scope

(Addition) Add the following: “In addition, masonry foundations shall comply with the applicable provisions of [SAES-Q-005](#) and masonry retaining walls shall comply with the applicable provisions of [SAES-Q-009](#).”

### Sec. 2103.1 Concrete Masonry Units

(Addition) Add the following at the end of the paragraph: “Concrete masonry units shall be in accordance with [SAES-Q-001](#).”

### Sec. 2103.2 Clay or Shale Masonry Units

(Modification) Delete the term “ASTM C 62” wherever it appears in this section and substitute “SASO SSA-184 and SASO SSA-185.”

(Modification) Delete the term ASTM C 126 wherever it appears in this section and substitute SASO SSA-184 and SASO SSA-185.

(Modification) Delete the term ASTM C 652 wherever it appears in this section and substitute SASO SSA-184 and SASO SSA-186.

### Sec. 2103.8 Mortar

(Addition) Add the following at the end of the paragraph:  
“The specified compressive strength of mortar shall not be less than 12.4 MPa (1800 psi). Mortar shall not be retempered.”

- Sec. 2103.12      Grout
- (Addition) Add the following sentence to the end of the paragraph, “Grout shall not be retempered.”
- Sec. 2103.13      Metal Reinforcement and Accessories
- (Modification) Delete in its entirety and substitute: “Reinforcement steel bars and welded wire fabric shall conform to [SAES-Q-001](#).”
- Sec. 2103.14      Aggregate (Add Section)
- (Addition) “Aggregates shall be in accordance with [09-SAMSS-088](#).”
- Sec. 2103.15      Water
- (Addition) “For the purposes of this chapter, water shall not contain more than 500 ppm total dissolved solids.”
- Sec. 2104.1.7      Pipes and Conduits Embedded in Masonry
- (Addition) “Sleeves, pipes, conduits, etc., of aluminum shall not be embedded in masonry unless effectively protected to prevent aluminum-concrete reaction. Protection shall be by wrapping with a suitable plastic tape applied so as to provide adequate protection at the overlap or by painting using an [SAES-H-001](#), APCS-26.”
- Sec. 2105.2.2.1.2      (Addition) Add the following sentence “The minimum compressive strength of concrete masonry units shall be 13.1 MPa (1900 psi). The corresponding specified compressive strength of masonry  $f'_m$  shall be limited to a maximum of 10.34 MPa (1500 psi) as per Table 2105.2.2.1.2.”
- Sec. 2107.2.7      Minimum Reinforcement
- (Addition) Add the following paragraph: “The minimum vertical reinforcement shall be 12 mm diameter bars at 1.2 meters spacing (#4 bars at 4 ft spacing). The minimum horizontal joint reinforcement shall be 2 longitudinal truss bars of 5 mm diameter placed at 400 mm (16-inch) centers.”
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## CHAPTER 22 - STEEL

### Sec. 2201.1 Scope

(Modifications) Modify this section to read: “the provisions of this chapter, [12-SAMSS-007](#), and [12-SAMSS-008](#) govern the quality, design, fabrication and erection of steel used structurally in building or structures.”

### Appendix 1 - Inelastic Analysis and Design

(Modification) The design approach in this appendix may only be used for the design of blast resistant buildings per [SAES-M-009](#).

## CHAPTER 23 - WOOD

### Sec. 2303.1 General

(Addition) Add the following paragraph: “Wood members shall be restricted to those listed in the Saudi Aramco Materials System Catalog.”

### Sec. 2304.11 Protection against Decay and Termites

#### Sec. 2304.11.1 General

(Addition) Delete this item in its entirety and substitute:  
“The Saudi Aramco operating area is an active termite zone. Buildings and wood structures shall include termite pretreatment to protect against termite attack.”

## CHAPTER 25 - GYPSUM BOARD AND PLASTER

### Sec. 2511.1 General

(Addition) Add the following: “Plaster shall not be retempered.”

### Sec. 2512.1 General

(Addition) Add the following: “Plaster shall not be retempered.”

## CHAPTER 27 – ELECTRICAL

Delete in its entirety and substitute the following:

“The electrical components, equipment and systems used in buildings shall be designed and constructed in accordance with the

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provisions of [SAES-P-100](#).”

## CHAPTER 28 – MECHANICAL SYSTEMS

Delete in its entirety and substitute the following:

“The heating, ventilating and air-conditioning (HVAC) systems used in buildings shall be designed and constructed in accordance with the provisions of [SAES-K-100](#).”

## CHAPTER 29 - PLUMBING SYSTEMS

Delete in its entirety and substitute the following:

“The plumbing systems used in buildings shall be designed and constructed in accordance with the provisions of [SAES-S-060](#).”

## CHAPTER 30 – ELEVATORS AND CONVEYING SYSTEMS

### Sec. 3001.2 Referenced Standards

(Modification): Add the following “Inspection and test shall be as required in GI-0007.030, Inspection and Testing of Elevating/Lifting Equipment”

### Sec.3002.4 Elevator car to accommodate ambulance stretcher

(Modification) Delete the words in parenthesis (star of life) and add the words (red crescent).

## CHAPTER 33 - SAFEGUARDS DURING CONSTRUCTION

### Sec. 3301.3 Scope

(Modification) Replace the section with the following:

“The provisions of this chapter and Saudi Aramco Construction Safety Manual shall govern safety during construction and protection of adjacent public and private properties. In the case of conflicts, the stricter requirement applies.”

### Sec. 3304.1.2 Surcharge

(Modification) Delete the second sentence and substitute the following: “Any planned excavation which could potentially undermine an existing foundation shall be braced, shored or the foundation shall be underpinned or otherwise protected against

settlement or lateral movement. Any excavation which intersects an imaginary plane which extends 45 degrees to the horizontal, projected downward from the bottom toe of the adjacent footing, is considered to have the potential to undermine the foundation.”

Sec. 3307

Protection of Adjoining Property

(Deletion) Delete this section in its entirety.

#### CHAPTER 34 - EXISTING STRUCTURES

Sec. 3411.8.11

Toilet Rooms

(Modification) Add the sentence to the end of this section.  
A “Family or Disabled Assisted-Use Toilet” sign shall be posted on or near the door in both English and Arabic, with Arabic above English.

Sec. 3411.8.12

Dressing, Fitting and Locker Room

Delete the last sentence in this section.

#### CHAPTER 35 – REFERENCED STANDARDS

(Modification) Delete the text in the introductory paragraph and add “This chapter lists the standards that are referenced in various sections of this document. The standards are listed herein by the promulgating agency of the standard, the standard identification, the effective date and title, and the section or sections of this document that reference the standard. The application of the most recent edition of the referenced standards (regardless of the effective date listed in the text) shall be as specified in Section 102.4.”

#### APPENDIX H – SIGNS

H101.1

General

(Addition) Add the following: Each building shall have identification signs posted on the sides of the main entrances of the building and other sides as deemed necessary by the building owner. All signs required by this Code shall be designed in accordance with the signing guidelines of Saudi Aramco Corporate Identity, Public Relations Department. Signs should not pose any hazards to occupants in buildings subject to blast loads.

## APPENDIX J – GRADING

### J101.1 Scope

(Addition) Add the following sentence: Excavation and backfill shall be in accordance with [SAES-A-114](#) and the requirements of this appendix as modified below.

### Sec. J103 Permits required

(Deletion) Delete this section, including all subsections in their entirety.

### Sec. J104 Permits applications and submittals

(Deletion) Delete this section, including all subsections in their entirety.

## APPENDIX K – ADMINISTRATIVE PROVISIONS

Delete this appendix in its entirety

## INDEX INDEX

Page 648 (Modification) Delete the word “CHURCHES” and add “MOSQUES AND MUSALLAS”

Page 662 (Deletion) Delete the line “MONASTERIES...310.1”

6 September 2011  
4 June 2013

### Revision Summary

Major revision.  
Minor revision.

## Special Appendix I – Table of Chapter and Waiver Responsibilities

2009 IBC Chapter	Reviewing Organization
1 Scope and Administration	CSD
2 Definitions	CSD
3 Use and Occupancy Classification	LPD
4 Special Detailed Requirements Based on Use and Occupancy	LPD
5 General Building Heights and Areas	LPD
6 Types of Construction	LPD
7 Fire and Smoke Protection Features	LPD
8 Interior Finishes	LPD
9 Fire-protection Systems	LPD
10 Means of Egress	LPD
11 Accessibility	LPD
12 Interior Environment	CSD
13 Energy Efficiency	CSD/P&CSD
14 Exterior Wall	CSD
15 Roof Assemblies and Rooftop Structures	CSD
16 Structural Design	CSD
17 Structural Tests and Special Inspections	CSD
18 Soils and Foundations	CSD
19 Concrete	CSD
20 Aluminum	CSD
21 Masonry	CSD
22 Steel	CSD
23 Wood	CSD
24 Glass and Glazing	CSD
25 Gypsum Board and Plaster	CSD
26 Plastic	CSD
27 Electrical	CSD
28 Mechanical Systems	CSD
29 Plumbing Systems	CSD
30 Elevators and Conveying Systems	LPD
31 Special Construction	LPD
32 Encroachments into the Public Right-of-Way	CSD
33 Safeguards during Construction	LPD
34 Existing Structures	LPD
35 Referenced Standards	LPD

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## Special Appendix I – Table of Chapter and Waiver Responsibilities (Cont'd)

### APPENDIX

C	Group U-Agricultural Building	LPD
E	Supplementary Accessibility Requirements	LPD
F	Rodent Proofing	CSD
H	Signs	LPD
I	Patio Covers	LPD
J	Grading	CSD

*Note: 1. Material standards will be reviewed by the department responsible for the associated chapter.*

### Legend:

- CSD – Consulting Services Dept.
- LPD – Loss Prevention Dept.
- P&CSD – Process & Controls System Dept.



## Special Appendix II – Table of Building Types, Applicable Standards and Design Requirements

Building Description	Applicable Mandatory Standards	Remarks
Blast Resistant Buildings	<a href="#">SAES-M-009</a> , <a href="#">SAES-B-014</a>	
Control Buildings	<a href="#">SAES-J-801</a>	
Offshore Production Facilities	<a href="#">SAES-B-009</a>	
Analyzer Shelter	<a href="#">SAES-J-502</a>	
Prayer Shelters & Mosque	<a href="#">SAES-A-109</a>	
On-Shore Substations	<a href="#">SAES-P-119</a> <a href="#">Standard Substation Library Dwgs.</a> <a href="#">DA-950150</a> to <a href="#">DA-950163</a>	
Process Interface Buildings (PIBs)	<a href="#">SAES-J-801</a>	
Waste Water Facilities	<a href="#">SAES-A-104</a> , Para. 4.7.2.3.2	
Compressor Sheds	<a href="#">SAES-M-001</a>	
Sunshades	<a href="#">SAES-M-001</a> or <a href="#">12-SAMSS-014</a>	<a href="#">12-SAMSS-014</a> cold-formed steel
Hammams	Std. Drawing AA-036011	
Pre-Engineered Metal Buildings	<a href="#">12-SAMSS-014</a>	
Offshore Buildings	<a href="#">SAES-B-009</a>	
Battery Rooms	<a href="#">SAES-J-801</a> & <a href="#">SAES-P-103</a>	<a href="#">SAES-B-069</a> (Eyewash)
Medical Buildings	NFPA 101	

**Note:** All buildings shall comply with the requirements of [SAES-B-009](#) (offshore), [SAES-B-014](#) and [SAES-B-055](#) as applicable. The listed specific requirements are only for guidance and are not all inclusive. All maintenance and operational requirements shall be met.