

Engineering Standard

SAES-A-202

04 January 2006

Saudi Aramco Engineering Drawing Preparation

Document Responsibility: Engineering Drawing Services

Saudi Aramco DeskTop Standards

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1 Scope

This standard establishes a uniform means of Computer Aided Design & Drafting (CADD) standards used, in producing and modifying Saudi Aramco engineering drawings in electronic format.

2 Definitions

Abbreviations and Letter Symbols: shall be used where physical space prevents complete spellings as in title blocks and in small drawings. Abbreviations should only be used when absolutely necessary and never be used when the meaning will not be clear. Saudi Aramco standard Abbreviations and Letter Symbols must be used to maintain consistency within the Saudi Aramco documents. Abbreviations and Letter Symbols are listed in Saudi Aramco standards Web site http://csd.aramco.com.sa/std/Web_Version.asp under other information. Other standard abbreviations commonly used in petroleum industry should be used if an appropriate abbreviation is not found on the referred list

As-Built Drawing: an Engineering drawing that has been revised to reflect actual field conditions after the completion of construction. Additions or changes to a drawing resulting from facility modification must also be verified as 'As-Built' and referenced to the Job Order (JO) in case of PMT, Engineering Work Order (EWO) in case of Design office and organization code in case of operation.

Auto-SACS: is the automated tool that provides a unique method to apply the Saudi Aramco CADD standards.

CADD Drawings: are Engineering Drawings generated electronically using software approved by Saudi Aramco as its standard medium for development and permanent retention (see appendix 'D' of [SAEP-334](#) for details). Prior approval is required from the Chief Draftsman for the use of any other software.

Data-Centric System: is a design program used to develop Instrumentation, Electrical, Mechanical and Piping related engineering information in a database format. These formats will be used to generate 2D/3D modules that are derived from the database. For more details refer to [SAEP-334](#) section 15.12.

Demolition Drawing: is any existing drawing that shows the extent of the demolition work to be done. For details refer to [SAEP-334](#) section 11.

Drawing Completion Certificate or DCC: is a document bearing the names and signatures of authorized persons accepting responsibility that the associated Engineering Drawings meet the applicable Saudi Aramco Engineering Standards and procedures. The DCC fulfills the approval/certification requirement in lieu of signing the title block of each drawing individually. Refer to [SAEP-334](#) section 14.

Drawing Number: is an arrangement of eight alpha/numeric characters [prefix + size (separated by dash '-') + number] used to provide the unique identity for individual Engineering Drawings. Refer to section 5.4 of this standard.

Drawing Name: is file system name of the Engineering Drawing in a standard Saudi Aramco format. The name format is used when transferring drawings to or from EDS. Refer to section 4 of this standard for more details.

Engineering Drawing Services Division or EDS: of Engineering Services (ES) charged with the responsibility of analyzing and setting drawing related standards and procedures, ensuring the compliance of these standards and having the custody and management of all Saudi Aramco Engineering and Vendor Drawings defined in, and governed by this standard and Saudi Aramco Engineering Procedure [SAEP-334](#).

Emergency Drawing: is an Engineering Drawing that has been designated by the Operating Engineering Organization (OEO) as being critical to the plant's operations during a disaster situation. These drawings are given top priority in every case.

Engineering Drawing: as used throughout in this procedure, is a document produced on an approved Saudi Aramco engineering form, by Saudi Aramco (or for Saudi Aramco by approved sources) which bears a Saudi Aramco engineering drawing number and which was prepared for the purpose of identifying engineering related information to be used for the construction, operation or maintenance of a Saudi Aramco plant and facility.

Engineering Forms: are the approved forms used for the presentation of engineering information which bears an official Saudi Aramco form number followed by "ENG" abbreviation for Engineering and the latest date of form revision. Forms may vary in size depending upon the information being presented. For list of Engineering forms refer to [SAEP-334](#) Appendix E.

Key Drawings: are engineering drawings designated as essential for continued facility operation and maintenance. The Proponent Organization and Project Management jointly determine Key Drawing status. Refer to item 5.13 in this standard for list of key drawings.

Library Drawings: are drawings of designs previously used or developed to be used as guidelines for new projects in Saudi Aramco facilities. Use of these drawings in future similar projects shall be considered. Library drawings provide "pre-designed" information that can be used on a repetitive basis. The utilization of Library Drawings can improve the use of stock material and eliminate the need for individual or unique designs. In addition, the use of Library Drawings provides savings by directly reducing drafting, design and engineering time in new projects. Library Drawings are archived on Plant M88 and governed by SAEP-305. They are available from the Saudi Aramco standards Web site http://csd.aramco.com.sa/std/Web_Version.asp.

Plant Drawing Online Collaboration – PlantDoc: is the sole corporate Saudi Aramco Engineering drawing and Data Management system that contains all approved and certified engineering data that are collected from the inception of the company. It is an automated system designed for administration and control of Saudi Aramco engineering drawings and data in a centralized library. This allows the users to query, view, print, retrieve and submit engineering and vendor drawings in addition of allowing them to retrieve new engineering drawing numbers, tag numbers, create new sheet numbers and to perform job tracking/creation functions. Refer to PlantDoc Users Guide for operational details.

Responsible Engineering Office or REO: is a Saudi Aramco "office" that has been entrusted with the production or revision of an Engineering Drawing. Non-Saudi Aramco firms or companies are not allowed to be the designated REO. Certain individuals within the REO shall be authorized to track issued existing Engineering Drawings and Facility Data.

Revision Status:

- a) **As-Built:** refers to all contents of the drawing that have been certified as representing existing conditions based on site verification.
- b) **Developmental:** refers to a drawing in the process of being changed. While in a changing state the design agency may assign increment revisions at each review milestone.
- c) **Design Revision:** refers to a drawing revised to incorporate new proposed changes, but which has not been As-Built.
- d) **Partial As-Built:** refers to an existing drawing formerly certified as As-Built but partially revised for new construction. The un-revised portions of the drawing continue to represent previous As-Built condition.

Saudi Aramco: shall mean Saudi Arabian Oil Company and its affiliated companies, including, but not limited to Aramco Overseas Company (AOC) and Aramco Services Company (ASC).

Standard Drawings: are specially prepared engineering drawings that have been pre-approved by responsible Saudi Aramco organization for mandatory application in the design of Saudi Aramco facilities when the information they contain applies and is appropriate during design. The production of a Standard Drawing follows the normal production requirements presented in this Standard. Standard Drawings are archived in Plant 990 and governed by SAEP-110. They are available from the Saudi Aramco standards Web site http://csd.aramco.com.sa/std/Web_Version.asp.

Title Block: is the reserved portion of a drawing containing information about the drawing, project and plant. (See item 5 and appendix 'A' of this document).

Vendor drawing: is any document developed by a manufacturer that supports the technical requirements of material or equipment and received as part of a purchase order. The vendor drawings are also governed by [SAEP-334](#) section 17.

3 Applicable Documents

Engineering Drawings shall be prepared and revised in accordance with all applicable Saudi Aramco standards, procedures and practices as well as those applicable international standards and practices approved by Saudi Aramco.

3.1 Saudi Aramco Engineering Standards

<i>SAES-J-004</i>	<i>Instrumentation Symbols and Identification</i>
<i>SAES-J-005</i>	<i>Instrumentation Drawings and Forms</i>
<i>SAES-L-105</i>	<i>Piping Material Specifications</i>
<i>SAES-P-104</i>	<i>Wiring Methods and Materials</i>

3.2 Saudi Aramco Engineering Procedures

<i>SAEP-103</i>	<i>Metric Units of Weights and Measures</i>
<i>SAEP-110</i>	<i>Saudi Aramco Standard Drawings</i>
<i>SAEP-127</i>	<i>Security and Control of Saudi Aramco Engineering Data</i>
<i>SAEP-305</i>	<i>Saudi Aramco Library Drawings</i>
<i>SAEP-334</i>	<i>Retrieval, Certification, and Submittal of Engineering & Vendor Drawings</i>

3.3 Saudi Aramco General Instructions

<i>GI-0710.002</i>	<i>Classification of Sensitive Documents</i>
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3.4 Saudi Aramco Standard Drawings

<i>AD-036204, sheet 001</i>	<i>Letter Designation for Line Numbers</i>
<i>AE-036411, sheet 001</i>	<i>Drawing Indices</i>
<i>AE-036411, sheet 002</i>	<i>Mechanical Equipment Marking</i>
<i>AE-036411, sheet 003</i>	<i>Electrical Equipment Marking</i>
<i>AD-036491, sheet 001</i>	<i>In-Line Instrument Symbols for ILLDs</i>
<i>AE-036625, sheet 001</i>	<i>Engineering Drawing Forms Layout</i>

3.5 Auto-SACS

- 3.5.1 Engineering Drawings must be prepared and revised using the latest version of **Auto-SACS** as approved by the Engineering Drawing Services Division (EDSD) only. **Auto-SACS** is available at (<http://edsd.aramco.com.sa/autosacs.asp> or request from EDSD).
- 3.5.2 When certain standards are not available in Auto-SACS and contradicting to Saudi Aramco CADD Standards, prior approval must be obtained from the Chief Draftsman, EDSD.

4 Drawing Name

Drawing Name must comply with the file naming convention. Vector, Hybrid (Vector and Raster), Microsoft Excel, Word and Acrobat PDF files shall have a naming format for drawing BA-123456, sheet 001, revision 01 or 01A as follows:

4.1 Vector drawings

Prefix + Number + Sheet + V or A + Revision

Example: B123456001V01 or B123456001V01A (for MicroStation files)

Example: B123456001A01 or B123456001A01A (for AutoCAD files)

4.2 Hybrid drawings, two Files

Vector file: Prefix + Number + Sheet + V or A + Revision

Raster file: Prefix + Number + Sheet + R + Revision

Example: B123456001V01 or B123456001V01A (for MicroStation vector)

B123456001A01 or B123456001A01A (for AutoCAD vector)

B123456001R01 or B123456001R01A (for raster portion)

4.3 Excel

Prefix + Number + Sheet + X + Revision

Example: B123456001X01 or B123456001X01A

4.4 Word

Prefix + Number + Sheet + W + Revision

Example: B123456001W01 or B123456001W01A

4.5 PDF (for Data-Centric only. Refer to section 15.12 of [SAEP-334](#) for details)

Prefix + Number + Sheet + P + Revision

Example: B123456001P01 or B123456001P01A

4.6 PSR (for Data-Centric only. Refer to section 15.12 of [SAEP-334](#) for details)

Prefix + Number + Sheet + Z + Revision

Example: B123456001Z01 or B123456001Z01A

5 Title Block Information (Refer to Appendix A)

5.1 Title Block Data Entry

Saudi Aramco drawing Title Block Automation (TBA) is a system designed to auto-generate the text box information within engineering drawing files. The same information is also automatically written into the design file within an element that is normally hidden to the user. It can validate whether the Title Block information contained within each Design File contains errors, and report them when detected. The TBA includes three modules; Data Entry/Edit, Validation and Reporting. Refer to [Auto-SACS](#) Read-me file for details.

Uniqueness:

5.1.1 The drawing number uniquely identifies a drawing.

5.1.2 If a drawing is part of a set, the drawing number plus the sheet uniquely identify the sheet in a set of drawings.

5.1.3 If a drawing has been revised, the drawing number, plus the sheet, plus the specific revision uniquely identify the drawing.

5.2 Drawing Index

5.2.1 The Drawing Index is a single character in the range of A to Z (excluding I and O). For complete listing, refer to Standard Drawing AE-036411, sheet 001.

5.2.2 The Index is shown on Engineering Drawings in the title block. A maximum of two index letters are acceptable on a drawing, arranged by order of importance (not in alphabetic sequence).

5.2.3 The Index implies, but does not determine, a group of associated types.

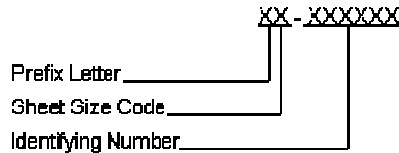
5.3 Drawing Type

- 5.3.1 Type is a three character code.
- 5.3.2 Type implies, but does not determine, a group of closely related drawing titles. One of the associated titles may be used to develop the first line of the drawing title. For a complete listing of drawing types refer to [Appendix B](#).

5.4 Drawing Number

- 5.4.1 The Drawing Number provides one part of the "unique" identification code for each Engineering Drawing. It is comprised of a single alpha character Prefix Letter, a single alpha character Sheet Size Code, and six (6) alpha-numeric characters identifying Number separated by a dash.
- 5.4.2 Typical Drawing Number that is entered in the engineering drawing. Refer to SAEP-334 for drawing number assignment.

Example: DB-765432



- 5.4.3 Prefix Letter: is a single character alpha code. The following Prefix Letters are currently used with new drawing numbers.

A	Standard Drawings only.
D	Library Drawings only.
B	Southern Area (Eastern Arabia).
H	Central Area (Eastern Arabia).
R	Northern Area (Eastern Arabia).
V	(Central and Western Arabia).

- 5.4.4 The following prefix letters appear on some of the existing Engineering Drawings but are no longer used on new drawing production. New sheets, however, can be added to the existing drawings using these prefixes.

A	Drawing numbers assigned by Aramco San Francisco or New York, AOC at Rome or London (except for Standard Drawing).
G	SOCAL
K	SCECO
L	Aramco Overseas Company, Beirut.

N	AOC, The Hague assigned drawing number.
X	ASC, Houston assigned drawing number.
D	Dhahran assigned drawing numbers (except for Library Drawings).

5.4.5 Drawing Sizes: is a single alpha character that defines the cut size of the drawing when printed or plotted. The following table shows the only acceptable sizes for Saudi Aramco Engineering Drawings.

SIZE CODE	OVERALL DIMENSIONS	
	mm	Inches
A	711 x 1016	28 x 40
B	508 x 711	20 x 28
C	356 x 508	14 x 20
D	279 x 432	11 x 17
E	216 x 279	8½ x 11

(Refer to Saudi Aramco [Auto-SACS](#))

5.5 Sheet Number

5.5.1 The Sheet Number is a three (3) digit numeric number ranging from 001 to 999 except for index/face sheets.

5.5.2 Values for Sheet Numbers are as follows:

Type of sheet	Lowest	Highest
Drawing sheet	001	999
Face Sheet	FS1	FS9

5.5.3 Drawing Sets: When an Engineering Drawing has more than one sheet, it's called a set. Most Engineering Drawings of the same Drawing Type are grouped as Sets. Example: P&ID, ILD, and E1L, etc. Rules governing the use are as follows:

5.5.3.1 Sets must be made for a common engineering subject, the subject may be: Design, Process or Service within a specific engineering discipline. For Example:

DESIGN: such as Plot Plans, Structural Details, Equipment Layouts, Hazardous Area Classifications, etc.

PROCESS: such as Process Flow Diagrams, Piping and Instrument Diagrams, Instrument Loop Diagrams,

etc.

SERVICE: such as Piping Isometrics of same product (e.g., Air, Steam, Fuel Gas, etc.) Electrical Drawings (e.g., One Line Diagram, Connection Diagram, Elementary Diagram., Electrical Layout, etc.), Instrument Points and Lines, etc.

- 5.5.3.2 For new construction, all sheets in a common set must be numbered sequentially without number gaps for 'Unused' sheets. If gaps are unavoidable, then an index sheet may be utilized to indicate "spare" in lieu of the unused sheet number.
 - 5.5.3.3 A set of pre-numbered sheets (Engineering Forms) pertaining to one piece of equipment/instrument (e.g., Instrument Specification Sheets or Equipment Data Sheets, etc.), shall make up one drawing set.
 - 5.5.3.4 Face/index Sheets may be provided for all size drawing sets having the same Drawing Numbers and more than ten sheets.
 - 5.5.3.5 The first Face Sheet is numbered FS1. The subsequent Face sheets will be designated as FS2, FS3...FS9. When required to be revised, Face Sheets shall only have full numeric revision numbers (i.e., 01, 02, etc.).
 - 5.5.3.6 Numbering sequences containing alpha characters are unacceptable except Face/Index sheet (FS1 to FS9). Existing drawings bearing alpha/numeric sheet identification should be corrected with numeric sheet numbers by the REO before the drawing is resubmitted with revision information. All reference drawings must be similarly corrected.
 - 5.5.3.7 Cover sheets or title sheets of a drawing or project should not be assigned engineering drawing numbers.
 - 5.5.3.8 Sets developed for Instrument Installation Schedules should be grouped based on category of instrument (pressure, temperature, flow, level, relief valve, MOV/AOV/GOV, miscellaneous) within a single plant.
 - 5.5.3.9 The second line title of individual sheets within a set may vary slightly, if so required for clarification and definition of location. However, Plant Number and Index must be the same on all sheets.
-

5.5.3.10 Engineering forms except Scope of Work and List of Material must be a single file for each sheet.

5.6 Drawing Titles: The title is written on four (4) lines in the standard Title Block

5.6.1 Line 1, Content of the Drawing: the general content of the drawing and the Drawing Type shall be entered on the first line. Use the appropriate approved descriptions as listed in Auto-SACS and should not exceed 30 characters. The users may edit the first line based on the drawing contents as listed on TBA. However, this title should match the drawing type. Loop number and line number shall be entered on first line for ILD and isometric piping details respectively. Similarly equipment, instrument tag or line number shall be mentioned on Safety Instruction Sheet (SIS), Data or specification sheets. TBA program matches this provision.

Type	First line title
ILD, ISO	ILD or ISO + the assigned loop or line number
SIS	SIS + the assigned line, equipment or instrument tag number

5.6.2 Line 2, Subject or Service: the main subject being covered by the drawing must be written here. This could be a process system, substation, service line, equipment number, building number, circuit or loop, etc. Use maximum of 35 characters as necessary to clearly explain the subject matter. Drawings concerning electrical substations shall have the substation number listed.

5.6.3 Line 3, Plant Description: the plant description of the plant corresponding with the plant number is written on this line. Use only the approved listing of plant descriptions. If two or more plants are covered, then only the description of the major plant covered by the drawing should be on line 3. Other plants covered shall be specified as part of the note section.

Exception:

Off-shore wellhead platforms where the platform name may be used.

5.6.4 Line 4, Geographical Location: The name of the Saudi Aramco geographic area where the facility is located. Geographic locations are shown in the plant list for each plant. The plant list is available in the title block data entry of Auto-SACS, PlantDoc and EDSO web site at <http://edsd.aramco.com.sa>. Any exception to this list must be approved by the Chief Draftsman. Abbreviations are not allowed on line 4.

5.7 Revision Number

- 5.7.1 Revision number is a two digit (in case of 100% field verified As-built) or three alpha-numeric characters (in case of design or partial as-built) number assigned per SAEP-334.
- 5.7.2 Full numeric revision numbers (i.e., 01, 02, 03, etc.) are assigned to 100% field verified As-Built, cancelled drawings, face sheets and the drawings whose Plant number has been changed.

Commentary Note:

Not all full numeric revisions indicate As-Built status. Revision 00 may enter the Engineering Drawing Library without being in the As-Built state. Drawings whose Plant has changed or the drawings that are canceled are promoted to the next full numeric revision, regardless of the As-Built status of the original drawing. The drawing user must evaluate the drawing and its revision history to determine As-Built status.

- 5.7.3 Design and partial as-built revisions are indicated by two numbers followed by an alpha character (A-Z, excluding I and O).
- 5.7.4 Each revised drawing must include information such as date, description, associated job number, and revision number in the drawing revision block.
- 5.7.5 Revisions to non-certified drawings are considered developmental. Alpha characters for new drawings, i.e., A, B, C, D, etc., and alpha/numeric for existing drawings, i.e., 1A1, 1A2, 1A3, etc., may be used as developmental revisions. Once it is determined that the drawing will be issued for construction, REO must assure that developmental revisions are removed and that the issued revision is reflected prior to certification and submittal to EDSD.
- 5.7.6 This table provides sample revision numbers, with descriptions and indicates if the revision is allowed to exist in the PlantDoc.

Revision	PlantDoc	Meaning
00	YES	Drawings entering the PlantDoc as new drawings are all revision 00.
03	YES	As-Built for existing drawing (see notes in 5.7.2)
A, B,C,	NO	Development Revision for new drawing
0A1, 0A2	NO	Developmental revision for existing drawing
03C	YES	Design or partial As-Built revision to revision 03.

- 5.8 Plant Numbers: a three character code indicating a facility, process or system. Plant codes are issued and controlled by EDSD.
- 5.8.1 Plant numbers are three alpha / numeric characters in length.
- 5.8.2 Only one active Plant Number should be assigned to an Engineering Drawing.
- Exception:*
- More than one plant number may be allowed under certain circumstances. Approval must be obtained from Chief Draftsman requiring more than one plant number.*
- Example:*
- When the drawing contains interrelated information for more than one plant: continuation of lines, interface points, jumpers, tie-in points, etc., and all such plants fall under the responsibility of the same operating organization.*
- 5.8.3 When an Engineering Drawing is 'typical' for more than one plant, then a separate drawing must be produced for each plant.
- 5.8.4 While changing the plant number of an existing drawing, revise the drawings that involve changing the plant number and plant description in the title block and state in the revision description "CHANGED PLANT NO. FROM XXX to YYY "along with As-built revision, if any.
- 5.9 Job Order / EWO Numbers: The Job Order (JO) Number assigned from SAP or the Engineering Work Order (EWO) Number shall be shown on Engineering Drawings in the title block. Below are samples of JO numbers
- OEO JO number = 391700 (6 digits organization code)
- IDO JO number = 04C123 (EWO number)
- PMT JO number = 10-12345-1234 (BI number + 4 digits)
- 5.10 Drawing File Type: The rectangular box provided at the bottom right corner of the border must be filled out to indicate file type, i.e., VECTOR, HYBRID, etc.
- 5.11 Emergency Drawings: See item 2 for definition. Ensure that all drawings are properly stamped for quick identification.
- 5.12 Information Sensitivity: All Saudi Aramco engineering drawings are classified as restricted drawings, unless classified at higher level as confidential. For more information refer to [GI-0710.002](#).
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5.13 Key Drawings: The following drawing types are required but not limited to be designated as Key Drawings:

- Piping and Instrument Diagrams (PID)
- Process Flow Diagrams (PFD)
- Valve Operating Diagrams (VOD)
- Plot Plans (FPP)
- Equipment Layouts (EQA)
- Underground / above ground Piping Installation Plans (PPL)
- Electrical One/Three Line Diagrams (E1L)
- ESD Logic Diagrams (LOG)
- Instrument Loop Diagrams (ILD)
- Area Classification Plans (HAZ)
- Building Floor Plans & Elevations (ARC)
- Equipment Data Sheets (DAT)
- Safety Instruction Sheets (SIS)
- Instrument Installation Schedules (IIS)
- Instrument Specification Sheets (ISS)
- Communication Cable Schematics (CBL)
- Line designation table

Other engineering drawings may be designated as Key drawings by the Proponent Organizations or the Project Management Team jointly with the Proponent Organization as appropriate for their specific projects prior to the start of project detail design.

5.14 Review for Key Drawing: Review required box in the title block shall be marked to indicate the requirement for review of key drawings by Saudi Aramco PMT and Operations.

5.15 Design Certification, Review for Key Drawing and Revision Validation: shall be completed as required by filling in the designated box in the drawing title block as per SAEP-334 section 13.

5.16 Drawing Scales

- 5.16.1 Graphic Scale, a line scale reference shall be included on both new and existing drawing just over the title block on scale drawings. The line scale shall be divided into units of length as determined by the scale of the drawing. Refer to Auto-SACS for a list of graphic scales symbols.
 - 5.16.2 The seed files and attached borders are created at 1:1 scale. To create a new drawing to any desired scale, the seed file and attached border must be enlarged to that specified scale. In the title block program menu, the correct scale must be placed in the field "SCALE" for the correct placement of title block attributes.
 - 5.16.3 Scale symbols MUST match the border scale.
 - 5.16.4 PID, E1L, VOD, ILD and PFD products do not support scale drawings.
 - 5.16.5 For scaled drawings, use the auto-dimensioning command where applicable and don't drop it.
 - 5.16.6 Do not scale down drawings, instead, rearrange the drawing or split the drawing into two drawings.
 - 5.16.7 The setting of all Saudi Aramco border files are set at (Global Origin) GO=0, 0. This 'GO' is defined at the left bottom corner of the border. No changes are allowed in the GO setting for all drawing types including scaled drawings.
- 5.17 Reference drawings and notes shall be placed in the area provided above the title block. Reference drawings listed shall be the necessary minimum engineering drawings only. Do not include Plant or Index reference of the referred drawings nor Standard Drawings.

6 Drawing Cancellation

Engineering Drawings must be cancelled under the circumstances identified below; full new revision number must be obtained per SAEP-334.

- 6.1 A facility, plant, installation, or a piece of equipment has been abandoned, removed, dismantled or transferred.
- 6.2 The drawing has been superseded by another drawing.

7 Demolition Drawing

- 7.1 Cloud and crosshatch the areas to be demolished without obscuring the information in the area being crosshatched.
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- 7.2 Describe in the revision block against the demolition revision.
- 7.3 For further design, obtain a new revision number per SAEP-334.

8 As-Built Drawing

Revision description shall be described in the revision block for the As-Built condition as follows:

- 8.1 As-Built; when a drawing is certified as field verified with no changes.
- 8.2 Revised As-Built; when a drawing is certified as field verified with changes. Description shall be clearly identified. Refer to item 5.7 for more details
- 8.3 Grass-roots LSTK project new drawings may be made as-built (Revision '01') without submitting initial revision (00) into PlantDoc. Title block and revision description for "as-built" must be completed.

9 Tag Number

EDSD assigns and manages the Tag numbers on-line <http://fdms.aramco.com.sa/> by order of numerical sequence within each category or type within a designated plant.

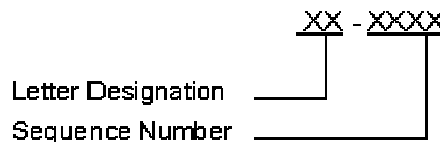
Exception:

For off-shore wellhead platforms, trains, units, etc., where identical tags are used for each facility and a platform prefix number or unit, etc., is applied to make each facility unique.

- 9.1 Cable & Conduit Numbers; each code is 5 to 6 characters in length, excluding dashes. The numeric part of the code is unique for each plant.

Example #1: C-0736

Example #2: PC-1281



- 9.1.1 The Letter Designations are 1 to 2 alpha characters signifying the type of service.

C	Conduit
CC	Control Cable
PC	Power Cable

IC	Instrument Cable
----	------------------

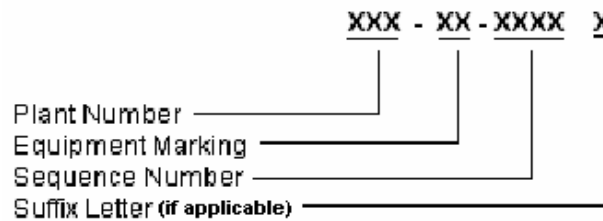
9.1.2 Cable and Conduit Numbers shall be assigned in strict numerical sequence starting from 0001, for each particular plant regardless of the size, type or service. Alpha suffix is not allowed.

9.1.3 Information related to each Cable and Conduit shall be entered in the Cable & Conduit Schedule (CCS).

9.2 Mechanical Equipment; Each mechanical equipment tag number is unique for a specific piece of equipment or an associated item within each plant and consists of 8 to 10 characters in length, excluding dashes as follows:

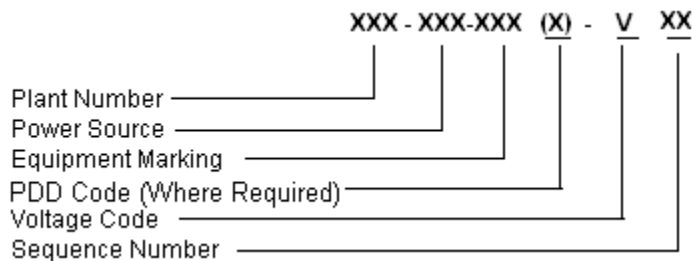
Example #1: D31-G-0012 (8 characters)

Example #2: D31-GM-0012A (10 characters)



Data sheets and Safety Instruction Sheets (if applicable) must be developed for each piece of mechanical equipment per SAEP-334.

9.3 Electrical Equipment; Each electrical equipment tag number is unique for a specific piece of equipment and consists of 11 to 13 characters in length, excluding dashes and parenthesis.



Example #1: D31 - 012 - GSW (K) - 502 (13 characters)
 Grounding Switch # 02 has 69 KV voltage from substation #12 and PDD code K in plant number D31.

Example #2: D31 - 012 - BC - 301 (11 characters)
 Battery Charger # 01 has 13.8 KV voltages from substation #12.

No PDD code in plant number D31.

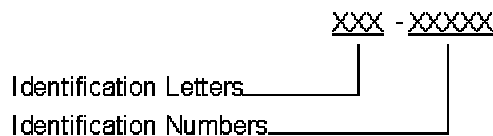
9.3.1 PDD codes are required only when they are different from the Standard Electrical Equipment Markings. Following are the approved PDD codes;

Description	Standard Marking	PDD
Circuit Switcher	CSW	S
Circuit Breaker (Power)	CB	A
Circuit Breaker (Switchgear)	CB	B
Disconnecting Switch	DSW	D
Fuse	FS	F
Fuse Disconnect	FSD	J
Grounding Switch	GSW	K
Grounding Resistor	GR	Y
Grounding Transformer	GT	X
Relay	RY	P
Switch	SW	E
Transformer	XFR	T

9.3.2 The following are the approved voltage codes:

Voltage Codes	Voltage Description
0	600 V & below AC or DC
1	2.4 kV
2	4.16 kV
3	13.8 kV
4	34.5 kV
5	69 kV
6	115 kV
7	230 kV
8	380 kV

9.4 Instrument Tag Number; each instrument tag is a unique tag/loop number within a plant. It consists of 6 to 8 characters in length, excluding dashes.



Example #1: PCV-0159 (7 characters)

Example #2: LT-0054 (6 characters)

Example #3: FRC-1010A (8 characters-rare)

- 10.7 When revising some pages of bulk drawings that have a single electronic file of the complete set such as scope of work, the revision block of only first sheet shall indicate the changes and revision number change. Complete set shall be submitted.
- 10.8 The standard north arrow symbol shall be drawn in a prominent place for all plan view drawings preferably in the upper left region of the drawing. It must be drawn pointing upward, or if unavoidable, pointing left, but shall never point down.

Exception:

For new generated drawing that has continuation link to the existing drawings that have north arrow symbol pointing down and Plan & Profile (PRF) of pipelines will remain the same.

- 10.9 Information covered by Standard Drawings, elaborated details, unnecessary views, and repetitions, which add no value to the drawings, shall be omitted.
- 10.10 All non-essential items from design which add nothing to the accuracy, completeness and clarity of the drawing shall be eliminated.
- 10.11 Drawing shading is not allowed on drawings. Hatching may be used as an alternative to shading. Exceptions of Cells used from Auto-SACS.
- 10.12 Revisions on drawings may be encircled or clouded on the prescribed layer for easy identification of the revised portion during certification and review cycle. However, for 100% As-Built drawings, all revision encirclement or clouding must be either removed or the level turned off prior to submitting the drawings to EDSO.
- 10.13 The letter "O" and "I" shall not be used for identification symbols on the drawings, as they are often confused with Zero and One.

Exception:

Exceptions are instrument symbols as shown in SAES-J-004.

- 10.14 Text on drawings shall always be uppercase.
- 10.15 Engineering drawings shall not be developed for any purpose in lieu of Standard Drawings and neither shall they be copied from Standard Drawings under any circumstances without the written permission by the committee chairman of that Standard Drawing.
- 10.16 New generated key drawings must be 100% vector.
-

11 CADD Standards

11.1 General

Saudi Aramco CADD standards and Auto-SACS were developed to assure consistency between drawings. Auto-SACS contain collections of seed files, cell libraries, border files, levels, line weights, font, line codes, MDL routines and Title Block Automation (TBA).

11.1.1 Raster Files

11.1.1.1 A raster file that is associated with a vector file **MUST** be referenced as Hybrid file as specified in section 4.2. This is to allow opening the vector file along with the raster file, without opening each format separately. The user **MUST** save the raster file in Microstation software, use fix option to save the raster file. Do not use Interactive.

11.1.1.2 The raster file **MUST** be placed correctly along with the vector file in the same exact coordinates.

11.1.1.3 The raster file **MUST** use one layer and only one raster file be associated with one vector file.

11.1.1.4 No raster editing is allowed in the raster file except deleting the raster portion to view the vector part. All changes **MUST** be in the vector file.

11.1.1.5 Existing data sheets that are in Raster (scanned) format **MUST** be converted to Excel files or PDF files in case of Data-Centric. Refer to SAEP-334 section 15.12 for Data-Centric drawings.

11.1.1.6 Existing Raster drawings issued by the COMPANY for revision purposes shall be upgraded to Hybrid. This is the minimum requirement.

11.1.2 Product Seed and Border Files

The Saudi Aramco product seed and border files are contained in the latest version of [Auto-SACS](#). Refer to [Appendix C](#) for more details.

11.2 Requirements

To ensure maximum productivity from the Saudi Aramco CADD systems, the CADD standards parameters must be followed.

- 11.2.1 All design files must be created from a Saudi Aramco product seed file.
- 11.2.2 Do not override or change the product seed file setups. Do not change the working units.
- 11.2.3 Saudi Aramco forms (borders) must be referenced only. Do not include forms as part of the design file. A border must be attached with the CADD drawing.
- 11.2.4 Reference Files-The drawings submitted to EDSD through PlantDoc shall have no reference files attached, except for the Saudi Aramco border files which must be attached in accordance with this Standard and Saudi Aramco Engineering Procedure [SAEP-334](#). The DESIGN CONTRACTOR shall ensure that the reference drawings that may be attached to a particular drawing at design/working stages are merged with the drawing.
- 11.2.5 Do not drop or change Standard Cells. Chief Draftsman's prior approval is required for any additional cell.
- 11.2.6 All elements in schematic type drawings (non-scale) must be placed with grid/unit lock set to ON position.
- 11.2.7 File design to display the drawing such as that view 1 (maximized) showing the title block with data fields turned on position. View 5 (maximized) showing the entire drawing with data fields turned off position.

Revision Summary

31 December 2003	The Saudi Aramco Drafting Manual has been cancelled and is superceded by this standard. Also, major changes were introduced.
30 September 2004	Editorial changes to delete vendor drawings procedure SAEP-111.
04 January 2006	Editorial revisions.

Appendix A – Saudi Aramco Engineering Drawing Title Block

Refer to the latest version of index.cfg file in Auto-SACS

REVISION VALIDATION									
THIS REVISION NO. _____ IS COVERED, FOR ALL APPROVAL/CERTIFICATION REQUIREMENTS, PER SAEP-334, UNDER DRAWING COMPLETION CERTIFICATE NO. _____									
XX-XXXXX-XXXX-XXX									
DESIGN CERTIFICATION (DESIGN AGENCY)			REVIEW FOR KEY DRAWINGS <input checked="" type="checkbox"/> REQUIRED (SAUDI ARAMCO)				OTHER		
ENGG./DATE		CERTIFIED BY/DATE		CONST. AGENCY/DATE		OPERATIONS/DATE		BY/DATE	
REV. NO.	DATE	REVISION DESCRIPTION							
JOB ORDER/EWO NO.				THIS REVISION IS NOT TO BE USED FOR CONSTRUCTION UNTIL CERTIFIED AND DATED					
SAUDI ARABIAN OIL COMPANY									
								DRAWING TYPE	
SAUDI ARABIA									
PLANT NO.		INDEX		DRAWING NUMBER			SHT. NO.	REV. NO.	
Saudi Aramco 5994 ENG. (09/03)									
EMERGENCY DRAWING			RESTRICTED			VECTOR		CADD-05	

Section 5.15 → [Revision Validation]

Section 5.7 → [Revision Description]

Section 5.9 → [Job Order/EWO No.]

Section 5.6 → [Drawing Type]

Section 5.2 → [Saudi Arabia]

Section 5.8 → [Plant No., Index, Drawing Number, Sht. No., Rev. No.]

Section 5.11 → [Emergency Drawing, Restricted, Vector]

Section 5.12 → [Restricted]

Sections 5.13, 5.14 → [Certification/Review/Other]

Section 5.3 → [Saudi Arabian Oil Company]

Section 5.4 → [Saudi Arabia]

Section 5.5 → [Saudi Arabia]

Section 5.7 → [Sht. No., Rev. No.]

Section 5.10 → [Vector, CADD-05]

Appendix B – Saudi Aramco Drawing Types

Refer to the latest version of index.cfg file in Auto-SACS

DRAWING TYPE	DESCRIPTION	DRAWING SIZE	COMMENTS
INDEX 'A'			
ABB	MARKERS & SIGNAGE	A-B-C-D	ROAD SIGNS, PIPELINE MARKER, etc.
DOC	SCOPE OF WORK	E	
DSC	DRAWING CONTROL SHEET	D	
EQA	EQUIPMENT ARRANGEMENT/LAYOUT/ LOCATION/LEGEND	A-B-C	
FPP	AREA MAPS	A-B-C	
FPP	FACILITY INDEX MAP	A-B-C	
FPP	FACILITY PLOT PLAN	A-B-C	
FPP	GENERAL LAYOUT PLAN	A-B-C	
FPP	GRID MAP	A-B-C	
FPP	MASTER PLOT PLAN	A-B	
FPP	OVERALL PLAN	A-B	
FPP	SITE PLAN/LOCATION PLAN	A-B	
FPP	TOPOGRAPHIC & CONTOUR MAP	A=B	
FPP	VICINITY MAP	A-B	
HGR	HYDROGRAPHIC MAP	A-B	
HYD	HYDROSTATIC TEST DIAGRAM	A-B-C-D	
HYD	SYSTEM LEAK TEST	A-B	GAS
LDT	LINE DESIGNATION TABLE	D	
PFD	PROCESS FLOW DIAGRAM	A-B-C-D	
PFD	UTILITY FLOW DIAGRAM	A-B-C-D	
PID	PIPING & INSTRUMENT DIAGRAM	A-B	
PRF	PLAN & PROFILE/PIPELINE ALIGNMENT	A-B-C	
SIS	SAFETY INSTRUCTION SHEETS (EQUIPMENTS/CRITICAL PIPING)	E	Line #1 shall also include Equip Tag or Line No.
VOD	VALVE OPERATING DIAGRAM	A-B-C-D	
INDEX 'B'			
FPS	AUTOMATIC SPRINKLER LAYOUT/DETAIL	A-B-C	FIRE PROTECTION SYSTEM
FPS	BLOCK DIAGRAM FIRE ALARM SYSTEM	A-B-C	
FPS	FIRE PROOFING/FIRE BREAKS & FIRE WALLS	A-B-C	
FPS	INSTALLATION DETAIL	A-B-C	FIRE FIGHTING SYSTEM
FPS	LAYOUT/PLAN/SECTION/DETAIL	A-B-C	PORTABLE SAFETY EQUIPMENT

DRAWING TYPE	DESCRIPTION	DRAWING SIZE	COMMENTS
FPS	PLAN/LAYOUT/DETAIL	A-B-C	FIRE PROTECTION SYSTEM
FPS	PLAN/LAYOUT/DETAIL	A-B-C	HALON FIRE PROTECTION SYSTEM
FPS	PLAN/LAYOUT/RISER DIAGRAM	A-B-C	FIRE ALARM SYSTEM
HAZ	AREA CLASSIFICATION	A-B-C-D	
HAZ	ELECTRICAL AREA CLASSIFICATION	A-B-C-D	
HAZ	FIRE HAZARDOUS AREA	A-B-C-D	
HAZ	HAZARD IDENTIFICATION CHECK LIST	E	
HAZ	HAZARDOUS AREA CLASSIFICATION	AB-C-D	
HAZ	LIGHTNING PROTECTION LAYOUT / DETAILS	A-B-C-D	
	INDEX 'C'		
DAT	DATA SHEET	D-E	
EQD	PLAN & DETAILS	A-B-C	
MDT	SCRUBBER ASSEMBLY DETAILS	A-B-C-D	
MDT	STRIPPER ASSEMBLY DETAILS	A-B-C-D	
	INDEX 'D'		
APP	LAYOUT OF APPURTENANCES	B-C-D	
DAT	PRESSURE VESSEL DATA SHEET	D	
EQD	ASSEMBLY/DETAILS (VESSELS, TANKS COLUMNS, SPHEROIDS)	A-B-C-D	
EQD	ASSEMBLY/DETAILS EQUIPMENT NO.	D	Add equipment number in Line #1.
EQD	FABRICATION DETAILS	A-B-C	
	INDEX 'E'		
DAT	DATA SHEET - SHELL & TUBE HEAT EXCHANGER	D	
EQD	DETAILS	A-B-C-D	EQUIPMENTS
	INDEX 'F'		
APP	LAYOUT OF APPURTENANCES & ASSOCIATED STACKS	A-B-C	
DAT	DATA/SPECIFICATION SHEET - (FLARES/EQUIPMENTS)	D, E	
EQD	DETAILS	A-B-C-D	
MDT	BURNER PIT PLAN/DETAIL	A-B-C-D	
	INDEX 'G'		
DAT	DATA SHEET - PUMP	D, E	
	INDEX 'H'		
SCH	PAINTING/COATING SCHEDULE	B-C-D	
	INDEX 'J'		
ECD	INSTRUMENT CONNECTION/ INTERCONNECTION DIAGRAM	A-B-C-D	

DRAWING TYPE	DESCRIPTION	DRAWING SIZE	COMMENTS
EWD	INSTRUMENT WIRING DIAGRAM	A-B-C-D	
IDT	INSTRUMENT LAYOUT/PLAN/SECTION/ DETAIL/ASSEMBLY/INSTALLATION OR MOUNTING DETAILS	A-B-C-D	
IIS	INSTRUMENT INSTALLATION SCHEDULE	D	
ILD	INDEX SHEET (INSTRUMENT LOOP DIAGRAM)	B-C-D	
ILD	INSTRUMENT LOOP DIAGRAM/I.L.D.	B-C-D	Loop Number shall also be entered in Line #1.
IPD	INSTRUMENT PIPING/INSTALLATION DETAIL	A-B-C-D	
IPL	INSTRUMENT CABLE/CONDUIT PLAN	A-B-C	
IPL	INSTRUMENT LOCATION PLAN	A-B-C	
IPL	INSTRUMENT POINTS & LINES	A-B-C	
ISD	INSTRUMENT SEGMENT DIAGRAM	B-C-D	
ISS	INSTRUMENT SPECIFICATION SHEET/ISS	E	Line #1 shall also include Instr. Tag Number.
ISS	ORIFICE PLATE DETAIL	E	
LOG	CAUSE & EFFECT DIAGRAM	A-B-C-D	
LOG	ESD/PLC LOGIC DIAGRAM	A-B-C	
LOG	FUNCTIONAL DIAGRAM	A-B-C	
LOG	LOGIC DIAGRAM	A-B-C	
MTL	INSTRUMENT MATERIAL SUMMARY SHEET	E	
PNL	INSTRUMENT PANEL LAYOUT/SECTION ARRANGEMENT/DETAIL	A-B-C-D	INSTRUMENT PANEL/LOCAL CONTROL PANEL/ ANNUNCIATOR BOARD/GRAPHIC PANEL
PNL	LAYOUT/DETAIL/ARRANGEMENT/SECTION	A-B-C-D	INSTRUMENT PANEL/LOCAL CONTROL PANEL/ ANNUNCIATOR BOARD/GRAPHIC PANEL
RAK	INSTRUMENT RACK LAYOUT/DETAIL	A-B-C	
RAK	RACK LAYOUT	A-B-C	
SCH	INSTRUMENT CONNECTION/WIRING SCHEDULE	A-B-C-D	
SCH	LIST OF NAMEPLATES FOR INSTRUMENTS	D	
SCH	PANEL SCHEDULE/PANEL INTERCONNECTION SCHEDULE	A-B-C-D	
SCM	INSTRUMENT BLOCK DIAGRAM	A-B-C-D	
	INDEX 'K'		
DAT	DATA SHEET - (EQUIPMENTS)	E	
HVA	AC DUCT FABRICATION LAYOUT/DETAIL	A-B-C	
HVA	COMPRESSOR LAYOUT/PLAN/ ASSEMBLY/DETAIL	A-B-C	
HVA	HVAC CHILLED WATER PIPING	A-B-C	

DRAWING TYPE	DESCRIPTION	DRAWING SIZE	COMMENTS
HVA	HVAC CONTROL DIAGRAM	A-B-C	
HVA	HVAC EQUIPMENT ASSEMBLY/LAYOUT/DETAIL	A-B-C	
HVA	HVAC LAYOUT/PLAN/DETAIL/DIAGRAM	A-B-C	
HVA	HVAC SYMBOLS/LEGEND	A-B-C	
HVA	VENTILATION SYSTEM	A-B-C	
SCH	EQUIPMENT SCHEDULE	A-B-C-D	
	INDEX 'L'		Process Piping
ISO	ISOMETRIC PIPING DETAIL/ISOM	B-C-D	Line # 1 shall include the Line Number.
PDT	PIPING DETAIL - PROPORTIONING PUMP	D	
PDT	PIPING DETAIL SHEET	D, E	
PDT	PIPING SECTION/DETAIL/ELEVATION	A-B-C	
PPL	PIPELINE ROUTING (ABOVE /UNDER GROUND/SUB MARINE)	A-B-C	RACEWAY/CORRIDOR
PPL	PIPING DRAWING INDEX	A-B-C-D	
PPL	PIPING PLAN/LAYOUT/ARRANGEMENT	A-B-C-D	
SCH	TIE-IN SCHEDULE	B-C-D	
SCM	PIPING SCHEMATIC DIAGRAM	A-B-C-D	
	INDEX 'M'		
DAT	DATA SHEET FOR OFFSHORE PLATFORM	D	
SCH	ANCHOR BOLT SCHEDULE	B-C-D	
SDT	FENCE PLAN/DETAIL/LAYOUT	A-B-C	
SDT	LADDER/HANDRAIL DETAILS, ASSEMBLY	A-B-C	
SDT	OFFSHORE PLATFORM PLAN/SECTION/ ELEVATION/DETAIL	A-B-C	
SDT	PIPE RACK DETAIL	A-B-C	
SDT	PIPE SUPPORT DETAIL/SCHEDULE/ ELEVATION	A-B-C-D	
SDT	PIPEWAY SLEEPER PLAN/SECTION/ ELEVATION/DETAIL	A-B-C-D	
SDT	ROOF FRAMING PLAN/SECTION/DETAIL/ELEVATION	A-B-C-D	
SDT	STRUCTURAL DETAILS/ELEVATION/LAYOUT/PLAN	A-B-C	INCLUDES STEEL PILES/STEEL STAIRS
SDT	STRUCTURAL PLATFORMS	A-B-C	
SDT	TRUSS DETAIL/SECTION/ELEVATION	A-B-C	
SDT	WALKWAY PLAN/SECTION/ ELEVATION/DETAIL	A-B-C	
	INDEX 'N'		
INS	INSULATION DETAIL	A-B-C-D	
	INDEX 'P'		
CBL	CABLE ROUTING PLAN	A-B-C	

DRAWING TYPE	DESCRIPTION	DRAWING SIZE	COMMENTS
CBL	CABLE TRAY/RACEWAY PLAN/LAYOUT	A-B-C	
CBL	CABLE/CONDUIT LAYOUT	A-B-C	
CBL	CABLE/CONDUIT RACEWAY PLAN/LAYOUT	A-B-C	
CBL	CONDUIT & JUNCTION BOX ARRANGEMENT	A-B-C	
CBL	CONDUIT PLAN/DETAIL/INSTALLATION	A-B-C	
CBL	DUCT BANK/CABLE TRENCH LAYOUT	A-B-C	
CBL	GROUNDING PLAN/LAYOUT/DETAIL	A-B-C	
CBL	OVERHEAD POWER LINE LAYOUT	A-B-C-D	
CCS	CABLE & CONDUIT SCHEDULE	D	
E1L	ELECTRICAL ONE LINE DIAGRAM	A-B-C	
E1L	ELECTRICAL THREE LINE DIAGRAM	A-B-C	
ECD	ELECTRICAL CONNECTION/ INTERCONNECTION DIAGRAM	A-B-C	
EDT	ELECTRICAL PLAN/LAYOUT/DETAIL	A-B-C	
EDT	JUNCTION BOX ARRANGEMENT/DETAIL/ LAYOUT/ELEVATION	A-B-C	
ELM	ELEMENTARY DIAGRAM	A-B-C	
EPD	POWER DISTRIBUTION/WIRING DIAGRAM	A-B-C	
EPD	POWER PLAN/GROUNDING LAYOUT	A-B-C	
EWD	ELECTRICAL WIRING DIAGRAM	A-B-C	
LTG	LIGHTING PLAN/LAYOUT/DETAIL	A-B-C	
LTG	POWER LIGHTING LAYOUT/PLAN/DETAIL	A-B-C	
LTG	STREET LIGHTING LAYOUT/PLAN/DETAIL AREA LIGHTING	A-B-C	
MCC	ELEVATION/DETAIL MOTOR CONTROL CENTER	A-B-C	
PNL	PANEL LAYOUT/ARRANGEMENT/DETAIL/ SECTION	A-B-C	
RAK	RACK LAYOUT	A-B-C	
SCH	CABLE TRAY LOADING SCHEDULE	A-B-C-D	
SCH	ELECTRICAL LOAD TABULATION	A-B-C- D	
SCH	LIGHTING & POWER SCHEDULE	A-B-C-D	
SCH	PANEL SCHEDULE	B-C-D	
SCH	LIGHTING PANEL SCHEDULE	C-D	
SCH	STRUCTURAL LIST OVERHEAD POWER LINE	C-D	
SCM	SCHEMATIC DIAGRAM	A-B-C	
SWG	SWITCHGEAR ELEVATION/DETAIL/ SPECIFICATION/ARRANGEMENT	A-B-C	
TRM	TERMINAL LAYOUT	A-B-C	
	INDEX 'Q'		
FDN	CONCRETE RETAINING WALL/SLEEPER (PLAN/LAYOUT/SECTION/DETAIL)	A-B-C-D	
FDN	FOUNDATION PLAN/LAYOUT/ SECTION/DETAIL	A-B-C-D	

DRAWING TYPE	DESCRIPTION	DRAWING SIZE	COMMENTS
FDN	SEWER MANHOLE PLAN/SECTION/DETAIL	A-B-C-D	
FDN	TRENCH LAYOUT/DETAIL	A-B-C-D	
FDN	VALVE BOX LAYOUT/SECTION/DETAIL	A-B-C-D	
STL	REBAR/REINFORCING BAR DETAIL	A-B-C-D	
STL	REBAR/REINFORCING BAR SCHEDULE	B-C-D	
STL	STEEL BENDING DETAIL	B-C-D	
	INDEX 'R'		
ARC	BEAM SECTION/DETAIL	A-B-C-D	
ARC	DOOR/WINDOW DETAIL	A-B-C-D	
ARC	FLOOR PLAN	A-B-C	
ARC	INTERIOR/EXTERIOR FINISH DETAIL	A-B-C-D	
ARC	PERSPECTIVE VIEW	A-B-C-D	
ARC	PLAN/LAYOUT/ELEVATION/SECTION/DETAIL (CONCRETE & WOODEN FRAME BUILDINGS)	A-B-C-D	ARCHITECTURAL
ARC	ROOF FRAMING PLAN	A-B-C-D	
ARC	WALL SECTION/DETAIL	A-B-C-D	
EQA	EQUIPMENT LAYOUT/LEGEND	A-B-C-D	BUILDINGS
SCH	DOOR/WINDOW SCHEDULE	A-B-C-D	
SCH	SCHEDULE OF FINISHES/FURNISHING	A-B-C-D	
SDT	ROOF & CEILING PLAN/ELEVATION/SECTION	A-B-C-D	
	INDEX 'S'		
GAP	BERMS PLAN/LOCATION/ELEVATION/ DETAILS	A-B-C	
GAP	GRADING/PAVING/EARTHWORK	A-B-C	
GAP	LANDSCAPING PLAN/LAYOUT/DETAIL	A-B-C	
GAP	MONUMENT REFERENCE	A-B-C	
GAP	ROAD CROSSING DETAILS	A-B-C	
GAP	ROADS/TRAFFIC ISLAND/PARKING LOT	A-B-C	
GAP	SITE DEVELOPMENT PLAN	A-B-C	
PLB	PLUMBING DRAIN/WASTE & VENT PIPING DETAIL/LAYOUT	A-B-C-D	
PLB	PLUMBING FLOOR PLAN	A-B-C-D	
PLB	PLUMBING PLAN/LAYOUT/DETAIL	A-B-C-D	
PLB	PLUMBING RISER DIAGRAM	A-B-C-D	
UTI	UTILITY ISOMETRIC PIPING DETAIL	A-B-C-D	
UTI	UTILITY PIPING ELEVATION/SECTION/DETAIL	A-B-C-D	
UTI	UTILITY PIPING PLAN/LAYOUT/ROUTING (RAW WATER/DRINKING WATER/FIREWATER / IRRIGATION/STEAM/SPRINKLER/GAS/ SEWER/DRAIN/WASTE/VENT)	A-B-C	

DRAWING TYPE	DESCRIPTION	DRAWING SIZE	COMMENTS
	INDEX 'T'		
ANT	ANTENNA & FEEDER MOUNTING DETAILS	A-B-C	
ANT	ANTENNA & TOWER FOUNDATION	A-B-C	
ANT	ANTENNA & TRANSMISSION LINE LAYOUT	A-B-C	
ANT	ANTENNA & TOWER INSTALLATION DETAILS	A-B-C	
ANT	ANTENNA COMMUNICATION TOWER (PLAN/LAYOUT/ELEVATION/DETAIL)	A-B-C	
ANT	ANTENNA MOUNTING DETAILS	A-B-C	
ANT	TOWER FOUNDATION LAYOUT	A-B-C	
ANT	TRANSMISSION LINE LAYOUT	A-B-C	
ANT	WAVEGUIDE FEEDER BRIDGE/DETAILS	A-B-C	
CBL	(CONDUIT/CABLE) INSTALLATION LAYOUT/DETAILS	A-B-C	
CBL	CABLE & CONDUIT LAYOUT	A-B-C	
CBL	CABLE (RUNWAY/WAY) & STRUCTURES/DETAILS	A-B-C	
CBL	CABLE (TRAY/VAULT) RACKING DETAIL	A-B-C	
CBL	CABLE ENTRANCE DETAIL	A-B-C	
CBL	CABLE IDENTIFICATION	A-B-C	
CBL	CABLE PULLING & REEL SET-UP	A-B-C	
CBL	CABLE ROUTE (STRAIGHT LINE DIAGRAM/DC POWER SYSTEM/SOLAR ARRAY)	A-B-C	
CBL	CABLE SCHEMATIC LAYOUT/DETAIL	A-B-C	
CBL	CABLE SPLICING DETAILS	A-B-C	
CBL	CABLE TERMINATION	A-B-C	
CBL	CABLE TRAY LAYOUT/DETAIL	A-B-C	
CBL	CEILING CHANNEL SUPPORT	A-B-C	
CBL	CONDUIT ELEVATION & DETAILS	A-B-C	
CBL	CROSSING & MISCELLANEOUS DETAILS	A-B-C	
CBL	FIBER OPTIC BACKBONE DETAILS	A-B-C	
CBL	FIBER OPTIC BYPASS	A-B-C	
CBL	FIBER OPTIC TRUCK CABLE INSTALLATION	A-B-C	
CBL	GROUNDING PLAN (LAYOUT/DETAILS/MISC)	A-B-C	
CBL	HORIZONTAL DATA & VOICE CABLE WAY PLAN	A-B-C	
CBL	HORIZONTAL DATA & VOICE OUTLET	A-B-C	
CBL	MANHOLE & CONDUIT LAYOUT/DETAILS	A-B-C	
CBL	MANHOLE FOLDOUT/DETAILS	A-B-C	
CBL	PDS EQUIPMENT & CABLE LAYOUT/DETAILS	A-B-C	
CBL	RADIO RF FEED LINE CABLE	A-B-C	
CBL	SUBDUCT INSTALLATION DETAIL	A-B-C	

DRAWING TYPE	DESCRIPTION	DRAWING SIZE	COMMENTS
CBL	TELEPHONE CABLE (PLAN/LAYOUT/ROUTING/DETAIL/ELEVATION)	A-B-C	
CBL	TELEPHONE FACILITY (PLAN/LAYOUT/ROUTING/DETAIL/ELEVATION)	A-B-C	
CBL	TELEPHONE LAYOUT/SWITCHING SYSTEM	A-B-C	
CBL	TRENCH LAYOUT (CABLE/CONDUIT)	A-B-C	
COM	CABLE & VIDEO SYSTEM, MATV, CCTV, PUBLIC ADDRESS SYSTEM, MICROWAVE SYSTEM, RADAR SYSTEM, VIDEO CONFERENCING, LAN, WIRELESS SYSTEM	A-B-C	
COM	CONNECTOR/INTERFACE DETAIL	A-B-C	
COM	GENERAL NOTES/LEGEND/ABBREVIATION	A-B-C	
DTA	DATA/VOICE COMMS FACILITIES	A-B-C	
DTA	PDS DATA NETWORK	A-B-C	
DTA	VOICE/DATA SYSTEM LAYOUT	A-B-C	
ECD	CONNECTION/INTERCONNECTION DIAGRAM	A-B-C	
EDT	ELECTRICAL DETAILS (PLAN/LAYOUT/ASSEMBLY)	A-B-C	
EQA	EQUIPMENT LAYOUT/DETAIL/LOCATION	A-B-C	
EQA	EQUIPMENT/CONSOLE ARRANGEMENT	A-B-C	
EQD	EQUIPMENT ASSEMBLY (PLAN/DETAILS)	A-B-C	
EWD	ALARM DIAGRAM	A-B-C	
EWD	BLOCK & LEVEL DIAGRAM	A-B-C	
EWD	CIRCUIT DIAGRAM	A-B-C	
EWD	DC POWER DISTRIBUTION	A-B-C	
EWD	TELEPHONE/COMMS/DIGITAL SIGNAL WIRING	A-B-C	
EWD	WIRING DIAGRAM	A-B-C	
RAK	RACK FACE ELEVATION	A-B-C	
RAK	RACK INTERFACE DETAIL	A-B-C	
RAK	RACK LAYOUT	A-B-C	
RPF	RADIATION PROFILE	A-B-C	
RPF	RADIO COVERAGE	A-B-C	
RPF	RADIO PATH PROFILE	A-B-C	
SCH	CABLE RUNNING LIST	A-B-C	
SCH	CROSS-CONNECT WIRE SCHEDULE	A-B-C-D	
SCH	PANEL INTERCONNECTION SCHEDULE	A-B-C-D	
SCH	PANELBOARD LOAD SCHEDULE	A-B-C-D	
SCH	WIRING LIST	A-B-C	
SCH	WIRING TABLE	A-B-C	
SCM	BLOCK & LEVEL DIAGRAM	A-B-C	
SCM	CABLE IDENTIFICATION TABLE	A-B-C	

DRAWING TYPE	DESCRIPTION	DRAWING SIZE	COMMENTS
SCM	CIRCUIT DIAGRAM	A-B-C	
SCM	INTERCONNECTION WIRING DIAGRAM	A-B-C	
SCM	RISER DIAGRAM	A-B-C	
SCM	SCHEMATIC DIAGRAM	A-B-C	
SCM	SYSTEM BLOCK DIAGRAM	A-B-C	
	INDEX 'U'		
ARC	HOSPITAL/LABORATORY/OFFICE (PLANT/LAYOUT)	A-B-C	
	INDEX 'V'		
EQA	MARINE EQUIPMENTS	A-B-C	
	INDEX 'X'		
CAT	ANODE BED DATA SCHEDULE	A-B-C-D	
CAT	ANODE BED IN-PLANT LOCATION PLAN	A-B-C	
CAT	ANODE BED LOCATION PLAN/LAYOUT/ INSTALLATION/DETAIL	A-B-C-D	
CAT	BLOCK DIAGRAM ANODE BED	A-B-C-D	
CAT	CATHODIC PROTECTION PLAN/LAYOUT/DETAIL	A-B-C-D	
	INDEX 'Z'		
DTA	DATA COMMUNICATIONS	A-B-C	
LOG	PROCESS COMPUTER TERMINAL MANAGEMENT	A-B-C	
MDF	DIGITAL DISTRIBUTION FRAME	A-B-C	
MDF	MAIN DISTRIBUTION FRAME	A-B-C	
MDF	MAIN/INTERMEDIATE DISTRIBUTION FRAME	A-B-C	
SCM	NETWORK CONFIGURATION	A-B-C	
SCM	NETWORK EQUIPMENT CONFIGURATION	A-B-C	

Appendix C – Saudi Aramco Borders and Seed Files

FORMS, SEED FILES AND BORDERS TABLE						
PRODUCT (Logical Name)	DWG. SIZE	FORM NO.	TITLE	SEED FILE NAME	BORDER FILE NAME	CADD VERSION
APP	B	2696	LAYOUT OF APPURTENANCES	2696.b	2696b02.bor	CADD-02
ARC	A	2615	ARCHITECTURAL & LANDSCAPING	arc.a	arca.bor	CADD-00
CIV	A	2615	CIVIL & STRUCTURAL	civ.a	civa.bor	CADD-00
COM	A	2615	COMMUNICATION	com.a	coma.bor	CADD-00
DAT	D	9527	PRESSURE VESSEL DATA SHEET	9527.d	9527d02.bor	CADD-02
DEF	A	2615	STANDARD "A" SIZE	def.a	defa04.bor	CADD-04
DEF	B	2634	STANDARD "B" SIZE	def.b	defb04.bor	CADD-04
DEF	C	2635	STANDARD "C" SIZE	def.c	defc04.bor	CADD-04
DEF	D	2636	STANDARD "D" SIZE	def.d	defd04.bor	CADD-04
DEF	E	2616	STANDARD "E" SIZE	def.e	defe04.bor	CADD-04
E1L	A	2615	ELECTRICAL ONE LINE DIAGRAM	e1l.a	e1la04.bor	CADD-04
EDT	A	2615	MISCELLANEOUS ELECTRICAL	edt.a	edta.bor	CADD-00
EQD	B	2527	EQUIPMENT ASSEMBLY AND DETAILS	2527.b	2527b02.bor	CADD-02
FPP	A	2615	FACILITY PLOT PLAN	fpp.a	fpaa04.bor	CADD-04
FSH	A	2615-1	FACE SHEET	deffsh.a	2615-1a02.bor	CADD-02
FSH	B	2634-1	FACE SHEET	deffsh.b	2634-1b02.bor	CADD-02
FSH	C	2635-1	FACE SHEET	deffsh.c	2635-1c02.bor	CADD-02
FSH	D	2636-1	FACE SHEET	deffsh.d	2636-1d02.bor	CADD-02
FSH	E	2616-1	FACE SHEET	deffsh.e	2616-1e02.bor	CADD-02
HVA	A	2615	HVAC	hva.a	hvaa.bor	CADD-00
ILD	B	7460	INSTRUMENT LOOP DIAGRAM	ild.b	ildb05.bor	CADD-05
ILD	C	7460-1	INSTRUMENT LOOP DIAGRAM	ild.c	ildc00.bor	CADD-00
ILD	D	7460-2	INSTRUMENT LOOP DIAGRAM	ild.d	lldd00.bor	CADD-00
ILD	B	8111	INDEX SHEET INSTRUMENT LOOP DIAGRAM	8111.b	8111b03.bor	CADD-03
ILD	C	8111-1	INDEX SHEET INSTRUMENT LOOP DIAGRAM	8111.c	8111c00.bor	CADD-00
ILD	D	8111-2	INDEX SHEET INSTRUMENT LOOP DIAGRAM	8111.d	8111d00.bor	CADD-00
ISD	B	7460A	INSTRUMENT SEGMENT DIAGRAM	isd.b	isdb01.bor	CADD-01
ISO	B	2825	ISOMETRIC PIPING DETAIL	2825.b	2825b03.bor	CADD-03
ISO	C	2825-1	ISOMETRIC PIPING DETAIL	2825.c	2825c00.bor	CADD-00
ISO	D	2825-2	ISOMETRIC PIPING DETAIL	2825.d	2825d00.bor	CADD-00
LOG	A	8110	LOGIC DIAGRAM	8110.a	8110a02.bor	CADD-02
PFD	A	2615	PROCESS FLOW DIAGRAM	pf.d.a	pfda04.bor	CADD-04
PID	A	5994	PIPING & INSTRUMENT DIAGRAM	pid.a	pida05.bor	CADD-05
PID	B	5994-1	PIPING & INSTRUMENT DIAGRAM	pid.b	pida00.bor	CADD-00
PPL	A	2615	PIPING PLAN	ppl.a	ppla.bor	CADD-00

FORMS, SEED FILES AND BORDERS TABLE						
PRODUCT (Logical Name)	DWG. SIZE	FORM NO.	TITLE	SEED FILE NAME	BORDER FILE NAME	CADD VERSION
PRF	A	6285	PLAN AND PROFILE	6285.a	6285a02.bor	CADD-02
SCH	C	6232	LIGHTING PANEL SCHEDULE	6232.c	6232c02.bor	CADD-02
STL	B	2871	STEEL BENDING DETAILS	2871.b	2871b02.bor	CADD-02
TAB	A	8114	ELECTRICAL LOAD TABULATION	8114.a	8114a02.bor	CADD-02
UTI	A	2615	PLUMBING & UTILITY	uti.a	utia.bor	CADD-00
VOD	A	2615	VALVE OPERATING DIAGRAM	vod.a	voda04.bor	CADD-04
