

Chapter 12 - Attachments

12.1 Attachment 1 – Instructions for Printing the Design Manual by Chapters

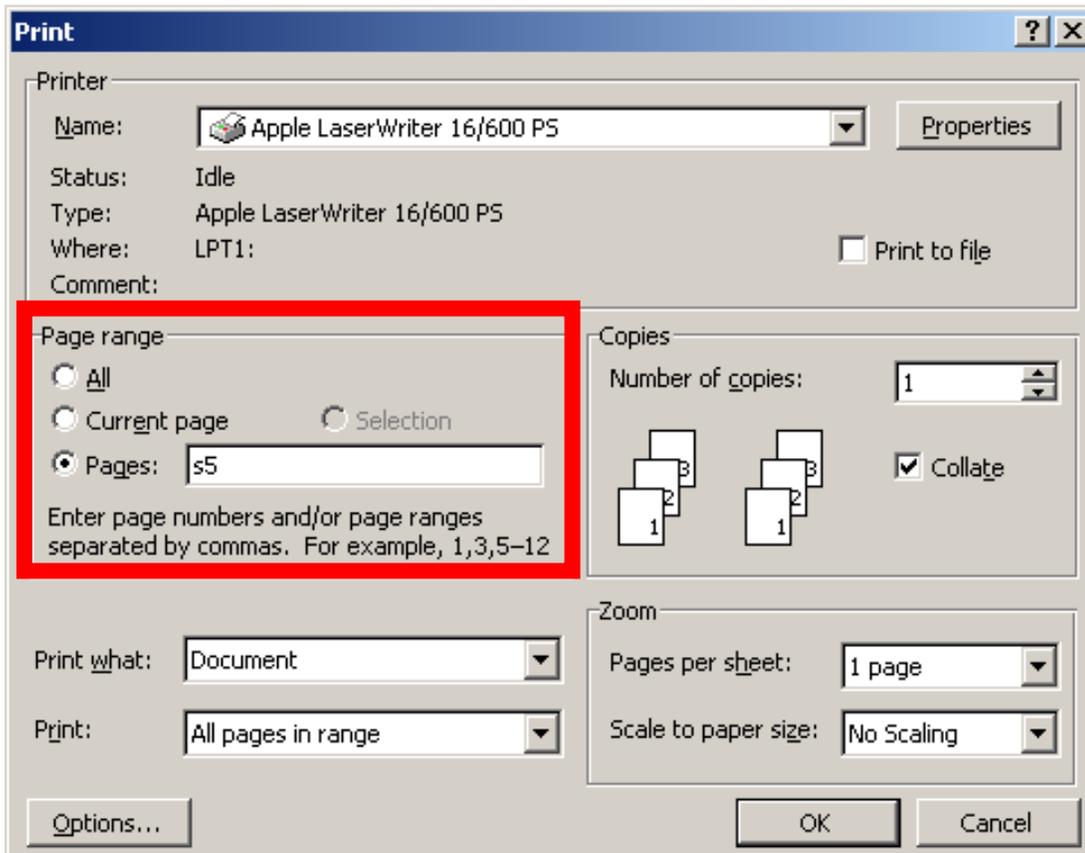
The Facilities Design Standards Manual is divided into several chapters and the accompanying front matter (the title page, table of contents, list of tables, and acronyms and abbreviations). If you don't want to print the entire document, Word allows you to print individual chapters of the manual by printing sections of the document. However, the section numbers don't match the chapter numbers. The following instructions should help you to print the chapters or pages that you want.

1. The manual is divided into the following chapters. The corresponding section number(s) for each chapter are listed on the right.

<u>Chapter</u>	<u>Section(s)</u>
<u>Title Page</u>	<u>1</u>
<u>Table of Contents</u>	<u>2</u>
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2. Go to the Engineering Standards URL (<http://www.sandia.gov/engstds/dsnmanual.html>) and click on the Design Standards Manual file to open it. Read the Table to find the pages you want to print.

- To print a single chapter, choose “Print” from the “File” menu. The Print dialog box will appear (see the image below). Under “Page Range”, click in the box next to “Pages” and type the section number of the chapter you wish to print, using the format s#. In the example below, I’ve asked to print Section 5 (s5), which corresponds to Chapter 1. Click OK to print.



- You can print multiple chapters by entering their section numbers. To print Chapters 1 (Section 5) through 6 (Section 10), for example, type “s5-s10” in the Pages box. To print Chapters 1 (Section 5), 3 (Section 7), and 7 (Section 11), type “s5, s7, s11” in the box.
- You can also print a few pages from a chapter, using the format “p#s#”. For example, to print pages 20 through 25 of Chapter 8 (Section 12), type “p20s12-p25s12” in the Pages box.

- End -

12.2 Attachment 2
Variances from Engineering Standards Program Requirements
Example: Building 969 Design/Built Project

Design completed: Design/Built contract

Construction complete: Projected completed by 9/04

Civil Variances

None Identified

Landscaping Variances

None Identified

Structural Variances

None Identified

Architectural Variances

None Identified

Fire Protection Variances

None Identified

Mechanical Variances

None Identified

Electrical Variances

Section	Description	Benefit	Approval
2.2.6S	Allow mechanical connectors that meet the requirements of UL96A to be used instead of exothermic connectors.	The reason for the change is to reduce construction costs, to improve worker safety, and to reduce cycle times.	Scott Rowland. The Facilities Electrical Systems Engineers have also approved this change to future standard specifications.

Telecommunications Variances

Allow cast-in-place telecommunication manhole instead of precast manhole. The reason for the variance is to allow for construction of the manhole around an existing telecommunications duct bank.

Section	Description	Benefit	Approval
1.1.2S	Allow cast-in-place telecommunication manhole instead of precast manhole.	The reason for the variance is to allow for construction of the manhole around an existing telecommunications duct bank.	Jay Peterson Telecommunications Systems.

Security Variances

None Identified

- End -

12.3 Attachment 3 – Design Reference Guide

SYSTEM	DESIGN GUIDES	SPECIFICATION SECTIONS	Title
Water Lines (Domestic and Fire Protection)	Sandia/NM Design Manual Chapter 3.4.1	SNL 02665	Underground Water Lines for Domestic and Fire Protection Systems
		SNL 02516	Flushing and Disinfection of Underground Water Lines for Domestic and Fire Protection Systems
Sanitary Sewer	Sandia/NM Design Manual Chapter 3.4.2	SNL 02720	Storm Sewer Systems (Replaced 15 E)
		SNL 02725	Sewer Manholes
		SNL 02730	Sanitary Sewer Systems
		SNL 02955	Sewer Flow Control
		SNL 02957 SNL 02958	Sewer Pipe Lining Manhole Rehabilitation
Natural Gas	Sandia/NM Design Manual Chapter 3.4.3	SNL 02553	Exterior Gas Piping Systems (Replaced 02685)
Liquefied Petroleum Gas	Sandia/NM Design Manual Chapter 3.4.4	No Standard Specifications	
Storm Drain	City of Albuquerque DPM and SNL Design Manual Chapter 3.4.5	SNL 02720	Storm Sewer Systems
		SNL 02725	Sewer Manholes
Site Work	Sandia/NM Design Manual Chapter 3.5	SNL 02200	Earthwork
		SNL 02222	Selective Demolition
Fencing	Sandia/NM Design Manual Chapter 3.5.2	SNL 01531	Temporary Fencing
		SNL 02444	Chain Link Fences and Gates
		SNL 02445	Barbed Wire Fences
Paving & Road Construction	Sandia/NM Design Manual Chapter 3.5.4	SNL 02510	Asphalt Concrete
Road Design	Chapter 3.5.4 AASHTO, a Policy On Geometrical Design of Highways and Streets, Latest Ed.	SNL 02511	Asphalt concrete Pavement
		SNL 02512 SNL 03300	Paving Asphalt Binder Cast-in-Place concrete
Landscape	Design Manual Chapter 3.5.6 &	SNL (in work)	

SYSTEM	DESIGN GUIDES	SPECIFICATION SECTIONS	Title
	Campus Design Development Guidelines		
Utility Removal	Sandia/NM Design Manual Chapter 3.5.7	Applicable Standard Specifications	
Drainage Design	City of Albuquerque DPM and Sandia/NM Design Manual Chapter 3.6.1		
NPDES and SWPPP	Sandia/NM Design Manual Chapter 3.6.2 (Referenced Documents)	Not Applicable	
Hydrology Criteria	City of Albuquerque DPM Section 22	Not Applicable	
Hydraulic Design	City of Albuquerque DPM Section 22.3	Not Applicable	
Surveying	Sandia/NM Design Manual Chapter 3.7	Not Applicable	

12.4 Attachment 4 – Additional Information and Requirements for Surveying

Types of Surveying

- A. Boundary Surveying is the determination, description, portraying, measuring or monumentation of the boundaries of a tract of land. Other types of surveying, except as indicated, are not Boundary Surveying.
- B. Topographic Surveying is the measurement and portrayal of the configuration of the ground and/or the location and description of objects thereon. It includes the plotting and description of property boundary monuments on a topographic map provided:
 - (a) Only existing monuments found at the time of the survey are shown and not boundary monuments are set.
 - (b) The following words are prominently shown on the topographic map: THIS IS NOT A BOUNDARY SURVEY. APPARENT PROPERTY CORNERS ARE SHOWN FOR ORIENTATION ONLY. BOUNDARY DATA SHOWN IS FROM PREVIOUS SURVEY REFERENCED HEREON.
- C. Easement Surveying is the description, portrayal, or monumentation of easement(s) only.
- D. Preparation of Legal Descriptions- The preparation of legal descriptions is a form of surveying and other than the citing of a lot or parcel of a duly recorded plat, must be performed by a licensed professional surveyor.
- E. Unclassified Surveying is surveying not defined above.

Dimensions means the direction, expressed as a bearing or an azimuth and the length of a survey line.

Easement means a right that a person or an entity in the land of another.

Monument means an object intended to mark a property boundary.

Surveyor means a professional surveyor licensed under the Engineering and Surveying Practice Act.

Tract or Lot means a parcel of land in separate ownership or a leasehold or set off for separate ownership or a leasehold.

Boundary Surveying

When doing Boundary Surveying, the surveyor shall be responsible for accomplishing all of the following:

- A. Obtain a copy of the last recorded deed and when available a copy of the title search for the tract being surveyed.
- B. Review all recorded plats and all plats known to and available to the surveyor that are germane to the tract being surveyed.
- C. Make a site visit and inspect the subject property and look for evidence of existing monuments and for evidence of possession and usage.

- D. Determine the relative location on the ground of all found existing monuments, which pertain to the survey using procedures, which achieve the minimum accuracy standards.
- E. Tag found monuments that are accepted by the surveyor and pertain to the survey with a metal tag, bearing the surveyor’s registration number, attached to the monument with a metal wire or strap. Monuments that have been set by a government agency and are clearly identified by the markings need not be tagged.
- F. Set new monuments in at all corners of the tract being surveyed using procedures that achieve the minimum accuracy standards, unless a permanent monument already exists.
- G. Follow the rules and procedures, except for the accuracy and monumentation standards, in the Manual of Surveying Instruction prepared by the United States Bureau of Land Management, if the tract being surveyed pertains to the United States survey of public lands in any way including the following:
 - (1) Is a section or and aliquot part of a section.
 - (2) Is a small holding claim, private claim, land grant, mining claim or any other tract described in the Manual of Surveying Instructions.
 - (3) Has a boundary, which is a boundary of a tract described in Subsection G Paragraphs (1) or (2) above.
 - (4) Prior surveys and physical evidence within and adjacent to the section being surveyed should be carefully considered as evidence of original corner locations.
- H. Never move, remove nor obscure an existing monument unless it is first properly referenced and all dimensions necessary to preserve its location are reported on a plat.
- I. Updating a Prior Survey – If an existing survey is updated for any reason, the surveyor shall comply with the minimum standards in effect at the time of the update unless the update is only to correct a minor scrivener’s error. If the update is solely to bring the survey into compliance with the minimum standards and the location of the boundary has not changed, re-monumentation is not required unless the original monumentation was not in compliance with the minimum standards in effect at the time the original survey was performed.
- J. Prepare a plat of the survey, unless the survey is only the re-monumentation of corners of a tract, shown on a plat of record, where some of the existing corners of the tract are recovered, whose measured dimensions on the ground are reasonably close to the record dimensions. The plat may contain as many sheets as required, which meet the size and material requirements of all applicable governing rules a regulations, and shall contain at least the following:
 - (1) The name, address and registration number of the surveyor responsible for the survey.
 - (2) A certificate followed by the dated signature and seal of the surveyor responsible for the survey stating that the surveyor conducted an actual survey on the ground and is responsible for the survey and that the survey and plat meet the Minimum Standards for Surveying in New Mexico. Only one surveyor’s signature and seal shall appear on a plat. The following model certificates considered to be an example of the minimum the surveyor should certify to:

“I, _____, New Mexico Professional Surveyor
 No. _____, do hereby certify that this Boundary Survey Plat and the actual
 survey on the ground upon which it is based were performed by me or under my direct
 supervision; that I am responsible for this survey; that this survey meets the Minimum

Standards for Surveying in New Mexico; and that is a true and correct to the best of my knowledge and belief.

_____, PS No. _____ Date _____”

- (3) A title which shall include the county in which shall include at least the following:
 - (a) The lot, block or tract number and subdivision or district name if the survey is within a subdivision or conservancy district.
 - (b) The city, grant, small holding, mining or private claim, or similar area in which the survey is located.
 - (c) If neither paragraph (a) or (b) applies, then the section(s), township(s), and ranges(s) in which the survey is located. If the survey is not within a section, then the projected section(s) shall be stated and designated.
- (4) A north arrow, equivalent scale and graphic scale for each sheet of the main drawing.
- (5) The basis of bearings used in the survey shall be upon based on a procedure such as a solar observation or geodetic control stations or a line shown on a prior document and defined on the ground by existing monuments. The use of assumed bearings is prohibited.
- (6) A description of all documents used to determine the boundaries and to prepare the plat of survey. The recording information shall be stated. If the document is not of record, all information used for the document shall be shown on the plat.
- (7) The boundary being surveyed including the dimensions as measured on the ground and the record dimensions unless the two are equivalent in which case it shall be so stated; all dimensions which pertain to the determination of the tract boundaries, and a tie to a suitable, permanent, existing monument.
- (8) All dimensions which pertain to the restoration of a lost or obliterated corner or the subdividing of a section in accordance with the rules and regulations pertaining to such subdivision.
- (9) The location and description of any evidence of a boundary or line of occupation including such things as fence, building, hedge, wall or the remains thereof which is on a boundary or close enough to a boundary to be confused with the boundary.
- (10) The location and description of all easements known or disclosed to the surveyor that cross, adjoin or serve a surveyed tract together with the recording data for the document that created the easement and the location and description of any visible structures which encroach upon said easement.
- (11) The radius, central angle, length, and chord dimension including bearing for all curves.
- (12) The lot number, tract number or other designation or the apparent owner of all adjoining tracts with the recording data of the as recorded plat.
- (13) Reserved.
- (14) The location and description of any evidence of use by a non-owner of the surveyed tract including such things as road, trail, path, pipeline or utility that crosses a boundary of the tract.
- (15) A letter or number providing a unique designation of each surveyed tract on a plat with more than one tract.

- (16) Reserved
- (17) Access easement. If the surveyed tract is not contiguous to a public right-of-way, any access easement of record that is known to the surveyor shall be described on the plat and its location shall be determined. If no easement is known to the surveyor, a note prominently shown shall disclose that fact.
- (18) The area of each surveyed tract and/or tract created by their survey.

Topographic Surveying

See Chapter 3.7, Surveying.

Easement Surveying

- A. When doing Easement Surveying, the surveyor shall use procedures in any field measurements that achieve minimum accuracy standards.
- B. If the easement does not run parallel to a boundary of the tract in which it is located, then the surveyor shall prepare a plat which shows the dimensions of the easement and complies with the following:
 - (1) Show ties record monuments at the beginning and ending of the easement and at least at every mile along the easement, or
 - (2) Shows the coordinates of the beginning, ending and all angle points in accordance with the New Mexico Coordinate System and shows the grid bearing and ground distance between said point, or
 - (3) Shows ties to existing corner of subdivisions or sections in which the easement is located.
- C. These field procedures and subsequent preparation must be conducted under the responsible charge of a professional surveyor.

Unclassified Surveying

When a surveyor does surveying of a type not described herein, the surveyor shall do all that is necessary to fully determine and report all information is relevant to the project. The scope of the project may be stated and limited.

Accuracy

The surveyor shall determine the class of a survey using the definition in the following Subsections A through C and achieve the accuracy specified in Subsection E for that class of survey. A closed traverse is not required if the surveyor uses procedures which will preclude blunders.

- A. Urban means a survey within or adjoining a municipality or a survey, regardless of location, or land zoned for or intended use for multifamily, commercial or industrial purposes.
- B. Suburban means a survey, which is not an Urban Survey of land zoned for or intended for use for residential purposes.
- C. Rural means a survey is neither an Urban or Suburban survey.

- D. Positional error means the error inherent in setting or measuring from a monument and is added to the error expressed as a ratio for closed traverse.
- E. Minimum Field Accuracy Standards

	Urban	Suburban	Rural
Unadjusted Closure	1:15,000	1:10,000	1:7,500
Location of Improvements	0.10 ft	0.2 ft	1.0 ft
Positional Error	0.05 ft	0.10 ft	0.25 ft

Vertical Positioning

Level closures, running forward and backward between fixed elevations or loop closures, must be to the following accuracy:

$$0.05 \text{ ft} \cdot \sqrt{M}$$

Where M is the distance in miles of the total level route, running forward and back between fixed elevations or along a level loop.

Monuments

See Chapter 3.7, Surveying.

example below:

- SW-0862-3** SW designates this as a 5 and 15 kV switch
0862 designates this switch is located adjacent to building 862
-3 designates this switch is the 3rd of several switches located adjacent to building 862.
- TF-0862-3** TF designates this is a transformer
0862 designates this transformer is located adjacent to building 862.
-3 designates this transformer is the 3rd of several transformers located adjacent to building 862.

12.5.4 Medium Voltage Feeder Labeling

Label medium voltage feeder cables as noted in standard drawing WP5021STD, Example Feeder Labeling.

12.5.5 Underground Utility Labeling

For utilities installed in remote locations, specify underground utility markers per standard drawing WU5006STD, Utility Markers for Buried Pipe and Cable.

- End -