

**Chapter 27 DRAFTING STANDARDS**

Chapter 27

**DRAFTING STANDARDS**

**INTRODUCTION**

This chapter presents the standards established for drafting and infrastructure construction plans to be submitted for approval to the City of Albuquerque. Detailed requirements for drafting, original drawing material, organization of plans, details of required information and acceptable methods of presentation are covered.

**Section 1. MATERIALS STANDARDS**

~~Draw construction plans on a stable transparent reproducible medium, such as polyester film (mylar).~~

Standard sheets must be 24" by 36" having a margin of 2" along the left and 1" on the top and bottom. Use of non-standard sheets must have prior approval of the City Engineer or City Architect in writing.

Use the City of Albuquerque format as illustrated in ~~Tables~~Figures 27.1 through 27.6 inclusive for all plan sheets.

All profile, plan & profile, and cross section sheets must be pre-printed in legible, reproducible divisions or, if hand drawn, must be as accurate and legible as pre-printed materials. Pre-printed materials with different borders may be used as long as the minimum margins with respect to the standard sheet size can be maintained in reproduction.

**Section 2. DRAFTING STANDARDS**

**A. Lettering and Line Work**

**1. Lettering Sizes**

Lettering must generally conform to the following minimum standards:

**Table 27.1**

**Comment [RMJ1]:** Clearly define existing vs new facilities via dashed / screened lines.

Include a sample sheet: include signature block, legends etc. DPS to create draft sample

**Comment [RMJ2]:** 1:10 of an inch min lettering size

**Comment [RMJ3]:** Does this table need to be updated?

**Comment [RMJ4]:** Are these still needed?

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**Comment [RMJ5]:** Plan and Profile

Plan Element	Freehand (Ames)	Mechanical Template	Pen Size (Leroy) Line Weight
Title in Title Block	# 5	140	# 1
Project No.	# 8	240	# 3
Map No.	# 8	240	# 3
Sheet ___ of ___	# 8	240	# 3
Notes	# 4	100	# 00
Scale	# 5	140	# 1
Street Name on plan view	# 6	175	# 2
Street Name below plan on P & P	# 10	290	# 4
Subdivision on plan view	# 8	240	# 3

Lot and Block Numbers	# 6	140	# 1
Title or Title Page	.70"	700	# 8
All others	# 4	100	#00

2. *Line Work*

- a. All line work must be of opaque ink of sufficient density to be reproducible by current Engineering Division microfilm reduction/reproduction processes. Line widths and character must conform substantially to the standards shown in Table 27.2. Plans containing line work which does not reproduce satisfactorily will not be accepted by the Design Review ~~Committee~~ Committee (DRC).
- b. Show:
  - All existing facilities (water lines, sewer lines, other utilities, curb & gutter, etc.) in dashed lines.
  - Facilities to be installed or constructed in solid lines.
  - Related construction immediately adjacent to the project.
- c. Use the standard symbols shown on Tables 27.3a through d.

3. *Notation*

- a. Prefix items to be constructed or to be removed with the appropriate word; (construct) or (remove). Clearly define the limits of construction.

**Table 27.2**  
**LINE WIDTHS**

TYPE OF LINE	<del>PEN SIZE</del> Line Type (NUMERICAL)	<del>DIAMETER</del> Line Weight(METRIC)
RIGHT- OF-WAY LINE	2	.56
PROPERTY LINE (SIDE)	1	.46
CENTER LINE	00	.30
PUBIC EASEMENTS	0	.25
SUBDIVISION BOUNDARY	3	.81
PROJECT/PHASE BOUNDARY	6	1.70
WATER PRESSURE ZONE BOUNDARY	4	1.14
NOTE LEADERS	00	.30
MATCH LINE	0	.35
SECTION CUT LINE	1	.46
NEW UTILITY LINES	4	1.14
EXISTING UTILITY LINES	1	.46
FUTURE UTILITY LINES	2	.56

Comment [RMJ6]: Show symbol used for line type

NEW CURB, GUTTER & SIDEWALK	0	.35
EXISTING CURB, GUTTER & SIDEWALK	00	.30
FUTURE CURB, GUTTER & SIDEWALK	0	.35
ALL OTHER LINES	0	.35

Click to view:

[Table 27.3a - Legend - Plan View](#)

[Table 27.3b - Legend - Plan View](#)

[Table 27.3c - Legend - Plan View](#)

[Table 27.3d - Legend - Profile](#)

(Adobe Reader required to view this image)

- b. Show all items for new construction on the drawings and identify by description.
- c. When City funds are involved, identify the limits of the facilities involving individual policies.

#### 4. Legend

Provide a legend identifying the nature of lines and symbols used in drawing the plans. Tables 27.3a through d provide acceptable standard symbols.

#### 5. Project Phasing and/or Multiple Work Orders

Clearly identify boundaries of project phases or of separate work order areas using the appropriate line type as shown in Table 27.2.

### B. Scales

The following scales are acceptable for use in construction drawings:

#### 1. Plan:

- 1" = 50'
- 1" = 40'
- 1" = 20'
- 1" = 10'
- 1" = 100' (for overall layouts only)

#### 2. Plan & Profile and Cross Sections:

Any combination of the following:

- | Horizontal | Vertical |
|------------|----------|
| 1" = 50'   | 1" = 10' |
| 1" = 40'   | 1" = 5'  |
| 1" = 20"   | 1" = 2'  |
| 1" = 10'   | 1" = 1'  |
| 1" = 5'    |          |

*NOTE:*

- a. 1" = 40' may be used only if profile grid is drawn to match this scale.
- b. Horizontal/vertical scale combinations may not result in exaggeration greater than 10:1.

3. *Details*

- a. Either engineer or architect scales are acceptable; however, usage should be consistent.
- b. Draw details to scale unless otherwise noted. Unscaled drawings are discouraged.
- c. Any deviations from the preceding must have prior approval of the DRC.

~~4. Adhesive Materials~~

~~Adhesive or "stick on" drafting materials must be approved by the DRC. Generally, such materials are allowed only for notes, logos and north arrows.~~

C. Bench Marks

1. Base all elevations shown on the plans on City of Albuquerque current datum. (NSL, North American Datum, 1929)
2. Note the location and description of the permanent bench marks used to extend level datum to the project in the designated location on the title block of each plan or plan & profile sheet. Identify bench marks by number, description, brief location, and elevation.
3. Show bench marks which are located within the area covered by the plans on the plan view in the proper location.
4. Designate all temporary bench marks used for control of the project on the plan view stating elevation, location and description. Show the nearest such bench mark on each sheet.
5. All elements in the site development plan will be laid out using geometric processes originating from a bench mark or other identifiable, permanent, physical element to facilitate staking by contractor. NO GRID LAYOUTS WITH DIMENSIONS.

Comment [RMJ7]: Xref to surveying chapter or web source

D. Orientation of Layout and Stationing

All construction documents that include schedules for surface finishes, doors and windows must appear on consecutive right hand sides of the sheet following the respective plan which references the schedule.

Standards set by the AIA or ASLA may be used for the above as well.

1. Orient the plan so that the north arrow generally points to the top or to the right of the sheet. ~~The north arrow may point either to the right or left of the sheet provided that it does not point below a line 450 above the horizontal toward the right of the sheet, or below a line below the horizontal toward the left of the sheet.~~ Stationing ~~should shall normally~~ increase on the sheet from left to right.
2. ALL street stationing, including surveys, should, where practical, ~~be increasing increase~~ north to south and west to east. If stationed separately, gravity hydraulic systems must be stationed increasing upstream. Water systems must conform to street stationing ~~when new streets with a water or sewer system are all proposed~~ together, construction shall be under the same contract. Provide adequate ties for all points, so that the project can be staked directly from the plans without ambiguity. Provide ties to intersecting street centerlines or existing

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documented property corners, if a plat is provided with the plan. Street centerline offsets are preferable to property line data.

3. Maintain one (1) direction of profile stationing on all profile sheets, even if the north arrow criteria must be violated to do so. The major portion of the street or R/W along the alignment should be placed horizontally on the plan. Should this be impractical, the plan continuity may be broken and the match lines joined by a leader and the word IDENTICAL. Place a north arrow on each portion of the plan where the orientation of the portions varies. In combined projects where storm drain plans are combined with street plans, the alignment of the street should be followed (if practical) to maintain the same orientation.
4. Orient enlargements or other plan details in the same direction as the plan orientation from which it was taken.

#### E. Title Page Criteria

A "special information" block needs to be located on the title page of plan sets and specifications to accommodate information that may be required for specific projects, e.g. those projects funded or partially funded by state grants need to have the state project number placed on the title sheet/spec cover.

1. Center project title (name of subdivision, street, arroyo, area, etc.) within the border.
2. Locate vicinity map in upper right hand corner. Use scale of 1000:1 or 500:1 for map. Standard Zone Atlas maps may also be used for preparing vicinity maps. [Clearly mark the location of the project and ensure all street names surrounding the project are shown.](#)
3. Locate index below PROJECT TITLE.
4. Locate signature block "Approved for Construction, City Engineer" in lower right hand corner and the project number and sheet \_\_\_\_ of \_\_\_\_.
5. If the plan is for a project going to public bid, also provide a block for plan set number in the lower right hand corner.
6. Place general notes near the right hand border in the 4" space provided, [or provide them on a separate sheet. Show applicable Standard required notes, which are available from the Albuquerque Development and Building Services Permit Center \[xref the location here\].](#)
7. A logo may be placed as shown on the standard title page, [Table Figure 27.1.](#)
8. Provide a revision block as shown in [Figure 27.1 Table 27.1.](#)
9. The title page will be considered as sheet I.

**Comment [RMJ8]:** Provide these on the sample sheet or link to a sheet that contains them.

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#### F. Plan & Profile

1. *General*
  - a) All plan or plan & profile sheets and site grading plans submitted as part of a project package for DRC approval must be on City standard drawing sheets.
  - b) Show all property lines, dimensions and locations referenced to property lines. This includes rights-of-way, easements, building lines.
  - c) Identify known existing utility lines, including City lines, as to [material type, size, and location and ownership. Utility type shall be shown in the complex linetype \(e.g. "G" for gas, "W" for water, "SAS" for sanitary sewer, and "SD" for storm drain. See Table 27.3 for further definitions of existing utilities.\)](#)
  - d) Clearly show all points of connection to existing facilities.
  - e) Show match lines to other plan sheets with sheet number.

2. Streets

- a) Use individual profiles showing top of curb profiles right and left and existing ground profiles at the curb line. Show existing ground at right-of-way lines if plans are not accompanied by other grading plans showing existing elevations. Curb profiles are to be run through intersections showing projected flowlines. Both curb lines may be shown on single profile, if clear. If clarity cannot be preserved, two profiles (individual curb lines) will be required.
- b) Use centerline stationing with right and left offsets to face of curb. Station median curbs similarly.
- c) Provide stationing to the centerlines and dimensions of proposed driveway entrances, if known.
- d) Horizontal curve data must indicate stationing of PC, PT, and PI, radius, delta, length of curve and tangent. Detailed street information not adequately shown on the plat must be shown on the plans. The plat must be included in the plan set.
- e) Vertical curve data must indicate stationing of VPC, VPT and VPI, length of curve, percent grade of tangents and middle ordinate (MO), and stationing of high points and low points.
- f) Provide top of curb and flowline elevation at returns and valley gutters as shown in the Standard Details.
- g) Crown and cross slope, if other than standard, must be sufficiently detailed to assure accurate construction. Transitions must be clearly defined.
- h) Show true slopes and lengths of curb lines through horizontal curves.

3. Water

- a) Stationing of water lines should correspond to the stationing of the street centerline if the street is new construction under the same contract as the water line. Show horizontal and vertical alignment of water lines. Vertical alignment may be by reference to top of curb. Reference elevation above sea level. Identify depth of cover from finished grade for all waterlines. If a private WUA easement is required, the width of the easement shall be shown with a place for the recording information.
- b) Identify all fittings, valves and other line features by type, size and possibly elevation, where necessary. Indicate material type and SDR where applicable as well as tracer wire location. Valve elevations shall be provided at both the top of the valve can lid, as well as the operating nut.
- c) Locate fire hydrants by station or tie to a centerline or property line with a distance to the hydrant from centerline shown. The elevation at the bottom of the flange must be shown. If an easement is required, the dimensions of the easement shall be shown.
- ~~d) Indicate water pressure zone lines, if applicable.~~
- d) For multiple water meters, fire hydrants, water valves, water manholes, and vaults, use tables to show location, stationing, and spatial coordinates (x,y, and z coordinates) to note their respective locations on the drawings. Coordinates shall be provided in the coordinate system stated in Section 2.C. (Provide coordinate tables during plan review stages, but actual coordinates are not required to be shown until record drawings are submitted.) Where backflow preventors are required, show or note where they will be located.

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- e) If the project is to be separated into several construction phases, such as master plan water line and normal distribution system, show the points or lines of separation.
- e) For nNon-pPressure connections to existing water lines, a water shutoff plan needs to be provided with an area map. In the Construction Notes section, there should be a link to the seven (7) day line shutoff request. If, or if San Juan Chama lines are involved in the excavation, an Administrative order number 9 permit will be required to work near the large San Juan Chama lines, and a permit form will need to be submitted.

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4. Sanitary Sewer

- a) Show horizontal and vertical alignment of the sewer line. The sewer will generally be located along the centerline of the street. Also include size, type, length and slope of pipe as measured between centerlines of manholes. Include tracer wire locations.
- b) Sanitary sewer lines may be shown by means of reaches giving the distance and slope of the line between centerlines of manhole barrels. For large diameter lines or for special circumstances where invert elevations at face of manhole are critical, additional notation may be required.
- c) Show the following information for all sanitary sewer manholes: location of the manhole tied to street centerline stationing (by angle and distance if not on street centerline); invert elevation of all connecting lines; rim elevation, material type and size. Specify invert elevations by showing “invert (in)” and “invert (out)” with a 0.1foot difference in elevation between inverts. Show manhole lid/rim elevations. Indicate flowline directions.
- d) Show all proposed sanitary sewer service lines. Information required: size, material type, length, invert at property line. When multiple service lines are required, provide an SAS Table showing the pertinent information.
- e) All sanitary sewer manholes, cleanouts, and vacuum valve pits require spatial coordinates (x,y, and z coordinates) to be noted for their respective locations on the drawings. Coordinates shall be provided in the coordinate system stated in Section 2.C. (Provide coordinate tables during plan review stages, but actual coordinates are not required to be shown until record drawings are submitted.)
- f) For cleanout and vacuum pits, show vertical data of lid or cap at surface, as well as invert elevations.

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5. Storm Drains

- a) Show horizontal and vertical alignment of the storm drains and size, material type, length and slope of pipe.
- b) Stationing of storm drain line when independent of street stationing must be increasing upstream of flows. If storm drain is depicted on the street plan, presentation may be as for sanitary sewers.
- c) Show the following information for all storm drain manholes: location tied to street centerline stationing (by angle and distance if necessary), invert elevations of all lines, elevation, type and size. Also provide rim elevations.
- d) Station catch basins at centerline of grate length and tie to street centerline. Also show type, invert elevations, top of curb elevations, grate elevations, pad size, type, length and slope of connecting pipe. If storm drain and street stationing are not identical, show both.

e) Hydraulic gradient, ~~and~~ design flow and velocities ~~information may be~~ required on design review plans.

#### 6. Channels

- a) Show channels both in plan and profile to illustrate the horizontal and vertical alignment. Also include dimensions of walls or side slopes and bottom, slope of channel and right-of-way.
- b) Profiles must include invert elevations, slope, top of channel and top of berm. All utilities when located must be shown, and information shown must include type, size, inverts, etc.
- c) Station channels along the centerline, ~~increasing upstream, regardless of north arrow orientation.~~
- d) Supplement channel design on plan and profile with corresponding cross sections.
- e) Clearly detail and tie transitions in both plan and profile.
- f) Water surface profiles, ~~and~~ design flows and velocities ~~may are be~~ required on design review plans.

#### G. Cross Sections

1. Include all typical sections and/or notes that are necessary to clearly reflect the design.
2. ~~1.~~ Cross sections may are be required by the DRC as a part of the construction plans when necessary to reflect more clearly the intent of the design.
3. ~~Cross-s~~ Sections are essential required when computing cut and fill quantities in design, construction and final pay items.
4. ~~2.~~ All cross sections for work within right-of-way or easements must be drawn to scale showing existing ground and proposed construction. Sections should extend into adjacent properties in order that unusual terrain or existing building data can be analyzed. Draw cross sections so that stations increase from the bottom of the sheet toward the top.
5. ~~3.~~ Station each section clearly along the centerline increasing upstream.
6. ~~4.~~ Station the beginning and ending points of a project and draw cross sections for both the stations.
7. ~~5.~~ Show cross sections of streets, alleys, drainage facilities as looking towards the increasing stationing. Show property lines on cross sections and label as north, south, east or west.
- ~~6.~~ Include all typical sections or notes that are necessary to clearly reflect the design.
8. ~~7.~~ Show the project name, stations covered on the cross section sheet and sheet numbers at the bottom right of the cross section sheet.

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#### H. Details

1. 1. Provide detail for all items that are not provided by City Standard Detail Drawings, special structures. This will include standard drawings from other government agencies.
2. If City Standard Detail Drawings are referred to, the drawing number and revision number must be specified on the plan or plan & profile.

#### I. Plan Revisions

1. Revision to plans will be recorded in the Revision Block only after signature of the City Engineer. All plan changes prior to the DRC general approval signature will not appear in the Revision Block.



2. All revisions after the plans are signed for approval by the DRC shall be identified by a triangle with the revision number on it, and have the name or initials of the person making the revisions and the number and date of revisions recorded in the "Revisions" portion of the sheet title block. The title sheet will list only the sheets on which revisions have been made.
3. A Revision Block is necessary on Sheet Number 1 of all revised plans and must note "Sheet No. \_\_ revised" with the date and must include sheets added, deleted, or sheet numbers changed. A space must also be provided on Sheet Number 1 for the City Engineer's approval of all plan revisions. Substantive revisions may require additional signatures as determined by the City Engineer.
4. Any party who makes revisions must ensure that the contractor, the owner, the Inspection Section and the consultant receive revisions as soon as possible so that construction changes can be noted.
5. All written corrections on the plan, ~~should shall~~ be ~~done legibly~~ legible in a permanent manner, ~~appropriate for reproduction on microfilm.~~

### Section 3. COLLATION AND CONTENTS OF CONSTRUCTION PLAN SHEETS

A project plan package consists of, but is not limited to, the following sheets and contents collated as follows:

#### A. Title Page

This page contains project title, vicinity map, zone atlas page, legal description, total square footage of project area, index, "Approved for Construction" signature block, general notes, logo and revision block with approval space. Blanks for separate work order numbers must be provided when applicable.

#### B. Plat Sheet

~~This sheet shall be provided for information purposes, which shall be clearly noted on the sheet.~~

This sheet contains a reproducible of the City-approved, but as yet unrecorded, plat for review purposes. Prior to release of project for construction, this sheet must be replaced with a ~~polyester film (mylar)~~ reproducible ~~version~~ of the recorded plat. The plats need not be placed on City standard ~~DRC Sheet~~ drawing format, but must be on a standard 24" x 36" sheet.

#### C. Grading Plan

1. ~~1.~~ ~~Clearly note that this sheet shall be provided for information purposes only.~~
2. Site layout with existing and proposed contours
3. ~~2.~~ Elevations at property line corners in residential subdivisions, build~~ing~~ pads, ponding area, along property line street fronts, and curbs and gutters
4. ~~3.~~ Locations and elevations of existing and proposed drainage courses
5. ~~4.~~ Locations and elevations of required retaining walls
6. ~~5.~~ Flow directions of on-site and right-of-way storm flows
7. ~~6.~~ Size (length, width and depth) of ponding areas
8. ~~7.~~ Cross slopes on walks, ramps, drives, parking, etc., shall all be indicated with an arrow indicating the direction of surface drainage and include the % of the cross slope.

#### D. Overall ~~Street~~ Paving Plan

1. Location of streets with names
2. Location of valley gutters with crown transitions
3. ~~Location of manholes and water valves~~

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- ~~4. Location of drainage easements~~
- 5. Direction of storm runoff flows
- 6. Street widths
- 7. Accessible ramps - which must comply with prescribed City standards for accessibility
- ~~9. ~~8.~~ Storm drain inlets~~
- 10. Sidewalk easements and any other roadway easements
- 11. Location of deferred sidewalks

E. Overall ~~Water Distribution Plan~~ Utility Plan (Water, Sewer and Storm Drain)

- ~~1. ~~1.~~ Location and size of water mains~~
- ~~2. ~~2.~~ Location of water valves and fire hydrants~~
- ~~3. ~~3.~~ Meter pressure zone boundaries, Service locations, pressure reduction valves and air pressure release valves,~~
- ~~4. ~~4.~~ Location of other water features~~
- ~~5. ~~5.~~ Connection points to existing system~~
- F. Overall Sanitary Sewer Plan
- ~~7. ~~1.~~ Location and size of sanitary sewer lines~~
- ~~8. ~~2.~~ Location of manholes~~
- ~~9. ~~3.~~ Direction of flow in the system~~
- ~~10. ~~4.~~ Connection points to existing system~~
- 11. Location of all storm drain structures and pipe sizes
- 12. Location of all utility easements and right-of-way lines.

~~NOTE: Overall water and sanitary sewer plans may be combined if clarity is preserved.~~

G. Street Plan & Profile

- 1. Elevations of top of curb at PC, PT, VPC, VPT, high and/or low points of vertical curve, midpoint of vertical curve, regular intervals
- 2. Slopes of curbs
- 3. Stationing
- 4. Horizontal distances R/W to R/W, flowline to flowline of curbs, R/W to centerline of street, flowline of curb to centerline of R/W
- 5. Both centerline horizontal and vertical curve data. Curve data may come from the plat, but stationing of points on plans is required
- 6. Location of handicap-ADA accessible ramps
- 7. Location and width of sidewalks and notation indicating whether sidewalk construction is a part of this project
- 8. Type of curb and gutters
- 9. Median curb details, stationing, location
- 10. At least one typical pavement cross section for each street width and pavement type proposed. Clearly show cross slopes for the entire section. Must also include adjoining structures in the section to indicate heights of new structure in relation to existing.
- ~~11. ~~12.~~ Curb radii, if other than standard and associated curve tables~~
- 11. ~~12.~~ Type of street crown or cross slope and transition areas

H. Street Cross Sections

Street cross sections may be required, if terrain or design problems are encountered.

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I. Sanitary Sewer Utility Line Plan & Profile

1. ~~1.~~ Horizontal and vertical location of sewer line
2. ~~2.~~ Size of pipe. The type of pipe shall be specified or the plan may contain a note which states: "All sewer lines in this project shall be constructed of DIP, VCP, or PVC unless specified otherwise."
3. ~~3.~~ Horizontal and vertical location, type, size and length of service connections
4. ~~4.~~ Required elevations for manholes (Rims, Invert (in) and Invert (out))
5. ~~5.~~ Stationing, type and size of manholes
6. ~~6.~~ Slopes of pipe
7. ~~7.~~ Stationing of service connections (Provide tables for multiple services.)
8. ~~8.~~ Other utilities crossed or to be crossed by proposed line (Show the separation distance.)

9. ~~9.~~ Existing utilities

J. Water Line Plan & Profile

9. ~~1.~~ Horizontal and vertical location of water line
10. ~~2.~~ Size of pipe. The type of pipe shall be specified or the plan may contain a note which states: "All waterlines in this project shall be constructed of DIP, ACP or PVC unless specified otherwise."
11. ~~3.~~ Location and character of all fittings, valves, and other line features
12. ~~4.~~ Location and flange elevation of fire hydrants
13. ~~5.~~ Pressure zone lines, if applicable
14. ~~6.~~ Location of meter boxes
15. ~~7.~~ Other utilities crossed or to be crossed
16. ~~8.~~ Existing utilities

K. Combination

~~If drawings can be prepared with clarity, the water line and sanitary sewer line plans and profiles may be combined on the same plan and profile sheet with paving.~~

L. Drainage Facilities Plan & Profile Sheets

1. Storm Drains
  - a. Horizontal and vertical location of proposed storm drain line
  - b. Material Type and size of pipe
  - c. Type of catch basins
  - d. Required elevations for manholes
  - e. Slopes of pipe
  - f. Stationing, type and size of manholes
  - g. Location of all other utilities crossed
2. Open Channels
  - a. Horizontal and vertical location of channel
  - b. Transitions
  - c. Invert, top of concrete channel, and berm profiles
  - d. Intersection of lateral drainage
  - e. Slopes of channel

M. Channel Cross Sections

Comment [RMJ14]: Coordinate with ABCWUA

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1. Existing ground profile at a particular station
2. Proposed channel configuration at the station
3. Areas of cut and fill
4. Quantities of cut and fill between stations
5. Elevations of channel invert and top of channel

N. Details

1. Construction details for special structures
1. ~~2.~~ Typical sections

Section 4. RECORD DRAWING CRITERIA

Record drawings shall be prepared to reflect any changes to the construction plan set, when construction is complete. They shall be clean, legible, presentation quality documents that are fully comprehensible to the owner. Each page shall be stamped with a noted-as-built, record drawing, or other acceptable completed notation.

The original drawings or reproducible polyester film transparency copies (mylars) bearing the original approval signatures must be used in the preparation of the record drawings. If such drawings cannot be revised to produce a clear and legible record, new drawings must be prepared and clearly marked "Redrawn for Record Purposes." Originals must be marked revised and submitted with the new drawings. The use of drawings incorporating aerial photographs in the plan view of a plan & profile sheet should be avoided due to the difficulty in obtaining acceptable copies of the microfilmed record drawing.

The applicable sections of the following criteria govern the type and accuracy of the information required on the record drawings for all construction work which is to be accepted by the City of Albuquerque. It is intended that most items for record drawings can be obtained by verification of compliance to design at time of construction and that resurvey should only be required in instances of substantial departure from design.

A. General Criteria

1. Show the new construction as actually accomplished on each drawing in heavy solid lines in both the plan and profile views.
2. Show the horizontal location, elevation, size, type of material and nature of all discovered underground utilities or obstructions. Facilities existing prior to the project are to be shown in a thin dashed line in both the plan and profile as required to indicate the continuity of the system.
3. The horizontal location information for all facilities within a public right-of-way or easement must be based on centerline stationing and centerline offsets. Sufficient ties to existing property corners or other right-of-way control monuments must be provided to clearly establish the actual location of such facilities.
4. Base all elevations on City of Albuquerque control monuments as shown on the plans.
5. Identify on each plan and/or profile sheet all revisions to the construction which occurred during construction by placing a revision symbol and number at the location on the drawing where the change occurred and by recording all required information in the revision block provided. Identify the limits of all revisions on the drawings.

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6. Where the as-built horizontal or vertical location of any facility or portion thereof differs from the location shown on the construction drawing by more than 10% of the respective scale of the drawing, that portion or portions of such drawing shall be replotted to show the true location on the record drawings. Design lines should remain, where possible, to indicate magnitude and nature of change.
7. Record the information required in the as-built information block after the record drawings have been prepared.

**B. Requirements for Sanitary Sewer Drawings**

1. Show on each drawing the type of material, type of joint, and the internal diameter of all pipe installed in sewer mains, service connections and risers.

2. All sanitary sewer manholes, cleanouts, and vacuum valve pits require spatial coordinates to be noted for their respective locations on the drawings. Coordinates shall be provided in the coordinate system stated in Section 2.C. Show location of the manhole tied to street centerline stationing (by angle- and distance if not on street centerline). Show manhole lid/rim elevation, invert elevations for all connecting lines within each manhole, and indicate flow directions. For cleanout and vacuum pits, show vertical data of lid or cap as well as invert elevations. Show all proposed sanitary sewer service lines with required information including size, material type, length, and invert at property line.

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2-3. Show the horizontal location of the center of all manhole barrels or junction boxes, the dead end of each sewer main or stub, the end of each service connection and all changes in the type of pipe material used for sewer mains to the nearest 1.0 ft. of the actual location.

3-4. Show invert elevations of all pipe (inlets and outlets) within each manhole to the nearest 0.1 ft. of the actual elevation when the slope of the pipe exceeds 1% or to the nearest 0.01 ft. where the slope of the pipe is less than 1%.

4-5. Show the invert elevation at the end of each service connection to the nearest 0.1 ft. of the actual elevation. This may be accomplished by revision of tables if originally presented in tabular form.

5-6. Indicate the type and diameter of all manholes and wall type (i.e. precast, block or poured in place) and the dimensions of all junction boxes on the drawings for each manhole or junction box or by general note.

6-7. Show the rim elevation of all manholes to the nearest 0.1 ft. of the actual elevation.

7-8. Show the length of pipe between manholes (measured center to center of manholes), the length of all dead end stubs, the height of each riser and the length of each service connection to the nearest 1.0 ft. of the actual length.

8-9. Show the slope of the pipe between manholes and on dead end stubs by actual slope to the nearest 0.01 percent (0.0001 ft./ft.).

9-10. When a new manhole is constructed around an existing sewer line, show the distance to the center of the existing adjacent manholes to the nearest 1.0 ft. of the actual distance.

10-11. Show the curve data, or the amount of deflection (ft./ft. of pipe) and the direction of such deflection when the horizontal or vertical alignment of the pipe is changed by deflection of the joints.

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**C. Requirements for Storm Drainage Drawings**

1. *Conduits*

- a) Use the requirements for sanitary sewer drawings for all pipes including connecting lines to catch basins and manholes. If there are more than two connecting pipes, specify spatial orientation of connecting pipe with respect to the manhole (i.e. NE, NW, SE, SW, etc.).
- b) Identify the type of catch basin constructed if other than shown.
- c) Show the horizontal location at the outlet of all catch basins to the nearest 1.0 ft. of the actual location.
- d) Show the invert elevation at the outlets of all catch basins to the nearest 0.1 ft. of the actual elevation.

2. *Open Channels*

- a) Show the type of material, bank or side wall slope and dimensions of all channels constructed.
- b) Show the horizontal location of all changes in type of material, cross section, horizontal and/or vertical alignment, of all cutoff walls, inlets to the channel, and all structures designed to change the flow characteristics to the nearest 1.0 ft. of the actual location.
- c) Show elevations on the top of the side walls or top of the bank in earth channels and the centerline of the channel for all points as defined in 2.b to the nearest 0.1 ft. of the actual elevation.
- d) Revise channel cross sections to show the actual elevation to the accuracy as defined in 2.c at each right-of-way line, at the top of bank or side wall on each side, at the bottom of bank or side wall on each side and at the centerline of the channel.
- e) Show the length of the channel between points as defined in 2.b to the nearest 1.0 ft. of the actual length.
- f) Show the slope on the centerline of the channel between all changes in vertical alignment to the nearest 0.01 percent (0.0001 ft./ft. ).

D. Requirements for Water Line Drawings

1. Show the type of material including class or code and internal diameter of all pipe installed by general note.
2. Show the horizontal location of all fittings, restrained joints, valves, valve boxes, meter boxes and fire hydrants denoting the actual location to the nearest 1.0 ft. An enlarged detail must be included when multiple fittings and/or valves are installed as a unit or when clarity of the location of the various items listed above cannot be obtained on standard plan and profile views.
3. Show the depth of cover and the top of pipe elevation at all changes in grade of the pipe. All valves, fire hydrants, meter boxes, water manholes, and vaults require spatial coordinates to note their respective locations on the drawings. Coordinates shall be provided in the coordinate system stated in Section 2.C.
- 3-4. Show the invert elevation of all fittings, valves and changes in grade of the pipe for lines 16" diameter and larger, top of cover elevation for all valve boxes not in paved streets and bottom of flange elevation on all fire hydrants to the nearest 0.1 ft. of the actual elevation.
- 4-5. Show the curve data or the amount of deflection (ft./ft. of pipe) and the direction of such deflection when the horizontal or vertical alignment of the pipe is changed by deflection of the joints.
- 5-6. Show the size and type of joint of all valves installed. For valves 16" and larger, show the number of turns required for stop to stop operations. If pressure relief valves or surge valves

are installed, show the location of all bypass valves, fittings and/or discharge lines in an enlargement.

- | ~~6-7.~~ Show the tubing diameter and type of material, including class or code, installed in each service connection. General notes stating types of material are acceptable when the same materials are used throughout,
- | ~~7-8.~~ Show special fittings in sufficient detail to facilitate the future maintenance or replacement.
- | ~~8-9.~~ Show the type of blocking, if blocked, or the type of restraint used for all fittings, joints and valves requiring restraint. If the same type of blocking or restraining is used, general notes will suffice.
- | ~~9-10.~~ Show the location of all anodes installed and all non-galvanic joints.
- | ~~10-11.~~ Show the length of pipe between tees and/or crosses to the nearest 1.0 ft. of the actual length.
- | ~~11-12.~~ Show and dimension all valves added to adjacent systems necessary to isolate the new system.

#### E. Paving Projects

1. Show the horizontal location to the flowline of the PC and PT of all curb returns and horizontal curbs; for all vertical curbs, show the VPC, the high point on a summit vertical and low point on a sag vertical, midpoint and VPT; and at all other changes in the horizontal or vertical alignment of the curb and/or gutter, show to the nearest 1.0 ft. along the centerline and 0.1 ft. on the offset.
- | 2. Show the top of curb or flowline elevations at each of the points defined in Section I above to the nearest 0.01 ft. of the true elevation on curbs which have slopes of less than 1% (0.01 ft./ft.) and to the nearest 0.1 ft. of the true elevation on curbs which have slopes of more than 1% (0.01 ft./ft.).
3. Show the right-of-way width and the paving width (measured flowline to flowline) on each drawing and at all changes in the width of the right-of-way and/or paving.
4. Identify the type of curb and/or gutter and the type of paving section including medians, and show the horizontal location of any changes in the curb and/or gutter type or change in the paving type by actual centerline stationing to the nearest 1.0 ft.
5. Show the sidewalk width and the distance the sidewalk is set back from the back of curb by actual width and distance to the nearest 0.1 ft. Clearly indicate on the record drawings those sidewalks built with the project at acceptance.
6. Show curve data including radius, central angle and length along the flowline of the curb on all curves in the curb and gutter including curb returns if different from original plans. The same requirement applies to median curb.
- | 7. Show the slope on the flowline of curb or top of the curb by actual slope to the nearest 0.01 percent (0.0001 ft./ft.).
8. Show the length of curb between changes in horizontal or vertical alignment to the nearest 1.0 ft. of the actual length.

All drawings in the project set must be clearly marked "Record Drawing". A Registered Professional Engineer must affix his seal and a certification bearing his signature. A Registered Land Surveyor may certify as to position. This certification must state that the drawings have been revised in accordance with information furnished

by \_\_\_\_\_ to reflect the construction as actually accomplished.

Submit the record drawings and one print of each sheet to the City Engineer for review.

## Section 5. CHECKLISTS

To assist in the preparation of uniform plan sets, the following checklist is to be used as a guide. The items contained in the checklist are considered essential for both design and construction. Additions or deletion may be required to fit the particular project plan preparation.

### A. Plan Preparation Checklist

#### 1. SANITARY SEWER:

##### a. Pipe

- \_\_\_\_\_ (1) Location (horizontal)
- \_\_\_\_\_ (2) Type of material
- \_\_\_\_\_ (3) Size (internal diameter)
- \_\_\_\_\_ (4) Slope (ft./ft.)
- \_\_\_\_\_ (5) Service connections (size, type, length, vertical and horizontal location),  
invert elevation, end of each service
- \_\_\_\_\_ (6) Risers (size, type, vertical and horizontal location)
- \_\_\_\_\_ (7) Invert elevations within manholes
- \_\_\_\_\_ (8) Deflection angle of line within manholes
- \_\_\_\_\_ (9) Required locations of electronic markers

##### b. Manholes

- \_\_\_\_\_ (1) Horizontal location of the center of manhole
- \_\_\_\_\_ (2) Horizontal location of center of rim (if eccentric )
- \_\_\_\_\_ (3) Invert elevations of all pipes (inlets and outlets)
- \_\_\_\_\_ (4) Type (as per Standard Details)
- \_\_\_\_\_ (5) Diameter and/or dimensions
- \_\_\_\_\_ (6) Material
- \_\_\_\_\_ (7) Rim elevation
- \_\_\_\_\_ (8) Horizontal distance between manholes center to center of manhole

#### 2. STORM DRAINAGE:

##### a. Conduit

- \_\_\_\_\_ (1) Utilize criteria from sanitary sewer, preceding, for all pipe including canceling lines to drop inlets and manholes.

##### b. Catch basins (Drop Inlets)

- \_\_\_\_\_ (1) Type as per Standard Details and number of units
- \_\_\_\_\_ (2) Horizontal location of the outlet
- \_\_\_\_\_ (3) Invert elevation of the outlet

##### c. Open Channels

- \_\_\_\_\_ (1) Type
- \_\_\_\_\_ (2) Lining Material
- \_\_\_\_\_ (3) Dimensions
- \_\_\_\_\_ (4) Slope (at centerline of channel)



Horizontal location at all changes in timing, materials, dimensions, alignment, both horizontal and vertical which change the flow characteristics

- \_\_\_\_\_ (6) Horizontal curve data location within R/W
- \_\_\_\_\_ (7) Horizontal location of joints
- \_\_\_\_\_ (8) Type of joints and material used
- \_\_\_\_\_ (9) Elevations

- \_\_\_\_\_ Top of sidewalk
- \_\_\_\_\_ Top of slope
- \_\_\_\_\_ Top of bank
- \_\_\_\_\_ Centerline of channel
- \_\_\_\_\_ Vertical profiles (grades)
- \_\_\_\_\_ Vertical curve data, if used

- \_\_\_\_\_ (10) Cross sections along channel (100 ft. or less)

### 3. WATER

#### a. Pipe

- \_\_\_\_\_ (1) Material
- \_\_\_\_\_ (2) Class or code
- \_\_\_\_\_ (3) Size (internal diameter)
- \_\_\_\_\_ (4) Joint type and length if specific types required
- \_\_\_\_\_ (5) Location of special fittings, valves, fire hydrants
- \_\_\_\_\_ (6) Depth of cover

#### b. Horizontal Location

- \_\_\_\_\_ (1) Restrained joints and type required
- \_\_\_\_\_ (2) Valves
- \_\_\_\_\_ (3) Valve and meter box
- \_\_\_\_\_ (4) Fire hydrants

#### c. Elevations

- \_\_\_\_\_ (1) Top of pipe of all fittings
- \_\_\_\_\_ (2) Top of pipe at changes in grade
- \_\_\_\_\_ (3) Bottom of flange on all fire hydrants. Horizontal alignment, in detail

#### d. Valves

- \_\_\_\_\_ (1) Size
- \_\_\_\_\_ (2) Type
- \_\_\_\_\_ (3) Normal position (open or closed)
- \_\_\_\_\_ (4) Type of joint
- \_\_\_\_\_ (5) Bypass detail, if required
- \_\_\_\_\_ (6) Dimension all valves in adjacent existing systems necessary to isolate

new system

#### e. Fire Hydrants

- \_\_\_\_\_ (1) Depth of bury

#### f. Service Connection

- \_\_\_\_\_ (1) Length
- \_\_\_\_\_ (2) Diameter

#### g. Special Fittings

- \_\_\_\_\_ (1) Pattern

#### h. Blocking or Restraint

- \_\_\_\_\_ (1) Type
- i. Anodes and Nongalvanic Joints
- \_\_\_\_\_ (1) Location
- j. Electronic Markers
- \_\_\_\_\_ (1) Location

#### 4. PAVING

##### a. Horizontal Location at Flowline of Curb

- \_\_\_\_\_ (1) PC and PT all curb returns
- \_\_\_\_\_ (2) PC and PT of horizontal curves
- \_\_\_\_\_ (3) VPC
- \_\_\_\_\_ (4) High and/or low points on summit or sag vertical curves
- \_\_\_\_\_ (5) Midpoint of vertical curve
- \_\_\_\_\_ (6) VPT
- \_\_\_\_\_ (7) All changes in vertical alignment of curb and/or gutter

##### b. Top of Curb Elevations or Flowline Elevations

- \_\_\_\_\_ (1) PC and PT all curb returns
- \_\_\_\_\_ (2) PC and PT of horizontal curves
- \_\_\_\_\_ (3) VPC
- \_\_\_\_\_ (4) High and/or low points of vertical curves
- \_\_\_\_\_ (5) Midpoint of vertical curves
- \_\_\_\_\_ (6) VPT
- \_\_\_\_\_ (7) Regular intervals along curb
- \_\_\_\_\_ (8) Slope

##### c. Flowline and Finished Grade Elevations

- \_\_\_\_\_ (1) At design points, PIs, other critical locations

##### d. Street Width

- \_\_\_\_\_ (1) Right-of-way width
- \_\_\_\_\_ (2) Paving width measured flowline to flowline of curb

##### e. Curb and/or Gutter

- \_\_\_\_\_ (1) Type and dimensions section
- \_\_\_\_\_ (2) Location of any change in type
- \_\_\_\_\_ (3) Changes in horizontal or vertical alignment

##### f. Paving Section

- \_\_\_\_\_ (1) Type and dimensions section
- \_\_\_\_\_ (2) Location of any change in type
- \_\_\_\_\_ (3) Temporary paving

##### g. Sidewalk

- \_\_\_\_\_ (1) Width
- \_\_\_\_\_ (2) Setback distance from flowline of curb or property line

##### h. Curve Data

- \_\_\_\_\_ (1) Radius
- \_\_\_\_\_ (2) Central angle
- \_\_\_\_\_ (3) Length
- \_\_\_\_\_ (4) Length along flowline of gutter (curves and curb returns)
- \_\_\_\_\_ (5) Length of vertical and middle ordinate of vertical curves

##### i. Medians

- \_\_\_\_\_ (1) Type of curb and/or gutter
- \_\_\_\_\_ (2) Location
- \_\_\_\_\_ (3) Type of surface treatment

**B. Record-Drawing Checklist**

This checklist is provided for convenience in reviewing record drawings for completeness. It is not a required submittal. Every plan sheet shall be stamped "Record Drawing".

**1. SANITARY SEWER:**

**a. Pipe**

- \_\_\_\_\_ (1) Location (horizontal)
- \_\_\_\_\_ (2) Type of material
- \_\_\_\_\_ (3) Size (internal diameter)
- \_\_\_\_\_ (4) Slope (ft./ft.)
- \_\_\_\_\_ (5) Service connections (size, length, vertical and horizontal location)
- \_\_\_\_\_ (6) Risers (size, vertical and horizontal location)
- \_\_\_\_\_ (7) Tees (size, vertical and horizontal location)
- \_\_\_\_\_ (8) Invert elevations within manholes
- \_\_\_\_\_ (9) Invert elevation, end of each service
- \_\_\_\_\_ (10) Length and slope of dead end stubs
- \_\_\_\_\_ (11) Location of markers

**b. Manhole or Junction Box**

- \_\_\_\_\_ (1) Horizontal location of the center
- \_\_\_\_\_ (2) Invert elevations of all pipes (inlets and outlets)
- \_\_\_\_\_ (3) Type
- \_\_\_\_\_ (4) Diameter and/or dimensions
- \_\_\_\_\_ (5) Lateral
- \_\_\_\_\_ (6) Rim elevation
- \_\_\_\_\_ (7) Horizontal distance between manholes center to center

**2. STORM DRAINAGE:**

**a. Conduit**

\_\_\_\_\_ (1) Utilize the criteria from sanitary sewer, preceding, above for all pipe including connecting lines to drop inlets and manholes.

**b. Catch Basins (Drop Inlets)**

- \_\_\_\_\_ (1) Type
- \_\_\_\_\_ (2) Horizontal location at the outlet
- \_\_\_\_\_ (3) Invert elevation at the outlet

**c. Open Channels**

- \_\_\_\_\_ (1) Type
- \_\_\_\_\_ (2) Material
- \_\_\_\_\_ (3) Dimensions
- \_\_\_\_\_ (4) Slope (at centerline of channel)
- \_\_\_\_\_ (5) Horizontal location at all changes in type, material, dimensions, alignment, etc., which change the flow characteristics.
- \_\_\_\_\_ (6) Elevations (when shown on plans) Top of side walls Top of slope Top of bank Centerline of channel
- \_\_\_\_\_ (7) Cross sections along channel (only if provided in plans)

3. WATER:

a. Pipe

- \_\_\_\_\_ (1) Type of material
- \_\_\_\_\_ (2) Class or code
- \_\_\_\_\_ (3) Size (internal diameter)
- \_\_\_\_\_ (4) Joint type and length
- \_\_\_\_\_ (5) Length between tees and/or crosses

b. Horizontal Location

- \_\_\_\_\_ (1) All fittings
- \_\_\_\_\_ (2) Restrained joints and type
- \_\_\_\_\_ (3) Valves
- \_\_\_\_\_ (4) Valve and meter box
- \_\_\_\_\_ (5) Fire hydrants

c. Elevations

- \_\_\_\_\_ (1) Top of pipe of all fittings
- \_\_\_\_\_ (2) Top of pipe at changes in grade
- \_\_\_\_\_ (3) Bottom of flange on all fire hydrants

d. Deflection

- \_\_\_\_\_ (1) Curve data or amount of deflection
- \_\_\_\_\_ (2) Direction (horizontal or vertical)

e. Valves

- \_\_\_\_\_ (1) Size
- \_\_\_\_\_ (2) Type
- \_\_\_\_\_ (3) Bypass detail, if required

f. Service Connection

- \_\_\_\_\_ (1) Length
- \_\_\_\_\_ (2) Diameter
- \_\_\_\_\_ (3) Type of material

g. Special Fittings

h. Blocking or Restraint

- \_\_\_\_\_ (1) Type

i. Anodes and Nongalvanic Joints

- \_\_\_\_\_ (1) Location of Markers

4. PAVING:

a. Horizontal Location at Back Of Curb

- \_\_\_\_\_ (1) PC and PT all curb returns
- \_\_\_\_\_ (2) PC and PT of horizontal curves
- \_\_\_\_\_ (3) VPC
- \_\_\_\_\_ (4) High and/or low points on summit or sag vertical curves
- \_\_\_\_\_ (5) Mid point of vertical curve
- \_\_\_\_\_ (6) VPT
- \_\_\_\_\_ (7) All changes in vertical alignment of curb and/or gutter

b. Top of Curb Elevations or Flowline Elevations

- \_\_\_\_\_ (1) PC and PT all curb returns
- \_\_\_\_\_ (2) PC and PT of horizontal curves
- \_\_\_\_\_ (3) VPC

- \_\_\_\_\_ (4) High and/or low points of vertical curves
- \_\_\_\_\_ (5) VPT
- \_\_\_\_\_ (6) Slope
- c. Street Width
  - \_\_\_\_\_ (1) Right-of-way width
  - \_\_\_\_\_ (2) Paving width measured back to back of curb
- d. Curb and/or Gutter
  - \_\_\_\_\_ (1) Type
  - \_\_\_\_\_ (2) Location of any change in type
  - \_\_\_\_\_ (3) Length between changes in horizontal or vertical alignment
- e. Paving Section
  - \_\_\_\_\_ (1) Type and dimensioned section
  - \_\_\_\_\_ (2) Location of any change in type
- f. Sidewalk
  - \_\_\_\_\_ (1) Width
  - \_\_\_\_\_ (2) Shown on details
- g. Curve Data
  - \_\_\_\_\_ (1) Radius
  - \_\_\_\_\_ (2) Central angle
  - \_\_\_\_\_ (3) Length
- h. Medians
  - \_\_\_\_\_ (1) Type of curb and/or gutter
  - \_\_\_\_\_ (2) Location

Section 6. FIGURES

Click to view:

[Figure 27.1](#)

[Figure 27.2](#)

[Figure 27.3](#)

[Figure 27.4](#)

[Figure 27.5](#)

[Figure 27.6](#)

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