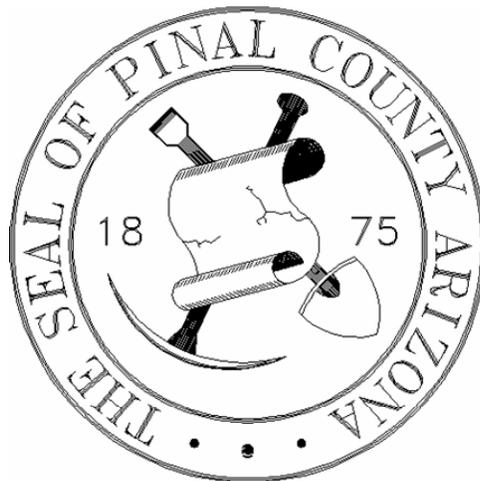


***Pinal County
Subdivision &
Infrastructure
Design
Manual***



**PINAL COUNTY
SUBDIVISION & INFRASTRUCTURE DESIGN MANUAL**

TABLE OF CONTENTS

	STARTING PAGE
PREFACE.....	V
CHAPTER 1 ADMINISTRATION, DEFINITIONS AND REFERENCES.....	1-1
1.1 Administration	1-1
1.2 General Information & Rules	1-1
1.3 Definitions	1-2
1.3 References.....	1-3
CHAPTER 2 DEVELOPMENT CLASSIFICATION	2-1
2.1 General Information	2-1
2.2 Residential Subdivisions	2-1
2.3 Commercial or Industrial Subdivisions	2-1
2.4 (Reserved for "Specific Site Plan Review")	2-1
CHAPTER 3 TENTATIVE SUBDIVISION PLAT REQUIREMENTS	3-1
3.1 General Information	3-1
3.2 Tentative Plat Format.....	3-1
3.3 General Requirements	3-2
3.4 General Notes	3-7
3.5 Special Notes.....	3-8
3.6 Other Information	3-10
CHAPTER 4 SPECIFICATIONS FOR FINAL PLAT	4-1
4.1 General Information	4-1
4.2 Final Plat Format.....	4-1
4.3 General Requirements	4-3
4.4 Legal Survey	4-17
4.5 General Notes.....	4-19
CHAPTER 5 GENERAL REQUIREMENTS FOR IMPROVEMENT PLANS	5-1
5.1 General Information	5-1
5.2 General Requirements	5-1
5.3 Registrants Seal and Signature.....	5-4
5.4 Plan Sheets.....	5-4
5.5 Plan and Profile Sheets.....	5-6
5.6 Detail Sheets.....	5-6
5.7 Technical Reports	5-6
5.8 Plan Review Comments.....	5-7
5.9 Approval of Plans.....	5-7
5.10 As-Built Plans.....	5-8
CHAPTER 6 STREET DESIGN REQUIREMENTS.....	6-1
6.1 General Information	6-1

6.2	Street Improvements	6-1
6.3	Street Classifications	6-1
6.4	Subdivision Street Planning	6-2
6.5	Street Right-of-Way Requirements	6-3
6.6	Easements and Dedications.....	6-4
6.7	Pavement Cross Section.....	6-4
6.8	Decorative Paving	6-5
6.9	Curb and Gutter	6-5
6.10	Sidewalks	6-6
6.11	Horizontal Alignment	6-7
6.12	Vertical Alignment	6-8
6.13	Intersections.....	6-9
6.14	Cul-de-Sacs and Knuckles	6-9
6.15	Dead End Streets.....	6-10
6.16	Blocks	6-10
6.17	Turning Lanes and Medians.....	6-10
6.18	Driveways.....	6-11
6.19	Multi-Use Trails	6-12
6.20	Existing Adjacent Unimproved Roads	6-12
6.21	Local Street Drainage	6-12
6.22	Street Name Signs	6-12
6.23	Survey Monuments	6-12
6.24	Traffic Signals	6-12
6.25	Paving Improvement Plan Requirements.....	6-12
CHAPTER 7 HILLSIDE SUBDIVISION IMPROVEMENT REQUIREMENTS.....		7-1
7.1	General Information	7-1
7.2	General Hillside Subdivision Requirements	7-1
7.3	Special Design Standards	7-1
7.4	Special Construction Standards:	7-1
CHAPTER 8 GRADING DESIGN REQUIREMENTS		8-1
8.1	General Information	8-1
8.2	General Requirements	8-1
8.3	Irrigation & Utilities	8-1
8.4	Grading Improvement Plan Requirements	8-2
CHAPTER 9 WATER SYSTEM DESIGN REQUIREMENTS		9-1
9.1	General Information	9-1
9.2	Water Main Extension	9-1
9.3	Water System Improvement Plan Requirements	9-2
CHAPTER 10 SEWER SYSTEM DESIGN REQUIREMENTS.....		10-1
10.1	General Information	10-1
10.2	Sewer Line Extension	10-1
10.3	Additional Sewer System Improvement Plan Requirements	10-1
CHAPTER 11 LANDSCAPE AND IRRIGATION REQUIREMENTS		11-1
11.1	General Information	11-1

11.2	Additional Landscape and Irrigation Improvement Plan Requirements.....	11-1
CHAPTER 12 TRAFFIC SIGNAL REQUIREMENTS		12-1
12.1	General Information	12-1
12.2	Design Criteria and Reference Documents	12-1
12.3	Additional Traffic Signal Improvement Plan Requirements	12-1
CHAPTER 13 TRAFFIC SIGNING AND PAVEMENT MARKINGS REQUIREMENTS..		13-1
13.1	General Information	13-1
13.2	Design Criteria and Reference Documents	13-1
13.3	Additional Traffic Signing and Pavement Marking Plan Requirements	13-1
CHAPTER 14 AS-BUILT PLANS REQUIREMENTS		14-1
14.1	General Information	14-1
14.2	Minimum As-Built Requirements	14-1
CHAPTER 15 PERMITTING, INSPECTION & CONSTRUCTION.....		15-1
15.1	General Information	15-1
15.2	Permit Requirements	15-1
15.3	Notification of Construction	15-1
15.4	Specifications	15-1
15.5	Materials.....	15-1
15.6	Pavement	15-2
15.7	Compaction	15-3
15.8	Contraction and Expansion Joints:.....	15-4
15.9	Utilities	15-4
15.10	Traffic Control Devices	15-4
15.11	Street Signs and Street Survey Monuments	15-4
15.12	Dust Control	15-4
15.13	Individual Mail Boxes	15-4
15.14	Inspection.....	15-5
15.15	Testing	15-5
15.16	Approval.....	15-6
CHAPTER 16 UTILITY CONSTRUCTION IN COUNTY RIGHT-OF-WAY		16-1
16.1	General Information	16-1
16.2	General Requirements	16-1
16.3	Utility Separation	16-1
16.4	Additional Utility Plan Requirements	16-1
16.5	Backfill and Compaction.....	16-2
16.6	Compaction Test Reports.....	16-3

LIST OF EXHIBITS

3.1	Tentative/Final Plat Cover Sheet
6.1	Schematic Subdivision
6.2	Street Sections
6.3	Centerline Deflection & Reverse Curves (Collector/Local Street)
6.4	Angle of Intersections for Local Streets

- 6.5** Angle of Intersections for Collector Streets
- 6.6** Street Jogs for Local & Collector Streets
- 6.7** Cul-De-Sacs for Local Streets
- 6.8** Knuckle Designs for Local Streets
- 6.9** Street Drainage for Local Streets

PREFACE

Pinal County

The Pinal County Subdivision & Infrastructure Design Manual introduces the processes associated with land development in the unincorporated areas of Pinal County. The Pinal County Subdivision Regulations and the Pinal County Subdivision & Infrastructure Design Manual have been adopted by the Pinal County Board of Supervisors and replace the **SUBDIVISION REGULATIONS & REQUIREMENTS AND MINIMUM STANDARDS FOR SUBDIVISIONS STREET PAVING FOR PINAL COUNTY, ARIZONA**. The Pinal County Subdivision & Infrastructure Design Manual is intended to provide guidance and direction to the development community in the preparation of subdivision plats and infrastructure improvement plans.

The Pinal County Subdivision & Infrastructure Design Manual sets forth Pinal County standards and policies for infrastructure design, and assists preparation of the technical plans and reports for submittal to and approval by Pinal County.

The Pinal County Subdivision & Infrastructure Design Manual clarifies and supplements requirements in the Pinal County Codes including the subdivision regulations, zoning ordinance, drainage ordinance, stormwater and floodplain regulations, and other regulations for land development within the unincorporated area of Pinal County.

CHAPTER 1 ADMINISTRATION, DEFINITIONS AND REFERENCES

1.1 Administration

- 1.1.1 Applicability:** All applications for subdivision approval that have been accepted as complete, including tentative or final plats, and are under County review on the effective date of this Manual shall be reviewed under County regulations existing at the time of acceptance, except that this Manual will apply if, during plat review, any approvals lapse or processing deadlines expire.
- 1.1.2 Conflict:** This Manual is not intended to interfere with, abrogate, or annul any other ordinance, rule or regulations, statute, or other provision of law except as provided in this Manual. Where any provision of this Manual imposes restrictions different from those imposed by any other provision of law, the provision that is more restrictive or imposes higher standards upon the development and use of land shall control.
- 1.1.3 Severability:** If any section, sub-section, sentence, clause, phase, term, part or provision of this Manual is held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall be confined in its operation to the section, sub-section, sentence, clause, phrase, term, part or provision or application directly involved in the controversy or validity of the remaining portions of this Manual or the application thereof to other persons or circumstances.

1.2 General Information & Rules

For the purpose of this manual, and when not inconsistent with the context:

- 1.2.1** Words used in the present tense shall include the future.
- 1.2.2** Words used in the singular number shall include the plural.
- 1.2.3** Words in the plural shall include the singular.
- 1.2.4** Words in the masculine gender shall include the feminine gender, corporate or other form.
- 1.2.5** The word "shall" is mandatory and not discretionary.
- 1.2.6** The word "may" is permissive.
- 1.2.7** The particular controls the general.
- 1.2.8** Enumeration is not limited.

- 1.2.9 The word "herein" means "in this manual" and the word "regulations" means "the Pinal County Subdivision Regulations".
- 1.2.10 The word "person" includes a corporation, a partnership, and an unincorporated association of persons such as a club.
- 1.2.11 The words "used" or "occupied" as applied to any land or building shall be construed to include the words "intended, arranged, or designed to be used or occupied".

1.3 Definitions

For the purpose of this manual, certain words, phrases, terms, and abbreviations shall have special meaning as defined herein, unless the context requires otherwise:

- 1.3.1 ADEQ: The Arizona Department of Environmental Quality.
- 1.3.2 Board: The Board of Supervisors of Pinal County.
- 1.3.3 Buffer: A strip of land established to protect one type of land use from another land use or to provide screening. Normally, a buffer yard is landscaped and developed in open space areas.
- 1.3.4 Clerk of the Board: The Clerk of the Pinal County Board of Supervisors.
- 1.3.5 Commission: The Pinal County Planning and Zoning Commission.
- 1.3.6 County: Pinal County, a political subdivision of the State of Arizona.
- 1.3.7 County Engineer: The Pinal County Engineer or designee.
- 1.3.8 Grade: The slope of a road, street, or way specified in percentage terms.
- 1.3.9 MAG: The Maricopa Association of Governments.
- 1.3.10 Public Works Department: The Pinal County Department of Public Works.
- 1.3.11 Public Works Director: The Pinal County Public Works Director or designee.
- 1.3.12 Regulations: The Pinal County Subdivision Regulations.
- 1.3.13 Right-of-Way: An area of land which by deed, conveyance, agreement, dedication, or process of law is dedicated to Pinal County for public purposes including, but not limited to, streets, highway, public utility, pedestrian facility, bikeway or drainage.
- 1.3.14 State: State of Arizona.

- 1.3.15** Street, Arterial: A general term including section line, major streets, state or county highways providing a system for through traffic movement.
- 1.3.16** Street, Collector: Provides the traffic movement within neighborhoods, between major streets and local streets, and for direct access to abutting property.
- 1.3.17** Street, Local: Provides for direct access to residential, commercial, industrial or other abutting land; primarily for local traffic movements with connections to collector streets.
- 1.3.18** Structures: Anything constructed or erected which requires location on or in the ground or is attached to something having a location on the ground. Structures do not include ditches and their appurtenances, poles, lines, cables, or transmission or distribution facilities of public utilities, freestanding mailboxes, on-grade slabs, walks, driveways, landscaping materials or fences.

1.4 References

The list of references included below presents the most current versions of the references (at the time the manual was developed). The user should always refer to the latest version of such publications.

- American Association of Nurserymen
- American Association of State Highway and Transportation Officials (AASHTO), Policy on Geometric Design of Highways and Streets, 2004
- Arizona Administrative Code Title 18, Chapter 9, Articles 2 & 3, 2005
- Arizona Nurserymen's Association, 2005
- Arizona Supplement to the 2003 Manual on Uniform Traffic Control Devices (ADOT), 2003
- Guide to Standardized Highway Lighting Pole Hardware; (AASHTO), 1980.
- International Fire Code, 2006
- Manual of Approved Signs; (ADOT), 1999
- Manual of Uniform Traffic Control Devices for Streets and Highways (MUTCD), 2003.
- Roadway Lighting Design Guide; (AASHTO), 2005.

- Signs and Marking – Standard Drawings; (ADOT), 2002
- Standard Specifications for Road and Bridge Construction Manual, (ADOT), 2000.
- Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals; (AASHTO), 2003
- Traffic Control Design Guidelines, (ADOT), 2003.
- Traffic Control Manual for Highway Construction and Maintenance; (ADOT), 1996.
- Traffic Controller Assemblies with NTCIP Requirements TS2-1998, National, Electrical Manufacturers Association, 2003
- Traffic Engineering Policies, Guidelines and Procedures; (ADOT), 2002.
- Traffic Signals and Lighting and Signing and Marking – Standard Drawings; (ADOT), 2004.
- Uniform Standard Specifications and Details for Public Works Construction As Published by Maricopa Association of Governments, 2006

CHAPTER 2 DEVELOPMENT CLASSIFICATION

2.1 General Information

The design guidelines that apply to each development may vary depending on the intended land use. This chapter notes the criteria used to classify each development as a residential, commercial or industrial subdivision.

2.2 Residential Subdivisions

Residential subdivisions are those where property is used for single family or multi-family dwellings regardless of the zoning classification. Residential condominiums shall be platted per A.R.S. § 33-1219.

2.3 Commercial or Industrial Subdivisions

In general, any subdivision whose intended use is not for residential dwellings shall be considered a commercial or industrial subdivision for the purpose of this Manual.

2.4 (Reserved for “Specific Site Plan Review”)

CHAPTER 3 TENTATIVE SUBDIVISION PLAT REQUIREMENTS

3.1 General Information

The tentative plat stage for land subdivision involves detailed subdivision planning, including the submittal, review and approval of the tentative plat. This chapter covers various requirements for preparation of the tentative plat. In addition to the requirements of Article 4 in the Pinal County Subdivision Regulations, the following requirements apply.

3.2 Tentative Plat Format

The Tentative Plat shall be in the following format: (See **Exhibit 3.1** for cover sheet layout for Tentative & Final Plats)

- 3.2.1** Tentative plat shall be submitted on one or more sheets of 24"x36". Clearly and legibly drawn to show all required details at a scale not greater than 100 feet to an inch. No architect or uncommon scale will be accepted.
- 3.2.2** When two or more sheets are used, the number of sheets must be noted on the bottom right corner (i.e. sheet ____ of ____ sheets).
- 3.2.3** Plats must be drawn with the north direction toward the top, or the right of the sheet. A graphical scale will be located directly below the North arrow. All text shall be oriented to be readable from the bottom or the right of the sheet.
- 3.2.4** Provide a location map (small scale vicinity map) which includes, but not limited to:
 - a.** The subject property, centered and identified, within a minimum one square mile area;
 - b.** Adjacent conditions, subdivisions, unsubdivided land, and schools, etc;
 - c.** Major streets, rivers, reservations, national forests, railroads and school sites;
 - d.** Section, township and range of the subject plat;
 - e.** Label sections;
 - f.** A North arrow, oriented with the north toward the top or the right of the sheet;
 - g.** The city, town or other jurisdictional limits, where applicable;
 - h.** A reference key or legend, if the plat has more than one sheet. Indicate the area covered by each sheet; and
 - i.** Access to the subject property.

- 3.2.5** Provide a Title Block, located at the top of each sheet including:
- a. The name of the subdivision.
 - b. Lot numbers, i.e. lot numbers ____ through ____ and common areas (units or blocks).
 - c. On cover sheet only, a brief legal description, including the section, township and range reference (G&SRB&M, Pinal County, Arizona). If the proposed subdivision is a replat of an existing plat of record, include full information on the original plat, including which lots are being replatted.
 - d. Labeled as "Tentative Plat".
- 3.2.6** A replat cannot bear exactly the same name as its precedent subdivision. If a subdivision is recorded and subsequently re-recorded, the second plat must bear a slightly different name from the original (i.e. "replat of" in front of the subdivision name). Subdivisions platted separately but representing phases of a project can bear the same name, so long as the lot numbers are sequential, or the name is followed by "unit" and a unit number only.
- 3.2.7** The subdivision boundary line, boundary lines of lots and common areas shall be drawn with a solid line. All easements lines and existing lot lines (if a replat) shall be shown with a dashed line. The subdivision boundary line width should be bolder (wider) than any other line on the plat.
- 3.2.8** Name, registration number, seal and signature of the land surveyor or other professional licensed and registered in the State of Arizona who is eligible to be responsible for conducting the land survey and preparing the tentative plat.

3.3 General Requirements

3.3.1 Planning Department

- a. Name, address, zip code, and phone number of persons involved in the tentative plat application (e.g. owner, subdivider, engineer, land surveyor, preparing the plat, including the registration number).
- b. Date of preparation including dates of any subsequent revisions.
- c. Site data, including gross area of proposed subdivision, number of lots proposed, approximate area of the open space, and other proposed non-residential uses.
- d. Proposed lot lines, typical and minimum lot sizes, for each type of proposed lot and density (lots per gross acre).

- e. Typical lot layout, including minimum building setback lines related to all right-of-way; dimensions of all corner lots and lots on curvilinear sections of street; each lot numbered individually and total number of lots shown.
- f. Show and label existing uses of land and zoning district classifications and uses on and immediately adjacent to the subdivision site. All lots must be consistent with zoning requirements. If more than one zone is involved, provide the number of acres within each zone, and identify the lots within each zone. If rezoning has been filed, provide designation of proposed zoning district and rezoning case number.
- g. Reference by dimension and bearing to section corners and quarter-section corners.
- h. Provide benchmark location, description, and elevation. Elevations shall be based on North America Vertical Datum 1988 (NAVD 88).
- i. The subdivision boundary lines will be labeled with distances and bearings.
- j. Record name, record date, and book and page or cabinet and slide of adjacent subdivisions or the names of record owners of adjoining parcels of unsubdivided land with Assessor Parcel Number (APN).
- k. List and label area, to be shown as tracts, if any, to be reserved or dedicated for parks, open spaces, playgrounds, schools, fire stations or other public uses.
- l. If a plat includes land for which multi-family, commercial or industrial use is proposed, such areas shall be clearly designated on the plat.
- m. Designate existing use of property and area and number of tracts, if any, to be excluded or abandoned from the proposed subdivision.
- n. All lots shall utilize a lot numbering system to be numbered consecutively throughout the plat. Exceptions such as tracts and private parks shall be so designated, lettered or named, and clearly dimensioned. Ownership and maintenance responsibilities for tracts and private parks shall be indicated on the plat.
- o. Label, city limits, well sites and vacant areas (state land, federal land, etc.).
- p. Lots backing or siding on streets may require tracts to allow for PUE's and landscaping.
- q. Show location of all proposed monument signs.
- r. All existing or proposed streets shall be identified by street names.

3.3.2 Public Works Department

A tentative plat shall contain the following information, and be accompanied by an A.L.T.A./A.C.S.M. title survey:

- a. Location and widths of all existing or proposed right-of-way, streets, intersections, and other ways, drainage ways, if any, and other rights-of-ways and easements, whether public or private and their purposes, within and adjacent to the tract, including all connections to adjoining platted or un-platted tracts, railroad rights-of-way and other important features such as section lines, political subdivision or corporate lines.
- b. Show all centerline data (delta, length, and radii), roadway dimensions and property line data (delta, length, and radii).
- c. Designation of all land to be dedicated, provided, or reserved for public uses (including all easements, with the use(s) indicated).
- d. Identification of all utility services in and for the subdivision, both existing and proposed; source of utilities service provider table; and whether such utilities will be underground or above ground.
- e. Any relocating, modification, etc., of the existing utilities and/or improvements required by this subdivision development will be paid by the subdivider.
- f. Information sufficient to locate accurately the property shown on the plat, with reference to survey markers or monuments, and bearings and distances.
- g. When lots are greater than one acre, existing and proposed contours at an interval and accuracy acceptable to the County Engineer shall be provided. When any of the lots are one acre or less, the following contour intervals shall be required and be sufficient to indicate drainage for all lots and streets. Contours taken from U.S. Geological Survey maps are not acceptable.

Gradual slopes	0 to 2%	2-foot intervals
Medium slopes	2 to 15%	5-foot intervals
Steep slopes above	15%	10-foot intervals
- h. Existing field conditions shall extend to the full existing right-of-way along the entire perimeter of the property or, where no right-of-way exists, extend approximately 100' beyond property boundary.
- i. At intersections with streets, show cross corner sight visibility triangle easement with appropriate dimensions and clearly indicate building setbacks in these locations.

- j.** All existing and proposed easements (with their dimensions, purposes, whether they are private, public or specific and recording information for existing easements) will be shown on the plat. Easements which are no longer used and obsolete should be cleared from the title prior to final plat recordation.
- k.** Identify drainage flows across or along proposed or existing streets and adequate access during flow times must be shown.
- l.** All existing drainage patterns affecting the land included in the tentative plat must be shown. A preliminary location of the proposed storm drain system shall be shown.
 - 1.** If any part of the storm water flow is to be handled by an underground storm drain system, the tentative location of the inlets, must be shown.
 - 2.** Development must be in accordance with the current Pinal County Drainage Ordinance.
- m.** Paved all weather roads shall be provided to all lots within this subdivision.
- n.** Vicinity map showing proposed subdivision and surrounding subdivisions and major streets located within a ½ mile radius.
- o.** Legend identifying symbols.
- p.** Basis of Bearings.
- q.** An overall key map to be provided to include proposed street names and neighboring properties to be noted as “UNSUBDIVIDED” if not yet platted, but if there is a proposed plat, provide plat name. If neighboring property is platted, provide recorded information.
- r.** Property line minimum radii shall be 25’ or 33’ (for all arterial intersections).
- s.** Sight Visibility Triangle Easements (SVTE) shall be 21’ x 21’ (local to local) and 33’ x 33’ (for all others).
- t.** Minimum right-of-way (ROW) width dimensions shall be: major arterials - 150’ ROW; minor arterials (section lines) - 110’ ROW; major collectors (mid-section lines) - 80’ ROW; minor collectors - 60’ ROW; and local streets - 50’ ROW.
- u.** Intersection spacing along an arterial shall be approximately every 1,320’ (1/4 mile).

- v. Avoid street jogs with centerline offsets of less than 135'. Collector or another arterial street intersecting with an arterial street should align if possible or meet the minimum requirement for spacing along an arterial.
- w. Local streets are not permitted to intersect with an arterial street.
- x. Residential lots shall front only local streets.
- y. Intersections shall intersect at right angles if possible, but no less than 75 degrees.
- z. Maximum length of a cul-de-sac is 500 ft. Minimum right-of-way radius for Cul-de-sac and its returns is 50'. See **Exhibit 6.7**.
- aa. Show all location and description of primary control points of reference. At least two corners of the subdivision shall be tied by bearing and distance to a section corner, a quarter section corner, or established city or county survey monument.
- bb. Show location and description of street centerline monuments and other survey points in place.
- cc. Show surrounding land around subdivision to include, but not limited to, existing right-of-ways, existing easements, existing plats and other properties.
- dd. Public Utility Easements (PUE) shall be a minimum 8' wide. PUE's are to be located outside the rear and side of all lots.
- ee. 1' vehicular non-access easement (VNAE) shall be dedicated on all lots adjacent to or backing up to any tract, drainage feature, collector street and arterial street.
- ff. Survey monuments are required on monument lines at intersections, PC's, PT's, and PI's. Also required at knuckles or cul de sacs.

3.3.3 Pinal County Flood Control District

A tentative plat shall contain the approximate boundaries of all areas subject to flooding as designated by FEMA Special Flood Hazard areas and the location and extent of all water courses and the nature of the water flow whether continuous, intermittent or sporadic.

3.3.4 Building Safety Department and Environmental Health Department

A tentative plat shall contain the following information:

- a. It shall be the responsibility of the subdivider to furnish the County Environmental Health Department and Arizona Department of Environmental Quality, (ADEQ) such evidence as those departments

may require for their satisfaction as to the design and operation of sanitary sewage facilities proposed. A statement as to the type of sewage disposal facilities proposed shall appear on the tentative plat. In subdivisions which are proposed to be served by individual lot septic tanks, percolation tests and test boring logs in accordance with the requirements of the County Environmental Health Department and ADEQ shall be taken within the proposed subdivision.

- b. It shall be the responsibility of the subdivider to furnish the County Building Safety Department such evidence as that department may require for its satisfaction as to the design and construction of connections to sewage facilities.
- c. If a portion of the subdivision is to be used for a water supply facility, it shall be so indicated on the plat.

3.3.5 Fire District in which the Subdivision is located or the Supplier of the existing or proposed fire protection

A tentative plat shall contain the identification of method and source of fire protection as needed to meet applicable Fire District requirements.

3.4 General Notes

3.4.1 Planning Department

- a. The gross area of the subdivision is ____ acres.
- b. Zoning Information:

Zoning is _____. (If more than one zone is involved provide the number of acres within each zone, and identify the lots within each zone.)
- c. The number of lots is _____.
- d. The approximate area in acres of parks, recreation areas, drainage ways, open space and all other proposed non-residential uses.

3.4.2 Public Works Department

- a. Street name [to be inserted] is the nearest paved access maintained by the County which serves this subdivision. It is _____ miles/feet away from or adjacent to, this subdivision.
- b. Any relocating, modification, undergrounding, etc., of the existing utilities and/or improvements required by this subdivision development will be paid by the subdivider.
- c. Note any proposed abandonment of public rights-of-way.

3.4.3 Building Safety Department and Environmental Health Department

a. If Public Sewers

- 1.** Prior to the issuance of building permits, all connections to public sanitary sewer facilities will be constructed in accordance with plans approved by the County Building Safety Department.
- 2.** Prior to the issuance of any Certificate of Occupancy building permits, all public sanitary sewer facilities shall have received an Approval of Construction from the County Environmental Health Department, and Certificate of Approval of Sanitary Facilities from ADEQ.

b. If Private Sewers

- 1.** Onsite sanitary sewers will be constructed, operated and maintained on a private basis, except public sewers within public sewer easements or rights-of-way. The location and method of connection to an existing public sanitary sewer is subject to review and approval by the County Building & Safety Department at the time of submittal of plumbing or building plans. The size, location and construction of septic tanks are subject to review and approval of the County Environmental Health Department at the time of Building Permit Application.
- 2.** A homeowners' association may be formed to accept responsibility and liability for construction, maintenance, operation, and control of all private sewers.
OR
- 3.** If no homeowners' association is being formed, maintenance and operation of the private sanitary sewer to its point of connection to the public sanitary sewer is the responsibility of each and every property owner within the subdivision.
- 4.** Statement regarding the location, collection, method of sewage disposal and the distance to the nearest solid waste disposal area by road. Identify the party or agency having operating jurisdiction.
- 5.** A statement as to the type of domestic water supply facilities, both existing and proposed, and the name of the provider shall be placed on the plat.

3.5 Special Notes

3.5.1 Planning Department

- a.** If any variance, waiver or special use permit approval is received, add a note stating who approved it, what was approved, and when it was

approved and the case number. Provide a copy of the minutes on each official action with the tentative plat.

- b. Indicate flood zone(s) designation.
- c. Minimum lot size _____ square feet.
- d. The following lots are subject to Hillside Development Design: [list lots]

3.5.2 Environmental Health and Building Safety Departments

a. Public Sewers

1. The required off-site public sanitary sewer line will be designed and constructed to ADEQ criteria.
2. The required off-site public sanitary sewer augmentation will be designed and constructed to ADEQ criteria.
3. All sanitary sewers will be designed to provide gravity flow. (This note to appear if invert and rim elevations are not shown on preliminary sewer plans).
4. The relocation, if any, of public sewers will be constructed, inspected, completed, and approved by ADEQ prior to issuance of County building permits.
5. The relocation of the existing public sewer is being done for the convenience of the subdivider.

b. Private Sewers

1. The required offsite sanitary sewer line will be constructed operated and maintained on a private basis. The location and method of connection to an existing public sanitary sewer is subject to review by the County Building Safety Department at the time of submittal of plumbing or building plans.
2. Sewerage disposal for lots ____ thru ____ will be by private individual disposal systems.

c. Drywells

The following statement shall appear on all plats for developments which uses drywells: All drywells shown on this plat shall be maintained by the owner and are to be replaced by the HOA/Owner when they cease to drain the stored surface water in a 36 hour period. Annual inspection and maintenance of the dry well silting chamber is required.

3.6 Other Information

During the course of staff review of the tentative plat additional information or notes may be required to carry out the purpose and intent of the Pinal County Subdivision Regulations.

CHAPTER 4 SPECIFICATIONS FOR FINAL PLAT

4.1 General Information

The final plat stage includes the final design of the subdivision, engineering plans for the public improvements and submittal of the subdivision improvement plans to the Pinal County Development Services Department. In addition to the requirements of Article 4 in the current Pinal County Subdivision Regulations, the following requirements apply.

4.2 Final Plat Format

4.2.1 The original of the final plat shall be drawn in black suitable ink on polyester or mylar, and shall include all affidavits, certificates, endorsements, and acknowledgments. All signatures shall be signed in black suitable ink, with the ink surface coated with a suitable substance when used on polyester based film to assure permanent legibility. Copies of the record plat shall be reproduced in the form of blueline or blackline prints on a white background.

4.2.2 After approval by the Board and before recording of the final plat, subdivider shall submit the approved final plat on a floppy disk in an AutoCAD format.

The final plat shall contain the following items:

- a. lot numbers,
- b. lot lines,
- c. street centerlines,
- d. street names,
- e. rights-of-way,
- f. easements,
- g. subdivision boundary,
- h. bearings and distances.

4.2.3 Where necessary the plat may be on several sheets. The size of each sheet shall be 24"x36" in size with a left margin of one and one-half (1½) inches and be drawn to an accurate scale not to exceed 100 feet to an inch.

4.2.4 The subdivision boundary line, boundary lines of lots and common areas shall be drawn with a solid line. All easement lines and existing lot lines (if a replat) shall be shown with a dashed line. The subdivision boundary line width should be bolder (wider) than any other line on the plat.

4.2.5 The number of sheets must be so noted at the bottom, right corner of each sheet comprising the final plat, i.e., "sheet _____ of _____ sheet(s)".

4.2.6 North arrow and scale (both written and graphic). Each sheet comprising the final plat should be oriented with north toward the top of the page, or the right and include a North arrow on each sheet. The scale should be shown beneath the North arrow. All text should be readable from the bottom and the right side of the sheet.

4.2.7 Cover Sheet

Every final plat shall have a cover sheet either as a separate page or as part of the final plat. (See **Exhibit 3.1** for cover sheet format for Tentative & Final Plats) Said cover sheet shall contain the following:

- a. The name or title under which the subdivision is to be recorded. The name or title of the subdivision shall not duplicate the name of any existing subdivision. A replat cannot bear exactly the same name as its precedent subdivision. If a subdivision is recorded and subsequently re-recorded, the second plat must bear a slightly different name from the original (i.e. "replat of" in front of the subdivision name). Subdivisions platted separately but representing phases of a project can bear the same name, so long as the lot numbers are sequential, or the name is following by "unit" and a unit number only.
- b. Below the title shall be a sub-title consisting of a general description of all the property being subdivided, by reference to subdivisions or to sectional surveys.
- c. References to subdivisions shall be worded identically with original records, with references to the record name, record date and book and page, or cabinet and slide of the adjoining subdivision(s).
- d. Affidavits, certificates, acknowledgments, and endorsements, acceptances of dedication and notaries seals required by law and by this Manual.
- e. A vicinity map showing the proposed subdivision and surrounding subdivisions and streets located within a one-half mile radius of the boundaries of the proposed subdivision.
- f. A legend which describe all symbols used.
- g. Planning Department case number.
- h. Basis of bearings.
- i. Pinal County Recorder's Block required on the upper right corner for each page of the final plat. (See **Exhibit 3.1**)

4.2.8 A title block shall appear on each of the remaining sheets comprising the final plat, if any, consisting of:

- a. The name of the subdivision.
- b. The number of lots, units, blocks or common areas (whichever is applicable).

- c. A brief legal description, including the section, township and range reference (G&SRB&M, Pinal County, Arizona). If the proposed subdivision is a replat of an existing subdivision, include full information on the replat, including which lots are being resubdivided. Whenever possible, avoid using "a portion of..."

4.3 General Requirements

4.3.1 Planning Department

- a. Name, registration number, surveyor seal, and signature of the land surveyor licensed and registered in the State of Arizona who is responsible for conducting the land survey and preparing the final plat. This shall be provided on each sheet.
- b. Name and registration number of the land surveyor licensed and registered in the State of Arizona who is responsible for the engineering that is necessary in preparation of the proposed subdivision.
- c. Date of plat preparation,.
- d. Primary control points or descriptions and ties to such control point, to which all dimensions, angles, bearings, and similar data on the plat shall be referred, and where a coordinate system shall have been established by the County Engineer, primary control points shall have been referenced thereto; at least two corners of a subdivision shall be tied by bearing and distance to a section corner, a quarter section corner, or established city or county survey monument, and the final plat must include a description of the corner marker, and indicate how the bearings were determined.
- e. Any excepted lots or parcel(s) within the plat boundary shall be accurately described by bearings and distances. Proper street and alley dedications adjacent to any proposed tracts or excepted parcels shall be provided by the subdivider by inclusion within the plat or by separate dedication noted on the plat.
- f. Location and dimensions of all lots shall be shown. Lot dimensions shall be indicated for at least one side lot line and either the front or rear lot line when lots are rectangular or square. If lots are not rectangular or square all lot line dimensions shall be indicated. Typical minimum setback lines shall also be located and dimensioned. Such lot dimensions, areas or building setback lines shall not be less than required by the County Zoning Ordinance or building line regulations applying to the property. Minimum finished floor elevations shall be indicated on all lots subject to inundation of a 100-year storm.
- g. All required "sight visibility triangle easements" (SVTE) shall be indicated at street corners.

- h. Where a subdivision is part of a Planned Area Development, those standards approved by the Board shall be shown on the final plat.
- i. All lots shall utilize a block and lot numbering system or be numbered consecutively throughout the plat. Exceptions such as tracts and private parks shall be so designated, lettered or named, and clearly dimensioned. Ownership and maintenance responsibilities for tracts and private parks shall be indicated on the plat.
- j. The accurate outline of all property which is offered for dedication for public use with the purpose indicated thereon and all property that may be served by deed covenant for the common use of the property owners in the subdivision.
- k. Identify all the uses and types of development proposed.
- l. Name, Book and Page Number or Cabinet and Slide Number of adjacent recorded subdivisions with location of existing adjacent lot, easements and rights-of-way show, or notation "unsubdivided" where appropriate.
- m. Lienholders' ratification.
- n. Identify and label all required tracts by letter designation.
- o. Provide the area of each lot, tract and common area. The area of the common area may be shown in the general notes.
- p. For final approval, submit three bond sets and one set of mylars when requested in writing by the Planning Department.
- q. Certification of survey with surveyor seal, signature, printed name, address and registration number of a land surveyor licensed and registered in the State of Arizona:

LAND SURVEYOR'S CERTIFICATION

I hereby certify that the survey and subdivision of the premises described and platted herein were made under my direction during the month of _____, _____, and this plat represents the survey made. I further certify all exterior boundary monuments shown hereon actually exist and their location, size and material are accurately shown and are sufficient to enable the survey to be retraced.

[Type in name, address & phone number] Date

Arizona Registered Land Surveyor, # _____ **[apply seal, also sign & date seal]**

- r. Agreement by owners of record that all lots will be staked and a certification of said staking filed with the Planning Department prior to issuance of any building permit.

It is agreed that prior to the sale of any lot or the issuance of any building permits, whichever occurs first, all lots will be accurately staked and marked, as designated on this plat, and a certification filed with Pinal County by an Arizona registered land surveyor certifying such lots are accurately staked and marked, as designated on this plat, and describing the type of markers used.

- s. Dedication Requirements.

1. The following dedications are required, if applicable, for all subdivision plats.
2. All signatures shall be original and appear in black ink.
3. Dedications should be in substantially the standard language indicated below. Alternative language may be needed for exceptional circumstances.
4. Declaration statement.

DECLARATION, TITLE WARRANTY, AND DEDICATION

KNOW ALL MEN BY THESE PRESENTS:

5. Statement of subdivision, including name of subdivision and legal description of property being subdivided.

[name of fee title owner], a **[Type of company and state of incorporation]**, as owner has subdivided under the name of **[name of subdivision]** located in **[legal description of subdivided property]** as shown platted hereon and hereby declares this plat sets forth the location and gives the dimensions of the lots, tracts, streets, and easements constituting same and that said lots, tracts and streets shall be known by the number, letter or name given each respectively.

6. Warranty of title for public streets and easements.

[name of fee title owner], a **[Type of company and state of incorporation]**, is the owner of fee title in: (A) the property being dedicated on this plat to the public for roadway purposes and all incidentals thereto; and (B) the property upon or across which easements are being dedicated on this plat to the public. **[name of owner]** hereby warrants to Pinal County, a political subdivision of the

State of Arizona, the title to such property against all persons, subject to all matters of record.

7. Warranty of title for easements only [when streets are private streets only].

[name of fee title owner], a **[Type of company and state of incorporation]**, is the owner of fee title in the property upon or across which easements are being dedicated on this plat to the public. **[name of fee title owner]** hereby warrants to Pinal County, a political subdivision of the State of Arizona, the title to such property against all persons, subject to all matters of record.

8. Dedication of public streets.

Streets shown on this plat are dedicated to the public for roadway purposes including, but not limited to, access, drainage, telecommunications and public utilities.

9. Dedication of right-of-way.

A total of _____ feet from the center line of **[insert name of road]** along the **[insert one: east, west, south, north]** property line, as designated on this plat, is hereby dedicated as right-of-way (fee) to the public for roadway purposes including, but not limited to, access, drainage, telecommunications and public utilities.

10. Dedication of sight visibility triangle easement for public streets.

Right-of-way sight visibility triangle easements as designated on this plat are hereby dedicated to the public at all intersections with a public street, 21' x 21' at local to local intersections and 33' x 33' at arterial or collector intersections with a public street.

11. Dedication of right of ingress and egress for emergency vehicles.

[name of fee title owner] hereby dedicates, grants and conveys rights of ingress and egress for all emergency vehicles and/or government vehicles over and across all private streets as designated on this plat.

12. Dedication of vehicular non-access easement when adjacent to public tracts, public drainage easements, tracts or facilities or adjacent to public arterial or collector streets.

As designated on this plat, one foot wide negative easements prohibiting vehicular ingress and egress are hereby dedicated to the

public upon all lots adjacent to **public** drainage easements, tracts, or facilities and/or adjacent to **public** arterial or collector streets.

13. Drainage easement dedication to the public.

Non-exclusive drainage easements are hereby dedicated to the public upon, over, across and through **[tracts _____ and/or those areas designated as such hereon]**. No use shall be permitted within the drainage easements which would prohibit or interfere with the drainage use. Maintenance of the drainage easements shall be the responsibility of the **[insert name of homeowner's association]**. Should the association not adequately maintain the drainage easements, the governing entity having jurisdiction over the area in which the drainage easements are located, at its discretion, may enter upon and maintain the drainage easements, and charge the homeowners association the cost of the maintenance. All other easements are subordinate to the drainage easements.

14. Public utility easement dedication.

Public utility easements are hereby dedicated to the public upon, over, under, across and through those areas designated as such hereon for the installation, maintenance, repair, and removal of underground utilities, including, but not limited to, water, sewer, gas, electric, and telecommunications. Maintenance of the areas subject to such public utility easements shall be the responsibility of the lot or tract owner.

15. Water and/or sewer easements dedication [if not part of public utility easements]:

[select and insert: Water and/or sewer] easements are hereby dedicated to the public upon, over, under, across and through those areas designated as such hereon for the installation, maintenance, repair and removal of **[water/sewer]** lines. Maintenance of the areas subject to such easements shall be the responsibility of the lot or tract owner.

16. Signature block for owner(s).

IN WITNESS WHEREOF:

[owner's name], a **[Type of company and state of incorporation]**, as owner, has hereunto caused its name to be affixed and has executed this subdivision plat by the signature of the undersigned, duly authorized, this day of _____, _____.

[INSERT NAME OF OWNER and type of company and state of incorporation]

By:
Title:

17. Acknowledgment block for owner(s).

ACKNOWLEDGMENT

STATE OF _____)
) ss.
COUNTY OF _____)

On this ____ day of _____, _____, before me, the undersigned, personally appeared _____ who acknowledged himself/herself to be **[insert title of office held]** of, a **[insert type of company and state of incorporation]**, and being authorized to do so on behalf of said entity, executed this plat for the purposes therein contained.

Notary Public My Commission Expires

[Note: If a second and different company, corporation or partnership is the Manager for the owner, then the following acknowledgment will apply.]

STATE OF _____)
) ss.
COUNTY OF _____)

On this ____ day of _____, _____, before me, the undersigned, personally appeared _____ who acknowledged himself/herself to be **[insert title of office held]** of, a **[insert type of company and state of incorporation]**, and being authorized to do so on behalf of said entity, executed this plat for the purposes therein contained.

Notary Public My Commission Expires

18. Ratification language (if applicable)

a) LIENHOLDER’S RATIFICATION

The undersigned is the holder of the beneficiary's interest under Deed of Trust dated _____ and recorded on _____, as instrument No. _____, in the official records of the County Recorder of Pinal County, Arizona, and does hereby ratify this plat this ____ day of _____, ____.

[Insert beneficiary's name], [insert type of company and state of incorporation]

By:
Title:

STATE OF _____)
) ss.
COUNTY OF _____)

On this ____ day of _____, _____, before me, the undersigned, personally appeared _____ who acknowledged himself/herself to be **[insert title of office held]** of **[insert beneficiary's name]**, a **[insert type of company and state of incorporation]**,¹ and being authorized to do so on behalf of said entity, executed the foregoing Ratification.

Notary Public My Commission Expires

[Note: If a second and different company, corporation or partnership is the Manager for the beneficiary, then the following acknowledgment will apply.]

STATE OF _____)
) ss.
COUNTY OF _____)

On this ____ day of _____, _____, before me, the undersigned, personally appeared _____ who acknowledged himself/herself to be **[Title of office held]** of **[name of second entity]**, a **[insert type of company and state of incorporation]**, as **[Manager]** for **[beneficiary's name]**, a **[insert type of company and state of incorporation]**, and being authorized to do so on behalf of said entities, executed the foregoing Ratification.

Notary Public My Commission Expires

b) LIEN HOLDER'S RATIFICATION

This subdivision is within the service area of **[name of water supplier]** which has been designated as having an assured water supply pursuant to A.R.S. § 45-576. A commitment to supply water service to this platted subdivision has been received from said company as evidenced by, a copy of which is submitted with this plat.

b) Private Streets Dedication.

Streets shown as Tract(s) _____ are private and shall be granted and conveyed to the **[name of homeowner's association]** for roadway purposes including, but not limited to, access, drainage, telecommunications and public utilities.

c) Private Streets/Sight Visibility Triangle Easement.

Right-of-way sight-visibility triangle easements, as designated on this plat, shall be granted and conveyed to the **[insert name of homeowner's association]** where private streets intersect into private streets, 21' x 21' at private local to local intersections and 33' x 33' at private arterial or collector intersections.

d) Vehicular non-access easement. As designated on this plat, one foot wide negative easements prohibiting vehicular ingress and egress shall be granted and conveyed to the **[name of homeowners' association]** upon all lots adjacent to private drainage easements or facilities and/or adjacent to private arterial streets or collector streets.

e) Trees, objects, structures, and landscaping within the right-of-way sight-visibility triangle easement.

No trees are permitted within the right-of-way sight-visibility triangle easements and no temporary or permanent object, structure or landscaping shall exceed twenty-four inches in height within the right-of-way sight-visibility triangle easements.

f) Common Areas.

Tracts _____ are common areas which shall be granted and conveyed to and maintained by the **[name of homeowner's association]**, an Arizona non-profit corporation.

g) Structures in drainage easements.

No structure shall be constructed in nor shall other improvements or alterations be made to the storm water retention areas or to drainage easements without prior approval by Pinal County.

h) Storm Water Retention.

The storm water retention volumes required by the Pinal County Drainage Ordinance have been met and the overall gross retention volumes will not be changed without prior approval by Pinal County. Maintenance of the areas subject to storm water retention shall be the responsibility of the lot or tract owner.

i) Underground utilities.

All new or relocated utilities shall be placed underground.

j) Street Lighting/Landscaping.

Maintenance of all street lighting and landscaping within the common area(s) and the street rights-of-way shall be the responsibility of the **[name of homeowner's association]**.

k) Subdivision streets permits/inspections.

All subdivision streets, whether public or private, and work within the subdivision streets and within public rights-of-way require permits from and inspections by Pinal County.

20. Utilities trench work.

All trench work within utility easements require permits from and inspections by Pinal County.

21. Building Setbacks.

On all lots the owner and/or developer shall ensure that residential dwellings can fit within the building setbacks including bay windows, fireplaces, porches, covered patios, etc.

22. Fire Code (if applicable)

This subdivision is subject to the requirements of the International Fire Code, as adopted by Pinal County and administered by the Pinal County Building Safety Department.

23. Agricultural Spray Easement (if applicable)

This subdivision is subject to an agricultural spray easement recorded by fee No. _____, in the official records of the County Recorder of Pinal County, Florence, Arizona.

24. School/Day Care (if applicable)

No school or day care centers shall be located within 1/4 mile of land in agricultural production requiring aerial spraying.

25. Model Homes (if applicable)

There will be a model complex, as an accessory use, on lots _____ through _____ inclusive. Lot _____ will be a sales center. Lot _____ will be a parking area, and lot _____ will be overflow parking. Lots shall be landscaped in conjunction with the parking. Upon completion of the site's use as a model complex, all lots will revert to residential units (upon build-out).

26. On-lot retention (if applicable on an acre size lot, or larger).

All lots in this subdivision require on-lot retention pursuant to the volume table on the plat.

27. Flight/noise (if applicable)

This subdivision is in the vicinity of the flight pattern/noise corridors of the **[insert name of airport]** and in the future may continue to be within the flight pattern/noise corridor of the said airport.

28. State land/Indian land (if applicable)

This subdivision is adjacent to **[Arizona state land/Indian Community land]**, which may be developed for any possible land use in the future.

29. CC&Rs

Covenants, conditions and restrictions were recorded on **[insert recording date]** in docket _____ at page(s) _____ in the official records of the County Recorder of Pinal County, Arizona.

30. APPROVALS

This plat has been approved as to form by:

Pinal County Planning & Development Services Date

Pinal County Environmental Health Date

4.3.2 Public Works Department

- a. Tract boundary lines, right-of-way lines of streets, easements and other rights-of-way, and property lines of all lots, common areas and other sites; with accurate dimensions, bearings or deflection angles and radii, arcs, semi-tangents and central angles of all curves.
- b. Names, centerlines, right-of-way lines, bearings, lengths and widths of all streets (public or private) and utility easements, radii, points of tangency and central angles of all curvilinear streets, and radii of all rounded street line intersections and identify as public or private.
- c. All drainage ways shall be shown on the plat and identified as public or private and designate as onsite or offsite drainage.
- d. Location and description of all permanent monuments, lot corners and other survey points in place.
- e. Show and label all drainage easements and drainage ways with appropriate dimensions and bearings, width, purpose and recording information, and identify as public or private. Major drainage ways may be dedicated to the public upon recommendation of the County Engineer and with Board approval.
- f. All tracts, easements, and drainage ways designated as private shall be maintained by the home owners' association.
- g. Signatures shall be in permanent black ink.
- h. Existing field conditions shall extend to the full existing right-of-way along the entire perimeter of the property or, where no right-of-way exists, extend approximately 100' beyond property boundary.
- i. Vicinity map showing proposed subdivision and surrounding subdivisions and streets located within a ½ mile radius.
- j. An overall key map to be provided to include proposed street names and neighboring properties to be noted as "UNSUBDIVIDED" if not yet platted, but if there is a proposed plat, provide plat name. If neighboring property is platted, provide recorded information.
- k. Property line minimum radii shall be: 25' or 33' (for all arterial intersections).

- l. The minimum right-of-way widths shall be: major arterials - 150' ROW; minor arterials (section lines) - 110' ROW; major collectors (mid-section lines) - 80' ROW; minor collectors - 60' ROW; and local streets - 50' ROW.
- m. Intersection spacing along an arterial shall be approximately every 1,320' (1/4 mile).
- n. Avoid street jogs with centerline offsets of less than 135'. Collector or another arterial street intersecting with an arterial street should align if possible or meet the minimum requirement for spacing along an arterial.
- o. Local streets are not permitted to intersect with an arterial street.
- p. Residential lots shall front only local streets.
- q. Intersections shall intersect at right angles if possible, but no less than 75 degrees.
- r. Maximum length of a cul-de-sac is 500 ft. (measured from the centerline of the intersecting street to the radius point of the turnaround). Minimum right-of-way radius for a cul-de-sac and its returns shall be 50'.
- s. Plat shall show all locations, dimensions, and purposes of any existing and proposed easements and right-of-ways.
- t. Show surrounding land around subdivision to include, but not limited to, existing right-of-ways, existing easements, existing plats and other properties.
- u. Show Public Utility Easements (PUE) - minimum 8' wide. PUEs are to be located in tracts outside the rear and side of all lots.
- v. Survey monuments are required at all street intersections and at the PCs and PTs of all curves.

4.4 Legal Survey

The final plat shall be based on an A.L.T.A./A.C.S.M. title survey of the subdivision and shall conform to the conditionally approved tentative plat by the Commission, and the requirements and specifications of this manual, other applicable county ordinances and regulations, and applicable state and federal regulations.

4.4.1 Section Corners

Two (2) corners of the final subdivision plat shall be tied by bearing and distances to a separate section corner, quarter section corner or established

city or county survey monument, as designated by the County Engineer. Additional data required as follows:

- a.** The survey ties shall be shown on the Subdivision Plat and be ground measured bearings and distances. Pinal County will provide descriptions and coordinates of the control monuments for the section in which the subdivision is contained. Contact Pinal County Public Works GIS Section.
- b.** If monumentation of any existing Section Corner or Quarter Section Corner is other than a G.L.O. Brass Cap or Pinal County Cap, it may be replaced, at the expense of the Subdivider, under the supervision of a Land Surveyor, registered in the State of Arizona, with an Aluminum Cap or Brass Cap provided by Pinal County.
- c.** All surveys shall be conducted as per the Arizona Board of Technical Registration Minimum Standards for Boundary Surveys.
- d.** Any Section Corner or Quarter Section Corner monumentation disturbed or destroyed during construction of the subdivision or off-site improvements shall, at expense to the Subdivider, be replaced under the supervision of a Land Surveyor registered in the State of Arizona, with a monument provided by Pinal County.
- e.** All Section Corner and Quarter Section Corner monuments set shall be marked with appropriate Corner information, with Registered Land Surveyor's license number.
- f.** The subdivider shall, at his or her own expense, provide NAVD 88, State Plane, Arizona Central coordinate values to Pinal County in the form of a spreadsheet sealed by a Land Surveyor registered in the State of Arizona for any Section Corner or Quarter Section Corner set utilizing the following fields and precision:
 - Latitude/Longitude to 5 decimal places,
 - Northing/Easting to 3 decimal places,
 - Elevation to 2 decimal places,
 - A point description.
- g.** All Subdivision Plats shall be submitted in NAVD 88, State Plane, and Arizona Central data.
 - Northing/Easting to 3 decimal places,
 - Elevation to 2 decimal places,

- A point description.

4.5 General Notes

4.5.1 Planning Department

- a. The gross area of the subdivision is _____ acres.
- b. Zoning Information:

Zoning is _____. (If more than one zone is involved, provide the number of acres within each zone, and identify the lots within each zone.)
- c. Provide a tract/parcel table stating the number of square feet (or acres) of parks, recreation areas, drainage ways, open space and all other proposed non-residential uses.
- d. The number of lots is _____.
- e. Minimum lot size is _____S.F.

CHAPTER 5 GENERAL REQUIREMENTS FOR IMPROVEMENT PLANS

5.1 General Information

Proposed development projects that involve construction of any infrastructure improvements (streets, grading and drainage facilities, utilities, etc.) are required to submit improvement plans and supporting reports to the Public Works Department for review, approval and permitting. This chapter describes the general requirements for all plans prepared for subdivision and infrastructure improvements in Pinal County. Other improvement plan requirements that are specific to the type of improvement proposed are identified in other chapters of this manual.

5.1.1 Improvement Plan Submittals

The improvement plans submitted to Pinal County for County Approval shall adhere to professional standards for submittal of complete improvement plans for construction. Improvement plans shall include all details, technical and drainage reports etc.

Improvement plans that do not meet the professional standards or are incomplete will be returned by the County Staff without review comments and be classified as the subdivision's first submittal.

5.2 General Requirements

5.2.1 Civil Engineering Standards: Pinal County uses the Uniform Standard Specifications and Details for Public Works Construction as published by Maricopa Association of Governments (MAG) engineering standards for construction of public infrastructure.

5.2.2 Document Size: Improvement plans shall be on 24" x 36" sheets with blue or black line types with a minimum of a 1 ½" left border and a ½" border on other sides.

Reports: All supporting or supplement reports shall be letter sized (8.5" x 11"). Any larger maps included within the reports are to be folded to letter size and bound or provided in a folder.

5.2.3 Final Approval Submittal: Improvement plans submitted for final approval shall be original 4 mil grade Mylar drawings. Plan submittals shall consist of one (1) Mylar cover sheet and three (3) bond copies.

5.2.4 Sheet Orientation: Plans shall be oriented with north towards the top or right of each sheet. A North arrow and scale (both written and graphic) shall be provided. All text should be readable from the bottom and the right of the sheet.

5.2.5 Text Designation: Minimum lettering and numbering size shall be 3/16" for manually drafted or 12 point font for mechanically/electronic produced letters, numbers and symbols. Lettering, numbering and line work must be uniform and with clear definition to be retrievable after microfilming.

5.2.6 Improvement Plan Designation: Separate improvement plans shall be provided for the following:

- a. Paving and Storm Drain Improvements shall be on the same sheet.
- b. Water system improvements
- c. Sanitary sewer improvements
- d. Grading and Drainage improvements
- e. Traffic Signalization
- f. Traffic Signing and Pavement Marking improvements
- g. Landscape and Irrigation improvements
- h. Streetlight and Electrical improvements
- i. Reclaimed Water
- j. Force Mains

5.2.7 Drawing Scales: The following are standard minimum drawing scales to be used for improvement plans submitted to Pinal County. Note: The Engineer shall take into account when selecting drawing scales, line weights and lettering size that the improvement plans may be photocopied, microfilmed or digitally scanned. Depending on the complexity of the design, a larger scale maybe required.

- a. Grading: 1" = 40' Horizontal.
- b. Water and Sewer: 1" = 40' Horizontal
1" = 4' Vertical
- c. Paving and Storm Drain: 1" = 40' Horizontal
1" = 2' Vertical
- d. Traffic Signalization: 1" = 20' Horizontal
- e. Traffic Signing and Pavement Marking: 1" = 40' Horizontal
- f. Landscape and Irrigation: 1" = 30' Horizontal

- 5.2.8** All existing topography shall be screened. This will typically include existing contours with adequate spot elevations to show drainage, existing aerial and underground utilities, existing irrigation facilities, adjacent land uses, city limits, county limits where applicable, 100-year floodplain, flood elevations and floodway limits where applicable.
- 5.2.9** Plans shall show existing and proposed right of way, easements and property lines. Dimensions of these shall be clearly indicated.
- 5.2.10** New construction line work and construction notes shall be sufficiently heavier than existing topography so as to allow it to be quickly and clearly identified.
- 5.2.11** Grade breaks shall be clearly shown with the applicable symbol on the plan and/or profile sheets.
- 5.2.12** “Blue Stake” notification shall be provided on each sheet.
- 5.2.13** An individual cover sheet with the following information is required for each type of improvement plan.
- a.** Project heading block indicating name of project, type of plans. (Title to be consistent with the Final Plat)
 - b.** Below the heading include the words “Pinal County, Arizona”.
 - c.** Title Blocks: All plan sheets shall note the project’s title or address in a title block on the sheets lower right hand corner. Project addresses may be located either along the bottom of the sheet, or the right hand side of the sheet.
 - d.** Developer’s name, address, telephone number and contact person.
 - e.** Engineer’s name, address, telephone number and contact person.
 - f.** Engineer’s seal with signature and date. (Provided on each sheet).
 - g.** Vicinity Map indicating the general location of the project with major arterial streets labeled and geographic orientation.
 - h.** Provide the Section, Township and Range data.
 - i.** Basis of bearings and benchmark (NAVD 88 datum).
 - j.** Sheet Index.
 - k.** Case number (S-000-00) at the lower right hand corner.
 - l.** Estimate of Quantities for all improvements.

- 5.4.1** Professional Seal: Each sheet shall be sealed, signed and dated in accordance with the Arizona Board of Technical Registration requirements.
- 5.4.2** Title Blocks: All plan sheets shall note the project's title or address in a title block on the sheets lower right hand corner.
- 5.4.3** Dimensioning: Pinal County requires that all existing and proposed improvements shall be dimensioned in accordance with the following:
- a.** All plan sheets showing street improvements or dedicated rights-of-way shall be dimensioned per MAG Standard Detail 112.
 - b.** All plan sheets showing the construction of utilities or existing utilities shall also dimension the utilities using the format of MAG Standard Detail 112.
 - c.** All plan sheets showing the construction of utilities within an easement shall dimension the overall width of the easement, the offset of the proposed or existing utilities from the centerline or edge of the easement.
- 5.4.4** Horizontal Control
- a.** The origination point of all position systems shall be based on an established survey point or monument and identified on the plans.
 - b.** Position systems shall be designed to proceed from South to North, West to East, left to right.
 - c.** All plan sheets shall be stationed in 100-foot intervals minimum.
- 5.4.5** Symbols: Symbols noted on the plan sheets shall be per MAG Standard Detail 110. Special symbols not represented on MAG Standard Detail 110 may be used provided the symbol representation is identified.
- 5.4.6** Construction Notes: Construction notes for all new construction shall be noted on each plan sheet.
- 5.4.7** Required Information to be Shown on Plans:
- a.** Existing and proposed rights-of-way shall be shown and dimensioned.
 - b.** Projects that are adjacent to corporate limits of municipalities shall delineate the location of the corporate limits and identify the jurisdictions on all applicable sheets.
 - c.** Plans shall differentiate between the existing and proposed improvements and show all the existing conditions.

- d. Plans shall show all existing utilities complete with line sizes, types (water, sewer, gas, etc) and locations.

5.5 Plan and Profile Sheets

5.5.1 Plan and profile sheets are required for the following:

- a. All arterial, collectors, local streets and access road paving and storm drain improvement plans. Provide separate profiles for left curb or left edge of pavement, right curb or right edge of pavement and the centerline.
- b. Waterline improvement plans for construction with size twelve (12) inches in diameter or greater.
- c. All sanitary sewer improvement plans.
- d. All storm drain improvement plans.
- e. All reclaimed water line improvement plans.

5.5.2 The profile shall indicate elevations and the stationing grid clearly.

5.5.3 The profile of the existing surface shall be shown with the proposed construction line work and construction notes (i.e. elevations, slopes, grade breaks).

5.5.4 The existing utility crossings shall be shown in the profile view. Utility conflicts and design resolutions shall be noted in all the appropriate profiles.

5.6 Detail Sheets

Supplement sheets that depict special construction details required to clarify some aspect of the proposed improvements.

5.6.1 Professional Seal: Each sheet shall be sealed, signed and dated in accordance with the Arizona Board of Technical Registration requirements.

5.6.2 Standard Details: MAG Standard Details are not to be included on the detail sheets unless the Detail is being modified. The modifications shall be clearly identified and the detail shall be titled "Modified MAG Detail."

5.7 Technical Reports

The following reports shall be submitted with each subdivision project.

5.7.1 Traffic Impact Analysis (TIA)

Developers shall be required, at the time of final plat submittal, to submit a final Traffic Impact Analysis for review and approval.

5.7.2 Geotechnical Report

Developers shall be responsible to submit a geotechnical report with street construction plans indicating "R" value, sieve analysis, plastic index of the subgrade and street structural cross section design. The design engineer is responsible for investigating and evaluating the existing pavement structure.

5.7.3 Drainage Report

Developers shall be required, at the time of final plat submittal, to submit a final Drainage Report for review and approval. The report shall be prepared in accordance with the current Pinal County Drainage Ordinance and Pinal County Floodplain Management Ordinance.

5.7.4 Environmental Report

Developers shall be responsible to submit for review an Environmental Report that addresses the following:

- a. Provisions for a supply of adequate and safe drinking water for all lots and land tracts.
- b. Provisions for adequate sewage disposal for all lots must be assured. The use of individual sewage disposal systems are discouraged.
- c. Provisions for the collection and disposal of solid waste generated by the development.

5.8 Plan Review Comments

All plan review comments (**Redlines**) shall be corrected or clarified. If there is a discrepancy concerning a redline comment, contact the County plan review staff. The redline set of plans shall be returned with the next improvement plan submittal. Include a separate redline correction response letter addressing each comment and correction measure provided. The letter shall address each comment with plan sheet location noted, along with the applicable resolution of the comment.

Failure to identify all of the changes shall result in the return of the plans with an additional review required and shall require additional fees based on the approved Public Works Department fee schedule.

5.9 Approval of Plans

5.9.1 When the improvement plans meet the requirements for approval in accordance with Article 8 of the Pinal County Subdivision Regulations, the original mylar cover sheet will be requested. With the submittal of the original mylar cover sheet include three (3) full size bond sets of plans and a

Engineer's Opinion of Probable Cost. Prior to County Engineer signature all applicable reviewing agencies shall have signed the cover sheet. If an agency does not sign the cover, a letter of their approval shall accompany the cover sheet and the letter date and signing party noted on the cover sheet. Plan approval is valid for one year from date of signature. If construction has not begun prior to the plan approval expiration date the plans become void. A re-approval of the construction plans are required and applicable plan review fees will apply.

5.9.2 The Public Works Department will review all such plans and specifications and may require revisions therein to comply with standards and specifications of these regulations and other applicable laws and ordinances. After the completion of revisions, the County Engineer may require that the Engineer's Cost Estimate be revised to reflect such revisions. The County Engineer shall only approve said plans and drawings if the improvements indicated are found to be in conformance with the standards and specifications of these regulations and other applicable laws and ordinances. Said approval shall be in writing.

5.10 As-Built Plans

As-Built Plans shall be prepared in accordance with Chapter 14 of this Manual.

CHAPTER 6 STREET DESIGN REQUIREMENTS

6.1 General Information

- 6.1.1** This chapter describes the geometric requirements for any public and private street classification: arterial, collector, local and all-weather access roads. The minimum requirements described herein are primarily based on safety considerations; therefore, standards that provide a greater degree of safety may be used.
- 6.1.2** The American Association of State Highway and Transportation Officials (AASHTO) policies on highway design and the Manual on Uniform Traffic Control Devices (MUTCD) prepared by the U.S. Department of Transportation are approved references and shall be used together with this manual and the MAG Uniform Standard Details.

6.2 Street Improvements

- 6.2.1** All subdivision projects within the County shall provide a paved interior street system adequate to ensure that all lots, tracts, parcels, or facilities within the subdivision shall have improved access to the balance of the public street system. Subdivider shall provide access into the subdivision for public service and/or emergency operations.
- 6.2.2** The subdivider is responsible for construction of all street improvements along the subdivision's frontage to the ultimate grade and alignment for the said perimeter street. This shall include the removal and replacement of the existing street surface to the centerline. Roadway Improvements, utilities, street lighting, landscaping and relocation of overhead and irrigation facilities will be required at the sole expense of the subdivider.
- 6.2.3** A Paved All-Weather Public Access Road shall be installed for legal ingress and egress to the subdivision from a paved public roadway as required by the County Engineer.

6.3 Street Classifications

- 6.3.1** Pinal County has five basic classifications of streets for use relating to subdivision development,. The location and street classification is determined as part of the site planning and platting process. The County Engineer will review each tentative plat and will specify any changes needed to conform with previously planned and approved street alignments. The County Engineer will also specify the classification for each street involved in the tentative plat. Refer to **Exhibit 6.2** for Street Cross Sections. All subdivisions shall provide for public arterial and collector streets at their normal alignments and as determined by the County Engineer.

- a.** Arterial Street: Arterial streets provide regional continuity and carry large volumes of traffic between areas of the County and through the County.

The normal alignment for an arterial roadway is along a section line. The standard cross section for a major and minor arterial is shown in **Exhibit 6.2**.

- b. **Collector Street:** Collector streets provide direct access to abutting land uses, handle local traffic and provide access to the arterial street system. The normal alignment for a major collector roadway is along a mid-section line. The standard cross sections for major and minor collector streets are shown in **Exhibit 6.2**.
- c. **Local Street:** Local streets provide direct access to abutting land uses and handle local traffic. Local streets will not be connected to arterial streets. Local streets provide access to the collector street system. The standard cross section local street and low density local streets are shown in **Exhibit 6.2**.
- d. **Low Density Local Street:** Low density local streets will not be connected to arterial streets. Low density local streets provide access to the collector street system. Low Density local streets are for subdivisions with a lot size of not less than 1.0 acre or greater than 3.33 acres. The standard cross section for a Low Density local street is shown in **Exhibit 6.2**.
- e. **Paved All-Weather Public Access Road:** A roadway that connects the subdivision or private development to an existing paved public street. The access road shall be within dedicated public right-of-way with a minimum pavement width of 28 feet to accommodate two-way traffic. The standard cross section for a paved all-weather public access road is shown in **Exhibit 6.2**.

6.4 Subdivision Street Planning

Subdivision street plans should provide the minimum number of intersections and wash crossings, and discourage through traffic.

6.4.1 All streets shall conform to the Pinal County Comprehensive Plan, County standards, specifications and requirements, and with due consideration to their relation to existing and other planned streets. This shall also include topographical conditions, surface drainage in and through subdivisions, public convenience and safety, and appropriate relation to the proposed uses of the land to be served by such streets. Where not shown in the Pinal County Comprehensive Plan, arrangement and other features of the streets shall provide for appropriate continuation of existing arterial and collector streets in surrounding areas where essential for circulation and access to community facilities.

6.4.2 Street configuration shall conform to the Traffic Impact Analysis and as approved by the County Engineer.

- 6.4.3** The subdivider may be required to provide additional right-of-way for local service or access along major streets, or other treatment to provide local access to residential properties.
- 6.4.4** Along a railroad right-of-way or limited access highway right-of-way, a parallel street may be required at a distance suitable for appropriate use of the intervening land, such as for park purposes in residential districts or for commercial or industrial purposes in appropriate locations; such distances also to be determined with due regard for their requirements of approach grades and future grades separation as approved by the County Engineer.
- 6.4.5** Provisions shall be made for railroad and other public or private utility crossings necessary to provide access to or circulation within the proposed subdivision, including the obtaining of all necessary permits from the public or private utilities involved, and any regulatory agencies having jurisdiction. The costs of such crossings shall be the responsibility of the subdivider.
- 6.4.6** Adequate provisions shall be made in the design of subdivisions for access to each lot or parcel, and for access to adjacent properties.

6.5 Street Right-of-Way Requirements

- 6.5.1** All public street right-of-way dedication shall be at no cost to the public and unencumbered. The public right-of-way requirements shall meet the ultimate development requirements. The dedicated right-of-way shall provide sufficient area for the installation for utilities, cut or fill slopes, sidewalks, traffic control devices, signs, fire hydrants, landscaping and other public facilities that must be located adjacent to street pavements.
- 6.5.2** Additional Right-of-Way widths may be required in special circumstances for the following conditions:
 - a.** Cut or fill slopes cannot be confined within the typical right-of-way.
 - b.** Minimum sight distance lines on horizontal curves do not meet the standards.
 - c.** Minimum sight distances at intersections do not meet the standards.
 - d.** Auxiliary traffic lanes are required.
 - e.** Other conditions that may be required by the County Engineer.

6.5.3 The minimum right-of-way requirements are as follows;

Major Arterial/Parkway	150 feet
Minor Arterial	110 feet
Major Collector	80 feet
Minor Collector	60 feet

Local Street	50 feet
Low Density Local Street	50 feet
Paved All-Weather Public Access Road	40 feet

6.6 Easements and Dedications

6.6.1 Public Utility Easements (PUE) shall be a minimum of 8 feet wide and located adjacent to each side of the dedicated street right of way. Public Utility Easements shall not be located within the side or back property lines.

6.6.2 Drainage easement dedications shall be provided conforming substantially with the lines of any water course, drainage way, channel, or stream and such further width or construction, or both, as will be adequate for the purpose. Parallel streets or parkways may be required in connection therewith. All drainage easements shall be outside the roadway right-of-way.

6.7 Pavement Cross Section

6.7.1 The minimum pavement width requirements are as follows (back of curb to back of curb):

Major Arterial	101 feet
Minor Arterial	75 feet
Major Collector	51 feet
Minor Collector	40 feet
Local Street	32 feet
Low Density Local Street	32 feet
Paved All-Weather Public Access Road	28 feet (No Curbing)

6.7.2 The minimum pavement section requirements are as follows:

Major Arterial	6"AC/10"ABC
Minor Arterial	4"AC/10"ABC
Major Collector	3"AC/8"ABC
Minor Collector	3"AC/8"ABC
Local Street	2"AC/6"ABC
Low Density Local Street	2"AC/6"ABC
Paved All-Weather Public Access Road	Per Geotechnical Report or County Minimum

6.7.3 The above referenced pavement sections are minimums. Actual pavement sections shall be determined by geotechnical analysis and pavement design prepared and sealed by a professional engineer registered in the State of Arizona, and approved by the County Engineer.

6.7.4 Undivided streets should have a normal crown that is a two way cross slope with the cross section high point on the street centerline. Divided streets should have cross slope on each pavement section. The high point of each slope on each pavement section shall occur on the edge of the pavement nearest the median. Unusual conditions may cause cross slope requirements to vary, but normally the desirable cross slope is 2%, with a maximum cross

slope of 3%. Any deviation from the desirable cross slope is subject to approval by the County Engineer.

- 6.7.5** Normal cross sections in street dip sections are discouraged. Where storm drainage runoff flows must cross the street, dip sections are needed. The pavements through the dip section should have a one way slope (no crown), curbing and medians must not be raised and cut off walls shall be installed. Transitions back to normal street cross slopes will be needed at both ends of the dip section.
- 6.7.6** All utility services to each lot of the subdivision shall be installed prior to placement of pavement.
- 6.7.7** Half-Street Improvements: Half-streets are to be avoided, except where essential to the reasonable development of the subdivision in conformity with this manual and where dedication of the other half will be practical when the adjoining property is subdivided. Where said partial rights-of-way would require the dedication of additional contiguous rights-of-way to make it full width, the subdivider shall include evidence that the additional right-of-way is available or is permanently reserved for future road purposes.

The minimum width for half-street improvements shall be twenty-four feet (24') measured from back of curb to the edge of the asphaltic pavement.

Half-street improvements terminating at the roadway monument or centerline shall be constructed with a thickened edge per MAG Standard Detail 201 Type A.

- 6.7.8** Alleys are not permitted unless approved by the County Engineer.

6.8 Decorative Paving

Decorative paving is not to be used without the County Engineer's approval. The local Homeowner's Association shall maintain all decorative paving. As an alternative to decorative paving, decorative stamped concrete may be used with the County Engineer's approval.

6.9 Curb and Gutter

- 6.9.1** The minimum curb and gutter requirements are as follows;

Major Arterial/Parkway	6" Vertical Curb
Minor Arterial	6" Vertical Curb
Major Collector	6" Vertical Curb
Minor Collector	6" Vertical Curb
Local Street	4" Rolled/4" Vertical Curb
Low Density Local Street	Ribbon Curb
Paved All-Weather Public Access Road	Thickened Edge Pavement
Tracts	Vertical Curb

- 6.9.2** Curb and Gutter shall be per the current MAG Uniform Standard Details.

Subdivision & Infrastructure Design Manual

6.9.3 All curb returns, except for local streets that have ribbon curbs shall (PC to PT) be constructed with vertical curb regardless of whether the tangent curb sections are vertical or roll curb. All curb returns shall be provided with sidewalk from PC to PT of the same width as that provided for the sidewalk behind the tangent curb sections. If no sidewalk is provided adjacent to the return, behind the tangent curb sections, the curb return sidewalk shall be a minimum width of four feet (4').

6.9.4 All street intersections shall be constructed with concrete vertical curb returns with a sidewalk ramp per the current MAG Uniform Standard Details and the American Disabilities Act (A.D.A.).

6.9.5 The radii for curb returns shall be in accordance with the table shown below: All dimensions are to back of curb.

Street Classification	Minor Arterial	Major Collector	Minor Collector	Local
Major Arterial	50'	30'	30'	-
Minor Arterial	50'	30'	30'	-
Major Collector	30'	30'	30'	25'
Minor Collector	30'	30'	30'	25'
Local	-	25'	25'	20'

6.9.6 In locations where dip sections are permitted the installation of a cut-off wall conforming to MAG Uniform Standard Details shall be installed.

The exposed portion of the cut-off wall shall have the appearance of a ribbon curb, with the same width as the street's regular curb and gutter. The cut-off wall shall extend across the flow path in the dip section to protect the pavement structure during runoff flows from a 100 year storm.

Install a five foot (5') transition section at each end of the dip section to match the street curb and gutter.

6.10 Sidewalks

6.10.1 Streets constructed to Pinal County standards shall have sidewalks installed per Standard Street Cross Sections **Exhibit 6.2** and MAG Standard Detail 230

Sidewalks shall be installed within right of way or sidewalk easement.

Sidewalk Widths:

- a. Major Arterial Street: Detached Sidewalk = Eight (8) feet wide with a minimum separation from back of curb of 5'. Meandering sidewalk requires a minimum radius of 150'. Attached Sidewalk = Ten (10) feet wide.

- b. Minor Arterial Street: Detached Sidewalk = Eight (8) feet wide with a minimum separation from back of curb of 5'. Meandering sidewalk requires a minimum radius of 100'. Attached Sidewalk = Ten (10) feet wide.
- c. Major Collector Street: Detached Sidewalk = Six (6) feet wide with a minimum separation from back of curb of 3'. Meandering sidewalk requires a minimum radius of 50'. Attached Sidewalk = Eight (8) feet wide.
- d. Minor Collector Street: Detached Sidewalk = Five (5) feet wide with a minimum separation from back of curb of 3'. Meandering sidewalk requires a minimum radius of 50'. Attached Sidewalk = Six (6) feet wide.
- e. Local Street: Four (4) feet wide (Attached).

6.10.2 Sidewalks are not required for residential subdivisions with lots one (1) acre and greater in area

6.10.3 Sidewalks are required on both sides of the local street for subdivisions with lot sizes less than one (1) acre.

6.10.4 Sidewalks are required on both sides of arterial and collector streets.

6.11 Horizontal Alignment

6.11.1 A horizontal curve is required when the angle of change in horizontal alignment is equal to or greater than ten (10) degrees.

6.11.2 The Minimum Curve Radius requirements are as follows when tangent centerlines deflect more than ten (10) degrees and less than ninety (90) degrees:

Local	200'
Minor Collector	300'
Major Collector	800'
Minor Arterial	1,500'
Major Arterial	1,500'

6.11.3 Compound curves (two curves with different radii in same direction) should be avoided. However if site conditions make the use of compound curve unavoidable, the shorter radius shall be at least 2/3 the length of the longer radius when the shorter radius is 1,000 feet or less. Compound curves are not permitted when design speeds require the shorter radius to be greater than 1,000 feet.

6.11.4 On two lane roads, tangent sections are required between compound curves.

- 6.11.5** A tangent section must be provided between reverse curves as shown in **Exhibit 6.3**.
- 6.11.6** A tangent section shall be provided between an intersection and a curve for all collector and arterial intersections.
- 6.11.7** Minimum horizontal clearance for roadways shall be in accordance with the most recent version of the AASHTO Policy on Geometric Design of Highways and Streets.
- 6.11.8** Superelevation is discouraged on horizontal curves; however, superelevation of 2% may be used when the standard radius cannot be provided due to circumstances beyond the control of the engineer and the general alignment cannot be changed. Superelevation greater than 2% may not be used except when approved by the County Engineer. In no case shall a superelevation exceed 6%. For superelevations, refer to the AASHTO publication, A Policy on Geometric Design of Highways and Streets.

Whenever superelevation is allowed on a divided street, a storm drainage system to collect the runoff along the median curb shall be provided. In no case shall nuisance water from the higher traveled way be allowed to cross the lower traveled way.

6.12 Vertical Alignment

- 6.12.1** The maximum longitudinal street grade requirements are as follows:

Arterial (Major & Minor)	6%
Major Collector	8%
Minor Collector	10%
Local	12%

- 6.12.2** The minimum longitudinal street grade for ALL streets is 0.25%.
- 6.12.3** A vertical curve is required when grade changes are greater than 1.5%. All sections of a street's vertical alignment must meet passing and stopping sight distance requirements for design speed established for the street. For further details, see the AASHTO publication, A Policy on Geometric Design of Highways and Streets.
- 6.12.4** When horizontal and vertical curves are combined, the horizontal curve shall lead and follow the vertical curve. For additional information on this topic, refer to the AASHTO publication, A Policy on Geometric Design of Highways and Streets.

6.13 Intersections

- 6.13.1** Intersections occurring on the inside of horizontal or crest vertical curves are prohibited. Where the grade of the through roadway is steep, flattening through the intersections is required as a safety measure.
- 6.13.2** A right angle intersection provides the shortest crossing distance for intersecting traffic streams. Where special conditions exist, intersection angles may diverge from a right angle by a maximum of 2 degrees on arterial and major collector streets and by a maximum of 15 degrees on minor collector and residential streets as shown in **Exhibits 6.4 and 6.5**.
- 6.13.3** Street jogs with centerline offsets will be a minimum of 135 feet as shown in **Exhibit 6.6**.
- 6.13.4** A minimum 33' x 33' sight visibility triangle easement shall be provided for all intersections of collector or arterial streets. A minimum 21' x 21' sight visibility triangle easement shall be provided for all local street intersections. Sight visibility triangle easements shall be measured from the property line PI.
- 6.13.5** Property lines at street intersections shall be rounded with a radius of 25 feet for local and collector streets and 33 feet for arterial streets to allow maintenance of sight distance.
- 6.13.6** Street intersections with more than four legs and y-type intersections where legs meet at acute angles are prohibited.
- 6.13.7** Concrete valley gutters shall be constructed at all intersections where the drainage pattern requires them.
- a. Asphalt valley gutters will not be permitted.
 - b. Valley gutters crossing a local street may be installed. Exceptions must be approved by the County Engineer.
 - c. Valley gutters shall be constructed in accordance with MAG Uniform Standard Details.
- 6.13.8** Intersections onto arterial streets shall be approximately every (1/4) mile intervals.

6.14 Cul-de-Sacs and Knuckles

Cul-de-sac streets shall terminate in a circular right-of-way turnaround area of at least fifty (50) feet in radius and returns of the same radius. The County Engineer may approve an equally convenient form of turnaround area where extreme conditions justify. Cul-de-sac streets shall not exceed 500 feet in length (measured from the centerline of intersecting street) to the radius point of the turnaround. Cul-de-sac streets in excess of 500 feet must be approved by the County Engineer. Knuckles shall have a

minimum right-of-way radius of 50' and returns of the same radius. Acceptable use of cul-de-sacs and knuckles are shown in Exhibits 6.7 and 6.8.

6.15 Dead End Streets

- 6.15.1** Dead end streets shall be required where a street connection is necessary to serve adjacent properties that will develop at a future date. A temporary turn-around shall be provided within the subdivision at all dead end streets.
- 6.15.2** The maximum length of a dead end street shall be the same as that of a cul-de-sac street.

6.16 Blocks

Block lengths, widths, and shapes of blocks shall be determined with due regard to:

- 6.16.1** Provision of sites suitable to the type of use contemplated.
- 6.16.2** Zoning requirements as to lot sizes and dimensions.
- 6.16.3** Need for convenient access, circulation, control and safety of street and pedestrian traffic.
- 6.16.4** Limitations and opportunities of topography.
- 6.16.5** Circulation within the subdivision, and access to the community facilities.
- 6.16.6** Lengths as long as practicable but not to exceed 1500 feet.

6.17 Turning Lanes and Medians

A separate turning lane permits separation of conflicting traffic movements and removes turning vehicles from the intersection area. Raised medians shall be used as directed by the County Engineer to separate traffic flows, channelize left turns and reduce conflicts. On collector streets, painted medians provide space between the through traffic lanes for left turning vehicles.

- 6.17.1** Right turn lanes shall be provided on arterial streets at all street intersections, where warranted per the Traffic Impact Analysis.
- 6.17.2** For left turn lanes at signalized intersections, dual turn lanes should be considered when the turn volume exceeds 25 vehicles per hour, the opposing through volume exceeds 100 vehicles per hour, or the delay to left turning vehicles exceeds 45 seconds. Abrupt reduction of alignment and sight distance standards should be avoided.
- 6.17.3** A median less than 4 feet wide shall be paved. The paved surface shall be crowned and have the same cross slope as the street pavement. Acceptable paving materials are asphalt or concrete. Medians wider than 4-feet shall be landscaped.

- 6.17.4** If a street has a raised median, it is not possible to provide an opening in the median for every street intersection or driveway location. Full median openings should occur at not less than ¼ mile intervals on parkways, expressways, and major arterials. Partial median openings, which allow only left turns off the major street, are acceptable at 1/8 mile spacing. On minor arterials, full median breaks should be no closer than 1/8 mile intervals. Partial median openings and full median openings will be permitted per the approved Traffic Impact Analysis. In built up areas, where reasonable alternate access is not available, median openings may be provided at smaller intervals with the approval of the County Engineer.
- 6.17.5** The cross-slope in the median opening shall be limited to 2%. Median openings on curves with super elevation exceeding 2% will not be permitted.
- 6.17.6** Deceleration lanes may be required on streets in conjunction with driveways per the approved Traffic Impact Analysis and may require additional right-of-way.
- 6.17.7** Deceleration lanes are required as determined by the approved Traffic Impact Analysis. In addition, deceleration lanes are required when both of the following factors are determined to apply:
- a. The 85th percentile traffic speed on the street is at least 35 miles per hour or 45 miles per hour for a two lane (one lane each direction) roadway.
 - b. At least 20 vehicles will be making right turns into the access way and 100 vehicle directional traffic during a one hour period.

6.18 Driveways

- 6.18.1** Driveways are to be constructed in accordance with MAG Uniform Standard Details.
- 6.18.2** The minimum residential driveway length is 20 feet, measured from the face of the garage opening to the back of sidewalk or the back of curb if no sidewalk is provided.
- 6.18.3** The minimum length for a commercial or industrial driveway is 30 feet, measured from the entrance to the off-street parking area to the back of sidewalk or the back of curb if no sidewalk is provided.
- 6.18.4** A maximum of one driveway opening shall be permitted to a particular residential site or residential parcel from each abutting street(s). One additional driveway entrance may be permitted by the County Engineer.
- 6.18.5** A new driveway will not be allowed within 30 feet of any commercial property line, except when it is a joint use driveway, serving two abutting commercial properties and access agreements have been exchanged between, and recorded by, the two abutting property owners. Commercial driveways will not

be allowed within 50 feet of the right of way line of an intersecting non-arterial street or within 600 feet of two intersecting arterial streets. Exceptions may be permitted by the County Engineer.

6.18.6 Driveway profile standards are illustrated in MAG Uniform Standard Details.

6.19 Multi-Use Trails

Trails constructed in County rights-of-way, such paths or trails must be approved by the County Engineer, and Parks and Recreation Department shall require a permit from the Pinal County Public Works Department.

6.20 Existing Adjacent Unimproved Roads

Existing unimproved roads in public right-of-way and adjacent to a subdivision may be required to provide a dust palliative such as a double chip seal.

6.21 Local Street Drainage

Streets shall be designed and arranged in relation to existing topography to facilitate drainage. Drainage ways between lots are discouraged. Streets shall not be used as primary drainage, unless curb and gutter is installed. Samples of residential street drainage are shown in **Exhibit 6.9**.

6.22 Street Name Signs

The subdivider shall be responsible for purchase and installation of all street name signs within a subdivision, including intersections with perimeter streets. All street name signs shall conform to county standards and shall be furnished and installed at no cost to the County at locations as shown on the approved plans.

6.23 Survey Monuments

Survey monuments are required at all street intersections and at the point of curvature and point of tangency of all curves on street monument line. Survey monuments shall conform to the applicable MAG Uniform Standard Details and shall be furnished and set by the subdivider at no cost to the County at locations as shown on the approved plans or as required by the Pinal County Public Works Department.

6.24 Traffic Signals

Traffic signals shall be designed and constructed in accordance with Arizona Department of Transportation (ADOT) when required by the Traffic Impact Analysis. Refer to Chapter 12 of this manual.

6.25 Paving Improvement Plan Requirements

The following requirements are for Paving Improvement Plan Submittal to Pinal County:

6.25.1 Cover Sheet

- a. Blue Stake notification.
- b. Project Heading block (located in the upper, middle of cover sheet) indicating name of project, type of plans. Check heading is consistent with final/tentative plat.
- c. Case number (S-000-00) at the lower right hand corner.
- d. Vicinity map with North arrow and section data.
- e. Index of plan sheets if more than one plan sheet.
- f. Developer's name, address, and telephone number.
- g. Engineer's name, address, and telephone number
- h. Engineer's stamp – signed and dated.
- i. Legend identifying all grades, symbols, lines, etc.
- j. Quantities.
- k. Basis of bearings and benchmark (NAVD 88 datum).
- l. Sheet numbering format - "1 of XX" where XX is total amount of sheets.
- m. An overall key map to be provided to include proposed street names and neighboring properties to be noted as "UNSUBDIVIDED" if not yet platted, but if there is a proposed plat, provide plat name. If neighboring property is platted, provide recorded information. (can either be on cover sheet or sheet 2)
- n. Pinal County Engineer Approval Block.

APPROVED BY:

<i>PINAL COUNTY ENGINEER</i>	<i>DATE</i>
<i>PINAL COUNTY, DEPARTMENT OF PUBLIC WORKS</i>	

APPROVAL EXPIRES:

DATE

- o. As-Built Certification Statement on the plans as follows:

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE "RECORD DRAWING" MEASUREMENTS AS SHOWN HEREON WERE MADE UNDER MY SUPERVISION OR AS NOTED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

REGISTERED ENGINEER/LAND SURVEYOR DATE

REGISTRATION NUMBER

6.25.2 General Requirements and Notes

The following are required for all paving construction. In addition these requirements must be set forth as general notes on all paving plans.

- a.** Developer shall obtain a Pinal County Right-of-Way Use Permit prior to any work being performed within the county right of way. Contact Pinal County Public Works Inspection Section at least seven (7) working days prior to work.
- b.** All work required to complete the construction covered by these plans shall be in accordance with MAG Standard Specifications and Details.
- c.** All frames, covers, valve boxes, and manhole covers shall be adjusted to finished grade prior to completion of paving or related construction.
- d.** Contractor is responsible for Blue Stake marking as construction is in progress.
- e.** All residents to be notified in person 24 hours prior to driveway crossing.
- f.** Traffic control and barricading shall be according to the Manual on Uniform Traffic Control Devices or Pinal County requirements.
- g.** Contractor shall submit a Traffic Control plan to Pinal County Public Works Inspection Section at least three (3) working days prior to work for review and approval.
- h.** Any work on arterial or collector roads shall require an off-duty Pinal County Sheriff's Officer for traffic control. Contact shall be made through the PCSO representative.
- i.** Any work done in a drainage channel or wash must comply with state and federal regulations.

- j. A Stormwater Pollution Prevention Plan (SWPPP) shall be submitted to Pinal County Public Works Department prior to issuance of construction permits.
- k. Plan approval is valid for twelve (12) months from the date of County approval. If approval expires, the plans must be resubmitted to Pinal County Public Works Department for update review and re-approval.
- l. The following notes are required when special preservation or hillside issues are involved:
 - 1. Before grading in areas containing native desert vegetation, the Contractor must obtain a permit from Arizona Department of Agriculture.
 - 2. This site has special preservation or hillside issues. The paving plan must show all landscape preservation easements, construction fencing locations, and appropriate areas labeled. Prior to any clearing, grubbing, or grading operations construction fencing shall be shown on approved plans, permitted and inspected and salvage operations permitted, inspected, and completed.

6.25.3 Plan and Profile Paving Sheet Requirements

- a. Drawing Scale (minimum): 1" = 40' horizontal and 1" = 4' vertical. Depending on complexity of design, a larger drawing scale may be required.
- b. Existing field conditions shall extend to the full existing right-of-way along the entire perimeter of the property or, where no right-of-way exists, extend approximately 100' beyond property boundary.

- c. Typical cross sections meet the requirements set forth in Subdivision Ordinance and stipulations. Shows width of sidewalk and minimum allowable pavement cross-slope. (pavement width is measured back-of-curb to back-of-curb)

ROW Width	Pvmt Width	Struct Sect
110'	75'	4"AC/10"ABC
80'	51'	3"AC/8"ABC
60'	40'	3"AC/8"ABC
50'	32'	2"AC/6"ABC

- d. A 21'x 21' (local to local) or 33'x 33' (for all others) sight visibility triangle easement (SVTE) all intersections.
- e. Typical Roadway Cross Sections shall indicate street names and station to station if more than one section is used for a street.
- f. Property line minimum radii: 25' or 33' (for all arterial intersections). No chords.

- g.** Intersection spacing along an arterial - approximately 1,320' (1/4 mile)
- h.** Avoid street jogs with centerline offsets of less than 135'. On arterials, intersecting streets should align if possible.
- i.** Local streets not allowed to intersect with an arterial street.
- j.** Residential lots shall front only local streets.
- k.** Have intersections as nearly as possible at right angles and in no case at less than 75°.
- l.** Maximum length of cul-de-sac is 500 ft. (measured from the center line of the intersecting street to the radius point of the turnaround) with minimum right-of-way radius of 50 ft. for both the turnaround and the returns.
- m.** Project Heading, title block (located in the lower right hand corner or right hand side of plan sheets), drawing scale, North arrow, and PE seal with signature.
- n.** Locations, dimensions, and purposes of any existing and proposed easements. Show ROW, existing and proposed pavement, curbs, and sidewalk with width dimensioned.
- o.** Show all existing and new utilities in the roadway.
- p.** Show centerline survey data.
- q.** Label sheet reference with station numbers at all match lines.
- r.** Label station and centerline spot elevation at intersections.
- s.** Survey monuments are required on monument lines at intersections, PC's, PT's and PI's. Also required at knuckles or cul de sacs. Local intersections shall be Type B monuments.
- t.** Station numbers shall be shown at all changes in street alignment, curb returns, and grade breaks.
- u.** Minimum separation between sidewalk ramps and driveways shall be 5'.
- v.** Grading between back of sidewalk and property line shall have a max. slope of 4:1. A minimum one foot bench is required at the back of sidewalk prior to start of the 4:1 slope.

- w.** Provide typical street cross section. (show cross slopes of roadway and sidewalks and required pavement section).
- x.** Pavement cross slope: 2% min.
- y.** Minimum longitudinal street grade is 0.25%.
- z.** Longitudinal local street grade changes greater than 2% require a vertical curve. Minimum vertical curve is 75'. For collector and arterial streets, use 1.5%.
- aa.** Transitions in roadway cross slopes shall be indicated on the plan view.
- bb.** There shall be a minimum of 1' of cover over any pipe under the roadway. Minimum cover shall not include the pavement structural section. For covers less than 1' a structural (load) analysis shall be required.
- cc.** All plans revised after the original approval shall be submitted to Pinal County Public Works for re-approval. Changes on each plan sheet shall be highlighted with "clouding" and be labeled with a numeral within a triangle (delta revisions). The original plan sheet shall be "x'd" out and shall remain the same sheet number and the plan sheet showing the revisions shall be labeled with the same number but with an "A" after the number. Pinal County Engineer's Re-Approval block indicating the delta revision shall be placed on the cover sheet.
- dd.** If a portion of the street improvements for this development is within State, City or Town jurisdiction, plans are subject to review and approval by that public agency.

CHAPTER 7 HILLSIDE SUBDIVISION IMPROVEMENT REQUIREMENTS

7.1 General Information

This chapter addresses special requirements for subdivision design occurring in Hillside areas within Pinal County.

7.2 General Hillside Subdivision Requirements

In addition to the requirements of Article 5 in the current Pinal County Subdivision Regulations the developer shall strive to sensitively integrate the infrastructure design into the natural hillside character of the development. The location of the roadway both horizontally and vertically as well as the cross-section should be compatible with the surrounding environment.

7.3 Special Design Standards

Given the unique physical conditions of the hillside areas, appropriate design standards are established for areas with natural slopes greater than fifteen (15) per cent, (for example, 15.1%) cross-slope.

7.3.1 Street grades shall not exceed twelve per cent (12%) without approval from the County Engineer.

7.3.2 Streets grades of twelve per cent (12%) or more shall have a maximum length of six hundred (600) feet.

7.3.3 Minimum dedicated street rights-of-way shall be forty (40) feet and are to be allowed only when justified by extreme cross slope or similar conditions and approved by the County Engineer.

7.3.4 "T" or "Y" type turning and backing areas may be substituted for circular turnarounds.

7.3.5 "Panhandle", double frontage, and other unorthodox lots may be permitted by the County Engineer.

7.3.6 Private streets or drives serving not more than three lots shall be permitted to a maximum length of three hundred (300) feet.

7.4 Special Construction Standards:

7.4.1 Streets shall be paved with asphaltic concrete not less than twenty four (24) feet wide and a five (5) foot concrete valley gutter on the uphill side and a six (6) foot gravel berm on the downhill side.

- 7.4.2** Where street grades exceed five (5) per cent, slope drainage shall be collected by and carried in a paved or concrete ditch section outside of right-of-way to an acceptable outlet with provisions for adequate erosion control.
- 7.4.3** Each drainage course shall be piped through the road fill or diverted into an improved drainage conveyance. Size and location, both horizontal and vertical, shall be subject to approval by the County Engineer.
- 7.4.4** Road fills shall have minimum compaction densities per MAG Specifications 601.4.4.
- 7.4.5** Driveway or garage cuts may be made at the time of street grading and before street paving.

CHAPTER 8 GRADING DESIGN REQUIREMENTS

8.1 General Information

This chapter provides reference, guidance, and minimum criteria for the design of grading and drainage plans within Pinal County. It is intended for use in planning, design, and plan preparation processes.

8.2 General Requirements

8.2.1 All grading and drainage design improvements for subdivisions shall comply with the current Pinal County Drainage Ordinance and current Pinal County Floodplain Management Ordinance.

8.2.2 It is the County's policy that all subdivisions shall provide adequate drainage facilities so as to convey runoff, generated both on and off the project, around or through the project in such a manner as to ensure that dwellings will be free from flooding and that there is access for emergency and public service vehicles. The subdivider shall install storm sewers, channels and/or other physical improvements necessary to achieve this result.

8.2.3 It is the County's policy that all subdivisions within the County shall provide sufficient retention so as to eliminate any adverse impact of that subdivision on its downstream neighbors. All subdivisions shall provide on site retention as required by the Pinal County Drainage Ordinance. Such retention facilities shall be a separate and distinct parcel, and maintained by the HOA within the subdivision and shall be planned for accordingly.

8.2.4 The subdivider shall provide a drainage easement maintained by the HOA for storm drainage conforming substantially with the line of such natural water course, channel, stream or creek, or provide an acceptable re-alignment of said water course, based upon a detailed drainage report prepared and sealed by a registered engineer, and meet all applicable requirements which may be required under Pinal County Drainage Ordinance and Pinal County Floodplain Management Ordinance.

8.3 Irrigation & Utilities

8.3.1 All irrigation facilities, drainage ditches / swales and other utilities must be relocated onto easements at no cost to the County. Unused facilities in the right-of-way must be removed to the satisfaction of the County Engineer.

8.3.2 Any conflicting existing utilities shall be relocated to non-conflicting locations at no cost to the County, as required by the County Engineer.

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE "RECORD DRAWING" MEASUREMENTS AS SHOWN HEREON WERE MADE UNDER MY SUPERVISION OR AS NOTED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

REGISTERED ENGINEER/LAND SURVEYOR

DATE

REGISTRATION NUMBER

8.4.2 General Requirements and Notes

The following are required for all grading construction. In addition, these requirements must be set forth as general notes on all grading plans.

- a. Developer shall obtain a Pinal County Grading and Drainage Permit prior to any work being performed. Contact Pinal County Public Works Inspection Section at least 7 working days prior to work.
- b. Drainage plan shall be in accordance with the current Pinal County Drainage Ordinance.
- c. The Contractor is responsible for obtaining an earth moving permit from Pinal County Air Quality Control and the EPA, and for complying with their requirements for dust control.
- d. All work required to complete the construction covered by these plans shall be in accordance with MAG Standard Specifications and Details.
- e. Contractor is responsible for Blue Stake marking as construction is in progress.
- f. A Stormwater Pollution Prevention Plan (SWPPP) shall be submitted to Pinal County Public Works Department prior to issuance of construction permits.
- g. All retention basins must drain any storm event within 36 hrs. The owner is responsible for any basin failing to meet the requirement and must

take corrective action to bring the basin into compliance with this criteria as well as the Pinal County Drainage Ordinance.

- h.** All dry wells shown on this project shall be maintained by the owners and are to be replaced by the owners when they cease to drain the surface water in a 36-hr period. Regular maintenance of the dry wells' silting chamber is required to achieve the best operation of the dry wells. The owner shall be responsible for registering all drywells with ADEQ.
- i.** Any work done in a drainage channel or wash must comply with state and federal regulations.
- j.** Plan approval is valid for twelve (12) months from the date of County approval. If approval expires, the plans must be resubmitted to Pinal County Public Works Department for update review and re-approval.
- k.** For plans with 1+ acre lots and on-lot retention: An individual grading and drainage plan for each parcel to be submitted for review and approval. The approved Master Drainage plan will need to be adhered to when individual parcel grading plan is submitted for review/ approval.

8.4.3 Plan Sheet Requirements

- a.** Drawing Scale (minimum): 1" = 40'. Depending on complexity of design, a larger drawing scale may be required.
- b.** An overall key map to be provided to include proposed street names and neighboring properties to be noted as "UNSUBDIVIDED" if not yet platted, but if there is a proposed plat, provide plat name. If neighboring property is platted, provide recorded information.
- c.** Show sheet reference at all match lines.
- d.** Blue Stake notification.
- e.** Project Heading, title block (located in the lower right hand corner of plan sheets), drawing scale, North arrow, and PE seal with signature.
- f.** Retention basins should have a max depth of 3' with 4:1 side slopes (HWE = 2.5' with 6" freeboard). The design storm is the 100yr – 2hr storm event. Sides of basins greater than 3' deep shall have 8:1 slopes.
- g.** Label volume required and volume provided in each retention basin. Label flow rates and depth of flows at all inlets to basins.
- h.** Dry well grate elevation shall be min 0.3 ft above the bottom of retention basin.

- i. Minimum size for storm drain pipe is 18" but 24" is preferred. HDPE N-12 pipe may be used for storm drains but prefer it not be used under pavement. Headwalls and trash racks are required for both CMP and HDPE pipe.
- j. Drainage arrows and grade breaks shall be shown to indicate drainage patterns.
- k. Driveway grades shall not be greater than 12%.
- l. All plans revised after the original approval shall be submitted to Pinal County Public Works Department for re-approval. Changes on each plan sheet shall be highlighted with "clouding" and be labeled with a numeral within a triangle (delta revisions). The original plan sheet shall be "x'd" out and shall remain the same sheet number and the plan sheet showing the revisions shall be labeled with the same number but with an "A" after the number. Pinal County Engineer's Re-Approval block indicating the delta revision shall be placed on the cover sheet.
- m. If a portion of the street improvements for this development is within State, Town or City jurisdiction, plans are subject to review and approval by that public agency.

8.4.4 Details

- a. Plans should include a dry well detail. Dry wells must be drilled a minimum of 10' into permeable porous strata or percolation tests will be required.
- b. Typical lot drainage detail – minimum side lot slope is 0.5%; no drainage from lot to lot allowed.

CHAPTER 9 WATER SYSTEM DESIGN REQUIREMENTS

9.1 General Information

This chapter provides guidance and minimum design criteria for the modification and construction of water systems within Pinal County. It is intended for use in planning, design and plan preparation processes.

The requirements for development of all potable water supplies shall not be less than those outlined by ADEQ regulations and engineering criteria for such installations.

9.2 Water Main Extension

- 9.2.1** A water system shall be provided, for any subdivision containing lots or parcels less than two acres in area.
- 9.2.2** Water mains connecting with existing potable systems shall be installed to serve each lot when and if connection to such system is available.
- 9.2.3** Prior to the approval of the final plat, the subdivider shall submit to the Planning Department a letter from the governing body of the water system showing the ability of the system to serve the proposed subdivision or development and evidence that a satisfactory agreement has been made for connection to the water system.
- 9.2.4** Fire hydrants and a fire distribution system shall be provided in accordance with the recommendations or requirements of the water system provider, and the fire department having jurisdiction, or by the County Engineer.
- 9.2.5** Water mains and fire hydrants shall be installed to grades, location, design, and sizes on plans submitted and sealed by a registered engineer in the State of Arizona and approved by the County Engineer, County Environmental Health Department and Engineer of the water system provider.
- 9.2.6** When connection to a water system is not available, the subdivider may provide service by the establishment of a shared water system in which case water mains and fire hydrants shall be installed to grades, location, design, and sizes as submitted and sealed by a registered engineer in the State of Arizona and approved by the Arizona Department of Environmental Quality (ADEQ), and the water supply shall be from an ADEQ approved source.
- 9.2.7** In the case of a subdivision with lots over two acres in area, water supply may be from an individual water system. In this case evidence shall be submitted to the Planning Department in a report showing that sufficient potable water is available, that the subdivision has the rights to the water and that it can be obtained for all lots in the subdivision.

9.2.8 Plans shall be prepared in accordance with the Improvement Plan Requirements shown in Chapter 5 of the Subdivision & Infrastructure Design Manual.

9.3 Water System Improvement Plan Requirements

The following is required for Water System Improvement Plan Submittal to Pinal County:

9.3.1 Cover Sheet

- a.** Blue Stake notification.
- b.** Project Heading block (located in the upper, middle of cover sheet) indicating name of project, type of plans. Check heading is consistent with final/tentative plat.
- c.** Case number (S-000-00) at the lower right hand corner.
- d.** Vicinity map with North arrow and section data.
- e.** Index of plan sheets if more than one plan sheet.
- f.** Developer's name, address, and telephone number.
- g.** Engineer's name, address, and telephone number.
- h.** Engineer's stamp - signed and dated.
- i.** Legend identifying grades, symbols, lines, etc.
- j.** Quantities
- k.** Basis of bearings and benchmark (use NAVD 88 datum).
- l.** Sheet numbering format - "1 of XX", where XX is the total amount of sheets.
- m.** Pinal County Engineer Approval Block.

APPROVED BY:

PINAL COUNTY ENGINEER *DATE*
PINAL COUNTY, DEPARTMENT OF PUBLIC WORKS
APPROVAL EXPIRES: _____

DATE

- n. Utility Company and ADEQ approval block. Both approvals are required prior to County approval.
- o. As-Built Certification Statement shall be shown on the plans as follows:

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE "RECORD DRAWING" MEASUREMENTS AS SHOWN HEREON WERE MADE UNDER MY SUPERVISION OR AS NOTED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

REGISTERED ENGINEER/LAND SURVEYOR

DATE

REGISTRATION NUMBER

9.3.2 General Requirements and Notes

The following are required for all water construction. In addition these requirements must be set forth as general notes on all water plans.

- a. Developer shall obtain a Pinal County Right of Way Use Permit prior to any work being performed within the county right of way. Contact Pinal County Public Works Inspection Section at least 7 working days prior to work.
- b. All work required to complete the construction covered by these plans shall be in accordance with MAG Standard Specifications and Details.
- c. All frames, covers, valve boxes, and manhole covers shall be adjusted to finished grade prior to completion of construction. (If located outside pavement section, prefer level with finished grade but allow 6" max above finished grade.)
- d. Contractor is responsible for Blue Stake marking as construction is in progress.
- e. All residents to be notified in person 24 hours prior to driveway crossing.
- f. Traffic control and barricading shall be according to the Manual on Uniform Traffic Control Devices or Pinal County requirements.

Contractor to supply lighted barricades at 50' intervals with open trench signage.

- g.** Contractor shall submit a Traffic Control plan to Pinal County Public Works Inspection Section at least three (3) working days prior to work for review and approval.
- h.** Any work on arterial or collector roads shall require an off-duty Pinal County Sheriff's Officer for traffic control. Contact shall be made through the PCSO representative.
- i.** No trench to be left open/uncovered after working hours unless properly signed and barricaded per the approved Traffic Control Plan.
- j.** Plan approval is valid for twelve (12) months from the date of County approval. If approval expires, the plans must be resubmitted to Pinal County Public Works Department for update review and re-approval.

9.3.3 Plan Sheets

- a.** Drawing Scale (minimum): 1" = 40' horizontal and 1" = 4' vertical. Depending on complexity of design, a larger drawing scale may be required
- b.** An overall key map to be provided to include proposed street names and neighboring properties to be noted as "UNSUBDIVIDED" if not yet platted, but if there is a proposed plat, provide plat name. If neighboring property is platted, provide recorded information.
- c.** Blue Stake Notification.
- d.** Sheet references shall be shown at all match lines.
- e.** Project Heading, title block (located in the lower right hand corner, or right hand side of plan sheets), drawing scale, North arrow, and PE seal with signature.
- f.** Caps on waterlines shall include a blow off valve assembly as required by utility company. All blow-off valve assemblies shall be located outside of the pavement section.
- g.** Water meters shall be located out of public rights-of-way.
- h.** With PUE: only dry utilities are allowed in PUE - waterline shall be placed within pavement section. Without PUE: dry utilities to be located in the area between the back of sidewalk and the right-of-way - the waterline shall be placed within the pavement section.

- i. All plans revised after the original approval shall be submitted to Pinal County Public Works Department for re-approval. Changes on each plan sheet shall be highlighted with “clouding” and be labeled with a numeral within a triangle (delta revisions). The original plan sheet shall be “x’d” out and plan remain the same sheet number and the plan sheet showing the revisions shall be labeled with the same number but with an “A” after the number. Pinal County Engineer’s Re-Approval block indicating the delta revision shall be placed on the cover sheet.
- j. If a portion of the street improvements for this development is within State, Town or City jurisdiction, plans are subject to review and approval by that public agency.

9.3.4 Details

- a. Plans shall include a typical detail for the trench. Trench typical detail per MAG Standard specification. Pea gravel material will not be allowed within rights-of-way or public utility easements.
- b. Plans shall include a typical service location detail.

CHAPTER 10 SEWER SYSTEM DESIGN REQUIREMENTS

10.1 General Information

This chapter provides guidance and minimum design criteria for the modification and construction of sewer systems within Pinal County. It is intended for use in planning, design and plan preparation processes.

The requirements for development of sewer collection systems and sewage treatment facilities shall not be less than those outlined by ADEQ regulations and engineering criteria for such installations. The sewer collection systems and sewage treatment facilities shall comply with the Arizona Administration Code Title 18, Chapter 9, Articles 2 and 3 (A.A.C. R18-9 – Article 2 & 3).

Minimum lot size may be modified by requirements of the County Environmental Health Department pertinent to sewer systems. Any such modifications shall be based on data provided by the appropriate county departments.

10.2 Sewer Line Extension

10.2.1 Where a public/private sewer system is reasonably accessible, the developer shall connect with such sewer system and provide a connection to each lot.

10.2.2 A sewer collection and treatment system shall be required for any subdivision containing lots or parcels less than one acre in area.

10.2.3 When connection to a community sewer system is not available, on-site sewer treatment facilities, including septic tank systems and alternative on-site technologies, may be permitted provided that approval for the use of this method of sewer treatment and disposal is obtained from the following:

10.2.4 Pinal County Environmental Health Department

10.2.5 Arizona Department of Environmental Quality

10.2.6 Plans shall be prepared in accordance with the Improvement Plan Requirements shown in Chapter 5 of this Subdivision & Infrastructure Design Manual.

10.3 Additional Sewer System Improvement Plan Requirements

The following requirements apply to Sewer System Improvement Plan Submittal to Pinal County:

10.3.1 Cover Sheet

- a. Blue Stake notification.

- b.** Project Heading block (located in the upper, middle of cover sheet) indicating name of project, type of plans. Check heading is consistent with final/tentative plat.
- c.** Case number (S-000-00) at the lower right hand corner.
- d.** Vicinity map with North arrow and section data.
- e.** Index of plan sheets if more than one plan sheet.
- f.** Developer's name, address, and telephone number.
- g.** Engineer's name, address, and telephone number.
- h.** Engineer's stamp - signed and dated.
- i.** Legend identifying grades, symbols, lines, etc.
- j.** Quantities.
- k.** Basis of bearings and benchmark (NAVD 88 datum).
- l.** Sheet numbering format - "1 of XX", where XX is the total amount of sheets.
- m.** Pinal County Engineer Approval Block.

APPROVED BY:

<i>PINAL COUNTY ENGINEER</i>	<i>DATE</i>
<i>PINAL COUNTY, DEPARTMENT OF PUBLIC WORKS</i>	

APPROVAL EXPIRES:

DATE

- n.** Utility Company and ADEQ approval block. Both approvals are required prior to County approval.
- o.** As-Built Certification Statement shall be shown on the plans as follows:

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE "RECORD DRAWING" MEASUREMENTS AS SHOWN HEREON WERE MADE UNDER MY SUPERVISION OR AS NOTED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

REGISTERED ENGINEER/LAND SURVEYOR

DATE

REGISTRATION NUMBER

10.3.2 General Requirements and Notes

The following are required for all sewer construction. In addition these requirements must be set forth as general notes on all sewer plans.

- a. Developer shall obtain a Pinal County Right of Way Use Permit prior to any work being performed within the county right of way. Contact Pinal County Public Works Inspection Section at least 7 working days prior to work.
- b. All work required to complete the construction covered by these plans shall be in accordance with MAG Standard Specifications and Details.
- c. All frames, covers, valve boxes, and manhole covers shall be adjusted to finished grade prior to completion of construction. (If located outside pavement section, prefer level with finished grade but allow 6" max above finished grade.)
- d. Contractor is responsible for Blue Stake marking as construction is in progress.
- e. All residents to be notified in person a minimum of 24 hours prior to driveway crossing.
- f. Traffic control and barricading shall be according to the Manual on Uniform Traffic Control Devices or Pinal County requirements. Contractor to supply lighted barricades at 50' intervals with open trench signage.

- g.** Contractor shall submit a Traffic Control plan to Pinal County Public Works Inspection Section at least three (3) working days prior to work for review and approval.
- h.** Any work on arterial or collector roads shall require an off-duty Pinal County Sheriff's Officer for traffic control. Contact shall be made through the PCSO representative.
- i.** No trench to be left open/uncovered after working hours unless properly signed and barricaded per the approved Traffic Control Plan.
- j.** Plan approval is valid for twelve (12) months from the date of County approval. If approval expires, the plans must be resubmitted to Pinal County Public Works Department for update review and re-approval.

10.3.3 Plan Sheets

- a.** Drawing Scale (minimum): 1" = 40' horizontal and 1" = 4' vertical. Depending on complexity of design, a larger drawing scale may be required.
- b.** An overall key map to be provided to include proposed street names and neighboring properties to be noted as "UNSUBDIVIDED" if not yet platted, but if there is a proposed plat, provide plat name. If neighboring property is platted, provide recorded information.
- c.** Blue Stake Notification.
- d.** Sheet references shall be shown at all match lines.
- e.** Project Heading, title block (located in the lower right hand corner or right side of plan sheets), drawing scale, North arrow, and PE seal with signature.
- f.** Sewer line shall be placed within the pavement section.
- g.** Sewer MH's shall located by station and offset.
- h.** All plans revised after the original approval shall be submitted to Pinal County Public Works Department for re-approval. Changes on each plan sheet shall be highlighted with "clouding" and be labeled with a numeral within a triangle (delta revisions). The original plan sheet be "x'd" out and shall remain the same sheet number and the plan sheet showing the revisions shall be labeled with the same number but with an "A" after the number. Pinal County Engineer's Re-Approval block indicating the delta revision shall be placed on the cover sheet.

- i. If a portion of the street improvements for this development is within State, City or Town jurisdiction, plans are subject to review and approval by that public agency.

10.3.4 Details

- a. Plans shall include a typical detail for the trench. Trench typical detail per MAG Standard Specifications. Pea gravel material will not be allowed within rights-of-way or public utility easements.
- b. Plans shall include a typical service location detail.

CHAPTER 11 LANDSCAPE AND IRRIGATION REQUIREMENTS

11.1 General Information

This chapter provides guidance and minimum design standards for Landscape and Irrigation design in subdivisions and associated infrastructure improvement projects that are submitted for review to the County. The intent of this chapter is to establish comprehensive and consistent design standards for the use in preparing and submitting landscape and irrigation improvement plans.

11.2 Additional Landscape and Irrigation Improvement Plan Requirements

The following requirements apply to Landscape and Irrigation Improvement Plan submittal to Pinal County.

11.2.1 General Landscape Requirements and Notes

The following are required for all landscape construction. In addition these requirements must be set forth as general notes on all landscape plans.

- a.** Contractor shall obtain a Pinal County Right-of-Way Use Permit prior to any work being performed within the county right-of-way. Contact Pinal County Public Works Inspection Section.
- b.** All plant material placed in public rights-of-way shall be on an Active Management Area low water use plant list and approved by the Arizona Department of Water Resources.
- c.** All plant material shall meet the minimum standards and specifications of the Arizona Nurserymen's Association or American Association of Nurserymen.
- d.** All trees placed in public rights-of-way shall be pruned up and maintained at a seven (7) foot minimum canopy height.
- e.** All plant material placed in the sight visibility triangle easements shall have a maximum growth height of 24 inches.
- f.** All landscaping and irrigation including drainage ways and rights-of-way shall be maintained by the home owners association or owner.
- g.** No plant material shall be placed within three (3') feet or trees within seven (7) feet of a fire hydrant, light pole, electrical or communications box.
- h.** Eucalyptus trees and Saguaro cactus shall not be placed in public rights-of-way.

- i. Turf grasses shall not be placed in public rights-of-way, but may be allowed as follows:
 - For erosion control within drainage ways.
 - When reclaimed water can be used for the irrigation system.
- j. Trees placed within seven (7') feet of a concrete structure shall have a root barrier installed adjacent to the structure.

11.2.2 General Irrigation Requirements and Notes

The following are required for all irrigation construction. In addition, these requirements must be set forth as general notes on all irrigation plans.

- a. All mainline pipe to be a minimum of schedule 40.
- b. Sleeves shall be a minimum of two times the diameter of the line size.
- c. All mainlines and irrigation equipment shall be placed in the landscaped areas outside of the public right of way and public utility easement (PUE).
- d. Controller wires that are direct buried shall be NO. 14 or better, bundled and tied or wrapped every twelve (12') feet. During installation wires shall have a 24" loop tied at all direction changes greater than 30 degrees and be untied prior to trench fill in.
- e. Flush caps shall be placed in a valve box at the end of all laterals.
- f. All valves, pressure regulators and other devices shall be placed in an appropriately sized valve box with a minimum of two (2") inches of pea gravel.
- g. Any and all reclaimed water used for irrigation shall conform to ADEQ Arizona Administrative Code R18-11, Article 3, Reclaimed Water Quality Standards. All reclaimed water lines shall be installed per MAG Specification Section 616.

11.2.3 General Backflow Prevention Device (BPD) Requirements and Notes

The following are required for all BPD construction. In addition, these requirements must be set forth as general notes on all irrigation plans.

- a. Prior to placing any irrigation system in service, an Arizona Certified Backflow Device tester shall test the backflow prevention device and

give a copy of the passed test results to the Pinal County inspector or mail it to the Pinal County Department of Public Works Inspection Section.

- b. After initial testing, all backflow devices shall be tested and passed annually in accordance with the locale utility company's requirements.
- c. Backflow prevention devices shall be placed a minimum of two (2') feet from the water meter and be the same size as the meter service line.
- d. All BPD devices shall have a minimum 24" X 36" X 4" class B concrete slab with pipe sleeves. If a security cage is installed concrete shall be six (6") inches larger on all sides than the security cage.

11.2.4 General Landscape Lighting Requirement and Note

The following is required for all landscape construction. In addition, this requirement must be set forth as a general note on all landscape plans.

All landscape lighting shall comply with the Pinal County Light Pollution Code and ARS Section 11-251, and be fully shielded.

11.2.5 General Wall and Fence Requirement and Note

The following is required for all landscape construction. In addition, this requirement must be set forth as a general note on all landscape plans.

Walls and fences shall be placed outside rights-of-way and public utility easements.

11.2.6 Cover Sheet

- a. Blue Stake notification.
- b. Project Heading block (located in the upper, middle of cover sheet) indicating name of project, type of plans. Check heading is consistent with final/tentative plat.
- c. Case number (S-000-00) at the lower right hand corner.
- d. Vicinity map with North arrow and section data.
- e. Index of plan sheets if more than one plan sheet.
- f. Developer's name, address, and telephone number.
- g. Landscape Architect's name, address, and telephone number.
- h. Landscape Architect's stamp – signed and dated.

- i. Legend identifying all grades, symbols, lines, etc.
- j. Quantities.
- k. Sheet numbering format - "1 of XX" where XX is total amount of sheets.
- l. Pinal County Engineer Approval Block.

APPROVED BY:

<i>PINAL COUNTY ENGINEER</i>	<i>DATE</i>
<i>PINAL COUNTY, DEPARTMENT OF PUBLIC WORKS</i>	
<i>APPROVAL EXPIRES:</i>	<i>DATE</i>

11.2.7 Plan Sheets

- a. Drawing Scale (minimum): 1" = 40' horizontal. Depending on complexity of design, a larger drawing scale may be required.
- b. An overall key map to be provided to include proposed street names and neighboring properties to be noted as "UNSUBDIVIDED" if not yet platted, but if there is a proposed plat, provide plat name. If neighboring property is platted, provide recorded information.
- c. Existing field conditions shall extend to the full existing right-of-way along the entire perimeter of the property or, where no right-of-way exists, extend a minimum 100' beyond property boundary.
- d. Show the 21'x 21' (local to local) or 33'x 33' (for all others) sight visibility triangle easement (SVTE) all intersections.
- e. Brick pavers are not allowed within Pinal County Right of Way. Decorative stamped concrete may be used as an alternative.
- f. Project Heading, title block (located in the lower right hand corner or right hand side of plan sheets), drawing scale, North arrow, and Landscape Architect's seal with signature.
- g. Plans shall show all locations, dimensions, and purposes of any existing and proposed easements. Show right-of-way, existing and proposed pavement, curbs, and sidewalk with width dimensioned.
- h. Sheet reference shall be shown at all match lines.

- i. All plans revised after the original approval shall be submitted to Pinal County Public Works Department for re-approval. Changes on each plan sheet shall be highlighted with “clouding” and be labeled with a numeral within a triangle (delta revisions). The original plan sheet shall be “x’d” out and shall remain the same sheet number and the plan sheet showing the revisions shall be labeled with the same number but with an “A” after the number. Pinal County Engineer’s Re-Approval block indicating the delta revision shall be placed on the cover sheet.

- j. If a portion of the street improvements for this development is within State, City or Town jurisdiction, plans are subject to review and approval by that public agency.

CHAPTER 12 TRAFFIC SIGNAL REQUIREMENTS

12.1 General Information

This chapter presents the minimum design criteria, standards and requirements to be referenced when preparing traffic signal improvement plans for submittal to the County.

Pinal County operates and maintains the traffic signal system throughout the unincorporated limits of the County. The traffic signals are installed through capital improvement projects, subdivision or private development infrastructure improvements.

12.2 Design Criteria and Reference Documents

The latest revisions of the following publications are to be used in the design of traffic signals.

- 12.2.1** Manual on Uniform Traffic Control Devices for Streets and Highways; USDOT, FHWA.
- 12.2.2** Arizona supplement to the 2003 Manual on Uniform Traffic Control Devices; ADOT.
- 12.2.3** Traffic Signals and Lighting and Signing and Marking – Standard Drawings; ADOT.
- 12.2.4** Traffic Control Manual for Highway Construction and Maintenance; ADOT.
- 12.2.5** Manual of Approved Signs; ADOT.
- 12.2.6** Traffic Engineering Policies, Guidelines and Procedures; ADOT.
- 12.2.7** Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals; AASHTO.
- 12.2.8** Roadway Lighting Design Guide; AASHTO.
- 12.2.9** Guide to Standardized Highway Lighting Pole Hardware; AASHTO.
- 12.2.10** Traffic Controller Assemblies with NTCIP requirements TS2-1998. National
- 12.2.11** Electrical Manufacturers Association.
- 12.2.12** Uniform Standard Specifications for Public Works Construction; MAG.

12.3 Additional Traffic Signal Improvement Plan Requirements

- 12.3.1** General Requirements and Notes

The following are required for all traffic signal construction. In addition, these requirements must be set forth as general notes on all traffic signal plans.

- a. Developer shall obtain a Pinal County Right-of-Way Use Permit prior to any work being performed within the county right-of-way. Contact Pinal County Public Works Inspection Section at least 7 working days prior to work.
- b. During the installation of traffic signals or traffic signal interconnect; the Contractor will be responsible for making contact with the Pinal County Public Works Inspection Section to arrange for inspections. At no time shall conduit be backfilled in the County's right-of-way without an inspection. Any questions concerning traffic signals, traffic signal interconnect or to arrange for an inspection, contact the Pinal County Public Works Inspection Section. Inspections must be scheduled a minimum of 48-hours (or 2 business days) in advance.
- c. Any conduit that is placed without wiring for a new signal or traffic signal interconnect, a tracer wire (twin green) shall be placed in each conduit.
- d. When required, the Contractor shall install 3-2" conduits to box an intersection for future traffic signal installation. If medians are present or are to be constructed with this project, the Contractor shall stub the conduit runs into a #5 pull box in each median.
- e. Pull boxes are to be spaced every 1000 feet on a conduit run, and are to be placed on each side of an intersecting roadway.
- f. Traffic signal conduit, pull boxes and Loop Detection shall be installed.

12.3.2 Plan Sheets

- a. Traffic signal plans shall be submitted on separate sheets apart from any other part of the construction documents with a scale no less than 1"=20'.
- b. Identify all ingress/egress points to include street intersections and residential/commercial driveways within 500' of the installation point of the traffic signal.
- c. Show all new and existing utilities within the right-of-way and label them accordingly.
- d. Show all existing town, city, county and state boundary limits and the existing and proposed right-of-way and dimension them accordingly.

CHAPTER 13 TRAFFIC SIGNING AND PAVEMENT MARKINGS REQUIREMENTS

13.1 General Information

This chapter provides the minimum design criteria, standards, and requirements to be referenced when designing traffic signs and pavement marking improvements within the County.

13.2 Design Criteria and Reference Documents

The following publications or their current revisions are to be used in conjunction with the design criteria in this Manual for traffic signs and pavement markings design work.

- 13.2.1** Manual of Uniform Traffic Control Device for Streets and Highways (MUTCD).
- 13.2.2** Signs and Marking – Standard Drawings (ADOT).
- 13.2.3** ADOT Traffic Control Design Guidelines (ADOT).
- 13.2.4** Manual of Approved Signs (ADOT).
- 13.2.5** Traffic Engineering Policies, Guidelines and Procedures (ADOT).
- 13.2.6** Uniform Standard Specifications for Public Works Construction (MAG).
- 13.2.7** Uniform Standard Details for Public Works Construction (MAG).

13.3 Additional Traffic Signing and Pavement Marking Plan Requirements

13.3.1 General Requirements and Notes

The following are required for all traffic signing and pavement marking design and construction.

- a.** Traffic signing and pavement markings plans shall be submitted with a scale no less than 1"=40' and include all centerline curve data.
- b.** Traffic signing and pavement markings design should be in the same plan view on the same plan sheet, if practical.
- c.** Entire length of project is to be shown in plan view. Typical sections representative of traffic signing and pavement markings will not be accepted.
- d.** Show the existing roadway, signing and marking and proposed signing and markings for approximately 500 feet beyond the project limits on each approach to the project.

- e. Identify all ingress/egress points to include street intersections and residential/commercial driveways within 500' of the project limits on both approaches and on both sides of the street.
- f. Show all new and existing signs within the right-of-way and identify them. Label existing signs "EXISTING" and show them grayed out.
- g. Right-of-way lines, city and county limits are to be clearly identified.
- h. All islands on arterial roadways shall be signed per the MUTCD guidelines. The beginning of each median where none exists prior, are to be signed. Median breaks in a continuous median will not require signing.
- i. STOP signs are to be shown at all local streets that intersect with collector streets within a subdivision. Local/local street intersections may not be STOP controlled unless directed by Public Works. STOP signs will be shown at all collector street intersections.
- j. All signing and pavement marking shall conform to the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD) as supplemented by the Arizona Department of Transportation with regard to size, color, shape, and placement. All sign posts shall be square tube in accordance with ADOT Standard Drawing S-1 and all post foundations shall be "slip base" in accordance with said standard drawing, unless as directed by the Pinal County Public Works Department. Sign retro reflective sheeting shall be in accordance with ADOT Section 1007.

13.3.2 Additional General Requirements and Notes

The following additional requirements are required for all traffic signing and pavement marking construction. In addition, these requirements must be set forth as general notes on all traffic signing and pavement marking plans

- a. Developer shall obtain a Pinal County Right-of-Way Use Permit prior to any work being performed within the county right-of-way. Contact Pinal County Public Works Inspection Section at least 7 working days prior to work.
- b. Contractors installing traffic signs shall obtain a right-of-way permit from the Public Works Department prior to beginning any work within the County's right-of-way.
- c. All signing installed within the County's right-of-way shall be installed by an individual that has current certification from the International Municipal Signal Association (IMSA) or the American Traffic Safety

Services Association (ATSSA), or equivalent. Equivalency shall be submitted for review prior to being accepted by the County.

- d. A pre-installation meeting with Public Works Department staff will be required prior to installing any signs or posts within the right-of-way. Permits may be issued prior to this meeting but will not be valid until after the pre-installation meeting is held. To schedule a pre-installation meeting contact the Public Works Division two (2) business days prior.
- e. All signing and pavement marking shall conform to the latest edition of the Manual on Uniform Traffic Control Devices as supplemented by the Arizona Department of Transportation with regard to size, color, shape, and placement.
- f. Street Name Sign installation – street name signs shall be installed at each intersection. If street name signs are to be installed on an existing or proposed street light pole, each sign shall be installed on a separate bracket. For street name sign blades that are 23” and under a 12” bracket shall be used. For blades that are 24” to 35”, an 18” bracket shall be used. For blades that are 36” and above, a 24” bracket shall be used.
- g. All sign sheeting shall conform to Section 1007 Retro reflective Sheeting of the ADOT Standard Specifications for Road and Bridge Construction Manual.
- h. All signs shall be installed using 2” square tubing in accordance with ADOT Standard Drawing S-1. Sign foundation systems shall be “slip base” type per the same standard drawing.
- i. The Contractor shall allow the concrete in the postholes to cure for at least 24-hours prior to standing the poles.
- j. Any signing that is to be relocated shall be reinstalled as directed by the Public Works Department.
- k. Any sign, except stop signs and street name signs, that is to be installed within 25 feet of an existing street light pole shall be installed on that pole and not on a separate support. Signs that need to be removed during construction shall be done so by the Contractor at their expense.
- l. The Contractor shall ensure that at no time a traffic sign is installed in such a way as to be blocked by trees or vegetation. In these cases the Contractor shall contact the Public Works Department to provide an alternate location for the installation of signing in question.
- m. Signing quantities and installation locations are subject to change at the time of installation based upon current accepted practice. The Contractor

completing the signing installation is required to make contact with the Public Works Department prior to any signing being installed within the County's right-of-way.

- n. All pavement markings shall conform to the Arizona Department of Transportation and Specifications unless otherwise specified in the Manual of Uniform Traffic Control Devices, (Latest Editions), or as noted on the plans.
- o. The Contractor shall spot mark the entire project before applying any paint. When the spotting is complete the Contractor shall contact the county construction inspector, to make arrangements for inspection prior to applying any paint (3 business days advance notice is required). The permanent marking plans may be modified as directed by the County Engineer. The Contractor shall refer any questions concerning pavement marking to the Pinal County Traffic Engineering Section.
- p. Any pavement markings applied prior to field inspection by the Pinal County Traffic Engineering Section shall be removed and re-stripped at the expense of the Contractor.
- q. It is the contractor's responsibility to ensure that the final surface course is placed so that the striping is offset 1 foot clear of the construction joint, unless otherwise directed by the County Engineer.
- r. The dimensions shown to pavement striping are to the center of the striping or, in the case of double striping, to the center of the double striping.
- s. The final striping shall be 60 mil (0.060 inch) thick hot-sprayed thermoplastic reflectorized striping. Line widths shall be in accordance with ADOT Standard Drawings.
- t. The pavement arrow, symbols and legend shall be white 90 mil (0.090 inch) thick alkyd extruded thermoplastic reflectorized markings. Turn lane arrows shall be located in accordance with ADOT Standard Drawing M-11 with the exception of the word marking "ONLY" which shall not be used.
- u. The contractor shall clean the roadway surface to the satisfaction of the County Engineer, by sweeping and air-jet blowing, immediately prior to the placement of all pavement markings. The roadway surface shall be dry and the air and pavement temperatures shall not be less than 50 degrees F for the placement of thermoplastic markings.
- v. All raised pavement markers shall have an abrasion resistant coating on the face of the prismatic reflectors and shall conform to the details of

Standard Drawing M-19. They shall be installed with a bituminous adhesive which is on the ADOT approved products list.

- w.** Where raised pavement markers are placed along solid striping, the nearest edge of each marker shall be offset 2 inches from the nearest edge of the striping.
- x.** All signs shall be in compliance with the Manual on Uniform Traffic Control Devices (MUTCD), the ADOT Signing and Marking Standard Drawings, and the Traffic Engineering Manual of Approved Signs. All signs shall be fabricated of flat sheet aluminum with direct applied copy or silk-screened legend. Retro reflective sheeting shall be in accordance with ADOT Section 1007.
- y.** The bottom of each sign shall be at least 7 feet above the nearest edge of pavement and at least 7 feet above the ground under the sign.
- z.** The contractor shall install the signs so the nearest edge or corner of each sign is offset 2 feet behind the back of the sidewalk.
- aa.** Raised median and curbs shall be marked in accordance with ADOT Standard Drawing M-1.
- bb.** All signing and pavement markings shall be installed within 5 calendar days of completion of the final lift pavement surface or as required by the Engineer.
- cc.** Traffic control and barricading shall be according to the Manual on Uniform Traffic Control Devices or Pinal County requirements.
- dd.** Contractor shall submit a Traffic Control plan to Pinal County Public Works Inspection Section at least three (3) working days prior to work for review and approval.
- ee.** Any work on Arterial or Collector Roads shall require an off-duty Pinal County Sheriff's Officer for traffic control. Contact shall be made through the PCSO representative .
- ff.** Plan approval is valid for twelve (12) months. If approval expires, the plans must be resubmitted for County update review and approval.
- gg.** All Signs must be manufactured of "ASTM D-4956-01a- Proposed Type XI Sheeting" (3M 4000 DG3 series or equivalent) which will be attached to the standard signage aluminum plates. Sign imaging shall be in compliance with the reflective sheeting manufactures matched component system. Sign imaging shall consist of an acrylic based electronic cuttable film (3M 1170 Series or equivalent) or silk screened

(depending on the quantity of signage) with standard highway colors. In addition, if called out on plans, to create a graffiti-protective coating, a premium protective overlay film (3M 1160 or equivalent) shall be used which is designated to comply with the underlying reflective sheeting match component system.

13.3.3 Cover Sheet

- a. Project Heading block (located in the upper, middle of cover sheet) indicating name of project, type of plans. Check heading is consistent with final/tentative plat.
- b. Case Number (S-000-00) at the lower right hand corner.
- c. Vicinity map with North arrow and section data.
- d. Index of plan sheets if more than one plan sheet.
- e. Developer's name, address, and telephone number.
- f. Engineer's name, address, and telephone number.
- g. Engineer's stamp - signed and dated.
- h. Legend identifying all grades, symbols, lines, etc.
- i. Quantities.
- j. Basis of Bearings.
- k. Sheet numbering format - "1 of XX" where XX is total amount of sheets.
- l. Pinal County Engineer Approval Block.

APPROVED BY:

_____	_____
PINAL COUNTY ENGINEER	DATE
PINAL COUNTY, DEPARTMENT OF PUBLIC WORKS	
APPROVAL EXPIRES:	_____
	DATE

- m. As-Built Certification Statement shall be shown on the plans as follows:

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE "RECORD DRAWING" MEASUREMENTS AS SHOWN HEREON WERE MADE UNDER MY

SUPERVISION OR AS NOTED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

REGISTERED ENGINEER/LAND SURVEYOR

DATE

REGISTRATION NUMBER

13.3.4 Plan Sheet Requirements

- a. Drawing Scale (minimum): 1" = 40' horizontal. Depending on complexity of design, a larger drawing scale may be required.
- b. Project Heading, title block (located in the lower right hand corner or right hand side of plan sheets), drawing scale, North arrow, and PE seal with signature.
- c. An overall key map to be provided to include proposed street names and neighboring properties to be noted as "UNSUBDIVIDED" if not yet platted, but if there is a proposed plat, provide plat name. If neighboring property is platted, provide recorded information.
- d. Existing field conditions shall extend to the full existing right-of-way along the entire perimeter of the property or, where no right-of-way exists, extend a minimum 100' beyond property boundary.
- e. Show right-of-way, existing and proposed pavement with width dimensioned.
- f. Show centerline survey data.
- g. Sheet references shall be shown at all match lines.
- h. 6.5' (measured from back of curb to center of striping) bike lanes shall be provided on both sides on all arterials and major collectors.
- i. All plans revised after the original approval shall be submitted to Pinal County Public Works Department for re-approval. Changes on each plan sheet shall be highlighted with "clouding" and be labeled with a numeral within a triangle (delta revisions). The original plan sheet shall be "x'd" out and shall remain the same sheet number and the plan sheet showing the revisions shall be labeled with the same number but with an "A" after the number. Pinal County Engineer's Re-Approval block indicating the delta revision shall be placed on the cover sheet.

- j. If a portion of the street improvements for this development is within State, City or Town jurisdiction, plans are subject to review and approval by that public agency.

CHAPTER 14 AS-BUILT PLANS REQUIREMENTS

14.1 General Information

This chapter provides guidance and minimum requirements for the preparation of As-Built plans. It is intended for use during construction and documentation of infrastructure projects.

In accordance with the Pinal County Subdivision Regulations acceptable As-Built plans are required prior to the release of a Certificate of Completion. Additionally, any type of construction will not be accepted until certified As-Built plans have been submitted to and accepted by the County.

14.1.1 Submittals

- a. “As-Built” plans shall be submitted on 24” x 36” mylar (4 mil thickness) and be of quality allowing microfilming.
- b. “As-Built” plans shall be signed and sealed by a Professional Engineer or Land Surveyor registered in the State of Arizona with a completed and sealed “AS-BUILT CERTIFICATION” approval block.

14.2 Minimum As-Built Requirements

These are the minimum technical requirements for As-Built plans. The As-Built plans must also include all noted changes to the improvement plans.

14.2.1 Street Plans

- a. Station for all grade breaks.
- b. Back of curb offset dimension at all changes in alignment.
- c. Top of curb, gutter and pavement centerline elevations at all grade breaks, curb return, valley gutters, plus any other location necessary to adequately show drainage.
- d. Survey monuments – installation and accuracy certifications.

14.2.2 Irrigation and Storm Drain Plans

- a. Street centerline station and offset dimension to the main at all changes in alignment and/or changes in grade.
- b. Street centerline station and offset dimension to all structures and changes in alignment.
- c. Top and invert elevations for all structures.

14.2.3 Grading Plans

- a.** Elevations at all drainage control points (i.e. retention overflow point, tops and bottoms of retention basins, drain rims, valley gutters, curbs).
- b.** Dimensions of all retention areas.
- c.** Retention calculations revised to as-built condition.
- d.** Finished pad and proposed finished floor elevations.

14.2.4 Water System Plans

- a.** Street centerline station and offset dimensions to:
- b.** All fire hydrants and fittings (i.e. valves, blow-offs, etc.).
- c.** Main at all changes in alignment.
- d.** All horizontal control points (i.e. centerline intersects, P.C., P.T.).
- e.** Station and elevations given at all vertical alignment changes.
- f.** Centerline station and offset to each service tap; size of tap and dimension to nearest side property line.
- g.** Note centerline station, offset and elevations to all changes in vertical alignment (i.e. dips, bends, etc., required to avoid conflicts with other utilities).

14.2.5 Sewer System Plans

- a.** Street centerline station and offset dimension from street centerline to main at manholes and all changes in alignment.
- a.** Sewer line station at centerline of each manhole.
- b.** Rim and invert elevation for each manhole.
- c.** Calculated slope between manholes.
- d.** Sewer line stationing at centerline of each service tap at 90 degrees to main; if not installed 90 degrees to main, station and offset to end of each service tap.

CHAPTER 15 PERMITTING, INSPECTION & CONSTRUCTION

15.1 General Information

This chapter outlines the requirements for permitting, inspection and overall standards for construction in Pinal County

15.2 Permit Requirements

All infrastructure improvements within right-of-way shall be constructed under an approved permit from the Pinal County Public Works Inspection Section. The permit application must be submitted at least seven (7) working days before work is scheduled to begin. Until all improvement plans, studies, reports, investigations and required assurances have been submitted and approved, the permit application for work within the subdivision and rights-of-way will not be accepted.

15.3 Notification of Construction

The County Engineer shall be notified at least seven (7) days prior to the start of construction.

15.4 Specifications

15.4.1 All work and material shall conform to the current Uniform Standard Specifications for Public Works Construction (MAG).

15.4.2 It is not the intention of the Pinal County Public Works Department to prohibit use of other materials, methods or designs for infrastructures improvements. Other County specifications may be substituted as satisfactory alternates with prior submission of structural designs, tests and other supporting data and upon written approval of the County Engineer prior to approval of plans or performance of work.

15.5 Materials

15.5.1 Base Material - Shall meet MAG Uniform Standard Specifications and Details for Public Works Construction. The total thickness shall be determined by laboratory tests of the subgrade materials with a minimum of six inch Class I Aggregate Base.

15.5.2 Asphaltic Concrete - Shall meet MAG Uniform Standard Specifications and Details for Public Works Construction except that the minimum asphalt content shall be five per cent (5%) unless otherwise approved in writing by the County Engineer.

- 15.5.3** Concrete for all curb, gutter, sidewalks, driveway entrances, wash crossings and street related concrete construction shall meet MAG Uniform Standard Specification and Details for Public Works Construction.
- 15.5.4** Reinforced Concrete Pipe - Shall meet MAG Uniform Standard Specifications and Details for Public Works Construction.
- 15.5.5** Corrugated Metal Pipe - Shall meet MAG Uniform Standard Specifications and Details for Public Works Construction.
- 15.5.6** Miscellaneous - All construction shall meet MAG Uniform Standard Specifications and Details for Public Works.

15.6 Pavement

- 15.6.1** All pavement and curbs and gutters shall be constructed to the grades set by the Engineer of the project per the approved plans.
- 15.6.2** The subgrade of the street shall be thoroughly compacted by wetting and rolling. The compacted depth shall be not less than six (6) inches.
 - a.** On every project samples of the subgrade material shall be taken at locations not more than 500 feet apart. Samples shall be tested by an approved laboratory. Laboratory reports shall be submitted to the County Engineer with street paving plans. The report shall show plastic index and gradation. The depth of the base material required shall be established after analysis of the subgrade soil and shall be in accordance with the plasticity index/grading chart set forth in these regulations.
 - b.** The base material shall be sand and gravel or crushed rock (not decomposed granite) and shall conform to gradation as required by the County Engineer. The plasticity index shall not exceed five (5). Material shall be placed in uniform layers not to exceed four (4) inches in depth. Each layer shall be bladed to a smooth surface conforming to the cross sections shown on the plans and shall be watered and thoroughly rolled in a manner satisfactory to the County Engineer. Laboratory reports showing gradation and the plasticity index, shall be submitted to the office of the County Engineer.
 - c.** The compacted depth of the bituminous mix required for surfacing shall be not less than two and one-half (2 1/2) inches. The aggregate shall be sand and gravel or crushed rock (not decomposed granite) and shall conform to gradation, as required by the County Engineer. Plasticity index shall not exceed five (5).
 - d.** The cost of all sampling and testing shall be borne by the subdivider or contractor.

- e. Bituminous material satisfactory to the County Engineer shall be used at the rate of 4% to 6% by weight. The materials shall be thoroughly mixed to provide a uniform coating and adequate cementation and stability. Mixing may be by field or plant methods. After spreading, the surface shall be rolled with a roller weighing not less than five (5) tons.
- f. Seal Coat- A construction fog seal shall be applied to the finished Asphaltic Concrete surface at the rate of 0.10 gallons of diluted mixture per square yard. The dilution shall be two (2) parts of the concentrate to one (1) part water. No sanding will be required.

The Fog Seal Concentrate shall be composed of a petroleum resin-oil base uniformly emulsified with water and shall conform to the following physical and chemical requirements:

Specification Designation	Test Method	Requirements
Viscosity, S.F. at 77°F, sec	ASTM D244-60	5-40
Residue, % (1)	ASTM D244-60 (Mod)	58-62
Cement Mixing Test, %	ASTM D244-60	Zero
Sieve Test, % Max. (2)	ASTM D244-60 (Mod)	0.10
Particle Charge Test	ASTM D244-60	Positive
Test on Residue from	ASTM D244-60	(Mod):
Viscosity, sc., 140°F	ASTM D445	100-200
Asphaltness, % Max	ASTM D2006-62T	0.75

- g. ASTM 244 Modified Evaporation Test for percent of residue is made by heating 50 gram sample to 300°F. until foaming ceases, then cool immediately and calculate results.
- h. Test Procedure identical with ASTM D244 except that distilled water shall be used in place of 2% sodium oleate solution.

15.7 Compaction

- 15.7.1 Subgrade: Top six inches of pavement and curb subgrade shall be compacted to a minimum of ninety five percent (95%) of the maximum density of the material. Sidewalk subgrade shall be compacted to a minimum of ninety percent (90%) of the maximum density of the material.
- 15.7.2 Base Material: The base course shall not be placed on subgrade until compaction tests of the subgrade have been completed by the Engineer of Record and found to meet the specifications contained herein. Base material shall be compacted, full depth, to a minimum of one hundred percent (100%) of the maximum density of the material being used.

15.8 Contraction and Expansion Joints:

Expansion joints shall be premolded bituminous fiber conforming to AASHTO M33 70 and placed only at intervals of 96' and at ends of curb returns. Contraction joints shall be placed at twelve foot (12') intervals on straight runs and within curb returns. Expansion joints shall also be placed at the end of days work if not at curb return. No cold joints will be permitted.

15.9 Utilities

It shall be the subdivider's responsibility to arrange for all necessary installation, relocation or removal of all conflicting utilities at no expense to the county. Before placement of base course or pouring of concrete the subdivider shall furnish to Pinal County Public Works Inspection Section utility clearance certificate from each utility having facilities in the area. Test reports as required by Chapter 16 herein, Special Provisions for Installation of Underground Utilities, must also be received by Pinal County Public Works Inspection Section prior to issuance of approval for paving or curb operations. The County Engineer will give approval for utility installation, grading and subgrade compaction.

15.10 Traffic Control Devices

The existence of any traffic control device within the limits of the construction area shall be shown on the plans and detailed as to legend or purpose. Under no circumstances shall the owner, his agent, or contractor be allowed to disturb any device so shown on the plans except with the approval of the County Engineer. The owner or his agent shall make known to the Pinal County Public Works Inspection Section in writing his desire for removal or relocation of any such device and it shall be so noted on the plans.

15.11 Street Signs and Street Survey Monuments

No approval or acceptance of a project will be given until street names signs and survey monuments are completely in place.

15.12 Dust Control

Existing regulations of the Pinal County Environmental Health Department, Pinal County Air Quality Department, and other applicable federal, state and county ordinances and regulations shall be rigidly observed and enforced. Water or other approved dust palliative in sufficient quantities shall be applied during all phases of construction involving open earth work to prevent the unnecessary discharge of dust and dirt into the air. An air quality permit shall be required. Subdivider shall contact Pinal County Air Quality Department.

15.13 Individual Mail Boxes

Individual mail boxes are permitted to be placed only in such locations that will not interfere with traffic, either vehicular or pedestrian, or create a hazard of any nature. If a sidewalk is constructed adjacent to the curb, the box shall be located behind the

Subdivision & Infrastructure Design Manual

sidewalk and clear of the vertical projection of the back edge of the sidewalk by a minimum one-foot. If no sidewalk is constructed, the box must clear the vertical projection of the back edge of the curb by a minimum of one foot. If no curb is constructed the box must clear the vertical projection of the edge of the pavement by a minimum of three feet. Installation of individual mail boxes in the County right-of-way shall be done under permit from the Pinal County Public Works Inspection Section.

15.14 Inspection

All work within rights-of-way shall be inspected by the Pinal County Public Works Department Inspector. The inspector shall have the authority to reject work or material that is not in compliance with the approved improvement plans and County requirements.

15.15 Testing

15.15.1 The samples and tests of material shall be made in accordance with the Uniform Standard Specifications and Details for Public Works Construction as furnished by the Maricopa Association of Governments and as follows:

- a. Samples are to be taken to a minimum depth of eight inches below proposed subgrade elevation. Depths of up to three (3) feet on arterial type roads may be required in certain instances.
- b. One test per eight hundred (800) lineal feet with at least one test per proposed street. Additional tests may be required by the County Engineer at apparent visible changes in soil type.
- c. Each sample is to have a sieve analysis per AASHTO T27 with results reported as percent passing, plus a plasticity index per AASHTO 90.
- d. Test results are to be forwarded to the Pinal County Public Works Inspection Section together with the paving plans.
- e. Additional tests may be required by the County Engineer for purposes of assurance of design information in cases of submittal of pavement designs other than the Standard.

15.15.2 Compaction tests shall be performed as follows:

- a. Pavement subgrade -one test per 800 lineal feet of roadway with at least 1 test per street minimum.
- b. Curb subgrade - one test per 500 lineal feet of curb with at least 1 test per street minimum.
- c. Base Material - one test per 800 lineal feet of roadway with at least 1 test per street minimum. Maximum densities for the materials being compacted shall be determined in the laboratory for the same materials

in accordance with AASHTO T-99. Field density tests shall be performed in accordance with AASHTO T-191.

15.15.3 The following daily concrete test cylinders shall be taken:

- a. Two sets per pour over four (4) hours pouring time, two six-inch (6") cylinders per set.
- b. One set per pour for less than four (4) hours pouring time, two six-inch (6") cylinders per set. A seven day break shall be made for each set. When the seven day break is below 1800 PSI a twenty-eight (28) day break shall be made. At least one 28 day cylinder shall be broken for each project with more than forty (40) cubic yards of poured concrete.

15.15.4 The following test shall be taken for asphaltic concrete:

- a. Gradation - Expressed as % by weight passing, using AASHTO T-164 and T-168.
- b. Asphalt content - Expressed as % by weight of total mixed material, sampled and tested per AASHTO T-164 and T-168.
- c. Compaction - As previously specified in paragraph VII-C above. A minimum of one sample per 1200 tons of material, but no less than one sample from each source is required for each day's paving. Additional samples may be ordered by the County Engineer or Engineer of Record whenever obvious.

15.16 Approval

The street improvements will not be considered ready for final inspection until all drainage items, grading, and backfill are complete and pavement, curbs, and sidewalks swept clean of all dirt and debris. Curbs and the area behind curbs shall be totally backfilled and neatly dressed to a maximum 4:1 slope. The contractor shall furnish a water truck at the time of final inspection for the purpose of testing street drainage. Any ponding in excess of ten square feet in surface area or one-quarter inch in depth shall require corrective action by the contractor. The corrected "As-Built" plans as described in Chapter 14 herein must be submitted before final project approval.

CHAPTER 16 UTILITY CONSTRUCTION IN COUNTY RIGHT-OF-WAY

16.1 General Information

This chapter presents the special provisions and requirements for design, permitting, and testing requirements for construction of utilities in dedicated County right-of-way.

Prior to the issuance of a permit to allow the excavation and installation of underground utilities, i.e., (electric power, cable, fiber optic, telephone, and water) in any County right of-way the subdivider, contractor or person installing underground utilities shall conform to the requirements of this Manual.

16.2 General Requirements

All work and materials shall conform to the current Uniform Standard Specifications and Details for Public Works Construction as furnished by the Maricopa Association of Governments apply to trench backfill material, backfill compaction and roadway surface restoration, except as noted in this chapter. In case of conflict between the MAG Standard Specifications and these Special Provisions, the Special Provisions shall govern.

Other agency specifications for construction material which are equal to or greater than Pinal County Specifications, listed herein, may be substituted as satisfactory alternates with prior written approval of the County Engineer.

Other construction methods, which are determined from engineering studies and laboratory tests, may be substituted as satisfactory alternates with prior written approval of the County Engineer.

16.3 Utility Separation

All underground electric power lines installed in the streets, alleys, roads, highways or right-of-ways belonging to the County, shall be installed at least twelve (12) inches below any underground water pipelines at the point where underground electric power lines cross or intercept any underground water pipelines. In addition, underground electric power lines shall be encased in conduit for a distance of at least five (5) feet on each side of the point of intersection with underground water pipelines. All installation costs of underground electric power lines and conduit shall be borne by those installing the underground electric power lines.

16.4 Additional Utility Plan Requirements

16.4.1 All preparation of plans, specifications, construction and inspection within County right-of-way shall be performed under the supervision of a Civil Engineer registered in the State of Arizona.

16.4.2 Plans shall be submitted on a maximum sheet size of 24" x 36" and must be neat, clear, legible, and completed in all respects. Profiles will be required on projects involving installation of sewer and underground irrigation lines in dedicated right-of-way. Power facilities must also be submitted in profile where the trade size of a single conduit exceeds six inches (6") in diameter or where multiple conduits including the concrete encasements are sixty (60) square inches or greater in cross-sectional area. In addition, profiles may be required by the County Engineer in cases of possible alignment or grade conflicts, cover problems, or crossing conflicts. Plans shall be submitted to the Pinal County Public Works Department for review and approval. The application for the construction permit will not be accepted until all improvement plans have been approved. Upon approval of all plans, the right-of-way permit application shall be submitted at least seven (7) days prior to beginning of work.

16.4.3 Upon completion of Construction, a set of As-Built plans shall be submitted to the Public Works Inspection Section.

16.5 Backfill and Compaction

16.5.1 Backfill: Material shall conform to the MAG Uniform Standard Specifications and Details for Public Works Construction Section 601.

16.5.2 Compaction:

- a. That portion of the backfill from the bottom of the trench to eight inches (8"), compacted depth, over the top of the pipe shall be backfilled with uniformly graded material with maximum size passing a one and one-eighth inch (1-1/8") screen. This material shall be uniformly jetted to ensure proper bedding of pipe. Backfill around underground electric lines must meet the specification of the responsible electrical utility.
- b. All trench backfill under existing or proposed roads shall be mechanically compacted in lifts no larger than 6 inches or water settling may be allowed under proposed roadway in new subdivisions per Soils Report. Backfill shall consist of material that has been screened with the largest rock being 2 inches. Backfill material shall be processed and have moisture incorporated to near optimum prior to placement in trench. All other trenches outside road section may be backfilled by water settling as noted in section 16.5.2d.
- c. All open cut trenches across existing asphalt or chip sealed roads shall be backfilled with a 1-sack slurry and patched with a minimum of 2 inch hot mix asphalt.
- d. Fill material in lifts not exceeding eight feet (8') in depth shall be leveled, the trench flooded and the material jetted to within one foot (1') of the

pipe with sufficient water to ensure filling of all voids with backfill material.

- e. Water settling is permitted beyond the limits of 16.5.2b with a required compaction of eighty-five percent (85%), or the natural compaction of the native material, whichever is higher.

16.5.3 Where an excavation meets the criteria of Section 16.5.2b above, the excavation shall be filled with A.B.C. or granular select material, placed at optimum moisture in lifts sufficiently thin to ensure required compaction for the full depth of the lift, and in no case greater than thirty inches (30") compacted depth, unless previously approved in writing by the County Engineer. Granular select material shall not exceed three inches (3") in diameter and shall be graded in such a manner as to ensure the exclusion of any and all voids in the backfill. The upper two feet (2') is to be mechanically compacted to not less than ninety-five percent (95%) of maximum density. Sufficient water may be added to raise the moisture content to optimum only. Below these two feet (2'), the material shall be compacted to not less than eighty-five percent (85%) of the maximum density for the backfill material as determined by AASHTO Test T-99. Field determination of density shall be made in accordance with AASHTO Test T-147 or other test procedure previously approved in writing by the County Engineer.

16.5.4 The minimum cover for utility lines shall be thirty-six inches (36") other than direct burial cable which shall be twenty-four inches (24"). Cover is defined as the difference in elevation between the top of the line or pipe and the ultimate gutter grade of the roadway.

For facilities outside the area defined in Section 16.5.2b above, cover is defined as the difference in elevation between the top of the line or pipe and the natural or regarded ground surface, whichever is lesser.

16.6 Compaction Test Reports

16.6.1 The cost of making compaction tests shall be paid by the owner or the contractor. The tests shall be made at the locations and depths specified by the County Engineer or his or her representative. A minimum of one set of tests shall be required for each one foot (1') of trench depth for trenches within the area defined in 16.5.2b above. The minimum number or passing tests per set anticipated to prove specification compliance may be estimated at the following rates:

- a. Pavement Cut Crossings – one (1) test per crossing.
- b. Pavement Cuts or Trenches within two feet (2') of pavement edge two (2) tests per five hundred lineal feet (500').
- c. At all other locations – one (1) test per four hundred lineal feet (400').

- d. Test may be taken at four-foot (4') vertical increments in the same vertical plane at the option of the Engineer of Record.
- e. Copies of all test reports shall be sent directly to the Engineer of Record from the testing laboratory, and to the Pinal County Public Works Inspection Section within five (5) days after tests are conducted.

16.6.2 Pavement Cutting and Restoration:

- a. All cuts in asphalt or concrete pavement shall have saw cut or neat and straight edges. Excavated pavement material shall be removed from the site.
- b. Pavement Cut Replacement: The asphaltic material used for replacement of pavement cuts shall conform to MAG Uniform Standard Specifications and Details for Public Works Construction.
 - 1. The thickness of the pavement and aggregate base replaced shall be consistent with the thickness of the existing asphalt pavement and base but shall not be less than two inches (2") of asphaltic pavement over nine inches (9"), compacted depth, of aggregate base compacted to one hundred percent (100%) of maximum density for the material.
 - 2. For Portland cement concrete paving cut replacement this same specification shall apply. The existing pavement shall be trimmed to a neat edge and the edge shall be treated with a proper emulsion to ensure a bond between the existing pavement and the patch.
- c. It is required that all roadway crossing of lines four inches (4") in diameter or less to be installed under pavement which is less than three (3) years old, be bored under the pavement.

16.6.3 Surface Restoration of Graveled or Earth Surfaced Roads: The surface replacement of gravel surfaced roads shall be consistent with the existing surface material in place, and consist of select material or A.B.C. as directed by the County Engineer.

Fill placed on existing gravel surfaced roads or earth surfaced roads to obtain minimum allowable cover over the pipe of utility lines shall be placed to proper grade for the full width of the existing roadway and shall be compacted and graded to the satisfaction of the County Engineer.

16.6.4 The Contractor shall secure a County Right-of-Way Use Permit prior to start of any construction operations within County right-of-way. The permit application must be submitted at least seven (7) working days before work is scheduled to begin.

- a. The permittee shall notify the property owner or resident of adjoining occupied property at least two (2) working days prior to disruption of access to the property, and at no time deny access to the property longer than one (1) normal working day, and shall provide plank for crossings, if necessary.
- b. The permittee shall maintain all existing traffic control signs within the construction area, and shall reset all signs in their original locations as soon as construction operations will permit. The permittee shall place and maintain traffic warning signs during the course of work, as required by the County Engineer.
- c. Only rubber-tired equipment shall be used on pavement except that crawler equipment using street pads may be used.
- d. Existing regulations of the Pinal County Environmental Health Department as applicable shall be rigidly observed and enforced. Water or approved dust palliative in sufficient quantities shall be applied during all phases of construction involving open earth work to prevent the unnecessary discharge of dust and dirt into the air.
- e. During the course of work, the permittee shall maintain the work area in a clean and orderly condition. Excess excavation, debris, etc., shall not be permitted to accumulate on the road surface or shoulders. Work shall progress in such a manner that no condition such as soft trenches, drop-offs from the edge of pavement, etc., shall exist. Upon completion of installation, the permittee shall clean the pavement surface, pull and dress shoulders, and otherwise put in order the entire work area to the satisfaction of the County Engineer. If said work is not completed in a manner acceptable to the County Engineer, the utility doing the work shall be held responsible and further permits shall not be issued pending the completion of the work.
- f. All work in County right-of-way shall be performed by a licensed contractor in the State of Arizona. The contractor shall show proof of liability insurance. Documents shall be submitted to Pinal County Public Works Inspection Section simultaneously with the permit application.
 - 1. Utility company and a licensed, bonded and insured contractor shall submit an application.
 - 2. Two sets of county approved utility plans.
 - 3. A copy of the contractor's license.

4. A copy of the contractor's insurance indicating Pinal County as additionally insured for a minimum of one million dollars (\$1,000,000.00).
5. A performance bond in the amount of five-thousand dollars (\$5,000.00) minimum or case bond in the amount of one thousand dollars (\$1,000.00) minimum or the cost of the job, whichever is greater.
6. A County approved Traffic Control Plan utilizing the Manual on Uniform Traffic Control Device Standards.

36"

24"

PINAL COUNTY COVERT SHEET FORMAT FOR TENTATIVE/FINAL PLATS

TENTATIVE/FINAL PLAT OF (PROJECT TITLE)

STATE OF ARIZONA
COUNTY OF PINAL
23
5"

A PORTION OF GILA AND SALT RIVER BASE AND MERIDIAN, PINAL COUNTY, ARIZONA
SECTION TOWNSHIP RANGE

OWNER
(COMPANY'S NAME)
STREET ADDRESS
CITY, STATE, ZIP

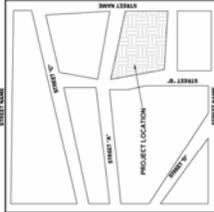
DEVELOPER
(COMPANY'S NAME)
STREET ADDRESS
CITY, STATE, ZIP

ENGINEER
(COMPANY'S NAME)
STREET ADDRESS
CITY, STATE, ZIP

VICINITY MAP

6	5	4	3	2	1
12	11	10	9	8	7
18	17	16	15	14	13
24	23	22	21	20	19
30	29	28	27	26	25
36	35	34	33	32	31

PROJECT SITE



LIEN HOLDER'S RATIFICATION

(IF ADDITIONAL SPACE IS NEEDED, CAN BE CONTINUED ON SECOND SHEET. ADD CONTINUATION NOTE ABOVE COMPANY NAME ON LOWER RIGHT CORNER OF SHEET.)

ACKNOWLEDGMENT

DECLARATION, TITLE WARRANTY, AND DEDICATION

(COVER SHEET ONLY)

ACKNOWLEDGMENT

NEARBY PUBLIC BY COMMISSION EXPENSES

NOTES

-
-
-

(COVER SHEET ONLY)

BENCHMARK

(COVER SHEET ONLY)

BASIS OF BEARINGS

(COVER SHEET ONLY)

LAND USE TABLE

ACRES

AREA OF TRACTS

AREA OF LOTS

TOTAL AREA OF LOTS

TOTAL AREA OF TRACTS

TOTAL AREA OF PROJECT

AVERAGE AREA PER LOT

TRACT TABLE

TRACT NAME

AREA

ACRES

GENERAL TRACT USES

ACRES

TOTAL

BASE ZONING

(COVER SHEET ONLY)

TYPICAL LOT LAYOUT & BUILDING SETBACKS

SERVICE PROVIDERS

LEGEND

(COVER SHEET ONLY)

LAND SURVEYOR'S CERTIFICATION

(COVER SHEET ONLY)

APPROVALS

(COVER SHEET ONLY)

(CONTINUATION NOTE FOR RATIFICATION (IF APPLICABLE))

ENGINEER COMPANY'S NAME

PROJECT TITLE

DATE PREPARED: -/-/

FORM #

SHEET 1 OF 1

00-000-S

EXHIBIT 3.1

SCREEN PLANTING OR BLOCK WALL AND ONE FOOT VEHICULAR NON-ACCESS EASEMENT PROTECT ADJACENT LOTS FROM STREET NOISE AND DUST AND PRESERVE THE TRAFFIC FUNCTION OF THE ARTERIAL ROUTE



SCHEMATIC SUBDIVISION

EXHIBIT 6.1

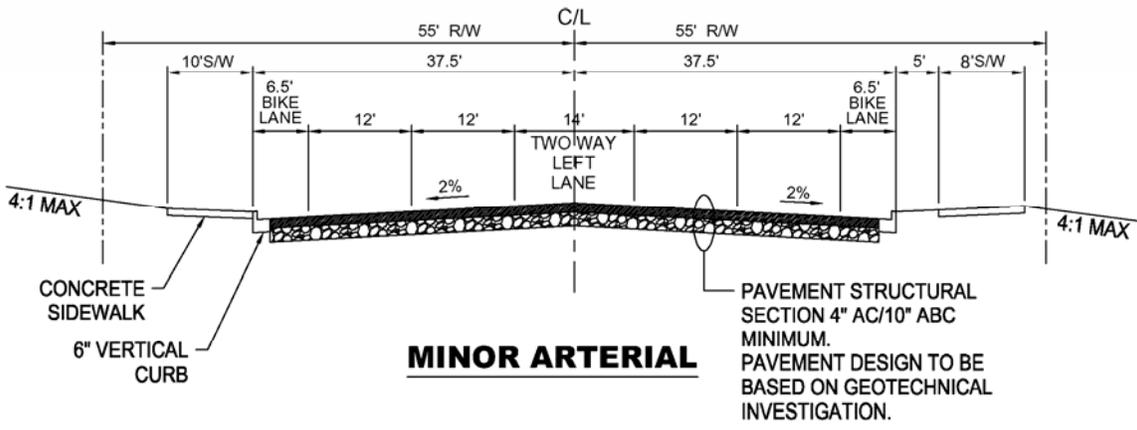
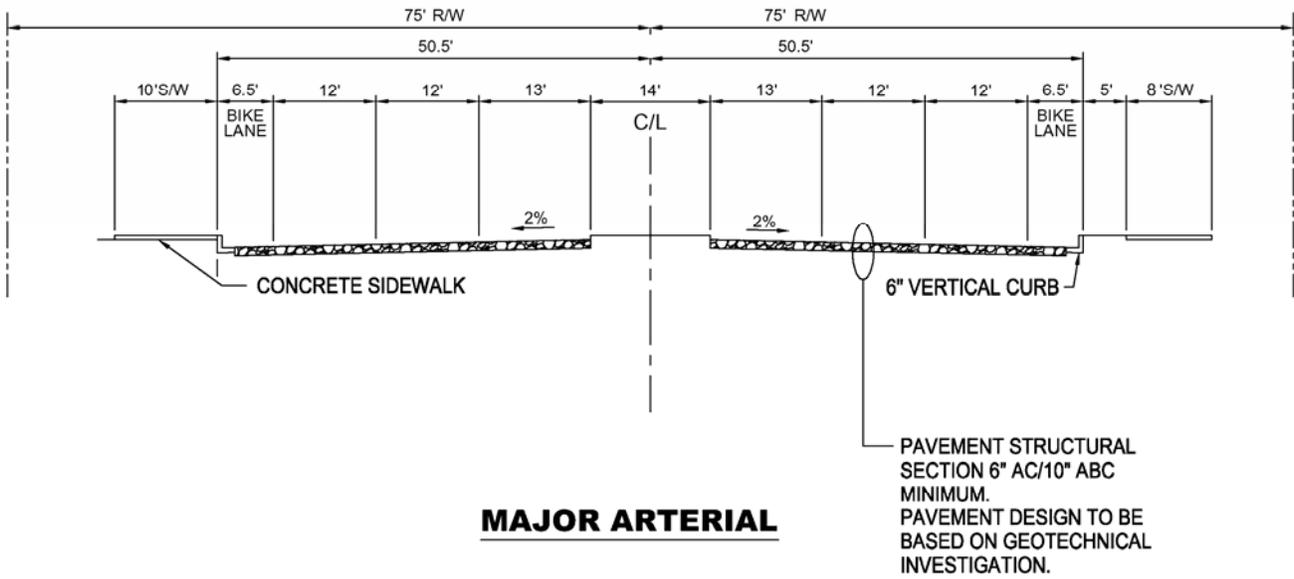


EXHIBIT 6.2

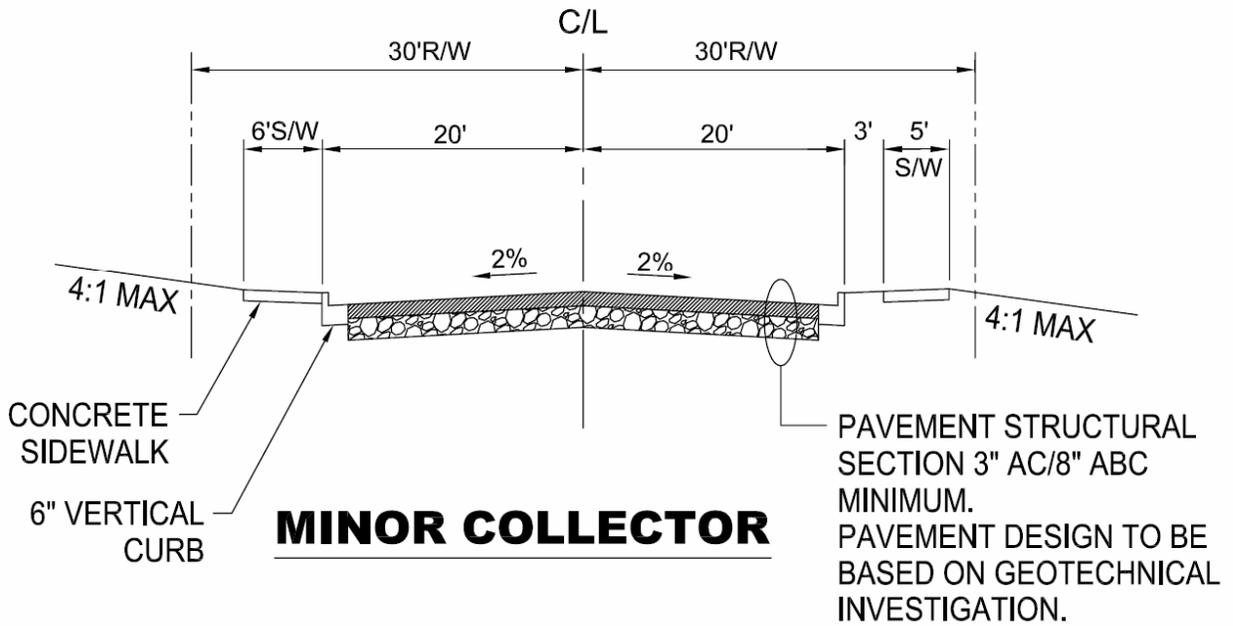
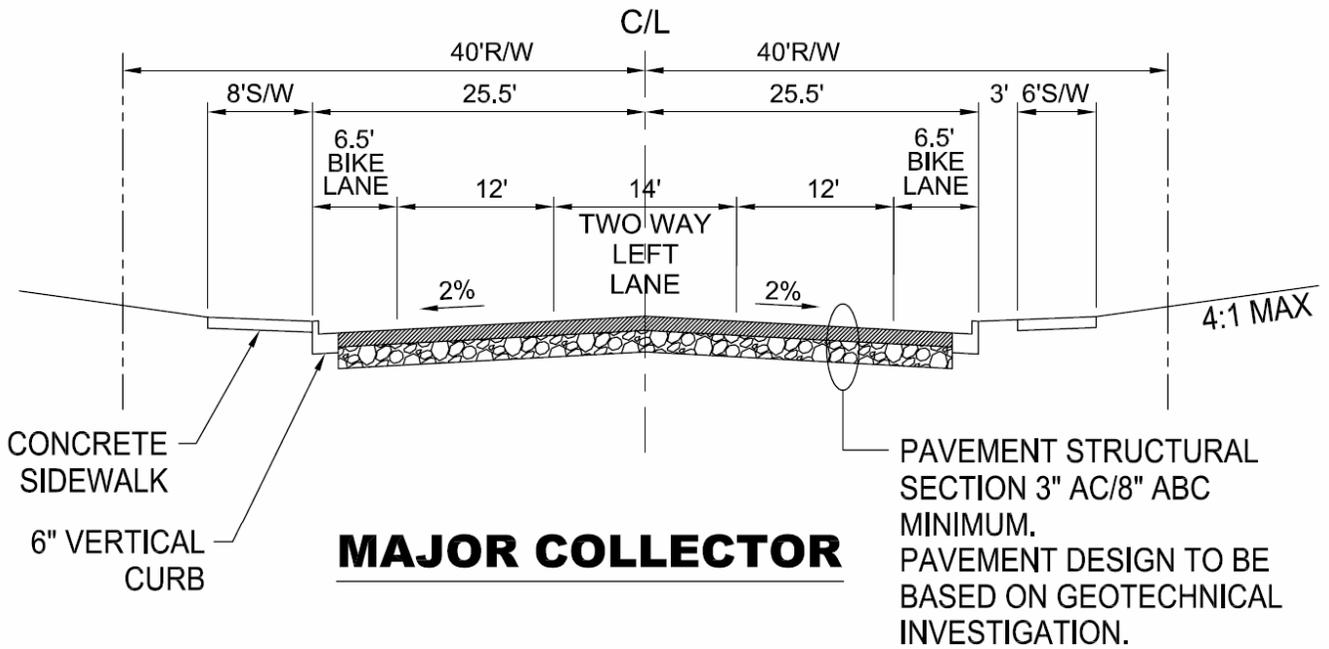
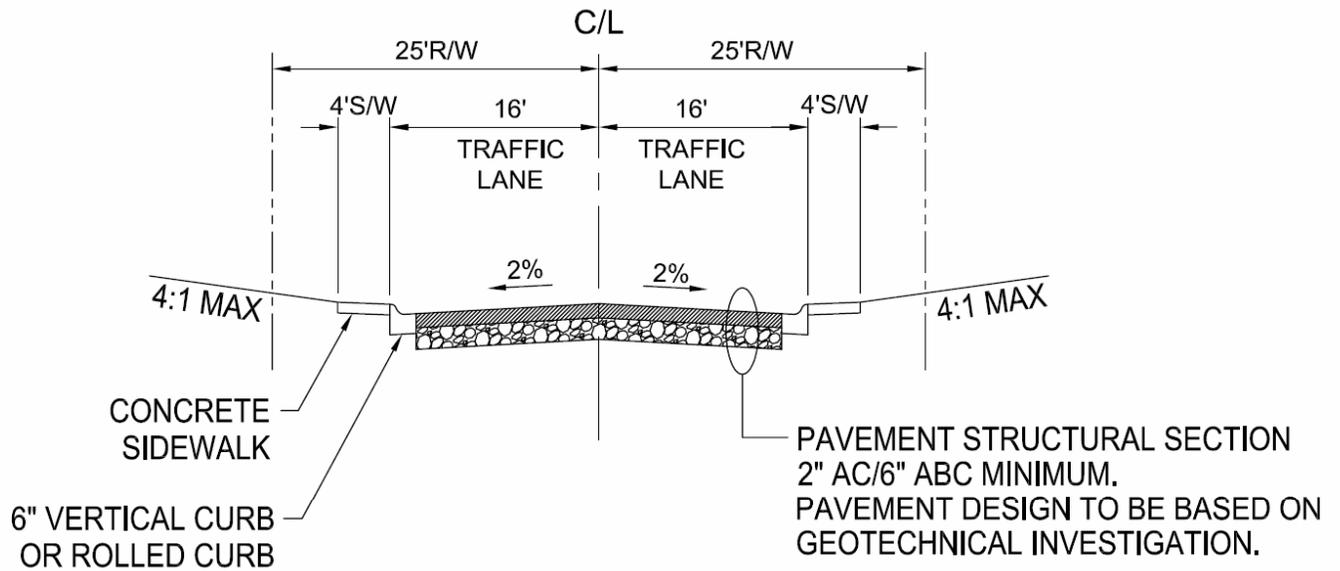
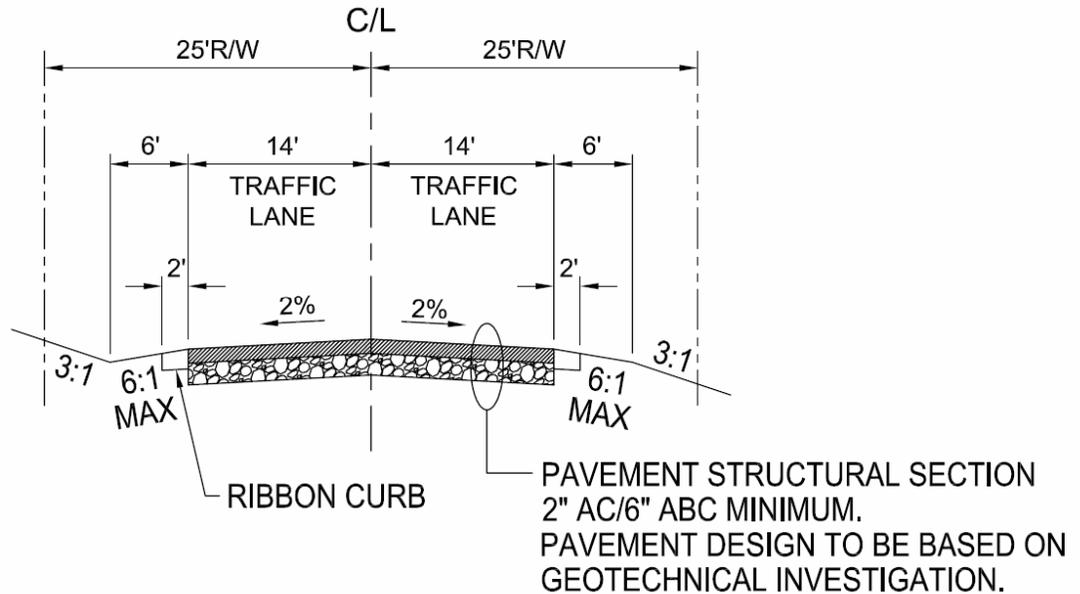


EXHIBIT 6.2 (CONT.)



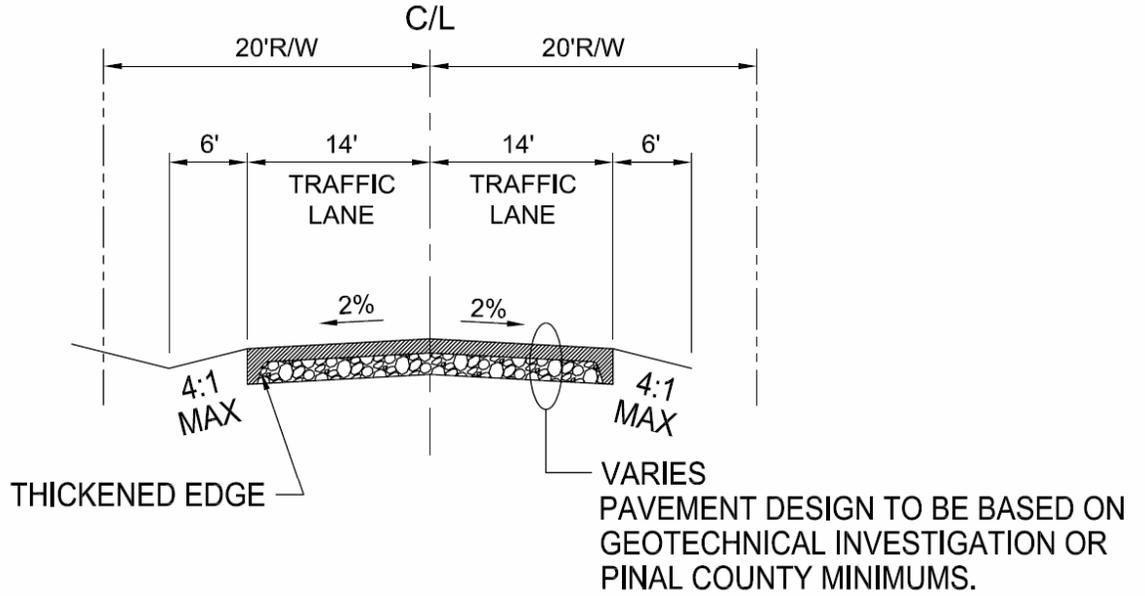
LOCAL STREET



LOW DENSITY LOCAL STREET

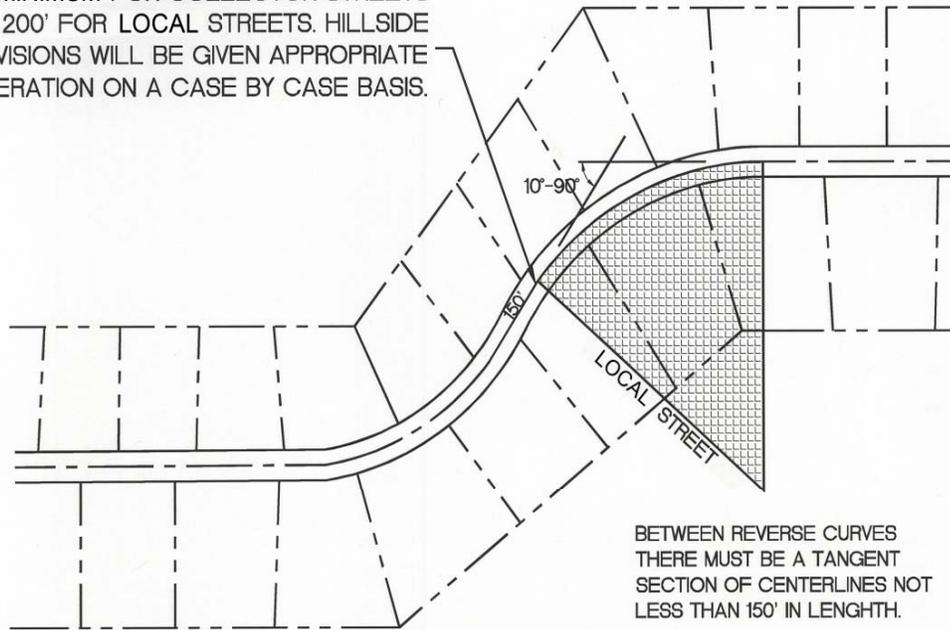
**LOTS 1 ACRE TO 3.33 ACRE AREA
WITH ON-LOT RETENTION**

EXHIBIT 6.2 (CONT.)



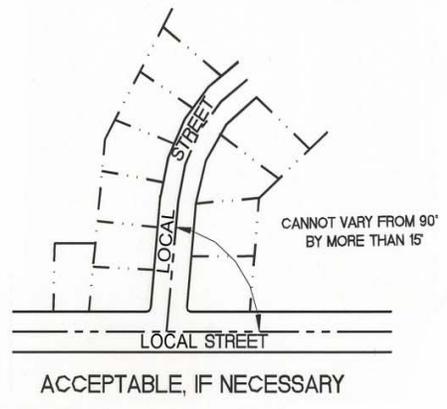
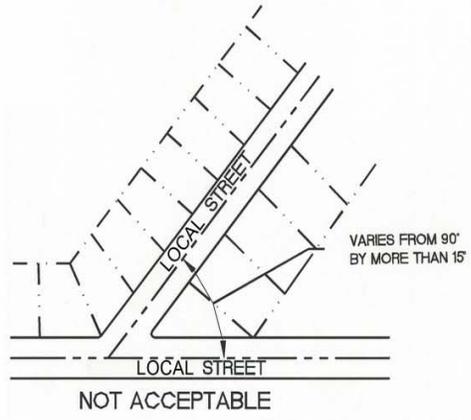
PAVED ALL-WEATHER PUBLIC ACCESS ROAD

WHEN TANGENT CENTERLINES DEFLECT MORE THAN 10° AND LESS THAN 90° THEY SHALL BE CONNECTED BY A CURVE WITH MINIMUM RADIUS EQUAL TO 300' MINIMUM FOR COLLECTOR STREETS AND 200' FOR LOCAL STREETS. HILLSIDE SUBDIVISIONS WILL BE GIVEN APPROPRIATE CONSIDERATION ON A CASE BY CASE BASIS.

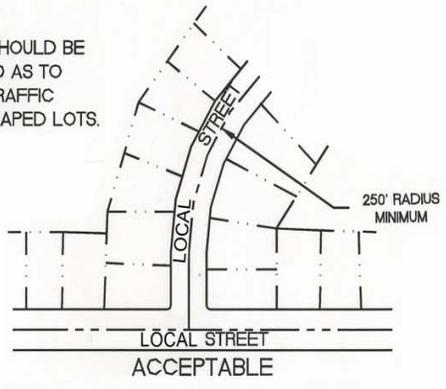


NOTE: HORIZONTAL ALIGNMENTS ON ARTERIAL ROUTES SHALL BE DETERMINED BY THE COUNTY ENGINEER.

CENTERLINE DEFLECTION AND REVERSE CURVES FOR COLLECTOR AND LOCAL STREETS



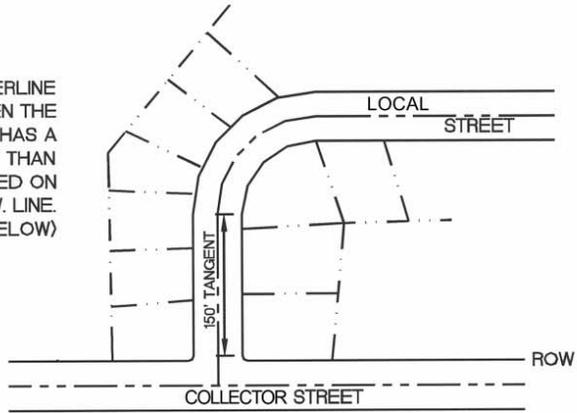
STREET INTERSECTIONS SHOULD BE CAREFULLY DESIGNED SO AS TO ELIMINATE DANGEROUS TRAFFIC MOVEMENTS AND ODD SHAPED LOTS.



ANGLE OF INTERSECTIONS FOR LOCAL STREETS

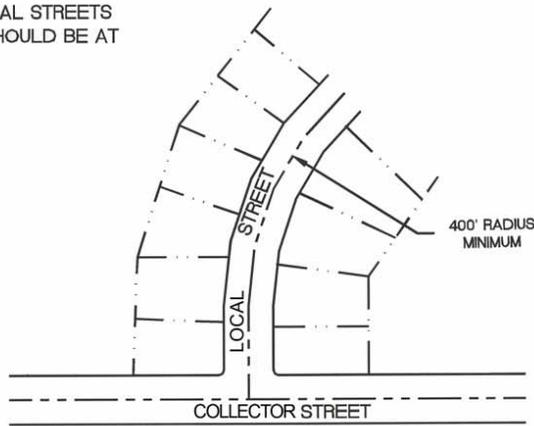
EXHIBIT 6.4

150' TANGENT SECTION OF CENTERLINE IS REQUIRED EXCEPT WHEN THE LOCAL STREET CURVE HAS A CENTERLINE RADIUS GREATER THAN 400' WITH THE CENTER LOCATED ON THE ARTERIAL STREET R.O.W. LINE. (SEE BELOW)



ACCEPTABLE

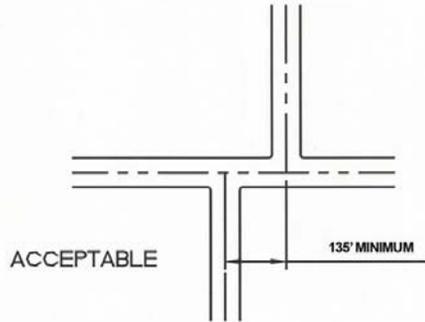
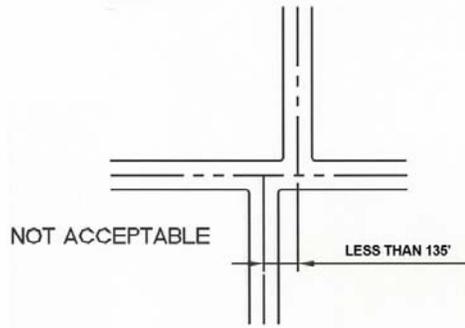
ALL INTERSECTION OF ARTERIAL STREETS AND COLLECTOR STREETS SHOULD BE AT RIGHT ANGLES.



ACCEPTABLE

ANGLE OF INTERSECTIONS FOR COLLECTOR STREETS

EXHIBIT 6.5



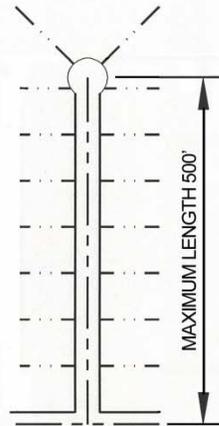
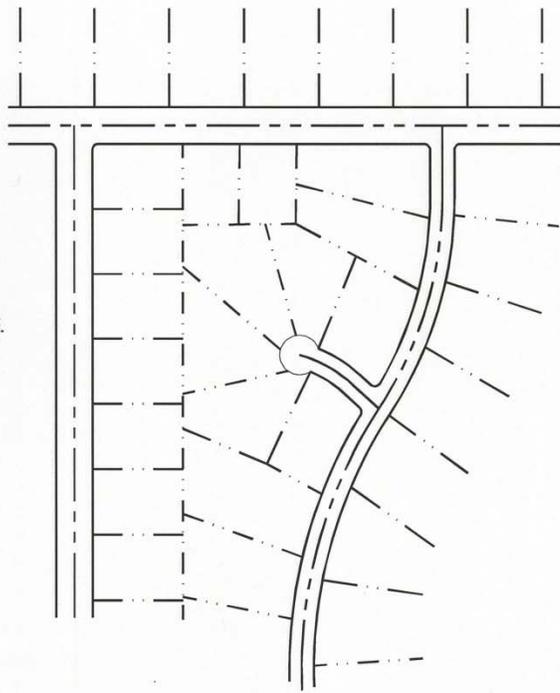
NOTE: HORIZONTAL ALIGNMENTS ON ARTERIAL ROUTES SHALL BE DETERMINED BY THE COUNTY ENGINEER.



**STREET JOGS
FOR
LOCAL AND COLLECTOR
STREETS**

EXHIBIT 6.6

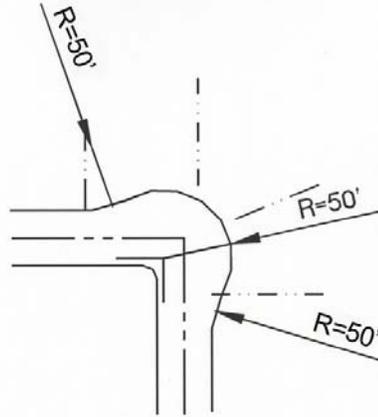
CUL-DE-SACS SHALL BE USED TO SERVE IRREGULAR AREAS OF A TRACT THAT WOULD OTHERWISE BE INACCESSIBLE. CUL-DE-SACS SHALL NOT BE USED EXCESSIVELY NOR AS A PRIMARY DESIGN FEATURE.



CUL-DE-SACS MAY NOT BE LONGER THAN 500 FEET AND SHALL TERMINATE IN A TURN-AROUND AT THE CLOSED END.

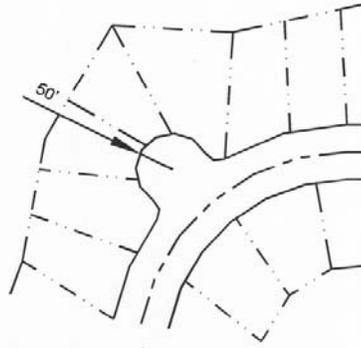
CUL-DE-SACS FOR LOCAL STREETS

KNUCKLE DESIGN AND LOTTING
ARRANGEMENT FOR RIGHT
ANGLE TURNS



ACCEPTABLE

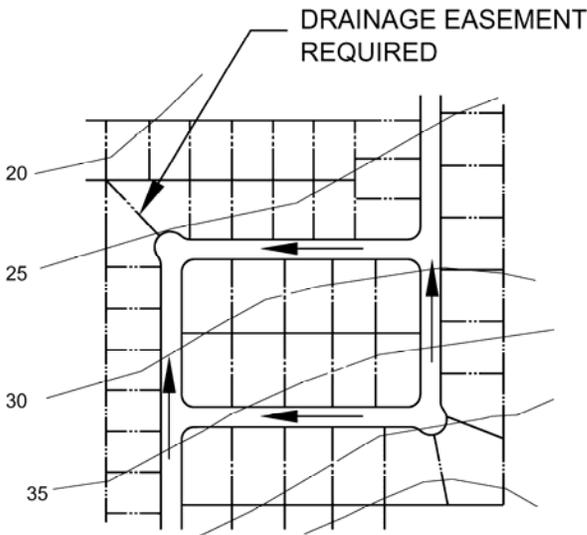
KNUCKLE DESIGN PROVIDES
FRONTAGE FOR ADDITIONAL
LOTS IN DEEPER PORTIONS
OF A BLOCK.



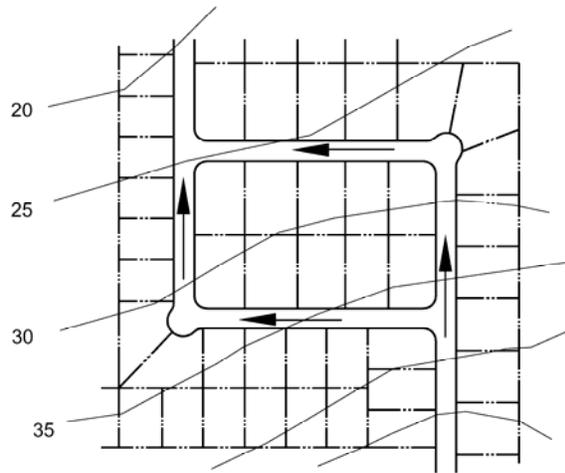
ACCEPTABLE

NOTE: KNUCKLE DESIGNS SHALL
NOT BE USED ON COLLECTOR
OR ARTERIAL STREETS.

KNUCKLE DESIGNS FOR LOCAL STREETS



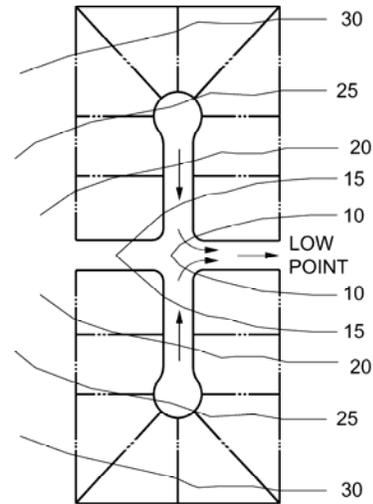
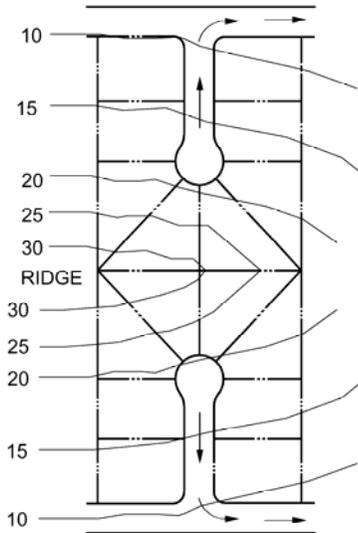
NOT ACCEPTABLE



ACCEPTABLE

STREETS SHOULD BE SO DESIGNED AND ARRANGED IN RELATION TO EXISTING TOPOGRAPHY AS TO FACILITATE DRAINAGE. PROPER DESIGN WILL ELIMINATE EXCESSIVE CUTS AND FILLS AND UNNECESSARY DRAINAGEWAYS BETWEEN LOTS.

STREETS SHOULD NOT BE USED AS PRIMARY DRAINAGE, UNLESS CURB AND GUTTER IS INSTALLED.



ACCEPTABLE

STREET DRAINAGE

FOR
LOCAL STREETS