

## **CHAPTER 6 - STREET DESIGN REQUIREMENTS**

### **601 GENERAL INFORMATION**

**601.1** This chapter describes the geometric requirements for any public and private street classification. The minimum requirements described herein are primarily based on safety considerations; therefore, standards that provide a greater degree of safety may be used.

**601.2** 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 sp MAG Uniform Standard Details.

### **602 STREET IMPROVEMENTS**

**602.1** All development projects within the City shall provide a paved interior street system adequate to ensure that all lots, tracts, parcels, or facilities within the development shall have improved access to the balance of the development and the public street system. Developer shall provide access into the development for public service and/or emergency operations.

**602.2** The developer is responsible for construction of all street improvements along the development'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 developer.

**602.3** A Paved All-Weather Public Access Road shall be installed for legal ingress and egress to the development from a paved public roadway as required by the City Engineer.

### **603 STREET CLASSIFICATIONS [15.32.20, 16.08.430, 16.08.420, 17.12.1400, 17.12.1410, 17.12.1420, 17.12.1430, 17.12.1440, 17.12.1450]**

**603.1** Casa Grande has eight (8) (or up to 13) basic classifications of streets. The location and street classification is determined as part of the site planning and platting process. The City Engineer and Planning Director will review each preliminary plat or preliminary development plan (site plan) and will specify any changes needed to conform with previously planned and approved street alignments. The City Engineer will also specify the classification for each street involved in the preliminary plat or preliminary development plan (site plan). Refer to **Figures 6-1 thru 6-8** for Street Cross Sections. All developments shall provide for public arterial and collector streets at their normal alignments or as determined by the City Engineer.

**603.2 Street Classifications (CG SATS).** Roads are classified based upon design and traffic

characteristics. Functional classification categorizes roads by how they perform in regard to providing access and mobility. A principal arterial, for example, provides mobility for longer distance trips with high speeds and minimal access to adjoining properties. Conversely, the function of a local street is to provide direct access to neighborhoods with lower speeds. These classifications are consistent with the City of Casa Grande General Plan 2010. The full functional classification definitions are defined below:

**603.2.1 Expressway:** This cross-section provides for the high-speed movement of large traffic volumes with no direct access to adjacent land. Expressways can be six, eight, or ten-lane roadways.

**603.2.2 Parkway:**

**603.2.3 Principal Arterial:** This facility serves regional circulation needs. It moves traffic at moderate speeds while providing limited access to adjacent land. Access is controlled through raised medians and through spacing and location of driveways and intersections. Generally, a principal arterial is a six- or four-lane facility. Principal arterials are provided at two-mile intervals in the Casa Grande Future Roadway Classification Plan.

**603.2.4 Minor Arterial:** This typical section is generally a four-lane and sometimes a two-lane roadway. Its purpose is to serve regional/sub-regional traffic circulation needs by moving traffic at moderate speeds while providing limited access to adjacent land. In the Casa Grande Future Functional Classification Plan, minor arterials are generally provided on the section line grid between the Principal Arterials.

**603.2.5 Major Collector:** This facility provides for shorter distance trips, generally less than three miles, and primarily serves to collect and distribute traffic between key traffic generators, local streets and arterial streets. This classification provides direct access to abutting land. **In Casa Grande, Major Collectors are located in the central commercial and residential core.**

**603.2.6 Minor Collector:** Minor Collectors serve shorter distance trips than the Major Collector, generally less than one mile. They provide direct access to adjacent land and collect and distribute traffic between key traffic generators, local streets and arterial streets. **In Casa Grande, Minor Collectors are located in the central commercial and residential core.**

**603.2.7 Local Streets:** The primary purpose of this roadway type is to serve residences and provide circulation to commercial, industrial, or other adjacent land.

**603.2.8 Rural:** This cross-section functions similarly to a local street, but in less densely developed areas. It typically includes cut ditches on each side to convey drainage.

**603.2.9 “Cul-de-sac”** means a short local street having but one end open for vehicular traffic, the opposite end being terminated with a permanent turn-around. (17.12.1440)

**603.2.10** “Alley” means a public service way used to provide secondary vehicle access to properties otherwise abutting upon a street. (17.12.1440)

**603.2.11** “Service street” means a street running parallel to a freeway, expressway or other roadway, and serving abutting properties. Also called Frontage Road. (17.12.1440)

**603.2.12** “Perimeter street” means a street running adjacent to the development boundaries. (17.12.1440)

**603.2.13** 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 Figures 6-1 thru 6-8. (17.12.1450)

## **604 SUBDIVISION STREET PLANNING**

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

**604.1** All streets shall conform to the City of Casa Grande Comprehensive Plan, City 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 City of Casa Grande 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.

**604.2** Street configuration shall conform to the Traffic Impact Analysis and preliminary plat or preliminary development plan as approved by the City Engineer and Planning Director.

**604.3** The developer 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.

**604.4** 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 City Engineer.

**604.5** Provisions shall be made for railroad and other public or private utility crossings necessary to provide access to or circulation within the proposed development, 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 developer.

**604.6** Adequate provisions shall be made in the design of developments for access to each lot or parcel, and for access to adjacent properties.

## **605 STREET RIGHT-OF-WAY REQUIREMENTS**

**605.1** 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.

**605.2** Additional Right-of-Way widths may be required in special circumstances for the following conditions:

**605.2.1** Cut or fill slopes cannot be confined within the typical right-of-way.

**605.2.2** Minimum sight distance lines on horizontal curves do not meet the standards.

**605.2.3** Minimum sight distances at intersections do not meet the standards.

**605.2.4** Auxiliary traffic lanes are required.

**605.2.5** Other conditions that may be required by the City Engineer.

**605.3** The minimum right-of-way requirements are defined in *Table 6.1 Roadway Design Guidelines*.

## **606 EASEMENTS AND DEDICATIONS**

**606.1** 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.

**606.2** 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.

## **607 PAVEMENT CROSS SECTION**

**607.1** The minimum pavement width requirements are defined in *Table 6.1 Roadway Design Guidelines*:

**607.2** The minimum pavement section requirements are defined in *Table 6.1 Roadway Design Guidelines*:

**607.3** 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 City Engineer.

**607.4** 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 City Engineer.

**607.5** Normal cross sections in street dip sections are discouraged. Where storm drainage runoff flows must cross the street, dip sections may be required. 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.

**607.6** All utility services to each lot of the development shall be installed prior to placement of pavement.

**607.7** Half-Street Improvements: Half-streets are to be avoided, except where essential to the reasonable development of the project 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 developer 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.

**607.8** Alleys are not permitted unless approved by the City Engineer.

## **608 DECORATIVE PAVING**

Decorative paving is not to be used without the City 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 City Engineer's approval.

## **609 CURB AND GUTTER**

**609.1** The minimum curb and gutter requirements are defined in Table 6.1 Roadway Design Guidelines follows;

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

**609.3** 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').

**609.4** 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.).

**609.5** Curb Return Radii for shall be in accordance with Table 6.2

**609.6** 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.

## **610 SIDEWALKS**

**610.1** Streets constructed to City of Casa Grande standards shall have sidewalks installed per Standard Street Cross Sections **Figures 6-1 thru 6-8** and MAG Standard Detail 230. Sidewalks shall be installed within the right of way or a sidewalk easement. Sidewalk Widths are defined in *Table 6.1 Roadway Design Guidelines*

**610.2** Sidewalks are not required for residential developments with lots one (1) acre ?? and greater in area nor in industrial developments.

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

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

## **611 HORIZONTAL ALIGNMENT**

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

**611.2** The minimum horizontal curve radius requirements are defined in *Table 6.1 Roadway Design Guidelines* for those cases when tangent centerlines deflect more than ten (10) degrees and less than ninety (90) degrees.

**611.3** 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.

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

**611.5** A tangent section must be provided between reverse curves as are defined in *Table 6.1 Roadway Design Guidelines*.

**611.6** A tangent section shall be provided between an intersection and a curve for all collector and arterial intersections are defined in *Table 6.1 Roadway Design Guidelines*.

**611.7** 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 are defined in *Table 6.1 Roadway Design Guidelines*.

**611.8** 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/developer and the general alignment cannot be changed. Superelevation greater than 2% may not be used except when approved by the City 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.

## **612 VERTICAL ALIGNMENT**

**612.1** The maximum longitudinal street grade requirements are defined in *Table 6.1 Roadway Design Guidelines*

**612.2** The minimum longitudinal street grade for ALL streets is 0.40% (PC 0.25% - requires special approval/surveying/testing)).

**612.3** A vertical curve is required when grade changes are greater than are defined in *Table 6.1 Roadway Design Guidelines*. ALL SECTIONS OF A STREET'S VERTICAL (AND

HORIZONTAL) ALIGNMENT MUST MEET PASSING AND STOPPING SIGHT DISTANCE REQUIREMENTS FOR THE DESIGN SPEED ESTABLISHED FOR THE STREET. For further details, see the AASHTO publication, A Policy on Geometric Design of Highways and Streets.

**612.4** 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.

4.32 Sight Distance: As a minimum, the sight distance requirements of [Detail G-448](#) shall be followed to provide adequate visibility on arterial and collector streets. The construction plans shall have the sight lines drawn on the plan sheets, along with a statement that the design meets the requirements of [Detail G-448](#). (Glendale)

## **613 INTERSECTIONS**

**613.1** 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.

**613.2** 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**.

**613.3** Street jogs with centerline offsets will be a minimum of 135 feet as shown in **Exhibit 6.6**.

*3.16.3 Lane/intersection alignment: Maximum offset of lanes across street intersections from each other is two (2) feet. The offset dimension is measured from the traffic lane centerline to the corresponding traffic lane centerline across the intersection.*

**613.4** (City code says 40' x 40') 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.

**613.5** ??????????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.

**613.6** Street intersections with more than four legs and y-type intersections where legs meet at acute angles are prohibited.

**613.7** Concrete valley gutters shall be constructed at all intersections where the drainage pattern requires them.

**613.7.1** Asphalt valley gutters will not be permitted.

**613.7.2** Valley gutters crossing a local street may be installed. Exceptions must be approved by the City Engineer.

**613.7.3** Valley gutters shall be constructed in accordance with MAG Uniform Standard Details.

**613.8** Intersections onto arterial streets shall be approximately at 1/4 mile intervals.

## **614 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 City Engineer may approve an equally convenient form of turnaround area where extreme conditions justify. Cul-de-sac streets shall not exceed the length (measured from the centerline of intersecting street) to the radius point of the turnaround as noted in *Table 6.1 Roadway Design Guidelines*. Cul-de-sac streets in excess of this distance must be approved by the City Engineer and the Fire Marshall. 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.

## **615 DEAD END STREETS**

**615.1** 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 development at all dead end streets.

**615.2** The maximum length of a dead end street shall be the same as that of a cul-de-sac street.

## **616 BLOCKS**

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

**616.1** Provision of sites suitable to the type of use contemplated.

**616.2** Zoning requirements as to lot sizes and dimensions.

**616.3** Need for convenient access, circulation, control and safety of street and pedestrian traffic.

**616.4** Limitations and opportunities of topography.

**616.5** Circulation within the development, and access to the community facilities.

**616.6** Lengths as long as practicable but not to exceed 1500 feet.

## **617 TURNING LANE 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 City 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.

**617.1** Right turn lanes shall be provided on arterial streets at all street intersections, where warranted per the Traffic Impact Analysis. At a minimum sufficient R/W shall be dedicated at all intersections of Major Arterial to Major Arterial.

**617.2** 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.

**617.3** 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.

**617.4** 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 City Engineer.

**617.5** 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.

**617.6** Deceleration lanes may be required on streets in conjunction with driveways per the approved Traffic Impact Analysis and may require additional right-of- way.

**617.7** In addition, deceleration lanes **are** required when both of the following factors are determined to apply:

**617.7.1** 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.

**617.7.2** At least 20 vehicles will be making right turns into the access way and 100 vehicle directional traffic during a one hour period.

## **618 DRIVEWAYS**

**618.1** Driveways are to be constructed in accordance with MAG Uniform Standard Details.

**618.2** 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.

**618.3** 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.

**618.4** 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 City Engineer.

**618.5** 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 City Engineer.

**618.6** Driveway profile standards are illustrated in MAG Uniform Standard Details.

**618.7** Driveway widths per MAG Uniform Standard Detail 250 or 251.

## **619 MULTI-USE TRAILS**

Trails constructed in City rights-of-way, such paths or trails must be approved by the City Engineer, and Parks and Recreation Department shall require a permit from the City of Casa Grande. Additional right of way will be required prior to approval to install a trail within the city's right-of-way.

## **620 EXISTING ADJACENT UNIMPROVED ROADS**

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

## **621 LOCAL STREET DRAINAGE (15.32.130)**

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**.

## **622 STREET NAME SIGNS (16.16.190)**

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

## **623 SURVEY MONUMENTS (16.16.030)**

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 developer at no cost to the City at locations as shown on the approved plans or as required by the City of Casa Grande Public Works Department.

## **624 TRAFFIC SIGNALS (See Chapter 15 for additional traffic signal criteria.)**

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.

## **625 PAVING IMPROVEMENT PLAN REQUIREMENTS**

The following requirements are for Paving Improvement Plan Submittal to City of Casa Grande:

### **625.1 Cover Sheet**

**625.1.1** Blue Stake notification.

**625.1.2** 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.

**625.1.3** Case number (S-000-00) at the lower right hand corner.

**625.1.4** Vicinity map with North arrow and section data.

**625.1.5** Index of plan sheets if more than one plan sheet.

**625.1.6** Developer's name, address, and telephone number.

**625.1.7** Engineer's name, address, and telephone number

**625.1.8** Engineer's stamp – signed and dated.

**625.1.9** Legend identifying all grades, symbols, lines, etc.

**625.1.10** Quantities.

**625.1.11** Basis of bearings and benchmark (NAVD 88 datum).

**625.1.12** Sheet numbering format - "1 of XX" where XX is total amount of sheets.

**625.1.13** 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)

## **625.2** 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.

**625.2.1** Developer shall obtain a City of Casa Grande Right-of-Way Use Permit prior to any work being performed within the City right of way. Contact City of Casa Grande Public Works Inspection Section at least seven (7) working days prior to work.

**625.2.2** All work required to complete the construction covered by these plans shall be in accordance with MAG Standard Specifications and Details.

**625.2.3** All frames, covers, valve boxes, and manhole covers shall be adjusted to finished grade prior to completion of paving or related construction.

**625.2.4** Contractor is responsible for Blue Stake marking as construction is in progress.

**625.2.5** All residents to be notified in person 24 hours prior to driveway crossing.

**625.2.6** Traffic control and barricading shall be according to the Manual on Uniform Traffic Control Devices or City of Casa Grande requirements.

**625.2.7** Contractor shall submit a Traffic Control plan to City of Casa Grande Public Works Inspection Section at least three (3) working days prior to work for review and approval.

**625.2.8** Any work on arterial or collector roads shall require an off-duty City of Casa Grande Officer for traffic control. Contact shall be made through the CASA GRANDE POLICE representative.

**625.2.9** Any work done in a drainage channel or wash must comply with state and federal regulations.

**625.2.10** A Stormwater Pollution Prevention Plan (SWPPP) shall be submitted to City of Casa Grande Public Works Department prior to issuance of construction permits.

**625.2.11** Plan approval is valid for twelve (12) months from the date of City approval. If approval expires, the plans must be resubmitted to City of Casa Grande Public Works Department for update review and re-approval.

**625.2.12** The following notes are required when special preservation or hillside issues are involved:

**625.2.12.1** Before grading in areas containing native desert vegetation, the Contractor must obtain a permit from Arizona Department of Agriculture.

**625.2.12.2** 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.

### **625.3 Plan and Profile Paving Sheet Requirements**

**625.3.1** Drawing Scale (minimum): 1" = 40' horizontal and 1" = 4' vertical. Depending on complexity of design, a larger drawing scale may be required.

**625.3.2** 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.

**625.3.3 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)

**625.3.4** A 21'x 21' (local to local) or 33'x 33' (for all others) sight visibility triangle easement (SVTE) all intersections.

**625.3.5** Typical Roadway Cross Sections shall indicate street names and station to station if more than one section is used for a street.

**625.3.6** Property line minimum radii: 25' or 33' (for all arterial intersections). No chords.

**625.3.7** Intersection spacing along an arterial - approximately 1,320' (1/4 mile)

**625.3.8** Avoid street jogs with centerline offsets of less than 135'. On arterials, intersecting streets should align if possible.

**625.3.9** Local streets not allowed to intersect with an arterial street.

**625.3.10** Residential lots shall front only local streets.

**625.3.11** Have intersections as nearly as possible at right angles and in no case at less

than 75°.

**625.3.12** 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.

**625.3.13** 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.

**625.3.14** Locations, dimensions, and purposes of any existing and proposed easements. Show ROW, existing and proposed pavement, curbs, and sidewalk with width dimensioned.

**625.3.15** Show all existing and new utilities in the roadway.

**625.3.16** Show centerline survey data.

**625.3.17** Label sheet reference with station numbers at all match lines.

**625.3.18** Label station and centerline spot elevation at intersections.

**625.3.19** 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.

**625.3.20** Station numbers shall be shown at all changes in street alignment, curb returns, and grade breaks.

**625.3.21** Minimum separation between sidewalk ramps and driveways shall be 5'.

**625.3.22** 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.

**625.3.23** Provide typical street cross section. (show cross slopes of roadway and sidewalks and required pavement section).

**625.3.24** Pavement cross slope: 2% min.

**625.3.25** Minimum longitudinal street grade is 0.25%.

**625.3.26** 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%.

**625.3.27** Transitions in roadway cross slopes shall be indicated on the plan view.

**625.3.28** 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. Cover less than 1' requires approval of the City Engineer.

**625.3.29** All plans revised after the original approval shall be submitted to City of Casa Grande 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. City of Casa Grande Engineer's Re-Approval block indicating the delta revision shall be placed on the cover sheet.

**625.3.30** If a portion of the street improvements for this development is within the jurisdiction of the State, County, another City or Town, plans are subject to review and approval by that public agency. Prior to or concurrent to approval by the City of Casa Grande.

TABLE 6-1 (CG Eng Des Man)  
ROADWAY DESIGN CRITERIA

Criteria	Functional Classification													
	Parkway <del>Expressway</del>	Principal Arterial	Minor Arterial	Major Collector	Minor Collector	Local					Alternative Local			
						Urban (1)	Urban (2)	Rural	Paved All-Weather Public Access Road	Local - Half Street	Urban (1)	Urban (2)	Alley)	Culdesac
Right-of-Way Width	300'	140' (130')	110'	80'	60'	44'	38'	40'	40'	(30)	50'	44'		(40')
Street Width (to back of curb)	138'	102' (93')	74'	50' (48')	36' (48')	32' (36')	26' (36')	24' (36')	24' (36')	(24)	32' (36')	26' (36')		(f)
Pavement Width	2 x 54'	2 x 42'	70'	46'	32'	28'	22'	24'	24'		28'	22'		(f)
Edge Treatment	Shoulders	Vertical Curb	Vertical Curb	Vertical Curb	Vertical Curb	Roll Curb/ Vertical Curb	Roll Curb/ Vertical Curb	Shoulder (w/Thickened Edge Pavement)/ Drainage Ditch	Shoulder (w/Thickened Edge Pavement)/ Drainage Ditch	Roll Curb/ Vertical Curb	Roll Curb/ Vertical Curb	Roll Curb/Vertical Curb		(f)
Sidewalk (both sides)	None	6' (5')	6' (5')	5' (4')	5' (4')	4'	4'	None	None	4'	4'	4'		(f)
Design Speed	75 mph	55 mph	45 mph	40 mph	35 mph	30 mph	30 mph	30 mph	30 mph	30 mph	30 mph	30 mph		(f)
Speed Limit	55 mph	40 mph (45)	35 mph (40)	35 mph	25 mph (35)	25 mph	25 mph	25 mph	25 mph	25 mph	25 mph	25 mph		(f)
Design ADT	120000	45000	30000	10000	8000	1000	1000	1000	1000	1000	1000	1000		(f)
(Minimum Radius)		750	575	400	400	150	150	150	150	150	150	150	150	(f)
(Min Tangent Btwn Compound Curves)														(f)
(Min Tangent Btwn Rev Curves)		(280')	(270')	(200' - (2 Lanes))	(200' - (2 Lanes))	(150')	(150')	(150')	(150')	(150')	(150')	(150')	(150')	(f)
(Min Sight Distance)		(475')	(400')	(325')	(325')	(175')	(175')	(175')	(175')	(175')	(175')	(175')	(175')	(f)
Sight Visibility Triangle Required/Size		33' x 33'	33' x 33'	33' x 33'	33' x 33'									(f)
Min Sight Distance ASSHTO Stds = ???														(f)
Longitudinal Slope - Maximum	6%	6%	6%	7%	7%	9%	9%	9%	9%	9%	9%	9%	9%	(f)
Longitudinal Slope - Minimum (Special approval/surveying/testing required)	0.40 % (0.25%)	0.40 % (0.25%)	0.40 % (0.25%)	0.40 % (0.25%)	0.40 % (0.25%)	0.40 % (0.25%)	0.40 % (0.25%)	0.40 % (0.25%)	0.40 % (0.25%)	0.40 % (0.25%)	0.40 % (0.25%)	0.40 % (0.25%)	0.40 % (0.25%)	(f)
Vertical Curve Required When Slope Diff is Equal to or Greater than		1%	1%	2%	2%	3%	3%	3%	3%	3%	3%	3%	3%	(f)
Minimum Length of Vertical Curve	Per ASSHTO													
Minimum Interval Between Full Median Breaks		1320'	1320	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(f)
Right Turn Bay Required?														(f)
(Min Curb Radii (B/C))		(50')	(50')	(30')	(30')	(20')	(20')	(20')	(20')	(20')	(20')	(20')	(20')	(f)
Minimum Pavement Section (AC/ABC)														(f)
Street Purpose	Mobility	Mobility	Mobility	Access/Mobility	Access	Access	Access	Access	Access	Access	Access	Access	Access	(f)
Parking	Not Allowed	Not Allowed	Not Allowed	Not Allowed	Not Allowed	Allowed	Not Allowed	Not Allowed	Not Allowed	Allowed	Allowed	Not Allowed	Not Allowed	(f)
Property Access	None	Major Driveway Only	Major Driveway Only	Individual Driveway Head Out	Restricted	Individual Driveway Back Out Ok	Individual Driveway Back Out Ok	Individual Driveway Back Out Ok	Individual Driveway Back Out Ok	Individual Driveway Back Out Ok	Individual Driveway Back Out Ok	Individual Driveway Back Out Ok	Individual Driveway Back Out Ok	(f)

Notes:	
Minimum Turn-Around (local streets only)	
(a) Right-of-Way Diameter	100
(b) Pavement Diameter	88
(c) Center Island Diameter (if required)	30
Maximum Length of Cul-de-Sac (Dead End)	
(d) Permanent	600
(e) Temporary	100
(f) Based on functional classification of street	