
5. Trail Development Standards

- 5.1 Applicability:** These Development Standards shall apply to the construction of all new Community Trails and Neighborhood Trails as identified in this Master Plan and as may be required by City of Casa Grande ordinances, codes, development standards, or project-specific development agreements.
- 5.2 Definitions - Community Trail System:**
- Community Trail System: The network of trails shown on the Trail System Map (Figure 2-A) included herein. This system of trails is intended to: connect various neighborhoods within the planning area, provide opportunities for public recreation, and provide opportunities for alternative modes of transportation.
- Linear Park: A component of the Community Trail System consisting of a broad open-space corridor with a paved path, a soft surface path, landscape improvements, and other amenities as identified herein. The features of a Linear Park are as described in the Master Plan narrative and as illustrated in Figures 2-H, 2-O, 2-P, 2-Q, and 2-R.
- Community Trail: A component of the Community Trail System consisting of an open-space corridor with a paved path, a soft surface path, landscape improvements, and other amenities as identified herein. The features of a Community Trail are as described in the Master Plan narrative and as illustrated in Figures 2-I, 2-S, 2-T, 2-U, 2-V, 2-W, 2-X, and 2-Y.
- Spur Trail: A component of the Community Trail System consisting of a paved path, a soft surface shoulder, landscape improvements, and other amenities as identified herein. The features of a Spur Trail are as described in the Master Plan narrative and as illustrated in Figures 2-J and 2-Z.
- Rural / Unpaved Trail: A component of the Community Trail System consisting of a natural surface trail, native or constructed landscape improvements, and other amenities as identified herein. The features of a Rural / Unpaved Trail are as described in the Master Plan narrative and as illustrated in Figures 2-K, and 2-AA.

5. Trail Development Standards

Primitive Trail: A component of the Community Trail System consisting of an natural surface trail and other minor improvements as identified herein. The features of a Primitive Trail are as described in the Master Plan narrative and as illustrated in Figures 2-L and 2-BB.

Community Trailhead: A feature of the Community Trail System consisting of an a developed parking area with provisions for both cars and truck/equestrian trailer rigs with structures and other amenities as identified herein. The features of a Community Trailhead are as described in the Master Plan narrative and as illustrated in Figure 2-CC.

5.3 Definitions - Natural Resource Trail Parks

Natural Resource / Trail Park: A tract of land that is owned by the City of Casa Grande, other public agency, or private entity, that remains in an undeveloped, natural conditions except for the construction of trails, trailheads, and related improvements. The features of a Natural Resource / Trail Park are as described in the Master Plan narrative.

5.4 Definitions - Neighborhood Trail System

Neighborhood Trail System: The network of trails that will be developed within individual Planned Area Developments, residential subdivisions, and/or other development projects. This system of trails is intended to provide residents with opportunities for public recreation in the immediate vicinity of their homes and to provide connections between residential areas and the Community Trail System. All elements of the Neighborhood Trail System shall be designed, engineered, constructed, operated, and maintained by private entities in accordance with the guidelines included herein and other applicable City codes, standards, regulations, and agreements.

Primary Neighborhood Trail: An element of the Neighborhood Trail System consisting of an open-space corridor with a paved path, a soft surface shoulder, landscape improvements, and other amenities as identified herein. The features of a Primary Neighborhood Trail are as described in the Master Plan narrative and as illustrated in Figures 4-A and 4-D.

5. Trail Development Standards

Secondary Neighborhood Trail: An element of the Neighborhood Trail System consisting of an open-space corridor with a paved path, landscape improvements, and other amenities as identified herein. The features of a Secondary Neighborhood Trail are as described in the Master Plan narrative and as illustrated in Figures 4-B and 4-D.

5.5 General Requirements for Community and Neighborhood Trails:

The following requirements shall apply to the planning and design of trails, trailheads, and related improvements.

1. All trails and related facilities shall be designed with consideration given to the principles of Crime Prevention through Environmental Design (CEPTD) as published by Crime Prevention Council.
2. To the degree required by federal law, state statute, and local ordinance, all trails shall be accessible as defined by the Americans with Disabilities Act and related design guidelines.
3. All trails and related facilities shall be physically separated from attractive nuisances such as railroad tracks, roadways, utility areas, and basins where standing water may accumulate.
4. The landscape development associated with trails shall be appropriate for the Sonoran Desert environment. Landscape developments shall emphasize the use of drought-tolerant and low-water use plants. Emphasis shall also be given to the use of trees that will provide abundant shade when mature.

5. Trail Development Standards

5.6 Facility Program Linear Parks:

All Linear Parks shall include the facilities and features listed below.

Corridor:

Typical Corridor Width 100'

Paths / Trails:

Paved Path Continuous / Concrete / 10' Wide

Soft Surface Trail Continuous / Fine Aggregate / 8' Wide

Access Control:

Fences / Access Barriers As-Needed / Determined by City

Lighting:

Pathway Lighting Continuous / Dusk to Closing Time

Trailhead Lighting Dusk to Closing Time

Access Point Lighting Optional / Dusk to Closing Time

Ramada Lighting Dusk to Closing Time

Trailheads:

Community Trailheads As identified in Master Plan

Public Access Points At ½ Mile Intervals (Typical)

Buildings:

Rest Rooms At Community Trailheads

Ramadas At 1 Mile Intervals (Typical)

Landscape Development:

Trees 25 Per Acre - Gross Corridor Area (Typical)

Shrubs As-appropriate for Trail Segment

Cacti and Accent Plants As-appropriate for Trail Segment

Irrigation System Automatic Drip System
(per std. horticultural practices)

Other Features:

Trail Identification Signs At all Trailheads / Entries

Trail Map / Use Regulation Signs At all Trailheads / Entries

Drinking Fountains At Restrooms, with Chilled Water

Benches 5 Per Mile / Clustered

Picnic Tables 4 Per Ramada

Trash Receptacles ... At all Trailheads / Entries identified by City

Access Control Bollards At location identified by City

5. Trail Development Standards

5.7 Facility Program Community Trails:

All Community Trails shall include the facilities and features listed below.

Corridor:

Typical Corridor Width 50'

Paths / Trails:

Paved Path Continuous / Concrete / 10' Wide

Soft Surface Trail Continuous / Fine Aggregate / 8' Wide

Access Control:

Fences / Access Barriers As-Needed / Determined by City

Lighting:

Pathway Lighting As Needed / Determined by City

Trailhead Lighting As Needed / Determined by City

Access Point Lighting As Needed / Determined by City

Ramada Lighting As Needed / Determined by City

Trailheads:

Community Trailheads As identified in Master Plan

Public Access Points At ½ Mile Intervals (Typical)

Buildings:

Rest Rooms At Community Trailheads

Ramadas Optional / At Access and Gathering Areas

Landscape Development:

Trees 20 Per Acre Gross Corridor Area (Typical)

Shrubs As-appropriate for Trail Segment

Cacti and Accent Plants As-appropriate for Trail Segment

Irrigation System Automatic Drip System
(per std. horticultural practices)

Other Features:

Trail Identification Signs At all Trailheads / Entries

Trail Map / Use Regulation Signs At all Trailheads / Entries

Drinking Fountains At Restrooms with, Chilled Water

Benches 5 Per Mile / Clustered

Picnic Tables 4 Per Ramada

Trash Receptacles ... At all Trailheads / Entries identified by City

Access Control Bollards At locations identified by City

5. Trail Development Standards

5.8 Facility Program Spur Trails:

All Spur Trails shall include the facilities and features listed below.

Corridor:

Typical Corridor Width 25'

Paths / Trails:

Paved Path Continuous / Concrete / 10' Wide

Soft Surface Trail Continuous as 3' Wide Shoulder

Access Control:

Fences / Access Barriers As-Needed / Determined by City

Lighting:

Pathway Lighting As Needed / Determined by City

Trailhead Lighting As Needed / Determined by City

Access Point Lighting As Needed / Determined by City

Ramada Lighting As Needed / Determined by City

Trailheads:

Community Trailheads As identified in Master Plan

Public Access Points At ½ Mile Intervals (Typical)

Buildings:

Rest Rooms At Community Trailheads

Ramadas Optional / At Access and Gathering Areas

Landscape Development:

Trees 20 Per Acre Gross Corridor Area (Typical)

Shrubs As-appropriate for Trail Segment

Cacti and Accent Plants As-appropriate for Trail Segment

Irrigation System Automatic Drip System
(per std. horticultural practices)

Other Features:

Trail Identification Signs At all Trailheads / Entries

Trail Map / Use Regulation Signs At all Trailheads / Entries

Drinking Fountains At Restrooms with, Chilled Water

Benches 5 Per Mile / Clustered

Picnic Tables 4 Per Ramada

Trash Receptacles ... At all Trailheads / Entries identified by City

Access Control Bollards At locations identified by City

5. Trail Development Standards

5.9 Facility Program Rural / Unpaved Trails:

All Rural / Unpaved Trails shall include the facilities and features listed below.

Corridor:

Typical Corridor Width 25'

Paths / Trails:

Paved Path Not Required

Soft Surface Trail Native Soil / 8' Wide

Access Control:

Fences / Access Barriers As-Needed / Determined by City

Lighting:

Pathway Lighting Not Required

Trailhead Lighting As-Needed / Determined by City

Access Point Lighting Not Required

Ramada Lighting Not Applicable

Trailheads:

Community Trailheads As identified in Master Plan

Public Access Points At ½ Mile Intervals (Typical)

Buildings:

Rest Rooms At Community Trailheads

Ramadas Not Required

Landscape Development:

Trees As-Needed / Determined by City

Shrubs As-Needed / Determined by City

Cacti and Accent Plants As-Needed / Determined by City

Irrigation System Automatic Drip System for new plantings
(Per std. horticultural practices)

Other Features:

Trail Identification Signs At all Trailheads / Entries

Trail Map / Use Regulation Signs At all Trailheads / Entries

Drinking Fountains Not Required

Benches Not Required

Picnic Tables Not Required

Trash Receptacles ... At all Trailheads / Entries identified by City

Access Control Bollards At locations identified by City

5. Trail Development Standards

5.10 Facility Program - Primitive Trails:

All primitive trails shall be developed to be in substantial compliance with the standards and recommendations as published by the International Mountain Bicycling Association (IMBA) and shall include the facilities and features listed below.

Corridor:

Typical Corridor Width Not Applicable

Paths / Trails:

Paved Path Not Applicable

Soft Surface Trail Native Soil / 3' Wide (Min.) 6' Wide (Max.)

Access Control:

Fences / Access Barriers As-Needed / Determined by City

Lighting:

Trailhead Lighting As-Needed / Determined by City

Access Point Lighting Not Applicable

Ramada Lighting Not Applicable

Trailheads:

Community Trailheads As identified in Master Plan

Public Access Points At 1 Mile Intervals (Typical)

Buildings:

Rest Rooms At Community Trailheads

Ramadas Not Required

Landscape Development:

Trees Not Applicable

Shrubs Not Applicable

Cacti and Accent Plants Not Applicable

Irrigation System Not Applicable

Other Features:

Trail Identification Signs At all Trailheads / Entries

Trail Map / Use Regulation Signs At all Trailheads / Entries

Drinking Fountains Not Required

Benches and Picnic Tables Not Required

Trash Receptacles At all Trailheads / Entries identified by City

Access Control Bollards At locations identified by City

5. Trail Development Standards

5.11 Facility Program Primary Neighborhood Trails:

All Primary Neighborhood Trails shall include the facilities and features listed below.

Corridor:

Typical Corridor Width 50'

Paths / Trails:

Paved Path Continuous / Concrete / 10' Wide

Soft Surface Trail Continuous / Aggregate / 3' Wide Shoulder

Access Control:

Fences / Access Barriers As-Needed / Determined by City

Lighting:

Pathway Lighting Not Required

Trailhead Lighting Dusk to Closing Time

Access Point Lighting Not Required

Ramada Lighting Not Applicable

Trailheads:

Public Access Points At ¼ Mile Intervals (Typical)

Buildings:

Rest Rooms Not Required

Ramadas Optional / At Access and Gathering Areas

Landscape Development:

Trees 15 Per (Gross Corridor) Acre (Typical)

Shrubs As-appropriate for Trail Segment

Cacti and Accent Plants As-appropriate for Trail Segment

Irrigation System Automatic Drip System for new plantings
(Per std. horticultural practices)

Other Features:

The developer shall provide three or more of the following items per mile of trail, as deemed appropriate for the subject project.

Trail Identification Signs Three (3) per mile

Trail Map / Use Regulation Signs Two (2) per mile

Drinking Fountains One (1) per mile

Benches Five (5) per mile

Picnic Tables Two (2) per mile

Trash Receptacles Three (3) per mile

(The developer shall also provide access control bollards at locations identified by the City.)

5. Trail Development Standards

5.12 Facility Program Secondary Neighborhood Trails:

All Secondary Neighborhood Trails shall include the facilities and features listed below.

Corridor:

Typical Corridor Width 25'

Paths / Trails:

Paved Path Continuous / Concrete / 8' Wide
Soft Surface Trail Not Required

Access Control:

Fences / Access Barriers As-Needed / Determined by City

Lighting:

Pathway Lighting Not Required
Trailhead Lighting Dusk to Closing Time
Access Point Lighting Not Required
Ramada Lighting Not Applicable

Trailheads:

Public Access Points At ¼ Mile Intervals (Typical)

Buildings:

Rest Rooms Not Required
Ramadas Optional / At Access and Gathering Areas

Landscape Development:

Trees 15 Per (Gross Corridor) Acre (Typ.)
Shrubs As-appropriate for Trail Segment
Cacti and Accent Plants As-appropriate for Trail Segment
Irrigation System Automatic Drip System
(Per std. horticultural practices)

Other Features:

The developer shall provide three or more of the following items per mile of trail, as deemed appropriate for the subject project.

Trail Identification Signs Three (3) per mile
Trail Map / Use Regulation Signs Two (2) per mile
Drinking Fountains One (1) per mile
Benches Five (5) per mile
Picnic Tables Two (2) per mile
Trash Receptacles Three (3) per mile

(The developer shall also provide access control bollards at locations identified by the City.)

5. Trail Development Standards

5.13 Outline Specifications - Pathways and Trails:

Part 1 - General (Reference Specifications and Standards)

- Maricopa Association of Governments (MAG) - Uniform Standard Specifications and Details for Public Works Construction (most recent edition)
- City of Casa Grande City Code - Public Improvement Requirements for Developers
- International Mountain Bicycling Association (IMBA) Recommendations and Guidelines for Trail Development

Part 2 - Materials

- Base Course Materials: Aggregate base material per MAG Specification Section 702. Depth as required by project geotechnical report.
- Concrete for Pathway Construction: Class A - 3,000 psi concrete per MAG Specification Sections 324 and 725. Four inch (4") minimum depth or as required by project geotechnical report.
- Aggregate Surfacing for Soft-Surface Paths: Decomposed Granite, 1/4" minus gradation, Per MAG Specification Sections 430 and 702. Color as approved by City.

Part 3 - Execution

- Subgrade Preparation: Per MAG Specification Section 301 and the project geotechnical report.
- Base Course Installation: Per MAG Specification Section 310 and the project geotechnical report
- Concrete Placement, Finishing, and Curing: Per MAG Specification Section 324. Joints and surface finish per approved sample panel.
- Decomposed Granite Paths: Per MAG Specification Section 430. Two inch (2") minimum depth after compaction.

5. Trail Development Standards

5.14 Outline Specifications for Landscape Work

Part 1 - General (Reference Specifications and Standards)

- Maricopa Association of Governments (MAG) - Uniform Standard Specifications and Details for Public Works Construction (most recent edition)
- City of Casa Grande City Code - Public Improvement Requirements for Developers
- Arizona Nursery Association - Growers Committee Recommended Average Tree Specifications

Part 2 - Materials

- Plants: All plants shall be normally developed individuals of their species. The habit of growth, development of foliage, and outline shall conform to grades of sound, first-quality nursery stock. All plants shall be free of disease, insects, insect larvae, and animal damage. Plants shall comply with MAG Specification Section 430.
- Hydroseeding Requirements: Seed shall comply with applicable state statutes for purity and germination. Mulch shall be wood fiber mulch. Seed mix and application rates shall be as approved by the City of Casa Grande.

Part 3 - Execution

- Landscape Installation Work: All landscape work including, but not limited to: the transport and storage of plant material, soil preparation, plant installation, staking, seeding, clean-up, and initial maintenance work shall be in accordance with MAG Specification Section 430, as amended by the City of Casa Grande, and in accordance with applicable industry standards.
- Initial Landscape Maintenance of Linear Park segments to be turned over to the City: All landscape improvements shall be maintained by the Contractor / Developer for a period of two (2) years from date of Substantial Completion and Acceptance by City.

5. Trail Development Standards

5.15 Outline Specifications for Irrigation Systems

Part 1 - General (Reference Specifications and Standards)

- Maricopa Association of Governments (MAG) - Uniform Standard Specifications and Details for Public Works Construction (most recent edition)
- City of Casa Grande City Code - Public Improvement Requirements for Developers

Part 2 - Materials

- Meters: As required by water provider. Separate meters shall be provided for irrigation.
- Backflow Preventers: Reduced pressure type with lockable security enclosure.
- Controllers: Calsense Model ET-2000 with lockable enclosure and optional features as identified by the City of Casa Grande.
- Master Valves: Griswold DW Series, or approved equal.
- Flow Sensors: Calsense, FM Series, or approved equal.
- Isolation Valves: Brass or bronze ball valves, Watts Model FBV, or approved equal.
- Remote Control Valves: Rain Bird Model PESB Series, or approved equal.
- In-Line Filters: AG-Products with 200 mesh screen, or approved equal.
- In-Line Pressure Regulator: Senninger, or approved equal.
- Mainline and Lateral Line Pipe: Schedule 40 PVC Pipe.
- Drip Emitters: Bowsmith, multi-outlet, pressure compensating emitters, or approved equal.
- Valve Access Boxes: Heavy duty, fiber reinforced, plastic valve boxes with bolt-down lids.

5. Trail Development Standards

Part 3 - Execution

- Backflow Preventer Testing: As required by code and water provider. Test certificates to be provided to City.
- Installation of Control System: Per City of Casa Grande standard details.
- Installation of Mainline and Lateral Line Pipe: Per City of Casa Grande standard details.
- Installation of Valves and Valve Access Boxes: Per City of Casa Grande standard details.
- Installation of Drip Emitters: Per City of Casa Grande standard details.
- Pressure Testing of Mainlines: Tested at 100 psi for a period of 4 hours without failure for acceptance.
- Operational Testing of Irrigation System: As needed to demonstrate to City that all components of the system have been installed, adjusted, and are working properly as required to apply appropriate amounts of water to all irrigated plants.
- Initial Maintenance of the Irrigation Systems to be turned-over to the City of Casa Grande: All irrigation systems shall be operated and maintained for a period of two (2) years from date of Substantial Completion and Acceptance by the City.
- The specified requirement for a Calsense Model ET-2000 Irrigation Controller shall apply only to those projects that will be turned over to the City of Casa Grande for maintenance. On all other projects a commercial-grade, automatic irrigation controller may be utilized.
- The use of reclaimed water for irrigation is encouraged in all instances where reclaimed water is available. Irrigation systems that utilize reclaimed water shall be designed to meet all applicable standards for design, cross-connection control, and material / equipment color-coding.

5. Trail Development Standards

5.16 Outline Specifications for Buildings, Shade Structures, and Site Furnishings:

Part 1 - General (Reference Specifications and Standards)

- Maricopa Association of Governments (MAG) - Uniform Standard Specifications and Details for Public Works Construction (most recent edition)
- City of Casa Grande City Code - Public Improvement Requirements for Developers

Part 2 - Materials

- Pre-Engineered Ramada Structures: Powder coated steel frame. Kynar finished steel roof. Concrete floor. Manufacturer and model as approved by the City of Casa Grande.
- Pre-Engineered Restroom Buildings: Pre-cast concrete structure with heavy-duty steel doors, Kynar finished steel roof, and prison-grade stainless steel fixtures. Manufacturer and model as approved by the City of Casa Grande.
- Benches: Commercial grade, powder coated steel benches with in-ground mount, and open mesh/web steel seats and backs. Manufacturer and model as approved by the City of Casa Grande.
- Trash Receptacles: Of same materials, style, and color as benches. Manufacturer and model as approved by the City of Casa Grande.
- Exercise Equipment: Heavy-duty powder-coated steel exercise stations as approved by the City of Casa Grande.
- Trail Identification Signs: Per City of Casa Grande standard detail.
- Trail Use Regulation / Trail Map Signs: Per City of Casa Grande standard detail.

5. Trail Development Standards

Part 3 - Execution

- Restroom and Ramada Buildings: Per approved building plans and applicable Code requirements.
- Site Furnishings (Benches, Trash Receptacles): Per City of Casa Grande Standard Details
- Trail Identification, Trail Use Regulation, and Trail Map Signs: Per City of Casa Grande Standard Details

5. Trail Development Standards

5.17 Outline Specifications for Trail System Lighting:

Part 1 - General (Reference Specifications and Standards)

- Maricopa Association of Governments (MAG) - Uniform Standard Specifications and Details for Public Works Construction (most recent edition)
- City of Casa Grande City Code - Public Improvement Requirements for Developers

Part 2 - Materials

- Electrical Service and Distribution System: Per applicable code requirements.
- Fixtures: Commercial / institutional grade fixtures. Manufacturer and model as approved by the City of Casa Grande w/ multiple vendors for replacement lamps and replacement parts.
- Lamps: High-Pressure-Sodium (HPS).
- Poles: Powder-coated heavy-duty steel poles with base plate and concrete foundation. Poles to accommodate fixture mounting height of 15' to 20'.
- Pole Foundations: Reinforced cast-in-place concrete foundations.

Part 3 - Execution

- Illumination Levels: Lighting systems to be designed to provide light levels and uniformity coefficients in accordance with Illumination Engineering Society (IES) standards and recommendations.
- Lighting Controls: Lighting systems to be equipped with photocells to turn lights on at dusk and with timers to turn all or some of the lights off at time designated by the City of Casa Grande.
- System Installation and Testing: Per permit and code requirements.