



**PAYSON CITY  
PUBLIC WORKS DEPARTMENT**

**DEVELOPMENT GUIDELINES**

As Adopted ~~December 18~~January 21, 20242026

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## INTRODUCTION

This document has been prepared and compiled by the Payson City Public Works Department. This document is to assist developers, architects, and engineers in understanding the current procedures for the review and approval of development/ construction projects within the City. The review process may require multiple reviews to obtain permission for construction, however, following these guidelines will help ensure the quickest review time and least number of reviews.

There are two submittal stages: Concept/Preliminary Plan and Final Plan. Section 16 of this document contains checklists to help make sure everything that is required is shown on the plans and included with each submittal. In addition to the previously mentioned reviews, developments may also require review and approvals for annexation and rezone requests. These submittals may follow the Concept/Preliminary Plan checklist.

This document includes a TABLE OF CONTENTS that directs the user to a specific topic and page; a process to guide the developer through the review and permitting process; and information required to be included in the submittal process.

All designs must be in the datum NAD 83 (2011), Utah State Plane, Central Zone, US Survey Foot, NAVD 88. The items contained in the document have been prepared as a supplement to the adopted subdivision ordinances and standards and are provided as a guide to the developer, architect, and engineer. Approval of this document by the Payson City Council places the requirement that the standards contained herein be followed as if directly stated within the Payson City Municipal Code.

The use of this document will allow the developer to more closely comply with adopted standards. This document is not intended to fully represent the current adopted subdivision ordinance, construction standards and drawings, master plans, or other City requirements. The developer is responsible for familiarizing themselves and complying with all the adopted ordinances and standards of Payson City. Review of the submitted plans will be performed to the maximum extent practicable by qualified Payson City employees. The reviews are not to be used as quality assurance or quality control (QA/QC). Responsibility for thorough peer review of design plans and other submitted products belongs to the Engineer/Architect of Record. Permission to develop based on the submitted plans does not constitute approval or acceptance of responsibility by Payson City. Submittals that contain insufficient information to perform the required reviews will be returned to the applicant as incomplete and will not be reviewed. Items that fail to comply with Payson City standards and ordinances and are not caught during the review process will be corrected in the field at the Developer's expense.

## SECTION 1: GENERAL IMPROVEMENT REQUIREMENTS

### 1. GENERAL

- a. This section defines the general requirements for public improvements within Payson City.
- b. The design must include all the improvements of a public need including, but not limited to, streets, striping and signage, culinary water, sanitary sewer, pressurized irrigation, power, street lighting, and storm drainage.
- c. If private utilities e.g. natural gas, cable, fiber, are desired, it is recommended that they be shown on the plans to verify that there is a place for them in the development. Private utilities are not permitted in the Payson City right-of-way and must be installed in the public utility easement (PUE) following the guidelines of this document.

### 2. DEFINITIONS:

- a. APPLICANT refers to the person responsible for coordinating the submissions and reviews with Payson City.
- d. CITY ENGINEER refers to the Payson City Engineer or designee.
- e. CONTRACTOR refers to the person or persons actually performing the construction work.
- f. CUSTOMER refers to any individual requiring utility services (power, water, sewer, pressurized irrigation, etc.)
- g. DEVELOPER refers to the contractor, property owner or agent as applicable.
- h. OWNER refers to subdividers, developers, contractors, or others responsible for the project within Payson City.
- i. PUBLIC WORKS DIRECTOR refers to the Payson City Public Works Director or designee.

### 3. CONSTRUCTION DRAWINGS

- a. Complete and detailed construction plans and drawings of improvements must be submitted to the Development Services Department.
- b. No construction is allowed to begin until plans have been reviewed and all required permits and bonding are obtained, stormwater pollution prevention BMPs are installed and inspected, and a pre-construction meeting has been held.
- c. Permitted construction drawings will be stamped by Payson City and returned to the applicant. A current copy of the stamped plans must be available on site at all times. Revisions to the stamped drawings must be submitted to the City Engineer for review.
- d. The following instructions are for the purpose of standardizing the preparation of drawings to obtain uniformity in appearance, clarity, size, and style.
  - i. An electronic copy of the full-size plan set generated from the computer-aided drafting program used for design must be submitted to the Development Services Department for review. Scans of paper documents or PDF/A type files that limit the ability to make electronic comments will not be accepted.
  - ii. Comments will be returned electronically to the applicant for corrections.
- e. The plans and designs must meet the Payson City Development Guidelines, and standard technical specifications and drawings hereinafter outlined. If a Payson City standard or specification does not exist for a specific item, utilize APWA or UDOT standards and specifications. Engineered products that do not follow an accepted industry standard must be submitted with enough information that the City Engineer is able to make a determination on the acceptability of the design.

- f. The Public Works Plan Review Checklist found in Section 16 of this document MUST be included in each submittal. Mark each item completed and provide reasons for any items not completed. Submittals without the checklist or with insufficient information will be returned as incomplete and will not be reviewed.
- g. At the completion of the Project, the Developer will provide a set of As-Built drawings in AutoCAD format by electronic transmittal or flash drive. Required As-Built drawings must be delivered before Final Acceptance is awarded and Bond returned.

#### 4. UTILITY DISCLAIMER

The locations, materials, slopes, flow line, rim elevations, and sizes of the existing underground or overhead utilities are shown as accurately as possible. Due to the age of the infrastructure and reporting errors, the sizes and locations of the utilities shown on the Payson City GIS map are approximate and should not be used for design purposes. The owner and/or contractor of a development project are responsible for contacting Blue Stakes to locate all the existing utilities and performing potholes to field verify the sizes, materials, and depths of the existing utilities to prevent errors in design based solely on the information shown on the GIS map. Cost changes due to the failure to field verify the existing conditions are the responsibility of the owner and/or contractor.

The engineering design of an open channel, pipe system, storm drainage detention/retention system, etc. should include hydraulics and hydrology calculations. Failure to comply with these requirements constitutes Unprofessional Conduct under the Utah State Division of Professional Licensing rules and regulations.

#### 5. PLAN SUBMITTAL - GENERAL

~~h-a.~~ North arrow.

~~i-b.~~ Scale bar.

~~j-c.~~ Consistent letter, stationing and numbering that reads left to right on the page and does not overlap with other text or leaders.

~~k-d.~~ Title block, located along the bottom or right side of each sheet to include:

- i. Project title.
- ii. Project location or address.
- iii. Date drawn.
- iv. Engineer, surveyor, and/or architect name, address, and phone number.
- v. Professional Engineer stamp box with signature and date.
- vi. Sheet number box.
- vii. Stamp plans "PRELIMINARY – NOT FOR CONSTRUCTION" until the review process is completed and permission to proceed to construction is granted.

~~l-e.~~ Existing property lines and easements.

~~m-f.~~ Construction notes with reference to Payson City, APWA, or UDOT Standard Details.

~~n-g.~~ Plans must be stamped, signed, and dated by a Utah Licensed Professional.

~~o-h.~~ Call 811 Before You Dig or Blue Stake of Utah symbol.

#### 6. TITLE SHEET

~~p-a.~~ Project name.

~~q-b.~~ Vicinity map.

~~r-c.~~ Drawing index table.

~~s-d.~~ Type of building information.

~~t-e.~~ Type of construction information.

~~u-f.~~ Type of occupancy information.

~~v-g.~~ Number of stories.

~~w-h.~~ Whether or not the proposed building will include automatic fire sprinklers.

~~x-i.~~ Required and provided parking stalls calculation table.

~~y-j.~~ Required and provided ADA stalls calculation table.

~~z-k.~~ Required and provided VAN ACCESSIBLE ADA stalls calculation table.

~~aa-l.~~ Site characteristic table with areas listed in square feet and acres.

~~bb-m.~~ Dumpster calculations for commercial projects or multi-family residential developments that choose to utilize Payson City Solid Waste services.

~~cc-n.~~ Contact list:

- i. Developer.
- ii. Architect.
- iii. Civil Engineer.
- iv. Geotechnical Engineer.

## 7. GENERAL NOTES

a. Payson City Standard Construction Notes.

~~dd-o.~~ Project specific notes.

~~ee-p.~~ Legend.

~~ff-q.~~ Abbreviations.

## 8. ALTA SURVEY

a. Existing property boundary.

~~gg-r.~~ Existing property legal description.

~~hh-s.~~ Benchmark.

~~ii-t.~~ Basis of bearing.

~~jj-u.~~ Section ties.

~~kk-v.~~ All easements and encumbrances from title report with coordinating callouts.

## 9. TOPOGRAPHIC SURVEY

a. Existing property boundary.

b. Benchmark.

c. Basis of bearing.

d. Existing site features.

e. Existing contours with labels.

f. Existing ground spot elevations shown on a 50' x 50' grid.

g. Existing utilities including rim and invert elevations as measured in the field.

h. Floodplain information if applicable.

i. Wetland information with approved Army Corp Wetland Delineation if applicable.

j. Sensitive land information (hillside, steep slopes, earthquake zones, liquefaction, etc.) if applicable.

## 10. HORIZONTAL CONTROL

- ~~k-a.~~ Proposed site improvements using solid dark lines.
- ~~l-b.~~ Table including the following information:
  - i. Landscape area in square feet and acres.
  - ii. Building area in square feet and acres.
  - iii. Hardscape area in square feet and acres.
- ~~m-c.~~ Existing conditions shown gray and/or dashed.
- ~~n-d.~~ Property boundary with bearings and distances.
- ~~o-e.~~ Existing and proposed street names/numbers and addresses.
- ~~p-f.~~ Existing and proposed public and/or municipal utility easements.
- ~~q-g.~~ Existing and proposed survey monuments.
- ~~r-h.~~ Parking lot dimensions including width and length.
- ~~s-i.~~ Parking lot drive aisle dimension.
- ~~t-j.~~ Location of proposed building(s) tied to at least two property corners.
- ~~u-k.~~ Building width and length dimension.
- ~~v-l.~~ Driveway width.
- ~~w-m.~~ Driveway location based on street stations.
- ~~x-n.~~ Location of proposed street lights.
- ~~y-o.~~ Location of proposed fire hydrants.
- ~~z-p.~~ Location of proposed garbage enclosure or dumpster/s.
- ~~aa-q.~~ Reference to pavement cross sections based on the soil report recommendations.
- ~~bb-r.~~ Location and dimension of proposed commercial signs.
- ~~cc-s.~~ Traffic signing and striping.
- ~~dd-t.~~ Parking stalls striped using a four inch (4") solid white or yellow line.
- ~~ee-u.~~ ADA parking stall striped using a four inch (4") solid blue line.
- ~~ff-v.~~ ADA sign location.
- ~~gg-w.~~ Existing and proposed curb and gutter.
- ~~hh-x.~~ Existing and proposed sidewalks.
- ~~ii-y.~~ Existing and proposed striping and signage.
- ~~jj-z.~~ Location of mailbox or CBU.
- ~~kk-aa.~~ Construction notes with reference to Payson City, APWA, or UDOT standards.

## 11. GRADING AND DRAINAGE

- ~~ll-a.~~ Layout of the subdivision or site plan using solid, dark lines.
- ~~mm-b.~~ Proposed contours with labels using solid dark lines.
- ~~nn-c.~~ Existing contours with labels shown gray and/or dashed.
- ~~oo-d.~~ Show daylight line (proposed contour line matches existing contour line).
- ~~pp-e.~~ Proposed storm drain pipes and structures plotted in color following the Uniform Color Code and Marking Guidelines. [Refer to Payson Standard Plan G-03 for RGB codes.](#)
- ~~qq-f.~~ Existing storm drain pipes and structures shown gray and/or dashed.
- ~~rr-g.~~ Size, material, slope, and length of existing and proposed storm drain lateral/s.

~~ss~~-h. \_\_\_\_\_ Size, material, slope, and length of existing and proposed storm drain main lines.

~~tt~~-i. \_\_\_\_\_ Size, rim, and invert of existing and proposed storm drain manholes.

~~uu~~-j. \_\_\_\_\_ Size, top of grate, and invert of existing and proposed storm sewer inlets.

~~vv~~-k. \_\_\_\_\_ Type of pretreatment device.

~~ww~~-l. \_\_\_\_\_ Plan and profile sheets: 5x or 10x vertical exaggeration.

- i. Plan and profile sheets are only required for systems installed in public roads.

~~xx~~-m. \_\_\_\_\_ Location of existing and proposed utilities including pipe crossings.

~~yy~~-n. \_\_\_\_\_ Drainage calculations showing the following:

- i. Pre- and Post-construction discharge rates
- ii. Cumulative peak flow calculations for each drainage sub-basin.
- iii. Capacity calculations for each segment of the pipe system.
- iv. Detention storage volume calculations.
- v. HGL elevations.
- vi. Orifice plate size calculations.
  - Size orifice plate to restrict outlet flow to pre-construction discharge rate or 0.2 CFS/ac, whichever is lower.

~~zz~~-o. \_\_\_\_\_ Construction notes with reference to Payson City, APWA, or UDOT standards.

~~aaa~~-p. \_\_\_\_\_ A Private Utility Maintenance Agreement is required for all stormwater controls to be privately owned and operated. The Private Utility Maintenance Agreement form is available to download from the Payson City website.

## 12. CULINARY WATER AND PRESSURIZED IRRIGATION

- a. Layout of the subdivision or site plan using solid, dark lines.

~~bbb~~-q. \_\_\_\_\_ Proposed culinary water and pressurized irrigation pipes, structures, and appurtenances plotted in color following the Uniform Color Code and Marking Guidelines. Refer to Payson Standard Plan G-03 for RGB codes.

~~ccc~~-r. \_\_\_\_\_ Existing culinary water and pressurized irrigation pipes, structures, and appurtenances shown gray and/or dashed.

~~ddd~~-s. \_\_\_\_\_ Size and location of existing and proposed individual or master water meters.

~~eee~~-t. \_\_\_\_\_ Size, material, and location of existing and proposed water laterals.

~~fff~~-u. \_\_\_\_\_ Size, location, and material of existing and proposed culinary water and pressurized irrigation mains.

~~ggg~~-v. \_\_\_\_\_ Size, location, and type of joint of existing and proposed isolation valves and major valves including pressure reducing valves.

~~hhh~~-w. \_\_\_\_\_ Location of existing and proposed fire hydrants.

~~iii~~-x. \_\_\_\_\_ Location of existing and proposed blow offs and air vacs.

~~jjj~~-y. \_\_\_\_\_ Size, location, and type of joint, of proposed bends with thrust blocks.

~~kkk~~-z. \_\_\_\_\_ Plan and profile sheets: 5x or 10x vertical exaggeration.

- i. Plan and profile sheets are only required for systems installed in public roads or where proposed utilities cross existing main lines outside of the roadway.

~~lll~~-aa. \_\_\_\_\_ Location of existing and proposed utilities including pipe crossings.

~~mmm~~-bb. \_\_\_\_\_ Construction notes with reference to Payson City, APWA, or UDOT standards.



### 13. SANITARY SEWER

- a. Layout of the subdivision or site plan using solid, dark lines.
- ~~nnn~~.cc. Location of nearest public drinking well if within a wellhead protection zone.
- ~~eee~~.dd. Proposed sanitary sewer pipes and structures plotted in color following the Uniform Color Code and Marking Guidelines. Refer to Payson Standard Plan G-03 for RGB codes.
- ~~ppp~~.ee. Existing sanitary sewer pipes and structures shown gray and/or dashed.
- ~~qqq~~.ff. Size, material, slope, and length of existing and proposed sanitary sewer laterals.
- ~~rrr~~.gg. Size, material, slope, and length of existing and proposed sanitary sewer main lines.
- ~~sss~~.hh. Size, rim, and invert of existing and proposed sanitary sewer manholes.
- ~~ttt~~.ii. Size, rim, and location of existing and proposed sanitary sewer cleanouts.
- ~~uuu~~.jj. Size, rim, and type of grease traps, sand traps, monitoring box, etc.
- ~~vvv~~.kk. Plan and profile sheets: 5x or 10x vertical exaggeration.
  - i. Plan and profile sheets are only required for systems installed in public roads.
- ~~www~~.ll. Location of existing and proposed utilities including pipe crossings.
- ~~xxx~~.mm. Construction notes with reference to Payson City, APWA, or UDOT standards.

### 14. POWER

- a. Layout of the subdivision or site plan using solid, dark lines.
- b. Proposed power lines, equipment, and structures plotted in color following the Uniform Color Code and Marking Guidelines. Refer to Payson Standard Plan G-03 for RGB codes.
- c. Existing power lines, equipment, and structures shown gray and/or dashed.
- d. Street names and/or numbers.
- e. Location of power line trench one foot (1') behind the sidewalk.
- f. Minimum two feet (2') separation between communication and power line conduits.
- g. Location of existing and proposed street lights.
- h. Location of existing and proposed transformer boxes with 10-foot clear zone identified.
- i. Location of existing and proposed splice boxes.
- j. Location of existing and proposed sectionalizers.
- k. Location of existing and proposed switches.
- l. Location of recorded and proposed utility easements.
- m. Location of existing and proposed power poles and guy wires.
- n. Construction notes with reference to Payson City standards and the NESC.
- o. Add a note: "Trenching one foot (1') behind the sidewalk and four feet (4') to the top of conduit for primary from final grade."

### 15. FIRE AND RESCUE

- ~~p~~.a. Layout of the subdivision or site plan using solid, dark lines.
- ~~q~~.b. Existing site features using gray and/or dashed lines.
- ~~r~~.c. Street names and/or numbers.
- ~~s~~.d. Type of building information.
- ~~t~~.e. Type of construction information.

- ~~u-f.~~ Type of occupancy information.
- ~~v-g.~~ Number of stories above grade plane.
- ~~w-h.~~ Building height above grade plane.
- ~~x-i.~~ Whether or not the proposed building will include automatic fire sprinklers.
- ~~y-j.~~ Location of existing and proposed fire lines.
- ~~z-k.~~ Location of the Fire Control Room (required for fire sprinklers).
- ~~aa-l.~~ Location of existing and proposed fire hydrants.
- ~~bb-m.~~ Fire lane.
- ~~cc-n.~~ Fire flow demand calculations.
- ~~dd-o.~~ Snow removal storage areas.
- ~~ee-p.~~ Emergency vehicle turn around area according to IFC Appendix D.

#### 16. STORMWATER POLLUTION PREVENTION PLAN

- a. Existing and proposed contour lines.
- ~~ff-g.~~ Existing and proposed storm drain features.
- ~~gg-r.~~ Delineated Jurisdictional Wetlands if applicable.
- ~~hh-s.~~ Initial SWPPP showing structural and non-structural BMPs to be installed prior to and maintained during construction.
- ~~ii-t.~~ Final SWPPP showing the removal of temporary BMPs and the permanent long-term BMPs. This plan must include how long-term stormwater BMPs were selected, the pollutant removal performance expected from the selected BMPs, and the technical basis supporting the pollutant removal performance claims.
- ~~jj-u.~~ Certification statement stamped, signed, and dated by a Licensed Professional.
  - i. "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

#### 17. PLAN AND PROFILE

- ~~kk-a.~~ Horizontal and vertical scale.
- ~~ll-b.~~ Typical road cross sections.
- ~~mm-c.~~ Road centerline stations (major every one hundred (100) feet and minor every fifty (50) feet).
- ~~nn-d.~~ Horizontal curve information based on a twenty-five (25) mph design speed.
- ~~oo-e.~~ Horizontal curve design according to AASHTO guidelines.
- ~~pp-f.~~ Profile major grid every five (5) or ten (10) feet.
- ~~qq-g.~~ Profile minor grid every one (1) or two (2) feet.
- ~~rr-h.~~ Profile elevation labels.
- ~~ss-i.~~ Plan view showing street and underground utilities layout.
- ~~tt-j.~~ Existing ground profile shown using a dashed line.
- ~~uu-k.~~ Proposed road profile shown using a solid line.

~~vv-l.~~ Proposed road slopes in percentage.

~~ww-m.~~ Sheet matchline information including station and following page numbers.

~~xx-n.~~ Proposed vertical curve lengths and K values according to AASHTO guidelines.

~~yy-o.~~ Proposed culinary water and pressurized irrigation lines including main sizes and materials; size, location, type, and type of joint of isolation valves; fire hydrants with location of valve and pipe size; blow-offs location and size; PRV stations; service laterals location and dimension; and meter sizes.

~~zz-p.~~ Proposed sanitary sewer lines sizes, materials, slopes; elevation of rim, invert in and invert out; sewer lateral location, size, and material; pressure sewer lines and lift stations.

~~aaa-q.~~ Proposed storm drain system including culverts, open channels size, slope, material; manhole location, size, elevation on rim, flow line in and flow line out; curb inlets; end sections with riprap; detention basins and irrigation ditches.

~~bbb-r.~~ Solved underground utility crossings (check water and storm drainage crossings).

## 18. DETAIL SHEET

~~ccc-a.~~ Detail sheets must include all current Payson City, APWA, and UDOT Standard Details applicable to the project plus any special or specific construction details required.

~~ddd-b.~~ Add reference to the site-specific geotechnical report for all pavement sections. Pavement sections must meet the Payson City Standards at a minimum but may be increased based on the geotechnical recommendations.

## 19. ADDITIONAL REPORTS AND FORMS

a. The following items are required for every project before construction is permitted to begin:

- i. SWPPP Construction General or Common Plan Permit.
- ii. Engineer's Estimate for all public improvements.
- iii. Bond for all public improvements.
- iv. Payment of inspection and material testing fees.
- v. Proof of completion of the Stormwater Training for Construction Professionals taken within the last year of the desired construction start date.

~~eee-c.~~ Based on the location of the project and type of application, the following reports may be required:

- i. Geotechnical report including CBR value calculated from the on-site soils, not assumed.
- ii. Percolation test taken from the proposed retention pond location.
- iii. Drainage Report or Technical Memo explaining the assumptions and calculations used.
- iv. Traffic Impact Study.
- v. Approved Jurisdictional Wetland Delineation by the USACE.
- vi. Sensitive Land Overlay report.
- vii. Floodplain Development Permit.
- viii. Notice of Intent for Construction Activities.
- ix. Notice of Intent for Industrial Activities.
- x. Dewatering Permit from the Utah State Division of Water Quality.
- xi. Conveyance of Water Rights to Payson City.
- xii. Payment of inspection and material testing fees.

- xiii. Utilities Notification form.
- xiv.
- xv.

## 20. INSPECTION, TESTING AND QUALITY CONTROL

~~fff.a.~~ All construction work involving the installation of improvements in Payson City, whether public or private, is subject to City inspections and testing as outlined in the quality control section of each specification.

~~ggg.b.~~ Request for inspection:

- i. Contact the Public Works Inspector or Secretary to request an inspection.
- ii. Forty-eight (48) hour advance notice is preferred.
- iii. All work is to be inspected and GPS location recorded prior to being backfilled or covered. Any work backfilled or covered before inspection and GPS location recorded will be uncovered at the Contractor's expense.
- iv. The contractor and/or project superintendent must be present for all inspections.

~~hhh.c.~~ Construction completion inspection:

- i. A final inspection will be made by the Public Works Director, or designee upon receipt of a request by the owner after all construction work is completed.
- ii. Any faulty or defective work must be corrected by the persons responsible for the work within a period of thirty (30) days from the date of the Public Works Inspection Report defining the faulty or defective work.

~~iii.d.~~ Quality Control Testing:

- i. Material testing will be conducted by an independent laboratory, approved by the Public Works Director, at the owner's expense. Material testing and inspection fees must be paid in full before requesting a pre-construction meeting.
- ii. All testing will comply with the current ASTM, AASHTO, AWWA, and/or Public Drinking Water Regulation standards and must meet the minimum testing requirements as outlined in the specifications.
- iii. Personnel performing tests must have the appropriate certifications to perform such tests.
- iv. The cost of any and all re-testing required to bring materials into specification is borne by the owner.
- v. The time and location of all tests will be set by the Public Works Inspector, subject to the availability of the testing firm.
- vi. If determined necessary by the Public Works Director or designee, additional material testing can be required.

~~jjj.e.~~ Test report:

- i. Written test results are required for review by the Public Works Director or designee after each portion of the work (i.e., pipeline construction, earthwork, curb, gutter, sidewalk, roadway construction, etc.)

## 21. AS-BUILT DRAWINGS

- a. Before final inspection, the Contractor must provide a complete set of as-built drawings that includes all items specified on the construction drawings.

~~kkk.f.~~ The as-built drawings are to show all improvements as constructed in the field.

~~iii-g.~~ A Pond Certification must be completed by the Engineer of Record for all detention and retention basins. A plan showing the as-built contours overlaid on the design contours of the basins must be included along with a Stage-Storage Table.

~~mmm-h.~~ Submit as-built drawings saved in DWG and PDF format via electronic transmittal or flash drive.

~~nnn-i.~~ No bond retainer shall be released until as-built drawings are received by the City Engineer.

~~ooo-j.~~ Early bond release for completed items may be requested but is not guaranteed. Requests for partial bond release must include:

- i. Agreement from the Public Works Inspector that the items are installed, tested, and accepted.
- ii. Confirmation from the GIS Administrator that the subsurface infrastructure has been shot and added to the Payson City GIS Map.
- iii. As-built information has been received, reviewed, and accepted by the City Engineer or designee.

~~ppp-k.~~ Partial bond release may only be requested for complete system improvements, i.e. water system, sewer system, etc.

## 22. GUARANTEE OF WORK

- a. The Owner will warrant and guarantee that the improvements provided for hereunder, and every part thereof, will remain in good condition for a period of **one (1) year** after the date of the acceptance of the project by the City.
- b. The Owner will make all the necessary repairs and maintain the improvements and every part thereof in good condition during the specified time at no cost to the City.
- c. The guarantee hereby stipulated extends to and includes, but is not limited to:

- i. Road base.
- ii. Asphalt or concrete pavement.
- iii. All pipes.
- iv. Pipe joints.
- v. Valves.

~~vi.~~ Manholes.

~~vi-vii.~~ All Low Impact Development (LID) improvements.

~~vii-viii.~~ Backfill.

~~viii-ix.~~ Curb.

~~ix-x.~~ Gutters.

~~x-xi.~~ Sidewalks.

~~xi-xii.~~ Striping and signage.

- d. Whenever, in the judgment of the Public Works Director, said work is in need of repair, maintenance, or reconstruction, written notice will be served upon the Owner and thereupon the Owner will undertake and complete such repairs in a timely manner.
- e. If the Owner fails to do so within thirty (30) days from the date of the service of such notice, the Public Works Director will have such repairs made and the cost of such repairs will be paid by the Owner including any additional expenses incurred by the City.

## 23. TRAFFIC CONTROL AND ROAD CLOSURES

~~f.a.~~ The Contractor must provide and maintain all necessary signs and barricades needed for traffic

control according to the MUTCD guidelines, latest edition.

~~g-b.~~ All necessary precautions are to be taken to protect the work and to safeguard the public.

~~h-c.~~ Street road closures must be approved by the City Engineer or designee.

~~i-d.~~ Sidewalk closures must include a walkable path for people with disabilities.

#### 24. PRE-CONSTRUCTION MEETING

a. A qualified contractor is required for all work completed in the right-of-way.

i. Contractor must be licensed in accordance with state laws.

ii. The City may refuse a contractor from public works construction for any of the following reasons from the past 5 years:

- Failure to pay suppliers or subcontractors on previous work.
- Poor communication.
- Threatening or intimidating communications.
- Willful and deceptive efforts to perform defective or substandard work.
- Defective or substandard work on previous projects.
- Unethical acts.

iii. Contractor must have proper insurance.

- Liability: One million dollars (\$1,000,000) per person, two million dollars (\$2,000,000) per event.
- Workers Compensation Insurance.

~~j-e.~~ A preconstruction meeting is required on all development or public works construction projects.

~~k-f.~~ Verify the following:

- i. Land Disturbance Permit has been issued.
- ii. Stormwater Pollution Prevention Plan has been approved, and UPDES NOI has been issued.
- iii. SWPPP BMPs are installed and approved.
- iv. Other necessary permits have been obtained.
- v. Conveyance of water rights to Payson City has been completed.
- vi. Payment of inspection and material testing fees has been completed.
- vii. Payson Fire Department Review approval letter signed.
- viii. When applicable, developer agreements are signed and executed.
- ix. When applicable, final plat application is approved.
- x. When applicable, performance guarantee bond has been posted.

~~l-g.~~ Attendance is required by contractor project manager, site supervisor(s), design engineer, consultants, significant subcontractors, significant suppliers, Public Works Director, City Engineer, Public Works Superintendents and City Inspectors.

~~m-h.~~ Discuss the following topics:

- i. Site supervisors and 24-hour contacts.
- ii. Compliance with OSHA guidelines.
- iii. Coordination.
- iv. Schedule.
- v. Required material testing submittals.
- vi. Geotechnical issues.

- vii. Survey issues.
- viii. Coordination of inspections.
- ix. Specifications & standards.
- x. Request for partial and final bond releases.

## 25. IMPROVEMENTS SEQUENCE

- a. City improvements are to be installed in the following sequence, unless otherwise directed by the Public Works Director:
  - i. Rough grading
  - ii. Sanitary Sewer
  - iii. Culinary Water
  - iv. Pressurized Irrigation
  - v. Storm Sewer
  - vi. Dry Utilities (In Public Right-of-Way)
  - vii. Subbase
  - viii. Curb and Gutter
  - ix. Road Base
  - x. Asphalt
  - xi. Dry Utilities (In Easements)
  - xii. Sidewalks and Trails
  - xiii. Manholes and Valve Collars
  - xiv. Survey Monument
  - xv. Street Signs
  - xvi. Street Lights
  - xvii. Clean Up
- b. Contractors and Developers are to ensure that all the improvement items installed prior to paving the road are inspected, surveyed, and approved by the City Inspector.
- c. No road cut permits will be issued on newly paved city streets for **five (5) years** from the date the pavement was accepted by the City without written approval from the Public Works Director.
- d. Trenching in a road whose pavement is less than five (5) years old will require at a minimum:
  - i. T-Patch trench repair per Payson City Standards;
  - ii. Two (2) inch mill and overlay from lip of gutter to lip of gutter a minimum of twenty (20) feet on each side of the trench; and
  - iii. Crack seal at all saw cut and overlay lines.

## 26. UPDES STORMWATER PERMIT

- ~~e-a.~~ A UPDES (Utah Pollutant Discharge Elimination System) Permit from the State of Utah is required for all projects that disturb greater than 1 acre or are less than one (1) acre and part of a common plan of development or sale that is greater than 1 acre.
- ~~f-b.~~ A UPDES Common Plan Permit is required for all projects that disturb less than one (1) acre.
- ~~g-c.~~ A Notice of Intent (NOI) is required prior to construction.
- ~~h-d.~~ A Notice of Termination (NOT) is required once stabilization has been achieved and before final approval is awarded.

## 27. BUILDING PERMITS

- a. No building permit shall be issued for a subdivision until:
  - i. All roads are paved and accepted.
  - ii. Curb and gutter are installed and accepted.
  - iii. Street signs are installed.
  - iv. All underground utilities are installed, surveyed, accepted, and functional.
  - v. Fire hydrants are installed and in full operation.
  - vi. It is reasonable to expect the remainder of proposed subdivision improvements to be completed prior to the occupancy of the buildings.
- e. Payson City may not withhold a building permit based on the lack of completion of a portion of a public sidewalk to be constructed within a public right-of-way serving a lot where a single-family or two-family residence or town home is proposed in a building permit application if an improvement completion assurance has been posted for the incomplete portion of the public sidewalk.
- i.f. If a home builder or developer wants to appeal the decision of the Public Works Inspector on a failed item of the subdivision, the appeal shall be first made to the City Engineer for a decision on the appealed item of the project. If the developer or home builder is still requiring an appeal of the decision made by the Public Works Inspector and the City Engineer, the appeal shall be made to the Public Works Director. The Public Works Director shall be the final decision of the inspected appealed issue.

## 28. CERTIFICATE OF OCCUPANCY

- a. A developer may not sell any portion of an approved development without informing the prospective buyer or builder that occupancy may not be obtained until all permanent improvements are installed and accepted by the City.



## SECTION 2: SURVEYING

### 1. SURVEYING STANDARDS

- a. All surveying of property lines and construction surveying for the locating of construction improvements shall be conducted under the direct supervision of a Utah Professional Licensed Surveyor (PLS).

### 2. HORIZONTAL CONTROL

- a. Payson City maintains all its data in the North American Datum of 1983 (NAD83)(2011) Utah Central Zone, U.S. Survey Feet, State Plane coordinate system, also known as the Grid System.
- b. All construction data must be provided to Payson City in this coordinate system.
- c. If data submitted to Payson City is not in this coordinate system and City staff must perform a transformation on the data received, the Owner will be billed for the time of the staff.
- d. Surveyors must not develop a local coordinate system.
- e. At least two principal corners in a subdivision plat are required. Uniquely shaped subdivisions may require an additional principal corner in order to provide state plane data to define the major extents of the subdivision.

### 3. VERTICAL CONTROL

- a. All vertical data must be in accordance with the North American Vertical Datum of 1988 (NAVD88).
- f. Surveyors must not develop a local vertical datum.

### 4. SURVEY MONUMENTS

- a. Monument classifications are as follows:
  - i. Class I –When within pavements use ring and lid per APWA Std. Plan No. 274. Outside of paved roadways may use monument cap and base per APWA Std. Plan No. 272.
  - ii. Class II – 18" #5 Rebar and aluminum or plastic cap stamped with PLS number driven flush to pavement surface or within 2" of ground surface.
  - iii. Class - III a metal plug drilled and set into the back of curb at the projected property line.

### 5. SURVEY MONUMENT INSTALLATION

~~b-a.~~ Subdivision or Property Corner Monuments are required to be set at:

- i. All angle points in survey boundary (Class II).
- ii. All points of tangency and points of curvature on and along survey boundary (Class II).
- iii. All Lot corners (Class II).
- iv. When it is not possible to set a property corner fronting the street a Class III monument will be set.

~~e-b.~~ Section Corner replacements will be Class I monuments. Any Section Corner replacement must be done under the supervision of the County Surveyor. Notify the County Surveyor prior to disturbing any section corner monument. Monuments must be set prior to the final acceptance of the improvements.

~~d-c.~~ Where hard rock or other physical obstructions are encountered, monument length sufficient to resist removal may vary within reasonable limits. A secondary reference monument with a bearing and distance tied to the actual marker location may be required.

### 6. EASEMENTS

~~e-a.~~ An American Land Title Association (ALTA) Survey is required for all developments. All existing parcel boundaries, easements, monuments, etc., shall be plotted on the ALTA Survey and labeled in

accordance with the Title Report.

~~f.b.~~ All plats must show the existing and proposed easements. When easements are to be provided for a lot of record, a Word document containing the easement legal description and exhibit map are to be provided to the City. The legal description must be tied to a Section Corner and include a basis of bearing. City Staff will review the legal description and (upon acceptance) will insert it into a formatted City Easement and provide the applicant with a signature copy of the Easement. After the Easement is signed and notarized the applicant will return the Easement to the City for recording at the Utah County Recorder's Office.

## 7. PLATS

a. Subdivisions: All subdivision plats must be in accordance with the Payson City Subdivision Ordinance.

~~g.c.~~ Right-of-Way Dedication: All roadways to be dedicated must have a plat prepared in accordance with the standards for subdivision plats as defined in the City's subdivision ordinance.

## 8. CONSTRUCTION SURVEYING

a. All public improvements must be installed based on construction survey stakes placed under the direction of a Utah Professional Licensed Surveyor.

b. Survey stakes for the construction of streets are to be installed at an interval no greater than one hundred (100) feet along straightaways. Curves require a stake at the point of curvature (PC), point of tangency (PT), and at the midpoint of the curve. If the distance along the curve between the midpoint and PC/PT is greater than one hundred (100) feet, additional stakes are required.

c. Fire hydrants are not to be installed without survey stakes to establish the finished grade and the exact location of the hydrant to prevent improperly depressed or elevated hydrants.

d. All curb returns are to be staked following the curve requirement in item (b) above.

## SECTION 3: CULINARY WATER

### 1. WATER DESIGN STANDARDS

- a. All water system installation and design must conform to Payson City Water System Master Plan and the Utah State Administrative Code, Rule R309-510.

### 2. HYDRAULIC DESIGN CRITERIA

- a. Payson City uses a hydraulic model to verify that the required fire flow and water demand for development are available in accordance with Payson City level of service requirements and Utah State Division of Drinking Water requirements. The existing water system may require modifications to meet the demand of the development per the hydraulic model analysis.
- b. Modifications to the existing water system may include, and are not limited to, pipe upsizing, installation of a new well, improvements to an existing well, and/or a new water tank.
- c. Modifications to the existing water system required to meet the demand of the development, whether on- or off-site, will be made at the cost of the development with no reimbursement from Payson City.
- d. The minimum fire flow is two thousand (2,000) gallons per minute (gpm).
- e. The fire flow may be increased as determined by the Fire Chief and based on the size of the proposed building(s), type of building, type of occupancy, and type of construction.
- f. The normal minimum operating pressure in all parts of the system is forty (40) psi.
- g. The anticipated maximum operating pressure of the system is one hundred to one hundred twenty (100 – 120) psi.
- h. The proposed water system must be designed to conform to the pressure zones shown on the Payson City Water Master Plan. The developer is responsible for installing pressure reducing valves at pressure zone boundaries within or adjacent to the development.

### 3. CULINARY WATER PIPE SIZE AND TYPE

- a. Minimum allowable main line size is eight inches (8") in diameter.
- b. Pipe type for water main lines is blue PVC pipe (C-900) or fused High-Density Polyethylene (HDPE). All other pipe types require written approval from the Public Works Director.
- c. Horizontal clearance between a water main and sewer lines is a minimum of ten feet (10') edge to edge per Utah Administrative Code R317-3-2 and R309-550.
- d. Minimum cover required is forty-eight inches (48") to top of pipe measured from the finished grade.
- e. The culinary water main lines are to be installed ten feet from the sewer main in the north or west side of the roadway.
- f. All unused water service lines must be abandoned at the water main line.

### 4. CULINARY WATER VALVES

- a. Water valves are required at all intersections and must equal the number of legs.
- b. Water valves are required at intervals not to exceed eight hundred feet (800').
- c. Water valves are required within ten (10) feet of the upstream and downstream ends of casing pipes.
- d. Blow-offs are required at the ends of water lines and at low points in the system. A fire hydrant may be installed at the end of a water main in lieu of a blow-off.
- e. Gate valves are to be used for all valves twelve (12) inches and smaller. Butterfly valves may be used for all valves larger than twelve (12) inches.

- f. Install direct bearing thrust blocks per APWA-Payson Standard Plan ~~564~~UT-03. Tie-down style thrust blocks are not permitted.
- g. Install collar for water valve box per Payson City Standard Plan UT-05.
- h. Water valve frame and cover must comply with APWA Standard Plan 502 or 503 respectively.
- i. Where required, install an approved backflow prevention device per Payson City or APWA Standard Drawings (latest edition).
- j. Air-vacuum valve stations are required at high points on transmission lines and at other locations as required for proper system operations.
- k. Pressure reducing valve stations are required at pressure zone boundaries as shown in the Payson City Water Master Plan.

#### 5. CULINARY WATER LATERALS AND METERS

- a. Minimum size water service line and meter is one (1) inch diameter.
- b. Install one (1) inch service connections, meters, and meter vaults according to Payson City Standard Plan W-02. Where possible, do not install the water meter in pavement. If it is not possible to avoid installation in pavement, a Raven Meter Pit and D&L Supply Frame and Lid are required per Payson City Standard Plan W-04.
- c. Install two (2) inch service connections, meters, and meter vaults according to Payson City Standard Plan W-03.
- d. ~~Services larger than two (2) inches will follow APWA Standards and Specifications~~ Install four (4) inch and six (6) inch service connections, meters, and meter vaults according to Payson City Standard Plan W-05.
- e. All unused water service lines must be abandoned at the water main line.
- f. The size of the water service line and meter required for non-residential applications must be calculated based on the water demand and number of automatic fire sprinkler heads.

#### 6. FIRE HYDRANTS

- a. The maximum spacing of fire hydrants is five hundred (500) feet in residential areas and at the end of all dead-end lines.
- b. The maximum spacing of fire hydrants is three hundred (300) feet in non-residential areas.
- c. Install fire hydrant per Payson City Standard Plan W-01.
- d. Valves are required at main lines for all fire lines and fire hydrants.
- e. The location and the number of fire hydrants must be approved by the Payson City Fire Chief or Fire Marshal.
- f. All fire hydrants are required to have a Copperhead Industries Snakepit, or engineer approved equivalent, and six (6) foot by six (6) foot concrete apron.

#### 7. EASEMENTS

- ~~g-a.~~ Minimum twenty (20) foot wide municipal utility easements (MUE) are required for all public water mains installed outside of the public right-of-way.

## SECTION 4: PRESSURIZED IRRIGATION

### 1. GENERAL

- a. Designed in accordance with all culinary water system requirements with the following exceptions:
  - i. Design pressures are ten (10) psi lower than the culinary water system in the same pressure zone unless otherwise approved. The typical minimum operating pressure in all parts of the system is forty (40) psi.
  - ii. The pipe material must be colored purple.
  - iii. No cross connection between secondary and culinary water systems is permitted.
  - iv. Where pressurized irrigation is available, culinary water is not to be used for irrigation purposes.
- b. Installed at a minimum depth of thirty (30) inches.
- c. Installed on the south and east side of the roadway.

## SECTION 5: SANITARY SEWER

### 1. SEWER DESIGN STANDARDS

- a. All sanitary sewer design and installation must comply with the Payson City Wastewater Collection System Master Plan, and Utah State Administrative Code, Rule R317-3-2.

### 2. HYDRAULIC DESIGN CRITERIA

- a. Sewer lines are to be designed to maintain a flow velocity of two (2) feet per second during peak flows.
- b. Where design velocities are projected to be greater than fifteen (15) feet per second, the sewer lines and manholes must be protected against displacement by erosion and impact.
- c. Sanitary sewers are required to be designed to carry the peak discharge as specified below:
  - i. Laterals and collector mains: 400 gallons/capita/day
  - ii. Interceptor and outfall mains: 250 gallons/capita/day
- d. Minimum Manning's "n" value is 0.013.
- e. Buoyancy of sewers must be considered, and flotation of the pipe prevented with appropriate construction where high groundwater conditions are present or anticipated.
- f. Velocity Calculations for gravity sewers:

Manning's Equation (Gravity):

$$V = \frac{1.486}{n} \times (R_H)^{\frac{2}{3}} \times S^{\frac{1}{2}}$$

Where: V = velocity in feet/second

n = coefficient of roughness (Manning), n = 0.013

S = slope of energy grade line, ft/ft

R<sub>H</sub> = hydraulic radius, ft

$$= \frac{\text{cross-sectional area of flow (ft}^2\text{)}}{\text{wetted perimeter}} \text{ OR } \frac{\text{diameter (in.)}}{48}$$

- g. The evaluation criteria for sanitary sewer pipelines vary by pipe size:
  - i. Pipeline capacity twelve (12) inch diameter and smaller: Peak flow in the pipe must be less than fifty (50) percent of the full flow pipe capacity.
  - ii. Pipeline capacity fifteen (15) inch diameter and larger: Peak flow in the pipe must be less than seventy-five (75) percent of the full flow pipe capacity.
- h. Design Peak Hourly Flow is the largest volume of flow to be received during a one-hour period expressed as a volume per unit of time.
- i. Peak Hour Factor must be calculated using the following equation:

$$\text{Peak Hour Flow} = \frac{18 + \sqrt{P}}{4 + \sqrt{P}}$$

In which P equals population in thousands

### 3. SANITARY SEWER PIPE SIZE AND TYPE

- a. Minimum main line size is eight (8) inches in diameter.
- b. Minimum depth of a sewer main, to top of pipe, will be not less than forty-eight (48) inches below subgrade of roadway.
- c. Sanitary sewers must be designed of sufficient depth to permit sewer laterals from basements to be

connected. Exceptions may be granted in subdivisions or areas in which no basements are to be constructed. A note is required on the plat to prohibit basements in these areas.

- d. Allowable sanitary sewer main pipe material for all projects is green PVC (SDR-35) or fused High-Density Polyethylene (HDPE).
  - e. Horizontal clearance to any culinary water line must be at least 10 feet (10') edge to edge per R309-550 and R317-3-2.
    - i. Any other utility crossing the sewer main must do so as close to a right angle as possible.
    - ii. For waterline crossings, the water is required to be a minimum of eighteen (18) inches above the sewer.
  - f. Unless otherwise accepted and approved by the City Engineer, the minimum slopes are as follows:
    - i. Eight (8) inch sewer lines: 0.40%
    - ii. Ten (10) inch sewer lines: 0.28%
    - iii. Twelve (12) inch sewer lines: 0.22%
    - iv. Fifteen (15) inch sewer lines: 0.15%
    - v. Eighteen (18) inch sewer lines: 0.12%
    - vi. Twenty-one (21) inch and larger sewer lines: 0.10%
  - g. Sewer main lines are to be located along the centerline of the road.
4. SANITARY SEWER MANHOLES

- a. Sewer manholes are required:
  - i. At a maximum spacing of four hundred (400) feet.
  - ii. At all changes in grade, size or alignment, and at all intersections with other main lines.
  - iii. At the end of main lines (no cleanouts allowed).
  - iv. Manholes are required on laterals six inches (6") or larger at the intersection with a sewer main line.
- b. Sewer manholes must be sized based on the following:
  - i. Payson City Standard Plan UT-04.
  - ii. Minimum five (5) foot diameter manholes are required for all sanitary sewer systems owned and/or maintained by Payson City.
  - iii. Six (6) foot diameter manholes are required for all configurations with any inlet or outlet pipe of diameter greater than fifteen (15) inches and less than or equal to twenty-four (24) inches, manholes over fifteen (15) feet deep, and manholes with over one (1) foot drop in manhole.
  - iv. Seven (7) foot diameter manholes are required for all configurations with any inlet or outlet pipe of diameter greater than twenty-four (24) inches and at three-way configurations with two or more pipes greater than or equal to twenty-four (24) inch diameter.
- c. Install sanitary sewer thirty (30) inch frame and cover per APWA Standard Plan 402.
- d. Install sanitary sewer cover collar per Payson City Standard Plan UT-05.
- e. Place manholes within ten (10) feet of the upstream and downstream ends of casing pipes.
- f. All sanitary sewer manholes are required to be cleaned and air tested prior to acceptance.

## 5. SANITARY SEWER LATERALS

- a. Minimum sanitary sewer lateral size for residential land use is four (4) inches in diameter and must be connected to the main at least three feet (3') from any structure utilizing a Wye or Insert-a-tee fitting. Residential service connections are not permitted in manholes.
- b. The minimum slope for a four (4) inch lateral is 2.00%.
- c. Lateral size is based on the number of fixture units in the residence and slope of lateral. Up to ninety (90) fixture units are allowed per each four (4) inch lateral set at a two percent (2%) slope.
- d. Connection of residential sanitary sewer laterals are to be at two (2) and ten (10) o'clock in relation to the sewer main pipe with twelve (12) o'clock being the crown of the pipe.
- e. Minimum sanitary sewer lateral size for all non-residential land uses is six (6) inches in diameter and must be connected to the main at a manhole. Wye or Insert-a-tee fittings are not permitted.
- f. The minimum slope for a six (6) inch lateral is 1.00%
- g. No roof drains, storm drains, foundation drains, or sub-drains are permitted to be connected to the sanitary sewer system.
- h. Cleanouts are required centered in the planter strip and between two (2) feet and five (5) feet from the structure. Additional cleanouts are required every at one hundred (100) feet-foot maximum spacing and at angle points all bends greater than twenty-two and one-half (22.5) degrees or at the discretion of the Sanitary Sewer Collections Direct Responsible Charge (DRC).
- i. Pretreatment will generally be required for each use producing a sewer load different from a standard residential unit. Install grease traps per APWA-Payson Standard Plan 441SS-04.
- j. A separate non-sanitary sewer lateral, grease trap, and sampling manhole is required for each unit of a development producing waste of a load different from a standard residential unit. If the future occupant of a unit is unknown, a non-sanitary sewer lateral is required to be plumbed to the unit and stubbed a minimum distance of ten (10) feet from the building foundation. An occupant determined to produce non-sanitary waste is required to install the required grease trap and sampling manhole and extend the non-sanitary lateral to the sewer main prior to Certificate of Occupancy.
- k. All unused sewer laterals must be abandoned at the main line.
- l. Install residential sanitary sewer lateral connections per Payson City Standard Plan SS-02.
- m. All sanitary sewer designs must comply with Payson City Standards or as approved by the City Engineer.

## 6. EASEMENTS

- a. Minimum twenty (20) foot wide municipal utility easements (MUE) are required for all publicly owned and maintained sewer main lines located on private property.
- b. Extend sewer easement ten (10) feet beyond dead end manholes.

## 7. SEWAGE LIFT STATIONS

- a. Sewage lift stations, where required, must be designed to conform to all requirements of the State Administrative Rules, and be approved by the Public Works Director.
- b. Minimum velocity of forcemain sewers is three (3) feet per second.
- c. Air relief valves may be required to prevent air lock. Air vents are required to be filtered to prevent odor with an approved device.
- d. No segment of forcemain is permitted to have zero slope.
- e. Install tracer wire along the entirety of the forcemain sewer.



- f. Construct lift stations where required to pump sewage from low elevation areas into an existing or proposed gravity system.
- g. Lift stations must be enclosed in a permanent structure as approved by the Public Works Director.
- h. Adequately size lift station enclosures to accommodate all the required pumps, wet wells, plumbing items, electrical equipment, and appurtenant items, as approved by the Public Works Director.
- i. Equipment for a SCADA system is required inside the lift station. The SCADA system must be compatible with the city's system and approved by the Public Works Director or designee.
- j. Property for lift stations is required to be dedicated to the City if it will be owned and maintained by the City, or to the Homeowner's Association, or Business Owner's Association, if maintained by a private entity.
- k. Lift stations must be provided with standby power systems as required by Utah State Code.

## SECTION 6: STORM DRAIN

### 1. DRAINAGE PLAN:

- a. All system installation and design must conform to the Payson City Stormwater Master Plan.
- b. Surface drainage is to be designed as such that all drainage is addressed within own project boundaries and does not adversely affect other properties.
- c. Provide protection to the project from natural drainage ways such as existing drainage irrigation.
- d. Identify all existing storm drain and irrigation features within and adjacent to the project boundaries.
- e. Projects within a delineated wetlands or high groundwater table zone must meet and address those conditions as part of the project including, but not limited to the following:
  - i. Provide minimum building finished floor elevations based on groundwater table depth elevation.
  - ii. Provide the high groundwater table elevation measured during spring season.
  - iii. Projects with a groundwater table elevation within five feet (5') of existing ground surface elevation must monitor groundwater for a twelve (12) month period. The results of the monitoring must be included in the geotechnical report.
- f. Identify public and private drainage systems.
- g. Provide overall pre-development and post-development pervious and impervious surface area measurements.

### 2. HYDRAULIC DESIGN CRITERIA:

- a. The design of a storm drainage system should have as its objective the design of a balance between the maximum allowable discharge rate and downstream receiving system's capacity.
- b. Use rainfall data published by the National Oceanic and Atmospheric Administration (NOAA) for all drainage studies.
- c. The NOAA Precipitation Frequency Data Server is located at the following link:  
[https://hdsc.nws.noaa.gov/pfds/pfds\\_map\\_cont.html?bkmrk=ut](https://hdsc.nws.noaa.gov/pfds/pfds_map_cont.html?bkmrk=ut)

Duration	Frequency (inches/hour)					
	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
5 min	1.9 <del>37</del>	2. <del>6872</del>	3.3 <del>48</del>	4. <del>3642</del>	5. <del>2835</del>	6. <del>3642</del>
10 min	1. <del>4750</del>	2.0 <del>38</del>	2.5 <del>48</del>	3.3 <del>16</del>	4.0 <del>27</del>	4.8 <del>49</del>
15 min	1.2 <del>14</del>	1. <del>6871</del>	2.1 <del>03</del>	2.7 <del>48</del>	3.3 <del>26</del>	4.0 <del>04</del>
30 min	0.8 <del>163</del>	1.1 <del>35</del>	1.4 <del>13</del>	1.8 <del>47</del>	2.2 <del>47</del>	2.6 <del>972</del>
60 min	0.5 <del>052</del>	0.7 <del>004</del>	0.8 <del>739</del>	1.1 <del>46</del>	1. <del>3840</del>	1.6 <del>68</del>
120 min	0.3 <del>092</del>	0.4 <del>092</del>	0. <del>49954</del>	0.6 <del>436</del>	0.7 <del>729</del>	0.9 <del>224</del>
3 hours	0.2 <del>364</del>	0.3 <del>01</del>	0.3 <del>617</del>	0.4 <del>557</del>	0.5 <del>365</del>	0.6 <del>335</del>
6 hours	0.1 <del>516</del>	0.1 <del>869</del>	0.2 <del>162</del>	0.2 <del>607</del>	0. <del>29834</del>	0.3 <del>415</del>
12 hours	0. <del>09540</del>	0.1 <del>152</del>	0.1 <del>324</del>	0.1 <del>566</del>	0.1 <del>768</del>	0. <del>19620</del>
24 hours	0.0 <del>586</del>	0.0 <del>708</del>	0.0 <del>809</del>	0. <del>09340</del>	0.1 <del>024</del>	0.1 <del>12</del>

Duration	Frequency (inches)					
	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
5 min	0.16 <del>1</del>	0.2 <del>2</del> 3	0.2 <del>7</del> 8	0.3 <del>6</del> 37	0.4 <del>4</del> 05	0.5 <del>3</del> 04
10 min	0.2 <del>4</del> 5	0.3 <del>3</del> 95	0.4 <del>2</del> 3	0.5 <del>5</del> 26	0.6 <del>7</del> 08	0.8 <del>0</del> 62
15 min	0.3 <del>0</del> 34	0.4 <del>2</del> 03	0.5 <del>2</del> 43	0.6 <del>8</del> 570	0.8 <del>3</del> 14	<del>0.999</del> 1.01
30 min	0.4 <del>0</del> 82	0.5 <del>6</del> 58	0.7 <del>0</del> 52	0.9 <del>2</del> 24	1.1 <del>2</del> 4	1.3 <del>5</del> 6
60 min	0.5 <del>0</del> 52	0.7 <del>0</del> 04	0.8 <del>7</del> 39	1.1 <del>4</del> 6	1.3 <del>8</del> 40	1.6 <del>6</del> 8
120 min	0.6 <del>1</del> 94	0.8 <del>1</del> 84	<del>0.998</del> 1.02	1.2 <del>9</del> 34	1.5 <del>4</del> 7	1.8 <del>4</del> 7
3 hours	0.7 <del>0</del> 93	0.9 <del>0</del> 63	1.0 <del>8</del> 14	1.3 <del>7</del> 40	1.6 <del>1</del> 4	1.9 <del>0</del> 4
6 hours	0.9 <del>0</del> 64	1.1 <del>1</del> 5	1.3 <del>0</del> 4	1.5 <del>6</del> 60	1.7 <del>8</del> 84	2.0 <del>5</del> 14
12 hours	1.1 <del>5</del> 20	1.4 <del>0</del> 4	1.6 <del>0</del> 6	1.8 <del>9</del> 96	2.1 <del>2</del> 8	2.3 <del>7</del> 44
24 hours	1.4 <del>5</del> 1	1.7 <del>8</del> 0	<del>1.922</del> 1.04	2.2 <del>4</del> 38	2.4 <del>7</del> 64	2.7 <del>1</del> 88

- d. Piped systems are to be designed using a ten (10) year, twenty-four (24) hour storm event.
  - e. Retention or detention basins are to be designed using a one hundred (100) year, twenty-four (24) hour storm event.
  - f. The stormwater drainage system is required to be separated and independent of the sanitary sewer system.
  - g. Design storm drainage systems using the Rational Method, SCS, or other methods approved by the City Engineer. Hillside developments must also use the TR-55 method to analyze the drainage channels from above the development.
  - h. A copy of the storm drainage calculations must be submitted along with the construction plans.
  - i. Inlets are required to be placed in locations that will prevent surface water from being carried across or around any street intersections.
  - j. Install catch basins to intercept runoff in locations where calculations indicate that curb capacities are exceeded.
3. RETENTION OR DETENTION PONDS:
- a. Retention or detention basins are to be designed using a one hundred (100) year, twenty-four (24) hour storm event.
  - b. As part of the design consideration, a geotechnical study with a percolation rate is required to determine infiltration rates and the highest ground water table elevation.
  - c. The percolation test must show the capability of draining the pond within seventy-two (72) hours. The percolation test must be performed at the lowest anticipated pond elevation in the location of the proposed basin.
  - d. A sump may be required to facilitate infiltration and get through clay or other slow infiltrating soil layers. A geotechnical boring is required to determine the depth of soils that will allow percolation.
  - e. Over-excavation of native clays and installation of free draining material may be required.
  - f. The floor of a detention basin must be at least ~~one-two~~ (42) foot above the seasonal high-water elevation.
  - g. Landscape the stormwater pond with water-wise landscaping as shown in Payson City Standard Plan SD-06 to control erosion and sedimentation.
  - h. The maximum design depth for a stormwater pond is three (3) feet with an additional one (1) foot for freeboard to the top of the spillway.

- i. The ~~minimum-maximum~~ side slope of a stormwater pond is 5:1 (horizontal to vertical) if the basin is to be landscaped and utilized as recreational open space.
  - j. Provide a minimum fifteen (15) foot wide maintenance access area to the hydraulic related features. Include a maintenance vehicle turnaround area.
  - j-k. An additional percolation (double ring) test is required in all stormwater basins and other Low Impact Development (LID) of concern, before final landscaping to confirm percolation rates are acceptable and consistent with the original Geotechnical Report. If tests fail, it is the responsibility of the developer to redesign the improvements and submit to Payson City a new proposal for stormwater retention.
4. STORM DRAIN PIPE SIZE AND TYPE:
  - a. Install storm drain pipes on the south or east side of the roadway.
  - b. Install storm drain pipes four-and-one-half (4-1/2) feet from the Top Back of Curb (TBC).
  - c. The minimum depth is eighteen (18) inches measured from the bottom of the road base to the top of the pipe.
  - d. The minimum vertical separation between storm drain pipes and other utilities is twelve (12) inches.
  - e. The minimum public storm drain main pipeline diameter is fifteen (15) inches and twelve (12) inches for laterals collecting runoff from one storm drain inlet.
  - f. All storm drain lines within public rights-of-way must be reinforced concrete pipe (RCP) or white polyvinyl chloride (PVC) pipe, unless approved by the City Engineer. Corrugated high density polyethylene (HDPE) pipe is not permitted for storm drain usage in the public right-of-way.
  - g. A storm drain manhole is required for accesses at all pipe transitions including changes in direction, elevation, slope, and pipe size.
  - h. The minimum slope for a storm drain pipe is 0.40 percent.
  - i. All storm drain pipes must have a video from a camera truck performed by a third party and the lines and structures cleaned before City acceptance.
5. STORM DRAIN MANHOLES:
  - a. The maximum spacing for storm drain manholes is four hundred (400) feet.
  - b. Install storm drain manholes per Payson City Standard Plan UT-04.
  - c. Install storm sewer thirty (30) inch frame and cover per APWA Standard Plan 402.
  - d. Install cover collar for storm sewer manhole per Payson City Standard Plan UT-05.
6. STORM DRAIN INLETS:
  - a. A minimum of twelve (12) inches of separation from the flow line of outlet pipe to the floor of the inlet box is required.
  - b. Install drop back hood curb inlet boxes per ~~APWA Standard Plan 315.1 or 315.2~~ Payson City Standard Plans SD-01, SD-02, and SD-03.
  - c. Maximum inlet box spacing is four hundred (400) feet of street curb and gutter.
  - d. Install a double inlet box at low points of vertical curves, downgrade cul-de-sacs or dead-end streets and in areas with steep slopes.
7. CULVERTS
  - a. The minimum culvert size is eighteen (18) inches in diameter.
  - b. Trash racks are required in locations the City determines there is a high risk of severe blockages.
8. OPEN CHANNELS
  - a. Located within a dedicated right-of-way, drainage easement, or equivalent.

- b. Convey a twenty-five (25) year twenty-four (24) hour storm event with a minimum freeboard of one (1) foot.
- c. Line with rock or other similar erosion control if velocities are expected to exceed two (2) feet per second.
- d. No side slopes steeper than 2H:1V.

#### 9. HEADWALLS

- a. For any culvert entrance or exit a headwall and concrete apron are required to control erosion.
- b. Staked rock with a concrete apron may be used for concrete pipe culverts.

#### 10. EASEMENTS

- a. Minimum twenty (20) foot wide municipal utility easements (MUE) are required for all publicly owned and maintained storm sewer main lines located on private property.
- b. Extend storm drainage easements ten (10) feet beyond dead end manholes.

#### 11. PRIVATE LOT DRAIN CONNECTION:

- a. Use four (4) inch diameter minimum white PVC SDR-35 for all lot drain piping.
- b. A backflow prevention device is required on lot drain lines.

#### 12. WATER QUALITY:

- a. A pretreatment device is required in all storm drain structures.
  - i. Pretreatment device must meet manufacturer design requirements and the following criteria:
    - Remove floatable contaminants.
    - Filter sediments.
    - Filter hydrocarbons.
- b. Pretreatment structure is required to comply with Payson City Standard Plan SD-03 or a City Engineer approved equivalent.
- c. Submit a Stormwater Pollution Prevention Plan (SWPPP) for construction activity.
- d. Provide a Long-Term Stormwater Management Plan.
- e. Provide a Storm Drainage System Maintenance Agreement for all components of the proposed private drainage system. A fillable PDF is available for download from the Payson City webpage.
- f. The agreement must include at a minimum:
  - i. The party responsible for executing the maintenance agreement, i.e., homeowners or business association, property owner, etc.
  - ii. Extent of the maintenance activities to be performed.
  - iii. Frequency of the proposed recordkeeping and reporting of performed maintenance and inspection activities.
  - iv. Provide easements to Payson City to access and inspect temporary and permanent stormwater controls.

## SECTION 7: GRADING

### 1. GRADING

- a. All site grading must comply with the grading requirements of this section, current zoning and subdivision ordinances, and Appendix J of the International Building Code (IBC), latest edition.

### 2. STREETS

- a. Design streets to match natural grade as much as practical within design requirements.
- b. When the design centerline of new streets exceeds two percent (2%) grade, the streets are required to be tabled across intersections at a grade that does not exceed two percent (2%) for the consideration of ADA compliant crosswalks.

### 3. CUTS & FILLS

- a. Imported fill material must meet the requirements of the geotechnical report.
- b. Acceptable fill material does not contain organic, frozen, or other deleterious materials. No rock or similar irreducible material greater than twelve inches (12") in any dimension is permitted in fills.
- c. Locate cut or fill slopes within the project boundary. Grading into an adjacent parcel is not permitted without written approval of the adjacent property owner.
- d. A 3:1 (H:V) slope or retaining wall is required between two adjacent parcels where the final grade differential exceeds four (4) feet in height.
- e. Retaining Walls greater than four feet (4') in height require design by a structural engineer. Retaining wall plans and details must be stamped and signed by the structural engineer responsible for the design.

### 4. SUBDIVISION LOTS

- a. Drainage across property lines is generally not accepted.
- b. Subdivision lots are to be designed with drainage along a common boundary to prohibit one lot from flooding another.
- c. Excess or concentrated drainage must be contained on site or directed to an approved drainage facility. Prevent erosion of the ground in the discharge area by installation of non-erosive down drains or other devices.

## SECTION 8: EROSION CONTROL

### 1. GENERAL

a. Refer to the Payson City Allowable Construction BMP and Low Impact Development Manual.

~~d.b.~~ Take all necessary measures to prevent erosion due to drainage at all points in new projects.

~~e.c.~~ The developer is responsible for controlling all potential storm runoff during grading and construction to prevent eroded soil and debris from entering any downstream water course or adjoining property. Refer to the Payson City Stormwater Management Program for During and Post Construction Site Inspection SOPs.

~~f.d.~~ Mitigate all erosion on adjacent properties due to runoff from the project boundary.

~~g.e.~~ Erosion mitigation will be permanent unless otherwise approved.

~~h.f.~~ Owners/operators must develop, implement, and enforce a program of BMPs to reduce pollutants in any stormwater discharging into the MS4 from certain post-construction activities including pollutants known to be discharged or having the potential to be discharged from the sites. These include design standards for post-construction stormwater controls, SOPs for inspections, maintenance, and reporting to the City in accordance with the approved Payson City Stormwater Management Program (SWMP).

### 2. UPDES PERMIT

~~i.~~ All new construction that disturbs one acre of land or more must obtain a UPDES Stormwater General Permit for Construction Activities (CGP) (Permit #UTR090000) before construction begins. All ~~new construction that is part of a larger~~ development ~~or sale~~ that disturbs ~~more~~ less than one acre must obtain a UPDES Common Plan Permit for Construction Activities (CPP) (Permit #UTRH00000) before construction begins.

~~a.~~

~~j.b.~~ The permit requires the operator, typically the contractor, to control and eliminate stormwater pollution sources through the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP).

~~k.c.~~ The permit also requires inspection of the BMP controls either:

- i. At least once every seven (7) calendar days, or
- ii. At least once every fourteen (14) days and within twenty-four (24) hours of the end of a storm event of one-half (1/2) inch or greater.

### 3. Stormwater Pollution Prevention Plan

a. The Stormwater Pollution Prevention Plan (SWPPP) is required to be submitted to the City Engineer and ~~SWPPP Inspector~~ MS4 Operator for review before the contractor can obtain the UPDES permit.

b. The plan must include, among other things:

- i. Possible sources of stormwater pollutants
- ii. Selection of Best Management Practices (BMPs) to reduce or eliminate pollutant impacts.
- iii. A SWPPP template that addresses all of the information required in the SWPPP can be obtained from the State of Utah Division of Water Quality web site:  
<http://www.waterquality.utah.gov/UPDES/stormwatercon.htm>

### 4. PERMITTING PROCESS

a. The Operator prepares a SWPPP in accordance with the UPDES Permit.

b. The Operator Submits SWPPP to City for review.

- c. Once the City has reviewed the SWPPP, the operator applies for the UPDES Permit by completing the Notice of Intent (NOI) form. The form can be completed online at: <https://secure.utah.gov/stormwater/main.html>

~~d.~~—

~~e.~~d. Construction may commence only after:

- i. The SWPPP has been reviewed by the City
- ii. The NOI has been submitted

iii. The Operator has attended a pre-construction meeting with designated City personnel to review and discuss the SWPPP,

iv. ~~All BMPs have been installed according to the CGP or CPP and inspected by the MS4 Operator or designee.~~

~~iii-v.~~ Land Disturbance Fees have been paid and Permit obtained from the City, and

~~iv-vi.~~ All other applicable ~~fees have been paid and~~ permits ~~have been obtained~~ from the City.

e. Once construction has been completed and the site stabilized, the contractor is required to request a final inspection with the Payson City MS4 Coordinator or designee.

f. ~~After the final inspection is deemed satisfactory, the contractor must~~ complete the Notice of Termination (NOT) form and submit to the Division of Water Quality.

~~f.g.~~ The Payson City MS4 Coordinator will close out the permit on the EPA CDX system.

~~g-h.~~ Any bond retention will not be released until the NOT has been provided.



## SECTION 9: STREET IMPROVEMENTS

### 1. STREET

- a. All streets within Payson City are to be designed structurally to conform to the Payson City Transportation Master Plan, AASHTO and MUTCD guidelines.
- b. Payson City streets follow a grid system. New roads are required to follow the designated grid to the maximum extent practicable.
- c. New roads will be assigned a coordinate number by the City Engineer or designee. Named roads are discouraged and require the approval of the City Engineer or designee.

### 2. DEFINITIONS

- a. For the purposes of this chapter, the following definitions apply:

"AASHTO guidelines" means the engineering and development standards published by AASHTO in the current edition titled "A Policy on Geometric Design of Highways and Streets."

"Alley" means a private right-of-way that is primarily designed to serve as an access to a garage from the rear or side of those properties whose principal frontage is on a public street.

"Arterial" means generally a five-lane road with signalized streets that primarily serve through traffic and provide access to abutting properties as a secondary function.

"Clearview" means that portion of the corners at intersections where obstructions are limited to two feet in height in order to preserve a safe sight distance for motorists entering intersections.

"Collector street" means streets providing land access and traffic circulation service within residential, commercial, and industrial areas. They enable moderate quantities of traffic to move efficiently between local streets and the arterial street network.

"Corner lot" means a lot abutting on two intersecting or intercepting streets, where the interior angle of intersection or interception does not exceed one hundred thirty-five degrees.

"Curb ramps" means a short ramp cutting through a curb or built up to a curb.

"Decision sight distance" means the distance required for a driver to detect an unexpected or otherwise difficult-to-perceive information source or hazard in a roadway environment that may be visually cluttered, recognize the hazard or its threat potential, select appropriate speed and path, and initiate and complete the required safety maneuver safely and efficiently.

"Developed parcel" means those land uses other than agricultural.

"Driveway" means an access constructed within and adjoining a roadway, private or public street, connecting the roadway with adjacent property and intended to be used in such a way that the access into the adjacent property will be complete and will not cause the blocking of any sidewalk border area or roadway.

"In-Fill development" means the development of vacant or partially developed parcels which are surrounded by or in close proximity to areas that are substantially or fully developed and are no larger than an acre and a half. Any in-fill development shall have pedestrian access to a public sidewalk.

"Local streets" means streets primarily providing access to immediately adjacent properties. Through movement may be possible but is not encouraged.

"Private roadway" means a roadway in private ownership which is controlled and maintained by the owners and not the city.

"Public roadway" means a roadway which has been dedicated, deeded, or otherwise conveyed to public use. Public roadways are owned and maintained by the city.

"Roadway" means the entire width between the boundaries of any highway, street or road which is used for vehicular traffic. The terms "roadway," "highway," "street" and "road" are used interchangeably in this chapter.

"Ramp" means a walking surface which has a running slope greater than 1:20.

"Sight distance" means the same as stopping sight distance.

"Stopping sight distance" means the minimum sight distance required that will allow motorists traveling at or near the design speed to stop before reaching a stationary object in its path.

"Sidewalk" means a facility provided for pedestrian movement, usually segregated from vehicular traffic by a curb or provided on a separate right-of-way.

### 3. STREET WIDTHS

- Proposed streets must have the minimum width for the rights-of-way based on the functional classification and listed in the table below. The width is measured from lot line to lot line.
- A ten (10) foot public utility easement (PUE) is required outside and adjacent to the right-of-way.
- Functional classification of existing and future roadways is defined by the Payson City Transportation Master Plan (TMP).

### 4. ROAD CLASSIFICATIONS

Type	ROW Width	Minimum CL Radius	Curb Radius	Pavement Width	Park-strip Width	Sidewalk Width
A-5-H	Varies	100'	25'	20'	6'	5'
MH ZONES	Varies	100'	25'	24'	6'	5'
INFILL LOTS / PRIVATE ROADS	Varies	100'	25'	26'	6'	5'
LOCAL	58'	100'	25'	32'	6'	5'
COLLECTOR	76'	200'	30'	50'	6'	5'
ARTERIAL	98'	500'	35'	72'	6'	5'
ARROWHEAD TRAIL	110'	500'	35'	84'	6'	5'
MAIN ST (NORTH OF SR-198)	113'	500'	35'	86'	6'	5'
900 NORTH (9600 SOUTH)	106'	500'	35'	70'	6'/11'	10'/5'

Type	Maximum Grade	Minimum Grade	Curb & Gutter	Pavement Thickness	Road Base Thickness	P.U.E. Width
A-5-H	10%	0.5%	2'	Gravel	8.0"	10'
MH ZONES	10%	0.5%	2'	3.5"	8.0"	10'
INFILL LOTS / PRIVATE ROADS	10%	0.5%	2'	3.5"	8.0"	10'
RESIDENTIAL	10%	0.5%	2'	3.5"	8.0"	10'
COLLECTOR	10%	0.5%	2'	5.0"	8.0"	10'
ARTERIAL	10%	0.5%	2'	5.0"	10.0"	10'
ARROWHEAD TRAIL	10%	0.5%	2'	5.0" MIN	10.0"	10'
MAIN ST (NORTH OF SR-198)	10%	0.5%	2.5'	5.0" MIN	10.0"	10'
900 NORTH (9600 SOUTH)	10%	0.5%	2'	5.0" MIN	8.0"	10'

- a. New perimeter streets are required with development following the TMP. Developments along a route identified in the TMP are required to improve half the street width plus ten (10) feet of a new perimeter street and dedicate the entire required street right-of-way width to Payson City at no cost.
- b. The pavement cross section for a public roadway is based on a CBR value obtained from lab results and recommended by a Geotechnical Engineer. The CBR value must be calculated from soil samples taken from the project location, not assumed, or estimated.
- c. The minimum pavement cross sections are identified in the table above. Development must follow either the recommendation of the Geotechnical Engineer or the minimum section, whichever is greater.

## 5. ROAD DESIGN

- a. Sidewalks in areas of high pedestrian traffic require greater width as determined by the City Engineer.
- b. Minimum curb return turning radius may increase based on the type of traffic and design vehicles and should be designed according to the AASHTO Design Guidelines, latest edition.
- c. See WCG Figure #2 at the end of this section for Arrowhead Trail right-of-way transition at Salem City Boundary.

## 6. GEOMETRIC DESIGN

- a. Design streets to provide adequate stopping sight distance in accordance with AASHTO guidelines.
- b. A vertical curve is required in all changes in grade where the algebraic difference is one percent (1%) or greater.
- c. The minimum K values for vertical curve design are:

Street Designation	Design Speed (mph)	K-Value (min)
Local/Residential	25	12
Collector	30	19
Arterial	35	29

## 7. INTERSECTIONS

- d. Street intersection and/or driveway centerline offsets must be one hundred fifty (150) feet or greater.
- e. The horizontal alignment of the street intersection is as near to ninety (90) degrees as possible, +/- ten (10) degrees maximum.
- f. The maximum grade of an intersecting street is two (2) percent and must have a minimum fifty (50) foot long tangent.
- g. Slope intersections at an angle no greater than two (2) percent to accommodate pedestrian crossings. It may be necessary to "table" an intersection in new construction areas.
- h. Do not locate intersections on the interior of, or near, sharp curves. Locate intersections a sufficient distance from all curves to provide proper sight distance for vehicles on the intersecting road or driveway and on the through road.
- i. New intersections with more than four (4) "legs" are generally not permitted.
- j. Accommodate the Payson City grid when designing local road networks. The typical block length is five hundred fifty (550) feet measured from centerline to centerline. The maximum block length without an intervening connector street is eight hundred (800) feet without written approval from the City Engineer, Chief of Police, and Fire Chief. Cul-de-sacs are not considered an intervening connecting street.

## 8. CUL-DE-SACS

- a. The maximum cul-de-sac length is **five hundred (500) feet** measured from edge of cross street to center of cul-de-sac.
- b. The minimum turnaround radius measured from the center of cul-de-sac to property line is ~~ninety-sixty-eight (9648)~~ feet for residential areas and ~~one hundred twentysixty (12060)~~ feet for all non-residential areas.
- c. Paved cul-de-sacs with curb and gutter and sidewalk are required on the permanent end of any city street.
- d. A fire hydrant and street light are required at the end of the cul-de-sac.

## 9. SIGNS AND PAVEMENT MARKINGS

- a. All street name signs, traffic control signs, and pavement markings required on the street system within a project or on adjacent roads as a result of the project, are to be installed at the developer's expense in accordance with the standard drawings and MUTCD standards.
- b. Submit a striping and signing plan with the engineering drawings; however, additional signing and traffic control may be added to the project as determined by the Chief of Police.
- c. Install street signs per APWA Standard Plan 292 and Payson City Standard Plan ST-07.
- d. Public road signs are green with white letters.
- e. Private road signs are blue with white letters.

## 10. PAVEMENT

- a. All streets and parking lots, public or private, must be surfaced to grade, with asphalt concrete pavement, to the required minimum width and thickness in accordance with these specifications.
- b. The cost to slurry seal new asphalt pavement is paid at the time of permit issuance. The Payson City Streets Department will contract the slurry seal operation during the paving season following project completion.
- c.

d.

#### 11. CURB, GUTTER, SIDEWALKS, AND WATERWAYS

- a. A twenty-four (24) inch curb and gutter is required on each side of developed streets.
- b. A five (5) foot wide concrete sidewalk is required on each side of developed streets except where other widths are deemed appropriate by the City Engineer. Sidewalks must comply with the latest Americans with Disabilities Act (ADA) requirements to the maximum extent practicable.
- c. A maximum grade of five (5) percent, or two (2) percent greater than the existing/proposed street grade, whichever is less, as measured along the running length of a meandering sidewalk, is required.
- d. Whenever any sidewalk connects with any trails, paths and/or other sidewalks that are larger or smaller in width, a transitional area is required for design and safety standards.
- e. The standard thickness for all sidewalks is six (6) inches. See ADA Ramp details in this specification for thickness of different portions of the ramp.

#### 12. PLANTER STRIPS

- a. A six (6) foot wide planter strip located between the curb and sidewalk is required in all street cross sections except as determined by the City Engineer. See Payson City Standards and Specifications for design guidelines.
- b. Planter strips must be landscaped with at least thirty (30) percent, by area of matured plant, of live vegetation.
- c. Do not fill planter strip with impervious material without written approval from the Public Works Director.
- d. The minimum and maximum slope of any planter strip is two (2) percent and ten (10) percent, respectively.
- e. Drought tolerant, water-wise landscaping is required. Utilize vegetation that may be maintained with drip irrigation. Spray type sprinkler heads are not permitted in any planter strip less than eight (8) feet wide.

#### 13. TRAILS

- a. Shared use trails must be installed in accordance with the Transportation Master Plan and the Payson City Active Transportation Plan.
- b. Provide a ten (10) foot wide trail with two and a half (2-1/2) inches of asphalt over four (4) inches of road base.
- c. Meandering trails and sidewalks are to be carefully laid out on the construction plans as follows:
  - i. Distance between inflection points of meander is typically two hundred (200) to three hundred (300) feet.
  - ii. In no case is the distance permitted to be less than one hundred (100) feet unless necessary to avoid an obstacle as approved by the City Engineer.
  - iii. The minimum radius of any meander is two hundred (200) feet unless necessary to avoid an obstacle as approved by the City Engineer.
  - iv. Additional easements or right-of-way width may be required for the placement of meandering sidewalks or trails.
  - v. All pedestrian trails and sidewalks must conform to ADA standards to the maximum extent practicable.

#### 14. MAILBOXES

- a. Mailbox location requires coordination and written approval from the local Postmaster.
- b. The Postmaster will determine if a Cluster Box Unit (CBU) style mailbox is required for the project.
- c. Mailbox locations must be ADA accessible.
- d. Install mailboxes in accordance with applicable postal standards in the following locations:
  - i. In areas where the sidewalk is next to the curb (no planter strip), install boxes eighteen (18) inches behind the sidewalk.
  - ii. In areas where a planter strip is provided, install mailboxes within the strip, provided no part extends into the sidewalk or beyond the back of the curb. A concrete pad is required for CBU applications.
  - iii. In areas where no barrier curb is installed, provide a minimum clear zone of ten (10) feet from the travel way.

#### 15. TRANSITIONS & TAPERS

- a. The minimum taper ratio is 15:1 for all streets that transition in width.
- b. The transition taper area may be installed as a temporary asphalt section with no less than three inches (3") of asphalt over eight inches (8") of road base.

#### 16. CROSS GUTTERS

- a. No cross gutters are allowed across collector and arterial streets.
- b. On commercial and industrial streets, cross gutters are generally not allowed and require approval by the City Engineer for their use.
- c. The City Engineer may prohibit construction of cross gutters on any street deemed necessary.

#### 17. CONCRETE COLOR

- a. Colored concrete requires approval from the Development Services Department.

#### 18. SECOND ACCESS REQUIREMENTS

- a. Second access spacing must comply with the International Fire Code, Appendix D.
- b. City Engineer approval is required for a second access point onto a road owned and maintained by Payson City.

#### 19. ACCESS MANAGEMENT

- a. Design access to corner lots from the lesser-classified road at the greatest distance possible from the intersection.
- b. Align accesses with existing access on opposite side of parcel.
- c. Where it is not feasible to align driveways, major driveways on opposite sides of the street must be offset one hundred fifty (150) feet at a minimum.
- d. Where commercial lots are not large enough to allow access on opposite sides of the street to be aligned, offset the center of driveways not in alignment a minimum of two hundred fifty (250) feet on collector streets, and three hundred (300) feet on arterial streets.
- e. Greater distances may be required if needed for left-turn storage lanes.
- f. Clear sight distance must be provided for drivers entering or leaving all accesses onto local streets according to AASHTO Guidelines.
- g. For corner residential lots, one (1) access on each frontage may be permitted if it is determined by the City Engineer that two (2) driveways are needed to provide safe access for traffic entering and leaving the lot because of site distance and geometric design considerations.

- h. For corner residential lots, the approved driveway must be located as far from the intersection as possible.
- i. Double frontage residential lots will only have one (1) access onto the lesser classified roadway unless approved by the City Engineer.
- j. Circular driveways are considered one (1) access.
- k. The maximum curb cut for single-family residential driveways is forty (40) feet.
- l. The maximum curb cut for circular driveways is twenty (20) feet per side.
- m. Right-turn deceleration lanes:
  - i. A right-turn deceleration lane is required on a collector or arterial road of speed limit thirty-five (35) mph or less with a traffic volume of fifty (50) vehicles per hour (vph).
  - ii. A right-turn deceleration lane is required for all roads with a speed limit greater than thirty-five (35) mph and a right-turn traffic volume of twenty-five (25) vehicles per hour (vph) or more.
  - iii. Follow AASHTO standards and specifications for Geometric Design of Highways and Streets for taper and storage lengths.
  - iv. Based upon safety and operational studies, median treatments such as Two-Way-Left-Turn Lanes (TWLTL) and Raised Non-Transferable medians may be required on arterial streets, as determined by the City Engineer and the Transportation Master Plan.
  - v. New access locations created by development must be unified whenever possible to create the fewest number of access points onto arterial or collector roads.
  - vi. Joint use or shared access agreements are required where necessary.

## 20. TRAFFIC STUDY

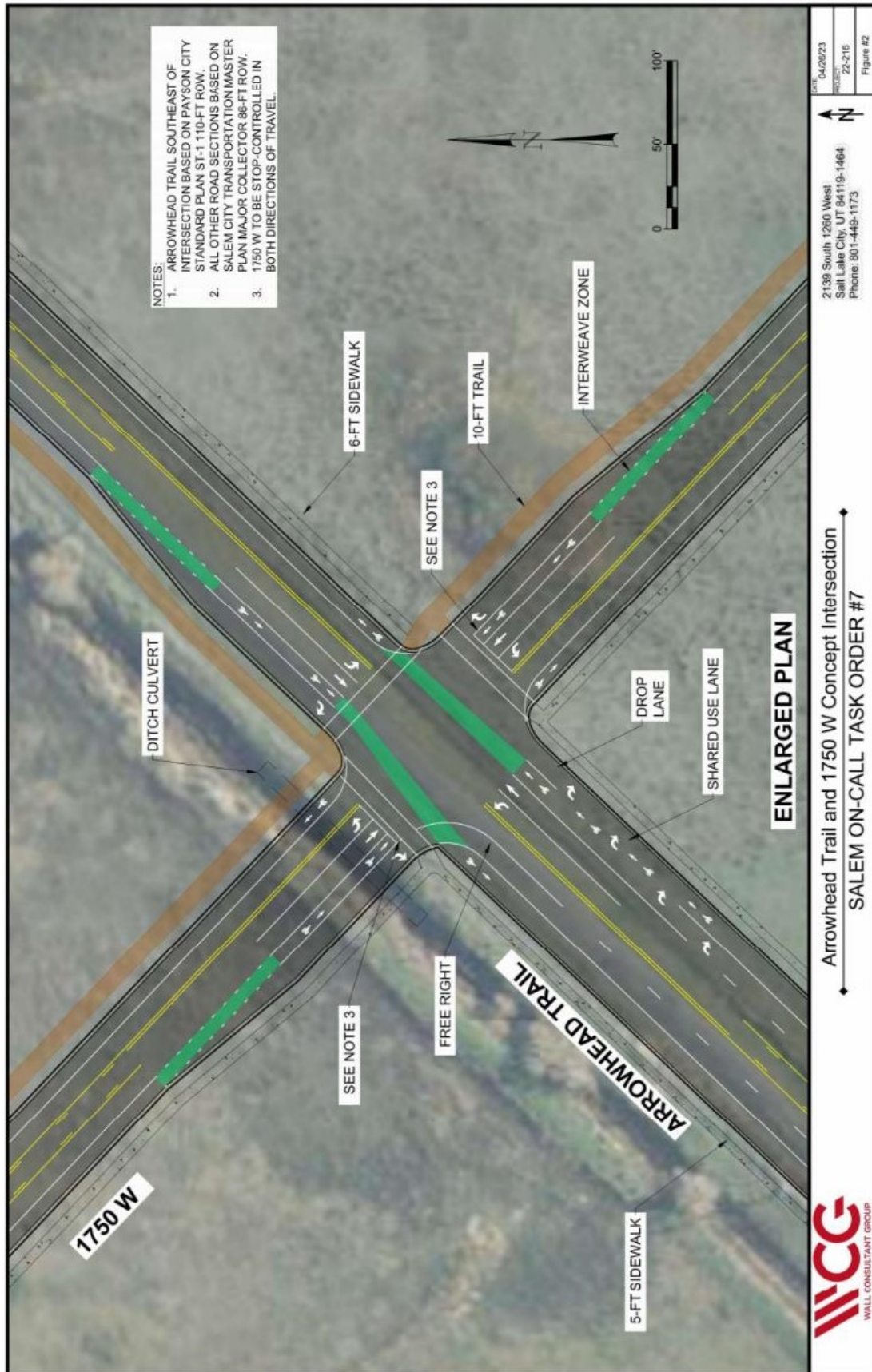
- a. A Traffic Impact Study may be required based on the size, location, and type of proposed project.
- b. Include the following items in a Traffic Impact Study:
- c. A study of existing traffic conditions.
- d. A traffic analysis of the existing traffic conditions plus the number of trips, according to the ITE Trip Generation Manual, generated by the proposed development.
  - i. Traffic analysis on adjacent signalized intersections.
  - ii. On-site and off-site improvement analysis, conclusions, and recommendations.

## 21. PRIVATE ROADS AND ALLEYS

- a. DESIGN: A roadway within a residential development may be designated as a private road or private alley, provided the street meets the following:
  - i. Private roads are only allowed for infill development or parcels with physical barriers and are not allowed for all other green field development. A physical barrier is Interstate 15, railroad tracks, the Highline Canal and/or natural streams. A subdivision of 5 acres or more in size will not qualify for private roads no matter what barrier exists on the property.
  - ii. Private roads may be permitted to access single family attached and multi-family land uses.
  - iii. Private roads must not create a conflict with the public road grid system.
  - iv. Each private road must have a minimum of twenty-six (26) foot wide drivable surface.
  - v. Roads less than thirty-two (32) feet wide must be signed as "No Parking – Fire Lane". Where curb and gutter are present, the curb is also required to be painted red.
  - vi. Follow the table above for all infill development.
  - vii.

- viii. All private roads are required to be finished with asphalt or concrete pavement. Gravel roads are only permitted in the A-5-H zone.
- ix. A Geotechnical Study must determine the asphalt or concrete pavement thickness.
- x. All private roads require a five (5) foot wide and six (6) inch thick concrete sidewalk adjacent to the private street, excluding private alleys.
- xi. All private roads require a two (2) foot wide concrete curb and gutter or reinforced concrete waterway, excluding private alleys.
- b. Off street parking is permitted adjacent to and accessing both sides of the private street, including 90-degree parking.
- c. A turnaround, such as a cul-de-sac or hammerhead, is required for private roads exceeding one hundred and fifty (150) feet measured from the right of way line of the public street.
  - i. Turnarounds, such as cul-de-sacs or hammerheads, must meet the Payson City Fire Department requirements.
  - ii. No parking at any time is permitted at turnarounds, cul-de-sacs, or hammerheads.
  - iii. The maximum length of a private road is two hundred fifty (250) feet.
  - iv. All fire hydrants along the private road must meet the Payson City Fire Department requirements.
- d. MAINTENANCE: The maintenance of the private road in the development is the responsibility of the Homeowner's Association (HOA), Business Owner's Association (BOA), Property Management Company (PMC), or home owner of the private road. A functioning organization that pays fees to maintain the roadway and private utilities must be set up to have private roads and utilities. The management organization is responsible for:
  - i. Street lights located within a private road.
  - ii. Snowplowing of private roads.
  - iii. Asphalt pavement maintenance.
  - iv. Landscaping maintenance.
  - v. Garbage collection: If the HOA chooses City collection of garbage, the garbage collection trash enclosure or individual garbage cans must be located at the entrance of the proposed private road and as approved by the City Engineer. The HOA may contract with a private collection company as per Payson City Code.
- e. EASEMENTS: All private roads are required to provide a municipal utility easement (MUE) for streets including a public sanitary sewer, culinary water, and/or pressurized irrigation pipe system.
  - i. The construction of the underground public utilities located within a private road must meet Payson City Standards and Design Guidelines.
  - ii. The construction of the underground public utilities located within a private road requires posting a performance guarantee bond and payment of inspection and material testing fees.
  - iii. Private roads require the recordation of a shared access easement and road maintenance agreement recorded at the Utah County Recorder's Office.





## SECTION 10: POWER

### 1. REQUIREMENTS FOR NEW PROJECTS

- a. Refer to the Payson City Power Electrical Construction Standard Specifications for more information.
- b. Conduit, wiring, and streetlights are required to be installed at the Developer's expense in all new and proposed project areas.
- c. All conduit for underground power must be gray SCH40 PVC. No other utility is permitted to use gray colored pipe for any reason.
- d. Project areas will be lighted in accordance with a written plan that addresses intersections, public facilities, trails, and crosswalks.
- e. Developers may purchase their own materials for the project. A copy of the material bids must be submitted to the Payson City Power Department before they are purchased to be sure they meet Payson City Standard Technical Specifications.
- f. Developer has the option of purchasing all the materials from the Payson City Power Department.

### 2. STREET LIGHTS

- a. Developer is required to install all street lighting.
- b. Light fixtures and poles will be purchased from the Payson City Power Department.

## SECTION 11: GEOTECHNICAL INFORMATION

### 1. MINIMUM INFORMATION REQUIRED

- a. Project plan showing boring locations
  - i. Boring Logs – Include the following:
    - Elevation
    - Drill or backhoe type
    - Samples
    - Field tests
    - Groundwater level fluctuations
    - Depth to gravel layer
  - ii. Laboratory Test – Performance in general accordance with ASTM
    - Sieve analysis
    - Atterberg Limits
    - CBR values (not assumed but calculated via lab test)
    - Direct Shear
    - Consolidation
    - Identify soils according to USCS
    - Moisture density curve(s)
  - iii. Engineer Analysis and Recommendations
    - Foundations and retaining walls:
      - Allowable bearing capacity
      - Lateral loads friction coefficients
      - Settlement
      - Drainage – backfill of trenches information
      - Seismic loading
    - Pavements
      - Traffic load analysis including construction heavy traffic
      - Subgrade support value (CBR value calculated in the lab)
      - Concrete and/or asphalt pavement thickness
    - Special considerations
      - Site preparation
      - Expansive soils
      - Collapsible soils
      - Slope stability
      - Rock fall
      - Shallow ground water level
      - Foundation drainage
      - Construction of basements
      - Surcharge/preloading
      - Identification of geologic hazards

- b. The number and depth of borings/pits for each specific project is determined by the geotechnical engineer. However, as a minimum, the depth must be deeper than any anticipated excavation (cuts, foundations, utilities, etc.). Bore deep enough to encounter a gravel layer suitable to allow infiltration.
- c. The number of borings is determined by the geotechnical engineer/geologist and must be compatible with the complexity/simplicity of the geology, subsurface conditions, and the type of project.
- d. Following the construction of the utilities in the street(s) within the project and prior to the final paving of the street(s), the Developer must submit written documentation from the consulting Geotechnical Engineer, the Design Engineer, and the Contractor, indicating that each have received and read the Geotechnical Report and have incorporated the recommendations into the design and construction of the project.

## 2. USE OF FILTER FABRIC FOR STREET CONSTRUCTION

- a. Normal woven or non-woven filter fabric is a viable material to use when a separation layer is needed over a soft subgrade and beneath granular fill. These materials provide some minor reinforcing for supporting loads, but primarily act to prevent the movement of many fines up into the overlying crushed base or other clean granular material.
- b. If reinforcement of soft subgrade is desired, a geogrid is required to be designed for the intended purpose.

## 3. FLOWABLE FILL

- a. Utility excavations and subsequent backfill are the source of many problems for paved streets. It is extremely difficult to nearly impossible to place the utility, and backfill the trench, so that some subsequent differential settlement does not occur at the pavement surface. Costs associated with supplying, placing in lifts and compacting conventional backfill materials is high, and results are unsatisfactory to marginal. Therefore, "flowable fill" is a preferential backfill alternative for utility installations beneath paved streets where hydraulic equipment is difficult to use such as a trench narrower than thirty-six (36) inches.

## 4. TRENCHLESS TECHNOLOGY

- a. Trenchless technology/directional drilling is encouraged for many utilities placed beneath streets without making a pavement utility cut. This procedure is preferred whenever feasible.
- b. It is required to pothole all utilities that cross the proposed bore path.
- c. A bore plan and profile are required showing the measured depth of all existing utility crossings.
- d. Boring across the public right-of-way requires written approval from the Public Works Director prior to performing any boring operations.

## SECTION 12: GARBAGE CONTAINERS

### 1. SPECIFIC WEIGHT OF THE WASTE USED FOR THE CONTAINER

- a. The specific weight tells how much weight there is in a given volume.
  - i. For regular trash, an average specific weight number is about one hundred fifty (150) pounds per cubic yard.
  - ii. For specific commercial uses dealing with metals, an average specific weight number is about two hundred twenty-five (225) pounds per cubic yard.
- b. An average trash generation of three (3) pounds per person per day.
- c. An average number of people per residential unit is three (3) people per unit.
- d. The estimated weekly trash generation is based on seven (7) days per week.

### 2. CALCULATE THE TOTAL WASTE PER WEEK

- a. Multiply the average trash generation times seven (7) days per week and divide by the specific weight.  
For example:

$$(3 \frac{\text{lbs}}{\text{person}} / \text{day} \times 7 \text{ days}) / 150 \frac{\text{lbs}}{\text{CY}} = 0.14 \frac{\text{CY}}{\text{person}} / \text{week}$$

### 3. VOLUME OF WASTE

- a. Multiply the number of units by three (3) people per unit.
- b. Multiply the total number of people by total waste per week. For example:

A fifty (50) unit residential development:

$$(50 \text{ units} \times 3 \frac{\text{people}}{\text{unit}}) \times 0.14 \text{ CY} = 21 \frac{\text{CY}}{\text{week}}$$

### 4. NUMBER OF DUMPSTERS

- a. Dumpsters vary in size. The most common sizes are four (4), six (6) and eight (8) cubic yards.
- b. Divide the volume of waste by the size of the dumpster. Examples:

$$21 \frac{\text{CY}}{\text{week}} / 6 \text{ CY} = 3.5 \text{ dumpsters} \rightarrow \text{Use } 4$$

$$21 \frac{\text{CY}}{\text{week}} / 8 \text{ CY} = 2.6 \text{ dumpsters} \rightarrow \text{Use } 3$$

## 5. DUMPSTER SIZES

- a. Dimensions for a four (4), six (6) and eight (8) front loading dumpster:

Four (4) cubic yard dumpster dimension



Six (6) cubic yard dumpster dimension



Eight (8) cubic yard dumpster dimension





## SECTION 13: PARKING FACILITIES

### 1. MINIMUM STANDARDS.

- a. Parking facilities must be designed to conform to the following minimum standards:
  - i. Parking Space Dimensions. The minimum size of a standard parking space is nine (9) feet wide and eighteen (18) feet long.
  - ii. Enclosed garages are required to have an interior dimension of at least twenty (20) feet wide and twenty (20) feet long.
- b. Driveways/Drive Aisles. Driveways providing access to parking facilities must have the following dimensions:
  - i. Non-residential Uses. When fire apparatus access is required, the minimum driveway width is twenty (20) feet for one-way traffic and twenty-six (26) feet for two-way traffic. Otherwise, the minimum driveway width for a one-way driveway is fourteen (14) feet. Where one-way drives exist, directional signs and arrows are required.
  - ii. Residential Uses (Two Units or Less). The minimum width is eighteen (18) feet.
  - iii. Residential Use (Three to Five Units). When fire apparatus access is required, the minimum driveway width is twenty (20) feet for one-way traffic and twenty-six (26) feet for two-way traffic. Otherwise, the minimum width for a driveway is twenty (20) feet.
  - iv. Residential Uses (More than Five Units). The minimum width is twenty (20) feet for one-way traffic and twenty-six (26) feet for two-way traffic. Where one-way drives exist, directional signs and arrows are required.
  - v. Residential Uses (All). In a residential zone, no portion of the required front yard area is permitted to be developed or used for vehicular off-street parking other than that portion occupied by the driveway. The standard curb cut for a driveway is twenty-four (24) feet in width. The driveway curb cut may be widened to accommodate a recreational vehicle parking pad. The maximum curb cut allowed is forty (40) feet.

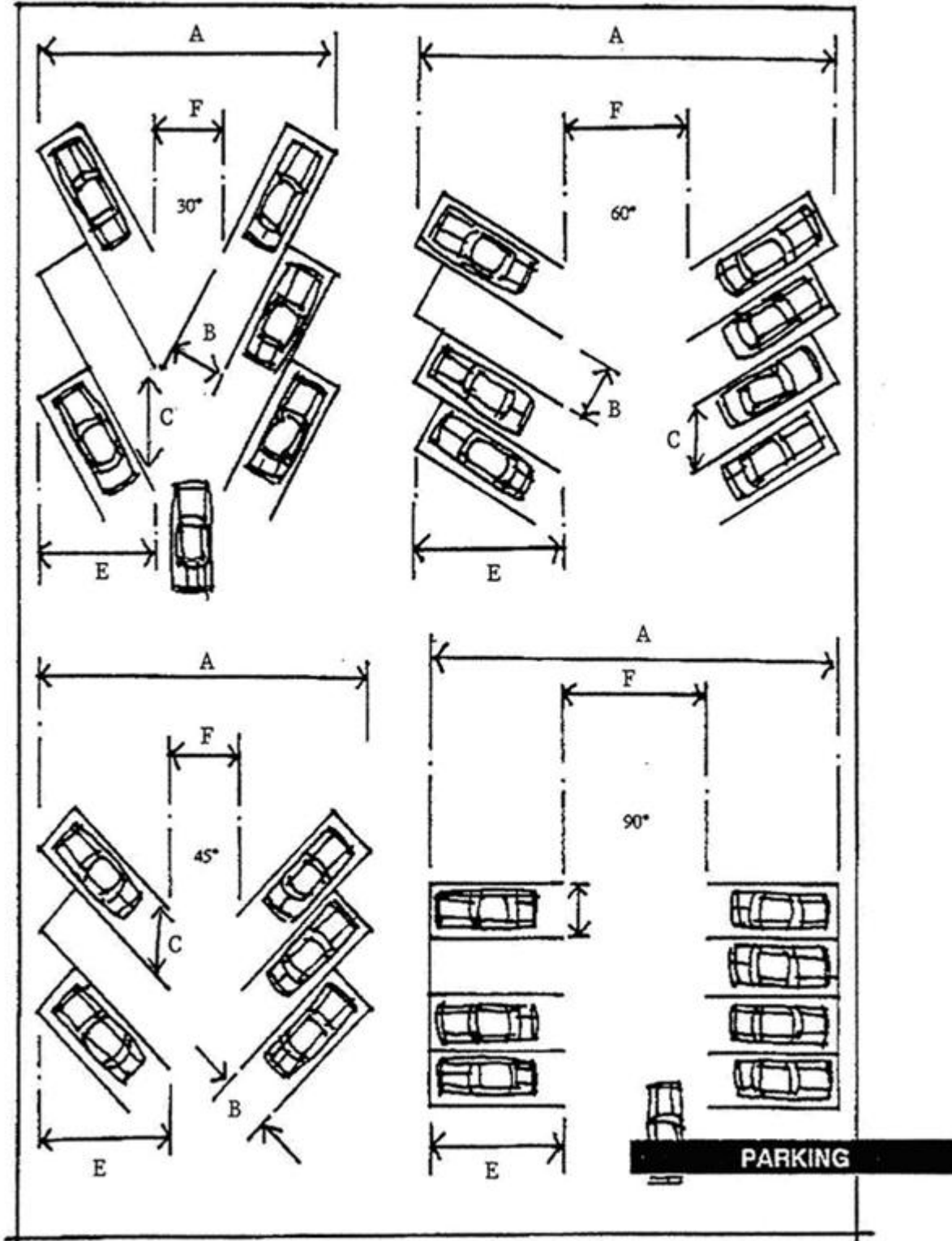
- 2. LIMIT ON RESIDENTIAL DRIVEWAYS. For all residential uses, the driveway must lead directly to a garage, carport or other approved parking facility. The length of driveway between the sidewalk (or curb if there is no sidewalk) and the garage foundation wall or carport supports must be a minimum of twenty-five (25) feet to accommodate a parked vehicle. The number of permitted driveways is one per one hundred fifty (150) feet of lot frontage, or fraction thereof, not to exceed a total of two driveways. For circular driveways, one hundred (100) feet of frontage is required. A maximum of one driveway will be allowed on Collector and Arterial roadways.
- 3. PAVING. All required parking spaces, recreational vehicle storage areas, material storage areas and associated driveways must be paved in accordance with the design and construction specifications.
- 4. STRIPING. All required vehicle parking spaces must be clearly marked with white paint or other easily distinguishable material.
- 5. ACCESS AND MANEUVERING. Safe and adequate ingress and egress is required to and from a street. Egress onto a public street must be in a forward direction with maneuvering permitted in the public right-of-way.
- 6. TURNAROUND. Any required garage, carport, or parking space located more than one hundred fifty (150) feet from the street or highway from which access is taken and served by a driveway or aisle less than twenty feet wide, must be provided with width and turnaround provisions in accordance with the current edition of the International Fire Code.

7. **LIGHTING.** Design and maintain lighting of outdoor parking areas in a manner to prevent glare or direct illumination from intruding into any adjacent properties.
8. **DRAINAGE.** All areas used for the movement, parking, and/or loading of vehicles is required to be graded to convey surface water consistent with the Stormwater Pollution Prevention Plan (SWPPP) requirements (if applicable). Drainage is not permitted across the surface of walkways or driveways.
9. **PARKING LOT LANDSCAPING.** All landscape areas must include tree, shrub, and groundcover plantings. Adhere to the city's water conservation program when selecting plants. The following landscape provisions apply to all unenclosed parking facilities:
  - a. Incorporate the use of drought tolerant plants to reduce water demand. Select and install a variety of plantings and hardscape appropriately for their intended use. A minimum of five (5) feet of landscaped area is required along the perimeter of a parking area.
  - b. Wherever a screen wall is provided and is set back from the lot line, the open area between the wall and the lot line must be landscaped with appropriate materials and continuously maintained.
  - c. A minimum of one (1) tree per ten (10) parking spaces is required. Each tree must be at least one and a half (1-1/2) inch caliper and of a species that provides a broad canopy. Disperse shade trees to provide fifty (50) percent tree canopy coverage of the parking lot within twenty (20) years of planting.
  - d. Landscaped planters are required in the interior of all parking lots. The minimum planter size is five (5) feet inside width and equal to the length of the adjoining parking spaces. Place planters at both ends of each row of parking spaces. Planter areas must contain at least one (1) tree and a combination of appropriate shrubs and groundcover or mulch or both. An additional landscaped planter area is required adjoining each tenth parking space, except that when there are more than fourteen (14) and less than twenty (20) spaces, install one (1) additional planter centered in the row.
  - e. In parking areas where more than four (4) parking stalls exist without a circulation aisle, one stall must include a continuous planting strip measuring five (5) feet in width, minimum inside dimension.
  - f. Regularly maintain all landscaping and irrigate using an automatic sprinkling system connected to the pressurized irrigation system.
10. **WHEEL STOPS.** Install securely fixed wheel stops, at least six (6) inches in height, in an appropriate location to prevent vehicles from overhanging a public right-of-way, a pedestrian walkway which would not meet disabled accessibility requirements, and adjacent to walls, fences, and buildings.
11. **MAINTENANCE.** Maintain all parking lots and structures and keep free of garbage and debris. Striping of parking stalls must be kept in a manner that allows each stall to be identified. Repair potholes, cracks, and other damage to the surface in a timely manner.



**Table 13.1**  
**Parking Space Dimensions**

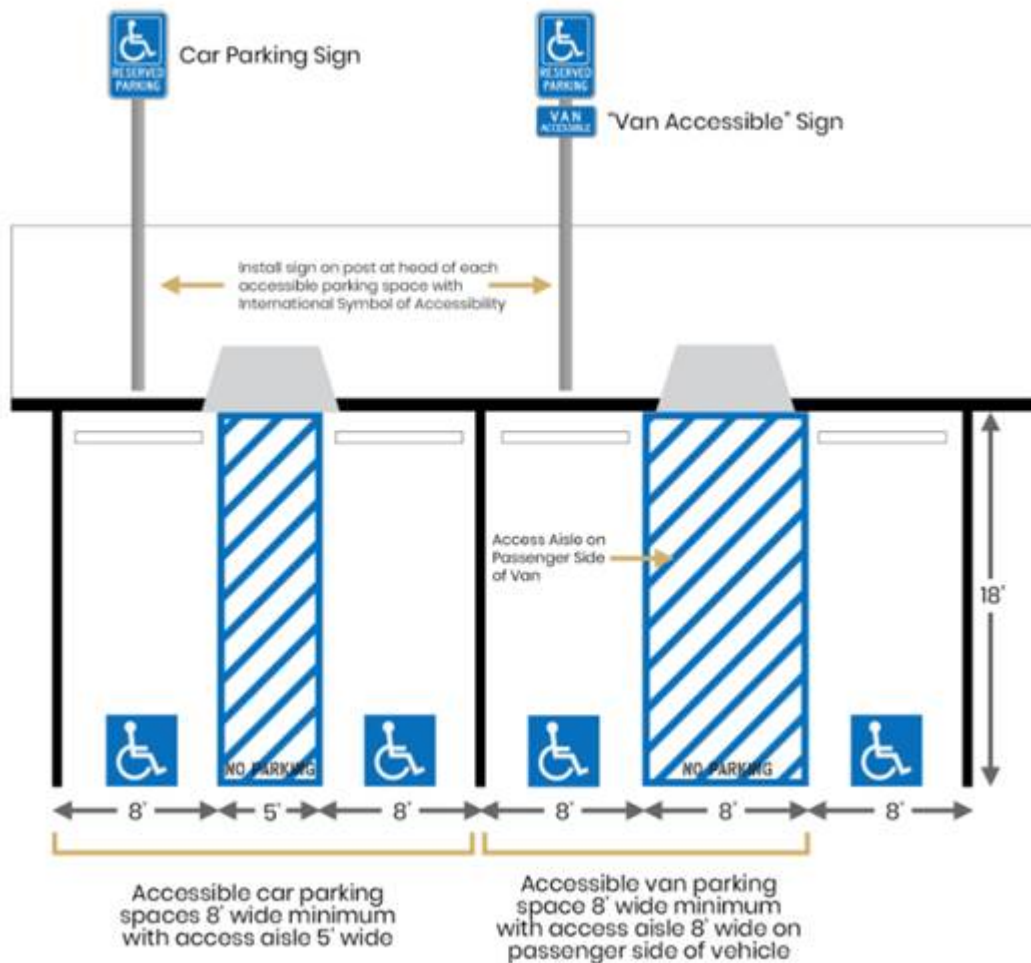
<b>Regular Size Parking Spaces</b>						
<b>Dimension Indicator</b>	<b>Description</b>	<b>Angle</b>				
		<b>0°</b>	<b>30°</b>	<b>45°</b>	<b>60°</b>	<b>90°</b>
	Overall module width					
A1	One-way	35.0	49.0	56.0	59.0	60.0
A2	Two-way	40.0	55.0	60.0	63.0	60.0
B	Stall width	10.0	9.0	9.0	9.0	9.0
C	Stall width parallel to aisle or curb	22.0	18.0	12.5	10.4	9.0
D	Length of parking stall	22.0	18.0	18.0	18.0	18.0
E	Stall depth to wall or curb	10.0	17.5	20.0	20.5	18.0
	Aisle width					
F1	One-way	15.0	14.0	16.0	18.0	24.0
F2	Two-way	20.0	20.0	20.0	22.0	24.0
F3	Fire Apparatus Accessible	26.0	-	-	-	26.0
<b>Parking Spaces for the Disabled</b>						
	Overall module width					
A1	One-way	43.0	57.0	62.0	64.0	60.0
A2	Two-way	48.0	63.0	67.0	68.0	60.0
B	Stall width	14.0	14.0	14.0	14.0	14.0
C	Stall width parallel to aisle or curb	23.0	28.0	19.8	16.2	14.0
D	Length of parking stall	23.0	19.0	19.0	19.0	18.0
E	Stall depth to wall or curb	14.0	21.5	23.0	23.0	18.0
	Aisle width					
F1	One-way	15.0	14.0	16.0	18.0	24.0
F2	Two-way	20.0	-	-	-	24.0
F3	Fire Apparatus Accessible	26.0	-	-	-	26.0



12. ADA ACCESSIBLE PARKING SPACES. The minimum number of accessible parking spaces required depends on the total number of parking spaces in the lot, as seen in the table below. Furthermore, one (1) of every six (6) accessible parking spaces, or fraction of six (6), must be van accessible. For example: A parking lot with four hundred (400) total spaces needs eight (8) accessible spaces, and two (2) of those eight (8) spaces must be van accessible.

Total Number of Parking Spaces in Parking Facility (Lot or Garage)	Minimum Total Number of Accessible Parking Spaces Required	Minimum Number of Van Accessible Sparking Spaces
1 - 25	1	1
26 - 50	2	1
51 - 75	3	1
76 - 100	4	1
101 - 150	5	1
151 - 200	6	1
201 - 300	7	2
301 - 400	8	2
401 - 500	9	2
501 - 1000	2% of total	1/6 of total ADA stalls required
1001 and over	20, plus 1 for each 100, or fraction thereof, over 1000	1/6 of total ADA stalls required

13. ADA PARKING STALL DIMENSIONS. Design all standard and van accessible ADA parking stalls using the following minimum dimensions:



14. ADA PARKING STALL LOCATION. ADA parking stalls must be located on the shortest accessible route of travel to an accessible facility entrance. Where buildings have multiple accessible entrances with adjacent parking, the accessible parking spaces must be dispersed and located closest to the accessible entrances.

## SECTION 14: OUTDOOR LIGHTING

### 1. SCOPE

- a. The purpose of this section is to regulate the placement, orientation, distribution patterns, and fixture types of outdoor lighting installed in the city. It is the intent of the City to encourage lighting that provides safety, utility and security while preventing glare on public ways, protecting the enjoyment of private property rights, conserving energy resources, and reducing atmospheric light pollution.

### 2. OUTDOOR LIGHTING PLANS

If a proposed development, except developments limited to one- and two-family dwellings, involves the installation or alteration of outdoor lighting fixtures, an outdoor lighting plan is required and must include the following information:

- a. A site plan, drawn to a scale of one (1) inch equaling no more than forty (40) feet, showing the location, height, manufacturer, model, lamp type, lumen output, and wattage of each outdoor lighting fixture in relationship to buildings, streets, and parking areas.
- b. An iso-lux plan showing the levels of illumination, in foot-candles, that would result at ground level from the lighting installation.
- c. A certification that the lighting fixtures to be installed are fully shielded, cut off type fixtures that will not allow light dispersion or direct glare to shine above a ninety (90) degree horizontal plane from the base of the fixture.
- d. A certification that the exterior lighting will comply with the maintained horizontal illuminance recommendations of the Illuminating Engineering Society of North America.

### 3. GENERAL PROVISIONS

- a. Turn off all outdoor lighting after business hours, except for essential security lighting.
- b. Lighting of signs, buildings, and displays must be directed downward. Uplighting is prohibited, provided that in landscaped areas uplighting may be allowed if approved by the Design Review Committee (DRC).
- c. Electrical service to outdoor lighting fixtures must be underground unless fixtures are mounted directly on utility poles.

### 4. EXEMPTIONS

The following types of outdoor lighting are exempt from the provisions of this Chapter:

- a. Holiday lighting during the months of November, December and January. Such lighting must not create dangerous glare on adjacent streets or properties.
- b. Temporary lighting, including but not limited to circuses, fairs, carnivals, and/or civic uses, for a period not to exceed thirty (30) days unless otherwise approved by the Development Services Department.
- c. Lighting associated with agricultural operations.
- d. Construction or emergency lighting, provided that such lighting is temporary and is discontinued immediately upon completion of the construction work or abatement of the emergency circumstances necessitating such lighting.
- e. Roadway lighting.

### 5. PARKING LOT LIGHTING

Parking lots must be illuminated adequately for security and safety, but such illumination is required to be controlled to prevent glare and avoid decreasing the visibility of neighboring properties. Do not use parking lot lighting to draw attention to a business.

- a. The maximum height of parking lot lighting is as follows:
    - i. Twenty (20) feet in a residential zone,
    - ii. Twenty-five (25) feet for a commercial, industrial, or public facility use abutting a residential use or zone, and
    - iii. Fifty (50) feet for a commercial, industrial, or public facility use not abutting a residential use or zone.
    - iv. Height is measured from the ground surface being illuminated to the bottom of the lighting fixture.
  - b. Parking lot lighting fixtures designed to portray an historic period or architectural style are encouraged. If such fixtures are not “cut off” or shielded fixtures, the maximum initial lumens generated by each fixture is not permitted to exceed two thousand (2000) (equivalent to a one hundred fifty (150) watt incandescent bulb). The maximum height of such lighting fixtures is fifteen (15) feet.
  - c. Design parking lot lighting so the minimum illumination at grade level is between two-tenths (0.2) and three-tenths (0.3) foot-candles in residential zones and between three-tenths (0.3) and five-tenths (0.5) foot-candles in commercial, industrial and public facility zones. The ratio of average parking lot illumination to minimum parking lot illumination is four to one (4:1) or less.
  - d. Except as modified elsewhere in this subsection, lighting fixtures must be shielded where necessary to prevent direct illumination of adjoining properties, with the exception of light needed to illuminate an adjoining public right-of-way.
6. LIGHTING OF GASOLINE STATION/ CONVENIENCE STORE CANOPIES
- Gasoline station and convenience store canopies must provide adequate lighting for customers but not so intense as to be an attention device for the business, as provided in this section.
- a. Lighting fixtures in the ceiling of canopies must be fully recessed in the canopy.
  - b. Light fixtures are not permitted to be mounted on the top or fascia of such canopies.
  - c. Do not illuminate the fascia of such canopies, except for approved signage.
  - d. Areas around gasoline pump islands and under canopies must have a minimum illumination at grade level between one (1) and five and one-half (5-1/2) foot-candles. The ratio of average illumination to the minimum illumination at grade in the areas around the gasoline pumps must not exceed four to one (4:1).
7. LIGHTING OF EXTERIOR SALES/DISPLAY AREAS
- The following provisions apply to businesses such as automobile, heavy equipment, and recreational vehicle dealerships and other businesses, such as building material stores, which rely on outdoor display of merchandise.
- a. Areas designed for parking or passive display of merchandise must be lighted in accordance with the standards for parking lots in Section 14.5 of this document.
  - b. Light fixtures must be shielded, cut off type fixtures located, mounted and aimed so that direct light is not cast onto adjoining streets or properties.
  - c. The maximum height of light fixtures is twenty-five (25) feet.
  - d. Design exterior sales/display areas so the minimum illumination at grade level is between one (1) and five (5) foot-candles. The ratio of average sales/display area lighting to minimum sales/display area lighting is not permitted to exceed four to one (4:1).
8. LIGHTING OF OUTDOOR SPORTS OR PERFORMANCE FACILITIES
- a. The lighting plans to be submitted with the development plan shall be prepared by a qualified lighting designer, experienced in lighting such facilities. The plan shall demonstrate that the location,

selection, and aiming of the lighting fixtures will focus light on the playing or performing areas, minimize glare and visibility from neighboring areas, minimize sky glow and promote energy efficiency.

- b. A dual lighting system shall be provided. The primary system shall be adequate for the sports or performing event. The primary system shall be shut off within forty-five (45) minutes of the conclusion of the event. The secondary system shall be designed to facilitate the exiting of patrons, clean up and maintenance.

#### 9. SECURITY LIGHTING

Adequate lighting is acceptable to protect persons and property and to allow for the proper functioning of surveillance equipment as provided in this Section.

- a. Security lighting plan must utilize shielded fixtures. Floodlights are not permitted.
- b. Vertical features, such as walls of a building, may be illuminated for security to a height of eight (8) feet above grade.
- c. The maximum height of security lighting poles is twenty (20) feet in height in residential zones and twenty-five (25) feet in height in commercial, industrial or public facility zones.
- d. Security lights intended to illuminate a perimeter, such as a fence line, are allowed only if regulated by a motion detection system that triggers the lighting when an intruder moves to within five (5) feet of the perimeter.
- e. The average horizontal grade level or vertical surface illumination of security lighting in residential zones must not exceed one-half (1/2) foot-candle. The average horizontal grade level illumination of security lighting in commercial, industrial or public facility zones must not exceed one and one-half (1-1/2) foot-candles.

#### 10. LIGHTING FAÇADES

Lighting of building façades is discouraged, except for approved security lighting. Government buildings, church buildings, historic buildings, and significant or contributing buildings within historic districts are exempt from this requirement.

- a. Lighted façades are not permitted to exceed an illumination of five (5) foot-candles on a vertical surface.
- b. Light fixtures must be shielded and directed downward.

#### 11. ILLUMINATION OF SIGNAGE

- a. Externally illuminated signs are required to be served by light fixtures that are shielded and directed downward. The average level of illumination on the sign face must not exceed three (3) foot-candles and the maximum ratio of average to minimum illumination is two to one (2:1).
- b. Design internally illuminated signs with light lettering or symbols on a darker background. If fluorescent lighting tubes are utilized, they must be spaced on at least twelve (12) inch centers and be mounted at least three and one-half (3-1/2) inches from the sign face.



## SECTION 15: TRAILS

### 1. SCOPE:

- a. This article establishes the minimum requirements for the design of Multi-Use Paths within Payson City. Multi-use paths are required where so indicated on the Payson City Active Transportation Plan, the Payson City Transportation Master Plan, as well as all other Payson area-specific plans.

### 2. DEFINITIONS:

- a. Trails and Separated Shared-use Paths: The terms shared use paths, multiple-use paths, and trails are interchangeable within Payson City. A trail or shared use path refers to a City owned right-of-way (or permanent easement) that allows non-motorized travel with, or without access to the adjacent properties.
- b. Bicycle Lanes: Refers to on-street lanes, a minimum of four (4) feet wide, designated by paint or barriers, dedicated for the use of people on bicycles.
- c. Sidewalks: Indicates a hard-surfaced path adjacent to a street, a minimum of five (5) feet wide, dedicated for the use of people walking.
- d. Neighborhood Pathways: Refers to short links between neighborhoods, adjacent businesses, parks, and other points of interest. In cul-de-sacs, strategically placed paths (between two lots) are encouraged to link bicyclists and pedestrians to local destinations without requiring long, indirect routes that tend to inhibit walking or bike riding.
- e. Non-standard or Temporary Pathways: Indicates the use of existing improvements such as sidewalks or roadway shoulders for trail routes and will only be considered for use after all other options have been exhausted. Such solutions are temporary expedients.

### 3. DESIGN AND CONSTRUCTION STANDARDS

- a. These standards are based on recommendations of the American Association of State Highway and Transportation Officials (AASHTO), as set forth in the AASHTO Guide for the Development of Bicycle Facilities, 1999; and the Manual on Uniform Traffic Control Devices, 2009 Edition (MUTCD 2009), and other sources. Should any of these design standards come into conflict with published national standards, follow those in the current AASHTO Guide and MUTCD.
- b. Separation of Facilities
  - i. When two-way shared-use paths are located adjacent to a roadway, wide separation between the two facilities demonstrates to both the bicyclist and the motorist that the path functions as an independent facility. Safety and comfort of the trail user are both critical considerations. A trail located next to high-speed traffic diminishes safety and creates discomfort for the patron and reduces trail use.
  - ii. A minimum horizontal separation of six (6) feet between the trail edge of pavement and roadway edge of pavement is required. Ideally, this buffer area will be lined with shade trees or other vertical and native and/or drought-tolerant landscaping that acts as a barrier. Where the trail runs parallel to a high-speed facility (greater than or equal to 40 mph), wider separation is recommended.
  - iii. When horizontal separation is not possible, a suitable physical barrier is required. Such barriers serve both to prevent path users from making unwanted movements between the path and the highway shoulder and to reinforce the concept that the path is an independent facility. Where used, the minimum barrier height is forty-two (42) inches, to prevent bicyclists from toppling over it. A barrier between a shared-use path and adjacent roadway must not impair sight distances at

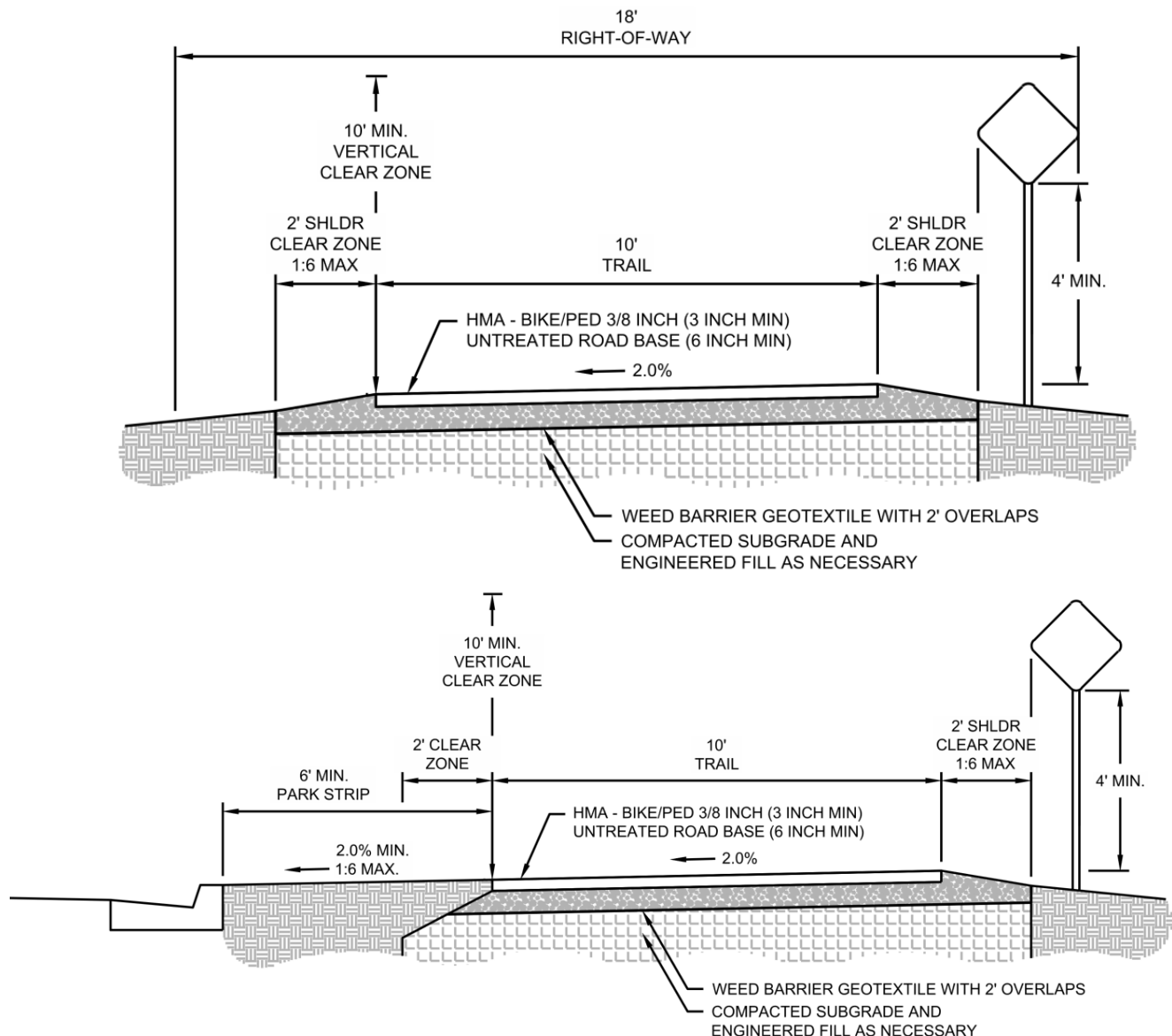


intersections, and not be a hazard to trail users or errant motorists.

- iv. Do not locate trails along roadsides where sidewalks are typically provided. Typically, sidewalks are not good candidates for use as trails since they tend to be too narrow to accommodate multiple services and are also frequently interrupted. Where good trail design is not possible due to frequent interruptions or lack of suitable separation from roadways, a combination of bicycle lanes and sidewalks may be more appropriate.

c. Trail Widths

- i. *Right-of-Way* - A minimum right-of-way width of eighteen (18) feet, deeded to the City, to accommodate the trail, shoulders, and signage is required. The trail right-of-way is meant to always provide public access along the trail. If extenuating circumstances prohibit the right-of-way to be deeded to the City, then an irrevocable permanent easement must be granted to maintain public access in perpetuity. Neighborhood trail connectors follow the same cross section, widths, and standards outlined in this document, even if part of a private development connection to the trail system.
- ii. *Paved Shared-Use Trails* - Minimum useable surface width is ten (10) feet for two-way, shared-use trails. Constrictions to eight (8) feet will be considered in certain situations, such as restricted physical space between a roadway and building or vertical drop-off. All such constrictions are not permitted to exceed one hundred (100) feet in length and must have smooth transitions. Install appropriate signage to warn users of changes in trail width.
- iii. *Natural surface paths* – The minimum width of a natural surface path in backcountry or rural settings is two (2) feet where only pedestrian use is anticipated. A minimum width of four (4) feet is recommended where multiple uses are anticipated, or where the path is adjacent to a paved urban trail. Where path usage levels are anticipated to be similar to paved trails, the minimum width is ten (10) feet.
- iv. *Neighborhood Pathways* – Short connecting paths of five hundred (500) feet or less, minimum six (6) feet in width.
- v. *Shoulders and clear zones* – A minimum two (2) foot wide horizontal clear zone, from which all lateral obstructions such as trees, signs, fences, etc., are to be removed is required on either side of the path. Within this clear zone, a two (2) foot wide graded area on either side of the trail with a cross-slope no greater than a 1V:6H must be provided. A vertical clear zone of ten (10) feet is also required, free of obstructions such as tree limbs, overhangs, etc. The horizontal and vertical clear zones together create a trail envelope free of obstructions and other hazards.



#### 4. TRAIL SURFACES:

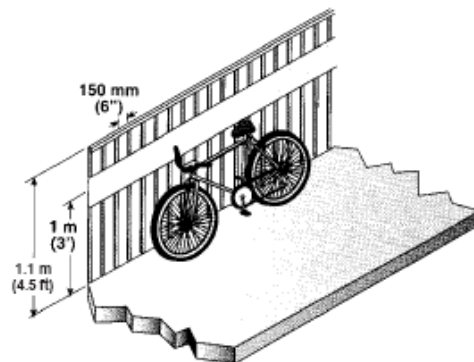
- Asphalt surfacing is preferred for trails in the city. If circumstances dictate that a concrete trail would be preferable, then it must be approved by the Development Services Director or designee.
- Design Loads** – While loads will be substantially less than highway loads, trails must be designed to sustain, without damage, occasional wheel loads from emergency and maintenance vehicles.
- Subgrade Identification** – Trail projects are required to identify the existing subgrades along the proposed trail route prior to construction. A geotechnical report completed by a licensed professional geotechnical engineer must be completed for all trail projects to analyze soil conditions and recommend a pavement design unless waived by the City Engineer or designee. Naturally occurring clay soils, peat, and high silt content sandy soils have been identified as having typically insufficient strength for proper pavement construction at minimum thickness.

- d. **Asphalt Surface Trail** – The minimum section of asphalt surface trails is three (3) inches bituminous surface course of PG 64-34, DM-1/2, 50 blow (APWA 32.12.05) on top of six (6) inches of three-quarter (3/4) inch minus untreated road base. Compact subgrade soil to a minimum of ninety-five (95) percent maximum density at optimum moisture (AASHTO T 99 standard). Base course must be compacted to ninety-five (95) percent of maximum density at optimum moisture as determined by the AASHTO T180 or ASTM D 1557 or as determined by a licensed, professional geotechnical engineer and approved by the City Engineer or designee.
- i. **General Specifications for Asphalt Work**
- Ensure that asphalt paving machines and handwork are able to form the smooth curves, width changes, surface pitch, and superelevation required.
  - Ensure that both the subgrade and the base are dry and free of frost and ice when asphalt work is done.
  - Scarify the surface of the subgrade to a minimum depth of six (6) inches, adjust the moisture condition as needed, then compact the soil.
  - Apply a root inhibitor or lay geotextile beneath the asphalt to prevent roots from heaving the surface.
  - Extend base course a minimum of two (2) feet beyond the paved surface width. Compact the shoulder and slope it away from the asphalt at a maximum 1V:6H slope.
  - Ensure that the finished asphalt surface is smooth and free of obvious imperfections. Where asphalt meets concrete or other hard surfaces, the joint must be smooth and even across both surfaces. Asphalt joints are to be butt rather than taper.
  - Feather the edge of pavement with base course or native soil to avoid any sharp drops from the trail edge.
- e. **Concrete Surface Trail** – The minimum section of Concrete Surface Trails is four (4) inch slab thickness on four (4) inch base course, with transverse saw-cut joints every ten (10) feet and a medium transverse broom finish. Finished surface must be flush with ground surface.
- i. **General Specifications for Concrete Work**
- Cross-slope, superelevation, grade and weed barrier geotextile fabric requirements for concrete trails are the same as for asphalt trails.
- ii. **Materials**
- **Concrete** – 4000 psi at twenty-eight (28) days, six (6) percent plus or minus one (1) percent entrained air. Utilize both coarse and fine aggregate with maximum coarse aggregate size of one and one-half (1-1/2) inch, conforming to the Standard Specification for Concrete Aggregate, ASTM C33. Air entraining agents must conform to ASTM C260.
  - **Cement** – Follow the standard specification for Portland Cement, ASTM C150, Type I or II, or ASTM 175 for Air-Entraining Portland Cement, Type IA or IIA.
  - **Water** – Use only water that is clean and free from injurious amounts of oil, acids, alkali, salt, or organic substances harmful to concrete.
  - **Curing Compounds** – Liquid membrane curing compounds must conform to ASTM C309.
  - **Preformed Filler** – Expansion joint material must be non-extruding preformed joint filler conforming to ASTM D1751.
  - **Joint Sealer** – Joint sealer must conform to ASTM D3405.

- f. Natural Surface Trail – Design trails using natural surfacing materials to provide facilities for as many users as possible. Compacted dirt, crushed stone and crusher fines are acceptable in appropriate aggregates and size.
  - i. Remove all large rocks, roots, stumps, and any other obstacles to users. Scarify all organic material within the path envelope unless the trail is planned specifically for single-track mountain bike use.
  - ii. The minimum compacted depth of crushed stone paths is four (4) inches of crushed stone; limestone, sandstone, or crushed rock, with an aggregate mix and passing a screen of no more than three-fourths (3/4) inch. No rounded aggregate is permitted. Path surfaces of only untreated base course aggregate are discouraged due to the typical inclusion of soils in base course materials that render them prone to rutting and displacement in wet conditions.

## 5. STRUCTURES:

- a. All overpasses, underpasses, and bridges must have a minimum clear width the same as that of the approach trail, plus the minimum two (2) foot wide horizontal clear zone. Align bridge or underpass approaches along the path to allow clear sight lines across or through the entire structure, and to avoid forcing trail users to make abrupt turns, climbs, or descents to access the structure.
- b. Widths and clearances – The clear width of the bridge surface must be equal to or greater than the approach path. A preferred width of fourteen (14) feet provides an additional clear width of two (2) feet on each side of a ten (10) foot traveled portion of a bridge that is to be used by both cyclists and pedestrians. A vertical clearance of ten (10) feet must be maintained.
- c. Design loads – When a bridge is wide enough to permit access by emergency vehicles, the design live load of the bridge must accommodate such vehicles.
- d. Railings – Railings installed on both sides of a multi-use path structure must be a minimum of forty-two (42) inches high. Additional height tends to obstruct the view of path users and should be avoided if appropriate. Attach smooth ten (10) inch wide horizontal rub rails to the inside of the railings at a handlebar height of three (3) feet above the bridge deck surface. The maximum width of openings in the handrail is six (6) inches to prevent young children from falling through the handrail.



i. Railing with "rub-rail"

*Adapted from Oregon Bicycle and Pedestrian Plan (1995)*

- e. Bridge entrances – Extend the handrails as described above at each entrance to the bridge a minimum of eight (8) feet beyond the end of the bridge and splayed outward at fifteen (15) degree angles to the pathway.
- f. Decking – If decking that does not provide a smooth and continuous surface is to be used (such as wood decking) it must be laid at no less than forty-five (45) degrees to the direction of travel along the

bridge to prevent gaps that may develop in the decking from trapping bicycle wheels. Where possible, install decking at ninety (90) degrees to the direction of travel. On all bridge decks, bicycle-safe expansion joints are required. Avoid decking materials that become slippery when wet. All screws or bolts must be countersunk flush with the deck surface.

- g. All structures, including underpasses, are required to maintain the minimum clear zone or envelope throughout.

#### 6. DRAINAGE:

- a. Design trails with a continuous cross slope of two (2) percent to provide for proper drainage and to be accessible to wheelchairs where wheelchair use is possible. Crowned surfaces are not usually wheelchair friendly.
- b. Ditches, swales, interceptor swales, and/or closed drain systems must properly drain water away from the trail surface and clear zones. Locate open drainage features outside the trail envelope.
- c. Drainage grates must be located outside of the trail envelope. However, if placement inside the envelope is necessary, only utilize grates of bicycle safe design and emplaced flush with the trail pavement surface.

#### 7. DESIGN SPEED:

- a. The design speed of paved trails is twenty-five (25) miles per hour to safely accommodate bicycle use; higher design speeds for multi-use paths are discouraged. Use fifteen (15) miles per hour for the design speed of unpaved trails.

#### 8. MINIMUM CURVE RADII FOR PAVED TRAILS:

Design Speed	Minimum Radius
12mph	36 feet
20mph	100 feet
25mph	156 feet
30mph	225 feet

- a. Where reduced curve radii must be used because of limited right-of-way, topographical, or other considerations, standard curve warning signs and supplemental pavement markings are required as per the latest edition of the MUTCD. Wider pavement can also be used to offset the effects of reduced curve radii.
- b. Superelevation – Superelevation or pavement banking on curves may be required. Refer to the latest edition of the *AASHTO Guide for the Development of Bicycle Facilities* for design recommendations.

#### 9. GRADES:

Grade	Maximum Length
6%	800 feet
7%	400 feet
8%	300 feet
9%	200 feet
10%	100 feet

- a. Typically, grades on trails are to be kept to a minimum, under five (5) percent, to best serve all non-motorized users. Only use steeper grades over short distances.
- b. Grades are not permitted to exceed ten (10) percent on straight sections, or five (5) percent on curves. Where a path must curve on a grade, provide longer than normal sight lines and a transition zone at

both top and bottom of the grade.

- c. The maximum grade is three (3) percent with crushed stone or other unpaved surfaces for bicycle handling, drainage, and erosion reasons. If this is not feasible, appropriate drainage and erosion mitigation measures are to be utilized. Refer to International Mountain Bicycling Association's publication *Building Better Trails* for design guidelines.
- d. Signs warning of steep grades must be provided at the top of sections with grades higher than five (5) percent, or where users cannot see the bottom of the grade.



W7-5  
18"X18"

e.

#### 10. SIGHT DISTANCE:

- a. Maintain adequate sight distances for the higher speed users, usually considered to be bicyclists. Use the guidelines provided in the latest edition of the *AASHTO Guide for the Development of Bicycle Facilities*.

#### 11. TRAIL-ROADWAY INTERSECTIONS:

- a. Long sections of trail without road crossings or driveways are most desirable. A minimum 1320 feet (1/4 mile) is required between such interruptions.
- b. Intersections between trails and roadways must be carefully designed to maintain the safety of users and motorists. Refer to the latest edition of the *AASHTO Guide for the Development of Bicycle Facilities* for design recommendations.
- c. Controlling motorized vehicle access may be required at trail/roadway intersections. Install the MUTCD standard sign R5-3 at all such intersections.

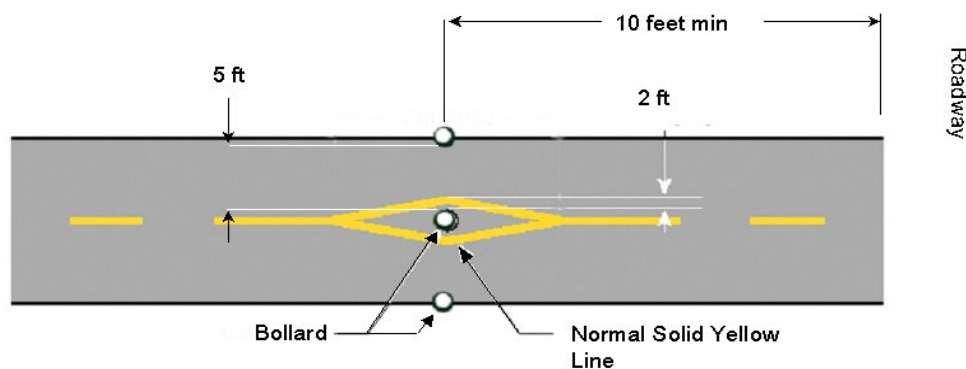


R5-3

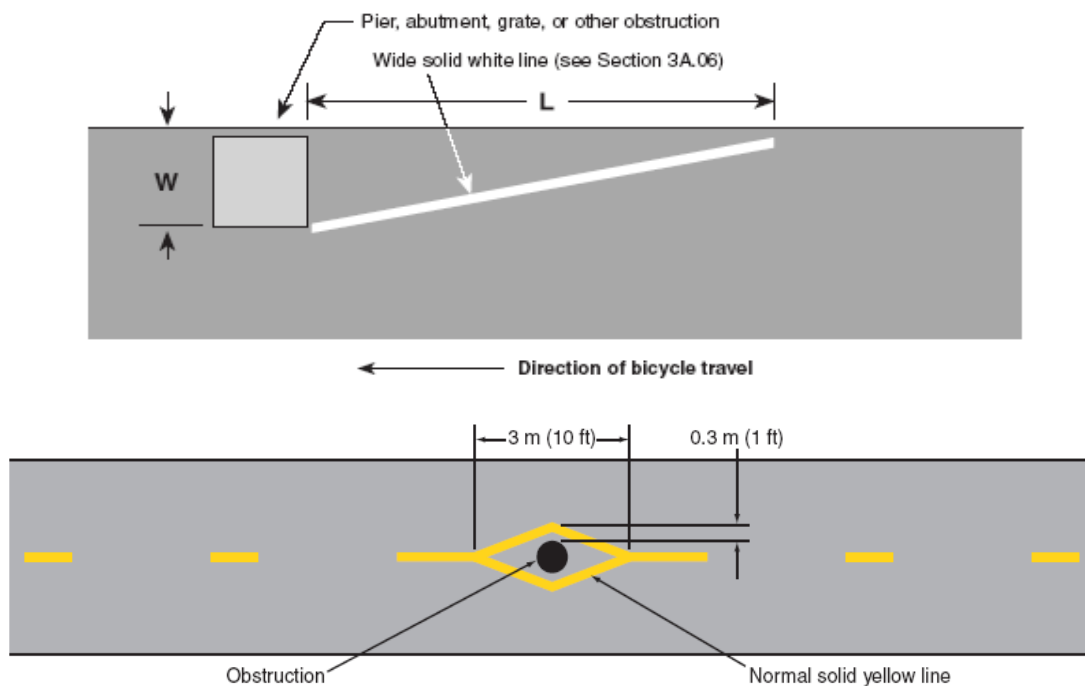
- i.
- d. Install lockable, removable bollards if more aggressive measures are needed. Posts or bollards are to be set back beyond the clear zone on the crossing roadway or be of a breakaway design. The post must be permanently retro-reflectorized for nighttime visibility and painted a bright color for improved daytime visibility. Striping an envelope around any post within the travel way of a paved trail is recommended. Refer to the latest edition of the *MUTCD, Traffic Controls for Bicycle Facilities*.
- i. Bollard Design – Three and one-half (3½) inch diameter galvanized steel, rounded top, painted

traffic yellow with retro-reflectorized obstruction marking. Install the bollard so the top is between three (3) and four (4) feet above paved surface.

- ii. **Bollard Placement and Pavement Markings** – Place an appropriate number of bollards across the trail to inhibit motorized access. Placement must keep “travel lanes” on the trail unobstructed and not force users to detour out of the normal line of travel. Install bollards with five (5) feet of separation to allow trail user access while not allowing automobiles.
- iii. Where the desire for ATV use of the trail can be reasonably anticipated, reduce the separation between bollards to a maximum of forty-eight (48) inches to discourage such vehicular access. Utilize appropriate obstruction marking and signing as needed when bollards intrude into the pathway surface.



**Figure 9C-8. Example of Obstruction Pavement Marking**





## 12. SIGNAGE AND PAVEMENT MARKINGS:

- a. All appropriate and necessary signage and pavement markings are to be provided according to the latest edition of the MUTCD, *Traffic Controls for Bicycle Facilities*.
- b. Follow MUTCD regulations for all sign placements. Place signs no closer than two (2) feet from the trail edge of pavement, and no farther than six (6) feet. Install signs so the bottom edges are between four (4) and five (5) feet vertically from the trail surface. These requirements facilitate access by users while maintaining the envelope. Scale down signs for trails to recommended sizes.
- c. Striping of bicycle lanes on the roadway in tandem with sidewalks for pedestrians can be provided to link two sections of separated pathway or to extend a route where needed. Proper signage must also be provided. Multiple or frequent transitions from trail to bike lanes/sidewalks are not recommended due to safety and usability problems. Refer to the latest edition of the *AASHTO Guide for Developing Bicycle Facilities*.
- d. Sample Signage



## 13. ACCESSIBILITY:

- a. Title II and Title III of The Americans with Disabilities Act (ADA) of 1990 require all new construction and alterations to be accessible to all Americans, including those with disabilities. The US Access Board publishes *ADA Accessibility Guidelines (ADAAG)* that must lawfully be applied to new construction in both the private and public sectors. While these guidelines do not yet specifically address trails, the following provisions can and should be applied:
  - i. Accessible Routes (ADAAG 4.3)
  - ii. Parking (ADAAG 4.6) - will usually apply to trailheads
  - iii. Curb Ramps (ADAAG 4.7)
  - iv. Ramps (ADAAG 4.8)



## SECTION 16: PUBLIC WORKS PLAN REVIEW CHECKLISTS

### PRELIMINARY/CONCEPT PLAN

Note: This checklist also serves as the guideline for annexation and zone change applications.

#### Cover Sheet

- ☐ Project Name
- ☐ Vicinity Map
- ☐ Drawing Index Table

#### Preliminary Site Plan

- ☐ Proposed site improvements using solid, dark lines
  - Curb and gutter
  - Sidewalk
  - Building
- ☐ Existing conditions shown dashed and/or gray
  - Curb and gutter
  - Sidewalk
  - Structures to remain
  - Street lights
  - Fire hydrants
- ☐ Property boundary
- ☐ Existing and proposed street names/numbers

#### Utility Plan

- ☐ Site layout
  - Proposed site improvements using solid, dark lines
  - Existing conditions shown gray and/or dashed
- ☐ Utilities
  - Existing utilities shown gray and/or dashed
  - Proposed drinking water mains, service laterals, and meters plotted in color following the Uniform Color Code and Marking Guidelines
  - Proposed pressurized irrigation mains, service laterals, and meters plotted in color following the Uniform Color Code and Marking Guidelines
  - Proposed sanitary sewer mains, structures, and service laterals plotted in color following the Uniform Color Code and Marking Guidelines
  - Proposed storm drain mains, structures, and laterals plotted in color following the Uniform Color Code and Marking Guidelines

## FINAL SITE PLAN

### Cover Sheet

- ☐ Project Name
- ☐ Vicinity Map
- ☐ Drawing Index Table
- ☐ Type of building information
- ☐ Type of construction information
- ☐ Type of occupancy information
- ☐ Number of stories
- ☐ Fire suppression required?
- ☐ Required and provided parking stalls based on each use type for multi-family and non-residential applications
  - ☐ Required and provided ADA stalls
  - ☐ Required and provided Van Accessible ADA stalls
- ☐ Site characteristic table with areas (hardscape, landscape, and building) listed in square feet and acres
- ☐ Dumpster calculations for multi-family and non-residential applications
  - ☐ Dumpster calculations are only required if collection services are to be requested from Payson City. Multi-family and non-residential applications have the option of contracting a private collection service if desired.
- ☐ Contact list
  - ☐ Developer
  - ☐ Architect
  - ☐ Civil Engineer
  - ☐ Geotechnical Engineer

### General Notes Sheet

- ☐ Payson City Standard Construction Notes
- ☐ Project specific notes
- ☐ Legend
- ☐ Abbreviations

### ALTA Survey

- ☐ Existing property boundary
- ☐ Existing property legal description
- ☐ Benchmark
- ☐ Basis of bearing
- ☐ Section ties
- ☐ All easements and encumbrances from title report plotted on the map with identifiers matching the title report.

**Topographic Survey**

- ☐ Existing property boundary
- ☐ Benchmark
- ☐ Basis of bearing
- ☐ Existing site features
- ☐ Existing contours with labels
  - Major contours @ 5' intervals
  - Minor contours @ 1' intervals
- ☐ Ground elevations on 50' x 50' grid
- ☐ Existing utilities as located in the field
  - Rim and invert elevations as measured in the field
- ☐ Floodplain information if applicable
- ☐ Wetland information with approved Army Corp Wetland Delineation if applicable
- ☐ Sensitive Land Information (Hillside, steep slopes, earthquake zones, liquefaction, etc.) if applicable

**Horizontal Control Plan**

- ☐ Proposed site improvements using solid, dark lines
  - Curb and gutter
  - Sidewalk
  - Striping and signage
  - Building
  - Street lights
  - Fire hydrants
  - Dumpster enclosure
- ☐ Existing conditions shown dashed and/or gray
  - Curb and gutter
  - Sidewalk
  - Striping and signage
  - Structures to remain
  - Street lights
  - Fire hydrants
- ☐ Property boundary
- ☐ Existing and proposed street names/numbers
- ☐ Existing and proposed addresses
- ☐ Does the site require road improvements shown on TMP?
- ☐ Wetland delineation if applicable
- ☐ Floodplain limits if applicable
- ☐ Existing and proposed easements
- ☐ Parking lot dimensions including length and width
- ☐ Drive aisle dimension

- ☐ Location of proposed buildings tied to two property corners
- ☐ Building dimensions
- ☐ Driveway location and dimensions
- ☐ Reference to pavement cross sections based on the soil report recommendations
- ☐ Location and dimensions of commercial signs
- ☐ Location of mailbox or CBU
  - Letter of approval from USPS
- ☐ Relevant notes with reference to Payson City, APWA, or UDOT standards

### **Grading and Drainage Plan**

- ☐ Site layout
  - Proposed improvements shown solid and dark
  - Existing conditions shown gray and/or dashed
- ☐ Site characteristics table with areas in square feet and acres
  - Hardscape
  - Landscape
  - Building
- ☐ Proposed contours with labels using solid, dark lines
  - Major contours @ 5' intervals
  - Minor contours @ 1' intervals
- ☐ Existing contours with labels shown gray and/or dashed
  - Major contours @ 5' intervals
  - Minor contours @ 1' intervals
- ☐ Daylight location
  - Locations where proposed contours tie into existing contours
  - Does it make sense?
- ☐ Proposed storm drain pipes and structures plotted in color following the Uniform Color Code and Marking Guidelines
  - Size
  - Material
  - Slope
  - Length
  - Rim/Top of grate elevation
  - Invert elevations
  - Pre-treatment in final structure?
  - Separate pre-treatment device?
- ☐ Existing storm drain pipes and structures shown gray and/or dashed
  - Size
  - Material
  - Slope
  - Length

- Rim/Top of grate elevation
- Invert elevations
- Retention basin or sub-surface retention system
- Drainage calculations showing:
  - Pre- and Post-construction discharge rates using measured perc rate.
  - Cumulative peak flow calculations for each sub-basin
  - Orifice plate size calculations for systems with an outfall/discharge point
    - Does discharge match the lesser of pre-construction rate or 0.2 CFS/ac?
- Relevant notes with reference to Payson City, APWA, or UDOT standards
- Plan and profile views of storm drain system to be installed in the public right-of-way with 5x or 10x vertical exaggeration
  - Show all utility crossings in profile view
  - Label all pipes and structures

### Utility Plan

- Site layout
  - Proposed improvements shown solid and dark
  - Existing conditions shown gray and/or dashed
- Proposed water usage calculations
- Proposed drinking water pipes and structures plotted in color following the Uniform Color Code and Marking Guidelines
  - Size
  - Material
  - Length
  - Meter location
  - Valves
  - Fittings
  - Fire hydrants
- Proposed pressurized irrigation pipes and structures plotted in color following the Uniform Color Code and Marking Guidelines
  - Size
  - Material
  - Length
  - Meter location
  - Valves
  - Fittings
- Proposed sanitary sewer pipes and structures plotted in color following the Uniform Color Code and Marking Guidelines
  - Size
  - Material
  - Slope
  - Length

- Rim elevations
- Invert elevations
- All manholes 60" or greater
  - Manholes at 400' max spacing
- Service lateral location
  - 6" Service laterals connected at a manhole
  - 4" Service laterals connected to main
  - Cleanouts at bends
  - Cleanouts at 100' max spacing
- Proposed non-sanitary (grease waste) sewer pipes and structures plotted in color following the Uniform Color Code and Marking Guidelines
  - Size (6" min)
  - Material
  - Slope
  - Length
  - Rim elevations
  - Invert elevations
  - Grease trap
  - 60" (min) Sampling Manhole
  - Process water holding tank if applicable
- Existing drinking water pipes and structures shown gray and/or dashed
  - Size
  - Material
  - Meter location
  - Valves
  - Fire hydrants
- Existing pressurized irrigation pipes and structures shown gray and/or dashed
  - Size
  - Material
  - Meter location
  - Valves
- Existing sanitary sewer pipes and structures shown gray and/or dashed
  - Size
  - Material
  - Slope
  - Rim elevations
  - Invert elevations
  - Service laterals
- All other existing utilities shown gray and/or dashed with appropriate callouts
- Relevant notes with reference to Payson City, APWA, or UDOT standards

- ☐ Plan and profile views of sewer, water, and PI to be installed in the public right-of-way with 5x or 10x vertical exaggeration
  - Show all utility crossings in profile view
  - Label all pipes and structures

### **Power and Lighting Plan**

- ☐ Site layout
  - Proposed improvements shown solid and dark
  - Existing conditions shown gray and/or dashed
- ☐ Existing and proposed street names/numbers
- ☐ Proposed power lines and structures plotted in color following the Uniform Color Code and Marking Guidelines
  - Power line shown 1' behind sidewalk
  - 2' min separation between power and communications
  - Street lights
  - Transformers
  - Splice boxes
  - Sectionalizers
  - Switches
  - Poles and guy wires
- ☐ Existing power lines and structures shown gray and/or dashed
  - Power lines
  - Street lights
  - Transformers
  - Splice boxes
  - Sectionalizers
  - Switches
  - Poles and guy wires
- ☐ Relevant notes with reference to Payson City or NESC standards
- ☐ Note added
  - "Trenching one foot (1') behind the sidewalk and four feet (4') to the top of conduit for primary from final grade."

### **Public Safety Plan**

- ☐ Site layout
  - Proposed improvements shown solid and dark
  - Existing conditions shown gray and/or dashed
- ☐ Existing and proposed street names/numbers
- ☐ Existing and proposed addresses
- ☐ Type of building information
- ☐ Type of construction information
- ☐ Type of occupancy information

- ☐ Number of stories above grade plane
- ☐ Building height above grade plane
- ☐ Fire suppression if required
- ☐ Existing and proposed fire lines
- ☐ Location of the Fire Control Room
- ☐ Location of all existing and proposed fire hydrants within 1000' of the project location
- ☐ Fire lane
- ☐ Fire flow demand calculations
- ☐ Snow removal storage areas
- ☐ Emergency vehicle turnaround area according to IFC Appendix D

**Stormwater Pollution Prevention Plan**

- ☐ Initial SWPPP showing BMPs during construction activities
- ☐ Final SWPPP showing permanent long-term BMPs including selection methods and estimated pollutant removal
- ☐ Existing and proposed contours
- ☐ Existing and proposed storm drain features
- ☐ Delineated Jurisdictional Wetlands
- ☐ Structural Best Management Practices
- ☐ Non-Structural Best Management Practices
- ☐ Certification statement stamped, signed and dated by a Licensed Professional

**Detail Sheets**

- ☐ Relevant Payson City Standard Details
- ☐ Relevant APWA Standard Details
- ☐ Relevant UDOT Standard Details
- ☐ Project specific construction details



## **SECTION 17: PAYSON CITY STANDARD DETAILS**

See attached