

CITY OF KINGMAN

2020 ADDENDUMS

TO THE

MAG UNIFORM STANDARD

SPECIFICATIONS

FOR PUBLIC WORKS CONSTRUCTION

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THE FOLLOWING ADDITIONS, DELETIONS, AND/OR MODIFICATIONS ARE MADE TO THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION SPONSORED AND DISTRIBUTED BY THE MARICOPA ASSOCIATION OF GOVERNMENTS, AS APPLICABLE TO PUBLIC WORKS CONSTRUCTION IN THE CITY OF KINGMAN, ARIZONA, AND FOR WATER AND SEWERAGE PROJECTS LOCATED WITHIN THE CITY'S WATER AND SEWERAGE SYSTEM SERVICE AREA.

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SECTION 105.6 (revised 2004) *Add the following at the end of the first sentence of the seventh paragraph*

“and except as required under the following conditions”
whenever the development causes water meter boxes, water valve boxes, sewer manholes, sewer cleanouts, or fire hydrants to be out of compliance with applicable City Specifications and Details, then the expense of the relocation or adjustment shall be borne by the Developer; the relocation or adjustment shall be in accordance with the applicable City Specifications and Details.

SECTION 105.8 (revised 2004)

Section 106.2.1 (new 2017)

All personnel who collect samples and perform the tests shall be Arizona Technical Testing Institute (ATTI) certified as a Field Technician and be certified by the American Concrete Institute (ACI) Concrete Field Testing Technician or other nationally recognized program applicable to the project and approved by the City of Kingman. (2020) Certification requirements will be waived for six months after effective date of the 2020 Addendums due to COVID 19 Restrictions.

Required materials sampling and testing shall be performed by a lab hired by the developer or contractor. Testing results shall be bound and sealed by a Civil Engineer registered in the State of Arizona. Bound packets shall include a statement indicating that it's the registrants' s opinion that the material testing were found to be in conformance with the applicable specifications, and that the tests were performed in accordance with the ASTM and AASHTO test procedures.

Section 301.3 (revised 2010) *Add the following:*

Minimum frequency for Subgrade compaction test:

Street Section: shall be a minimum of one per lift per 500ft per 12' span

Curb/Gutter/Sidewalk: minimum of one per lift per 500ft.

Sidewalk ramp. Driveway & Alley entrance: Minimum of one per lift, per ramp, driveway or alley entrance.

*Additional tests may be required as deemed necessary by the City of Kingman Engineering Representative.

Section 310.1 (revised 2010) *Add the following:*

Minimum frequency of Compaction Tests for Aggregate base course:

Street Section: shall be a minimum of one test per lift per 500ft per 12' span.

Curb/Gutter/Sidewalk: minimum of one per lift per 500ft.

Sidewalk ramp. Driveway & Alley entrance: Minimum of one per lift, per ramp, driveway or alley entrance.

*Additional tests may be required as deemed necessary by the City of Kingman Engineering Representative.

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Minimum testing requirements for Aggregate Base:

Tests shall be per MAG Sect 702 – sample point stockpile or onsite – minimum one per source per project.

SECTION 321.4 (revised 2020) Application of Tack Coat:

Add to the end of second paragraph that specifies grade of emulsified asphalt: **“Or as Approved”**

Add to the third paragraph specifying tack coat to be applied **to longitudinal surfaces**

SECTION 321.10 (Revised 2020)

321.10.1.1 Projects Placing 15 SY or less: The permittee shall be responsible to use compaction equipment of sufficient size and weight to accomplish the required compaction. At any place not accessible by a roller, the mixture shall be thoroughly compacted with tampers to provide a uniform and smooth layer over the entire area compacted in this manner. No lab testing will be required.

321.10.1.2 Projects Placing 16 SY to 199 SY: Quality control monitoring and or testing per Section 321.9 shall be provided to the Engineer at the permittee’s expense. Test results shall be provided to the Engineer substantiating that the in place asphalt has achieved the density requirements in accordance with Section 321.10.5. In lieu of asphalt cores, nuclear density testing will be acceptable provided the field technician is certified by the Arizona Technical Testing Institute (ATTI) and the results are sealed by a Civil Engineer as specified in Section 106.2.1. If in-place density does not meet the minimum specifications, the asphalt shall be removed and replaced at the permittee’s expense.

321.10.1.3 Projects Placing 200 SY or greater: Asphalt concrete will be divided into lots for the purpose of acceptance. A lot shall be one day’s production. Each lot shall be divided into sublots of 500 tons or fraction thereof. Tests used to determine acceptance will be performed by a laboratory accredited by the AASHTO Accreditation Program (AAP) for the tests being performed. The contracting agency shall provide an appropriately accredited laboratory or laboratories to perform the acceptance testing. Laboratories shall use properly certified technicians in accordance with ASTM D3666, Section 7 (Personnel Qualifications). The acceptance laboratory will take representative samples of the asphalt concrete from each subplot to allow for testing of gradation, binder content, air voids, pavement thickness, and compaction of base and surface courses as described in the subsequent sections. Acceptance of each subplot will be based on the test data from the sample(s) from that subplot. All acceptance samples shall be taken using random locations or times designated by the Engineer in accordance with ASTM D3665.

The contracting agency will pay for laboratory testing as required in this section. If corrective measures are required, including removal, the permittee will be responsible for all subsequent laboratory testing costs including quality control and acceptance testing of new asphalt being placed. All acceptance testing shall be performed by the contracting agency’s laboratory to be reimbursed by the permittee.

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321.10.1.4 For permit work, testing that does not strictly adhere to the sampling and testing methodology and requirements outlined in this section shall be disregarded and not considered in any acceptance determination. All required retesting shall be at the expense of the permittee. If corrective measures are required, including removal, the permittee will be responsible for all laboratory testing costs including quality control and acceptance testing. All acceptance testing shall be performed by the contracting agency's laboratory to be reimbursed by the permittee.

321.10.1.5 For purposes of calculating the total square yardage above, the total area of asphalt being placed on a project shall be used. The Engineer reserves the right to require acceptance testing per Section 321.10.1.3 on any size of asphalt project.

SECTION 321.10.3 (revised 2004) (2004 section No. 321.5.4 revised to 321.10.3 per 2010 mag) *Surface Testing:*

Add the following to Paragraph 2: The water testing of streets requirement may be waived by the Engineer or his designated representative if acceptable drainage patterns are evident.

Section 321.10.5 (revise 2017) *Add the following:*

Density verification by the nuclear method is acceptable for pavement matching and surface replacement over pipe trenches as approved by the city.

SECTION 336.2.2 (revised 2010) *Modify wording:*

Where existing asphalt has to be removed for any construction or repairs, the existing asphalt shall be cut back far enough to remove any asphalt edge damaged by construction and shall not be less than two feet wide. The length of the cut shall be sufficient enough to encompass asphalt that was disturbed by construction activities as directed by the City of Kingman Engineering Representative.

SECTION 336.2.4.1 (revised 2010) *Modify wording of third paragraph:*

Pavement replacement for all pavement cuts including trenches and pot holes shall be per City of Kingman Standard Detail 200-1. All pavement patches shall be compacted with a vibratory steel wheel roller to the same density specified for asphalt concrete pavement.

~~**SECTION 336.3**~~ (revised 2010) (delete this section 2020)

~~Eliminates T-Top Asphalt Replacement~~

Section 340.2.1 (revised 2017) *Add to last sentence:*

Allowable materials shall be cast in Place Wet Set design Cast iron as manufactured by Neenah Foundry or equal. Other materials as approved.

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SECTION 340.3 (revised 2010) *Modify to specify expansion joint spacing and concrete finish:*

Contraction and Expansion joint spacing for curb and sidewalk shall be per City of Kingman Standard Detail 230. The finish of all concrete shall be smooth, straight and defect free, this includes but not limited to cracks, chips and broken edges.

SECTION 340.5 (revised 2012) Add to end of 2nd paragraph.

Payment for Curb Ramp Radial installations shall be all areas between the E.C.R. and B.C.R. including curb & gutter.

SECTION 361-NEW SECTION (2020) SIGNING AND PAVEMENT MARKING POLICIES

Signing Polices:

STOP (R1-1) Sign

Reference City of Kingman Standard Detail 135 for Stop sign design and placement requirements.

SPEED LIMIT (R2-1) Sign

For Residential and Business District Speed Limit, post regulatory Speed Limit signs at the entry(ies) on roads or streets (1/4 mile minimum) of a Residential District and/or Business District in such areas where such District(s) commence(s) to provide actual notice to motorist who are leaving public highways, roads, and streets with higher speed limits. Arizona Revised Statutes 28-101 defines a Residential District and Business District. Arizona Revised Statutes 28-701 establishes an *altered prima facie* regulatory speed limit in a Residential District or Business District of twenty-five (25) miles per hour.

STREET NAME (D3-1) Sign

Reference City of Kingman Standard Detail 134 for Street Name Signs-extruded sign or flat sign for design and placement requirements.

Reference City of Kingman Standard Detail 132 and 130 for Street Name sign base and cross bracket details for mounting hardware requirements.

PERMANENT ROADWAY TERMINATION BARRICADE

Pavement Marking Polices

LONGITUDINAL PAVEMENT MARKINGS

Use lead-free, waterborne traffic paint applied at a thickness of 0.0015 inches (15 mils). Apply Highway Safety Spheres consisting of a 1.50 refractive index to the traffic paint at a drop on rate of 4 pounds to 6 pounds per gallon.

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Install centerline pavement markings on (1) all paved urban arterials/collectors with traveled way of 20 feet or more and Average Daily Traffic (ADT) volume of 4,000 vehicles per day or greater OR (2) all paved roadways with regulatory speed limit of 300 mph or greater.

Apply broken centerline pavement markings consisting of a 40-foot cycle equaling a 10-foot segment separated by a 30-foot gap.

Install edge line pavement markings on all paved roadways with a (1) traveled way of 20 feet or more in width and (2) posted regulatory speed limit of 45 mph or greater.

Apply longitudinal centerline and edge line pavement markings at 6-inches in width, and provide a 6-inch gap between lines comprising a double yellow centerline marking.

TRANSVERSE PAVMENT MARKINGS

Transverse pavement markings and pavement symbol markings shall be preformed thermoplastic, minimum 90 mils.

Install transverse stop lines, minimum 12 inches wide, supplementing STOP signs on all paved intersection approaches, greater than 100 feet in length, to (1) intersecting roadways having a posted regulatory speed limit of 35 mph or greater, (2) railroad crossings, or (3) crosswalks.

**CITY OF KINGMAN STANDARD SPECIFICATION
SECTION 400
SURVEYING STANDARDS**

SECTION 400 (revised 2004)

City of Kingman Specifications Section 400-Surveying Standards is added.

SECTION 400.1 (revised 2004) *General*

All public works improvements and new subdivision developments requiring construction or land surveying shall conform to the standards set forth herein.

SECTION 400.2 (revised 2004) *Public Works Improvements under city contract:*

The City Surveyor shall survey and set construction stakes on improvements made under contract with the City of Kingman, unless otherwise stipulated in the contract.

SECTION 400.3 (revised 2010) *Add temporary lot corner staking to end of paragraph:*

On all public works improvement projects installed under private contract, it shall be the responsibility of the contractor to obtain, at his expense, the services of a professional engineer or land surveyor, registered in the State of Arizona, to survey and stake the project. Temporary staking of lot corners shall be furnished by a registered land surveyor licensed to practice in the state of Arizona and shall be placed prior to the start of construction.

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SECTION 400.4 (revised 2004) *Preservation of survey monuments and bench marks:*

The contractor shall notify the City land surveyor at least seven (7) days before starting work, in order that the City engineer or land surveyor may take necessary measures to ensure the preservation of survey monuments and bench marks.

The contractor shall not disturb permanent survey monuments or bench marks without the consent of the City Surveyor, and shall bear the expense of replacing any that may be disturbed without permission. Replacement shall be done by the City Surveyor.

When a change is made in the finished elevation of the pavement of any roadway in which a permanent survey monument is located, the contractor shall adjust the monument cover to the new grade unless otherwise specified by the City Surveyor.

The contractor shall preserve property line and corner survey markers, except where their destruction is unavoidable. Markers that are lost or disturbed shall be replaced at the contractor's expense by a land surveyor registered by the State of Arizona.

SECTION 400.5 (revised 2004) *Construction stake preservation:*

The contractor shall preserve construction survey stakes and marks for the duration of their usefulness. If any construction survey stakes are lost or disturbed and need to be replaced, such replacement shall be done by a civil engineer or land surveyor registered by the State of Arizona.

SECTION 400.6 (revised 2020) Interval for construction stake of curbs & gutter, blue tops, storm drains, & sewer line.

Construction staking shall conform to the following intervals, unless otherwise approved or stipulated by the City Engineer or Assistant City Engineer:

TYPE	MAXIMUM INTERVAL
Sewer & Storm Drains	50' stations, manholes.
Curb & Gutter	50' stations on tangent, 25' stations on curves with 3 stake Minimum and radius points where feasible
Blue Tops	25' stations and a minimum of 14' laterally.

SECTION 400.7 (revised 2020)

Elevations shall be based on the City of Kingman Vertical Datum (NGVD29) and maintain the following accuracy: The vertical misclosure(ft.) of the level run must be less than the square root of the horizontal distance(ft.) divided by 400.

Vertical misclosure < $\sqrt{\text{horizontal distance}}$ - 400

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SECTION 400.8 (revised 2020)

Alignment and elevation stakes shall be furnished by the contractor at agreed upon offsets. Grade sheets shall include: stationing, stake elevation, design grade, cut or fill, off sets, misclosures, and benchmarks used, with description. On water main projects, elevation stakes will be furnished when deemed necessary by the City of Kingman Engineer. Grade Sheets shall be complete and submitted prior to the start of construction. Grade sheets must have the Engineer or Surveyors company name and name of field personnel.

SECTION 400.8.1 (revised 2010) *ADD: As-built / Record plans or drawings:*

Prior to final acceptance, As-Built / Record Drawings and a Point File in common interchange format (contains ASCII – American Standard Code for Information Interchange, with CSV – Comma Separated Values) shall be furnished to the City Engineering Department.

SECTION 400.9 (revised 2010) *Modify subsection (12) omitting survey assurance requirement:*

The applicant/developer of a new subdivision shall have a registered land surveyor, licensed to practice in the State of Arizona, place permanent reference monuments in the subdivision as required herein.

- (1) Permanent Monuments shall be either:
 - a. Iron pipe not less than three quarter (3/4) inch in diameter and not less than twenty-two (22) inches in length with (RLS) identification attached.
 - b. Nail and tag (RLS) set in lead.
 - c. Rebar not less than one-half (1/2) inch in diameter and not less than twenty-four (24) inches in length with (RLS) identification.
 - d. Large spike and washer stamped with (RLS) identification.
 - e. Concrete monument not less than six (6) inches in diameter and not less than eight (8) inches in length with metal disc stamped with (RLS) identification properly attached thereto and set flush with finished surface of paved street.
- (2) Permanent monuments shall be set on the tract boundary at the following locations:
 - a. At all angle points
 - b. At intersection of street limits (R/W)
 - c. At intersection of City boundary
 - d. At distances on tangent not to exceed one-thousand (1000) feet

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- e. At intervisible points on tangent
 - f. At intersection of street or alley center lines
 - g. At intersection of Section lines
- (3) Permanent monuments shall be Type e as shown in Section 400.9 (1) and shall be set on street or alley center lines at the following locations:
- a. At P.I.'s or sub P.I.'s within street limits (R/W)
 - b. At P.C.'s, P.T.'s and intervisible chord points where P.I. is not accessible
 - c. At street and alley center line intersections
 - d. At street and alley center line intersections with City boundary.
- (4) Ties to Geodetic and section survey monuments will be made as follows:
- a. Direct ties shall be made to all Geodetic and Section survey monuments within the tract.
 - b. When no monument exists within a tract, ties shall be made to two (2) or more monuments outside the tract boundary within the quarter section.
 - c. When any Geodetic or Section monument is to be removed by construction of tract, the City surveyor's office shall be notified not less than thirty (30) days in advance of the removal date.
 - d. If Geodetic or Section monuments are shown on the subdivision plat by bearing and distance, tie sheets for these monuments are required.
- (5) Existing referenced monuments:
- Monuments shall be set and tied out if located one-hundred (100) feet or more from previously tied out point.
- (6) Tie points shall be in the form of:
- a. Lead and tack (L&T)
 - b. Spike and tin (S&T)
 - c. Any exceptions to use other tie points must be approved by the City Engineer.
- (7) The number per point tied shall be:
- a. No less than three (3) tie points for each point referenced

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- b. Tie points shall be kept within the street limits (R/W)
 - c. Two of the three tie points shall be on the center line or tract line produced or
 - d. If P.I. falls within the street limit (R/W) and the tangent distance does not exceed one-hundred (100) feet, it is not necessary to tie out the P.S. or P.T. if the P.I. is tied out.
 - e. Measured angles shall be shown at all P.I.'s, intersections and to all tie points set.
- (8) Lead and tack ties shall be used as example, but not limited to the following locations:
 - a. Sound rock dykes or ledges
 - b. Large deeply embedded boulders
 - c. Mortar laid masonry
 - d. Concrete curbs and walks
 - e. Concrete catch basins, bridges, head walls or any permanent concrete structure.
- (9) Spike and tin ties shall be used as example, but not limited to the following locations:
 - a. Trees and poles
 - b. Sound wooden fence posts
 - c. Asphalt pavement
- (10) Tie Notes Procedure shall be as follows:
 - a. Only one point or street intersection shall be shown on a record sheet.
 - b. Notes shall conform to the furnished example plates obtainable from the City surveyor's office:
 - i. Title - Plate 1
 - ii. Tract boundary and/or City boundary with street center line - Plate 3
 - iii. Street center line intersection - Plates 2 and 4
 - iv. P.I.'s, P.C.'s, P.T.'s, P.C.C.'s and chord points - Plates 5, 6 and 7

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- v. Tie lines to Geodetic and Section monuments - Plates 8 and 9
 - c. All completed tie sheets shall be submitted to the City of Kingman Engineering Department. They will be filed there as a permanent record.
 - d. Show street widths, center line point to point distances and center line curve data.
 - e. Notes on any street shall be kept on consecutive pages and properly referenced from one page to another.
- (11) Tie Notes shall be on a standard sheet as follows:
- a. The notes shall be on quadrille rules loose leaf sheets (8 1/2" x 11") punched for a three-ring binder
 - b. North arrow to be shown on each tie sheet
 - c. Every effort shall be made to keep north to the top of the sheet
 - d. All tie sheets to be signed, sealed, and dated per A.R.S. 32-125
- (12) Lot Corners:
- All lot corners shall be monumented by a registered land surveyor licensed to practice in the State of Arizona, and shall be completed prior to recordation of the final plat. Lot monuments may be three-quarter (3/4) inch iron pipes, five-eighths (5/8) inch rebars, one-half (1/2) inch rebars or equal.

SECTION 400.10 (Revised 2004) *Survey accuracy (excepting construction surveys)*

Survey accuracy shall conform to the following specifications:

- (1) Minimum of 1/20,000 in distance and direction

This specification to apply to: Section lines, Tract boundaries, core areas of the City or where zoning regulations permit zero set-backs and other high risk areas where property line locations are critical.
- (2) Minimum of 1/15,000 in distance and direction

This specification to apply to: Street center lines, Block boundaries in residential areas of the City where the intensity of use does not exceed about six dwelling units to the acre, shopping centers or malls and such other less critical or lower risk areas where zoning regulations do not permit major structures or buildings to be built on the property lines.
- (3) Minimum of 1/10,000 in distance and direction

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This specification to apply to: Rural areas in the City where land may be used for recreation, park or other such uses, where the residential lot is one acre or larger and shall be restricted from further subdivision.

- (4) Application of the above criteria shall not operate to impose an error of measurement discrepancy which is no more than 0.03 feet between sequential monuments.

SECTION 400.11 (revised 2004) *Permit revocation, penalty:*

In addition to any penalty imposed by law, any person violating any provision of this article shall have his permit revoked, and during the period of revocation no new permit shall be issued to such person until the violation is corrected to the satisfaction of the City Engineer. In the case where a contractor has disturbed permanent survey monuments or bench marks without written consent of the City Surveyor resulting in the replacement of the permanent survey monument or bench mark by City forces, the contractor shall reimburse the City for the cost of the replacement upon presentation of the cost figure by the City.

SECTION 405 (revised 2004)

Sections 405.1 through 405.5 are deleted; refer to City of Kingman Specification No. 400-Surveying.

SECTION 601.2.8 (revised 2020) add to end of first paragraph:

Wet unsuitable material must be removed at the discretion of the Engineer.

SECTION 601.4 (revised 2020) *Revise Table:*

Minimum testing requirements for Aggregate Backfill for structure, pipe bedding, haunching, initial backfill and final trench backfill:

Proctor, P.I., Gradation - sample point onsite - minimum one per source per project.

Minimum testing requirements for Aggregate Base for streets:

Tests shall be per MAG Sect 702 - sample point onsite - minimum one per source per project.

*Additional tests may be required as deemed necessary by the City Engineer.

SECTION 601.4.6 (revised 2010) *Add New Table:*

Minimum frequency for compaction testing of trench backfill includes water / sewer mains, service lines, telephone, gas, electric, cable tv or other utilities or appurtenance.

Parallel to street centerline: Minimum of one per lift per 500ft

Perpendicular to street centerline: Minimum one per lift per crossing.

*Additional tests may be required as deemed necessary by the City Engineer.

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SECTION 601.4.5 (revised 2012) *Delete: use of water consolidation as a means of achieving Compaction.*

"Mechanical compaction in accordance with this section shall be performed to achieve desired compaction in all locations where Backfill Type I, II or II is required per Table 601.2.

SECTION 610.3 (revised 2010) *Add text concerning unacceptable ultraviolet exposure:*

Polyvinyl chloride pressure pipe showing signs of physical damage or unacceptable ultraviolet exposure, as determined through visual inspection by the City of Kingman Engineering Representative, may be rejected. Pipe stored outside, and exposed to sunlight for more than thirty (30) days shall be covered with an opaque material such as canvas. Clear plastic sheets shall not be used for pipe cover. Air circulation shall be provided under the covering.

SECTION 610.3.1 (added 2012)

Water line materials containing Brass or Bronze must comply with the current NSF 61 Standards at the time the project begins.

SECTION 610.4 (revised 2012) *Add to last paragraph:*

Any vertical deflection of 22 ½ degrees or more will require ductile iron with approved joint restraints per Mag Standard Details 302-1, 302-2, 303-1 and 303-2 unless specified otherwise in the special provisions, plans or by the City Engineer.

Repair Sleeves/Couplers or any line coupling or splice fitting shall not be used unless approved otherwise the City Engineer.

Pipe bevels shall be removed when required at fittings, valves, fire hydrants and related appurtenances and the pipe marked so proper depth of pipe insertion can be verified.

SECTION 610.5.5 (revised 2012) *delete both notes in paragraph allowing concrete encasement,*

And add to end of paragraph:

Concrete encasement as a means of extra protection will not be allowed unless approved otherwise by the city engineer.

SECTION 610.6.1 (revised 2020) *Revise paragraph to require polywrap*

"Pipe, valves and fittings shall be protected from corrosion by encasement in a polyethylene protective wrapping referred to hereafter as polywrap. Although not intended to be completely air and water tight enclosure the polywrap shall provide a continuous barrier between the pipe and surrounding bedding and backfill."

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Section 610.10 (revised 2017) *(add to wording for water shutdown of an existing water main.*

Shut down date & times shall be authorized by the city of Kingman. Typical times are from 9am to 3pm M-F. Notification of water service customers shall be a minimum of 24 hours prior to shut down. The contractor shall distribute shutoff notices to each individual water service customer affected at no additional cost to the city.

SECTION 610.11 (revised 2017)

When plans call for connections from a new water main to an existing water meter, the work shall include ~~new polyethylene (PE) or~~ schedule 80 PVC pipe for services up to 2" per City of Kingman Standard Detail 344-1 or Crosslinked Polyethylene per City of Kingman Standard detail 344-1-A. Restrained ductile iron pipe will be used for 3-inch and larger service lines. ~~PE pipe shall be iron pipe size SDR 9, 250 psi, meeting M.A.G. 755.~~ Residential meters and boxes shall be set parallel to the street centerline and to the finish grades and locations specified in the special provisions, plans or at the direction of the City of Kingman Engineering Representative.

When plans call for the abandonment of water services the old meter shall be removed and the angle meter stop plugged with an approved threaded plug.

SECTION 610.12 (revised 2010) *Fire Service Line Connections – Add wording:*

It is the contractor's responsibility to coordinate onsite construction requirements, testing and inspections with the Fire Department that has jurisdictional authority over the project.

SECTION 611.2.2 (revised 2017) *Modify wording for pressure test:*

All new lines and fittings shall be pressure tested against new valves unless approved otherwise by the City Engineer.

Acceptance pressure and leakage testing of new water mains shall be made AFTER subgrade preparation is completed and all utilities have been installed within the right-of-way.

Contractor shall provide gauges used for pressure testing. Gauges shall be used with a range based on test pressure putting the indication approximately mid-span. Any gauges deemed defective or inaccurate by the City of Kingman Engineering Representative shall be replaced by an acceptable gauge at the contractor's expense.

Hydrostatic pressure and water makeup testing for all water mains and appurtenances including Ductile Iron Pipe shall be per applicable portions of M.A.G. Spec. 611. ~~or as modified herein and shall be performed concurrently for a minimum of 2 hours or as directed by the City of Kingman Engineering Representative. Allowable leakage for will be in U.S. Gallons per hour.~~ Pressure and Leak testing of PE piping systems shall be per ASTM F-2164.

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~~Formula: $L = \frac{ND\sqrt{P}}{7400}$~~

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~~Where:~~

~~L = testing allowance (makeup water) in gallons per hour~~

~~N = Number of joints being tested~~

~~D = Nominal diameter of pipe in inches~~

~~P = Average observed test pressure of the pipe measured at the lowest end of test section shall be a minimum of 200 psi for lines smaller than 16 inches and 150 for lines 16 inches or larger unless specified otherwise in the special provisions, plans or by the City of Kingman Engineering Representative~~

SECTION 611.7 (revised 2017) – *Modify section to specify disinfection process:*

A mixture of Sodium Hypochlorite and water shall be used for the disinfection of water mains and associated appurtenances per ADEQ Engineering Bulletin No. 8. Any other disinfection method must be approved by the City of Kingman Engineering Representative. Brass service saddles and corp stops per 344-1 shall be provided by the contractor at locations directed by the city engineer for the introduction of the disinfection solution and testing.

SECTION 611.8 (revised 2010) – *Modify existing section concerning introduction of chlorine into water systems:*

The mixture of water and sodium hypochlorite shall only be introduced into the water main, fire hydrants, fire service lines or associated appurtenances by a method and concentration that is approved by the City of Kingman Engineering Representative.

SECTION 611.10 (revised 2017) – *Rewrite paragraph to reflect chlorination process:*

The initial chlorine content shall be measured and authorized for use by a City of Kingman Engineering representative before introduction into the line. The Minimum residual chlorine content after 24 hours shall be no less than 10ppm. Maximum chlorine concentration shall not exceed 150ppm in any part of the line. Chlorinating agent retention period shall not exceed 72 hours.

SECTION 611.15 (revised 2010) *Revise 3rd paragraph to specify Bac-T sample frequency:*

Sample frequency shall be one per 1000ft with one minimum or as determined by the City of Kingman Engineering Representative.

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SECTION 615.1 (revise 2020) Curvilinear sewer & Invert verification

Sewers shall be laid with straight alignments. Curvilinear sewers are not permitted. Existing sewer invert elevations shall be exposed and verified by the design engineer.

Section 615.6.1 (revised 2004) Add Repair/Replacement of Existing Sewer Service Lines:

A plumber or contractor wishing to make a repair or replacement of an existing sewer service line must first obtain a City Right-of-Way permit and Sewer Tap permit (if applicable) and pay all appropriate fees. 48 hours advance notification to the Public Works Inspection Department is required prior to actual construction.

The contractor must then expose the existing service line to the sewer main to determine the condition of the existing line and tap. If the existing tap is usable per current City and UPC standards. The contractor has the option of utilizing the existing tap or installing a new

service tap, which will require a Sewer tap permit. If a new tap is made, the old tap must then be capped or plugged at the sewer main by an acceptable method such as a VCP cap, plug and epoxy, grout, or concrete encasement.

SECTION 615.9 (revised 2020) sanitary sewer cleanouts

Cleanouts are permitted provided that the distance from the cleanout to the nearest manhole does not exceed 200 feet and there is no potential for extension.

SECTION 615.10 (revised 2004) *Testing:*

Acceptance testing of new sewer lines shall be made AFTER subgrade preparation is completed and all utilities have been installed within the right-of-way.

SECTION 615.11 (A) (6) (revised 2010) *Add pressure gauge specification to note 6:*

Contractor shall provide gauges used for pressure testing. Gauges shall be used with a range based on test pressure putting the indication approximately mid-span. Any gauges deemed defective or inaccurate by the City of Kingman Engineering Representative shall be replaced by an acceptable gauge at the contractor's expense.

SECTION 615.11 (A) (7) (revised 2010) *Replace note 7 with low pressure air specification:*

Low Pressure Air Acceptance testing will be per ASTM F-1417-92, (2005) or latest revision.

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Section 615.11 (D) (revised 2020) *Revise paragraph specifying closed circuit camera inspection of sewer:*

All new sewer mains shall have the interior visually inspected prior to paving using a remote closed circuit camera. The city may provide closed circuit camera service with the contractor's cooperation. The contractor shall coordinate with the City of Kingman Wastewater Superintendent to schedule closed circuit camera inspections. The contractor shall make manholes and cleanouts accessible and safe for the city's wastewater crew and run water through the main prior to the interior inspection to the extent deemed necessary by the City of Kingman Waste Water Superintendent. If the contractor fails to schedule or cooperate with the city and or paving is already completed, the contractor will provide closed circuit camera inspection with Digital documentation at no cost to the city. Any defect in the pipe or construction methods revealed by the closed circuit camera inspection that's deemed unacceptable to the wastewater superintendent shall be corrected by the contractor at no additional cost to the City of Kingman. This includes but not limited to bellies in the main indicated by standing water, dirt & debris, lips at joints, shifted connections at couplers or unacceptable service line connections at the main.

Section 615.11 (E) (revised 2010) *Add lamp lighting or remote camera testing requirement.*

All sewer line shall be tested for uniform slope by lamp lighting or remote camera per Arizona Administrative Code R18-9-E301.4.01. In the event remote camera services are not available, the engineer of record or his designee will conduct the lamp lighting test at no cost to the city.

SECTION 625.1.1 (revised 2010) *Revise to include concrete collars as part of construction:*

Sewer Manholes: Construction shall consist of furnishing all materials and constructing manholes complete in place and set to finish grade as detailed including foundations walls, manhole frames, and covers, concrete collars, grouting the interior, and any incidentals thereto, at locations shown on the plans.

SECTION 625.3.1 (revised 2010) *Add to the end of section addressing cracked concrete, Testing of manholes and approved interior coatings*

Concrete collars for frame and cover, cleanout frames and manhole bases shall be free of cracks and other defects and shall be replaced at no expense to the City before acceptance.

SECTION 625.5 (revised 2010) *Revise first paragraph addressing concrete collars/finish grade*

Payment will be made at the unit price bid for each manhole, and shall be compensation in full for furnishing and installing manhole with frame and cover set to finish grade, complete with formed invert, concrete foundation, ladder rungs, cast iron frame and cover, concrete collar, excavation and backfill, paving cut replacement in excess of the applicable pay widths authorized in section 336, and any incidentals thereto in conformance with the plans and specifications.

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SECTION 630.4 (revised 2017) *Delete paragraph 3 and add the following: Future add:*

The City of Kingman only taps existing water mains for service connections 2" or smaller. Wet taps to water mains for lines other than service connections shall be made by the Contractor. The Contractor making the tap must be approved by the City of Kingman Public Works Department prior to beginning any work.

SECTION 631.1 (revised 2004) *Delete – covered in 2010 addendum 610.11*

SECTION 631.2 (revised 2017) *First Paragraph*

~~Polyethylene pipe (iron pipe size I.D., 200 psi), shall conform with Section 755. (deletes "copper pipe, tubing and fittings shall conform with Section 754")~~

SECTION 631.3.3 (revised 2004) *First Sentence:*

Revise to read: "The minimum depth of service pipe shall be as shown in the City of Kingman Detail No. 344-1."

SECTION 631.3.5 (revised 2004) *First Paragraph:*

One inch and 3/4 inch service taps to new water mains may be made with a saddle. (deletes "tapped coupling or direct tap in accordance with the following provisions:")

Section 702. Revised 2010) *Add table:*

Minimum testing requirements for Aggregate Base:

Gradation, P.I., Proctor-sample onsite – 1 per source. 1 sample per 2000 Ton- 1 sample min.

Abrasion, Fractured Faces- sample onsite – 1 sample per 2000 Ton – 1 sample min.

– Sample onsite – 1 sample per 2000 Ton min.

SECTION 710.2.1 Asphalt Binder: (revised 2020)

Modify the first paragraph as follows (modified text is shown in **bold**):

The asphalt binder specified in this section has been developed for use in desert climate

Cold conditions. When used in other climates, consideration should be given to

adjustments in the asphalt binder selection. The asphalt binder shall be Performance Grade

Asphalt conforming to the requirements **of AASHTO M320 and M322 for PG PG 70-22,**

unless otherwise approved by the Engineer or specified differently in the plans or special provisions.

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SECTION 710.3.1 General: (revised 2020)

Modify the first paragraph as follows (modified text is shown in **bold**):

The mix design for asphalt concrete shall be prepared by a laboratory that is accredited through the AASHTO Accreditation Program (AAP) in Hot Mix Asphalt Aggregates and Hot Mix Asphalt. The laboratory shall be under the direct supervision of a Civil Engineer, registered by the State of Arizona, and who is listed by ADOT as a "Qualified Asphaltic Concrete Mix Design Engineer" within ADOT's latest list of approved laboratories. The latest list of approved laboratories is available on ADOT's web page www.azdot.gov. **As an alternate, the laboratory shall be under the direct supervision of a Civil Engineer, registered in Nevada, Utah, or California, and who is listed as a "Qualified Asphaltic Concrete Mix Design Engineer" in those jurisdictions.** The date of the design shall not be older than two years from the date of submittal, unless supportive documentation is provided and approved by the Engineer.

SECTION 710.3.2 MIX DESIGN CRITERIA: (revised 2020)

Each mix shall be designed using Marshall compaction methods. Gyrometric compaction methods only by approval of the Engineer.

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SECTION 710.3.2.1 Marshall Mix Design: (revised 2020)

Modify Table 710-3 as follows: Change absorbed asphalt: %, Range to 0-1.50 in Table 710-3

TABLE 710-3				
MARSHALL MIX DESIGN CRITERIA				
Criteria	REQUIREMENTS			
	3/8" Mix	1/2" Mix	3/4" Mix	Designated Test
1.Voids in Mineral Aggregate: %, min	15.0	14.0	13. 0	AI MS-2
2.Effective Voids: %, Range	4.0±0.2	4.0 ±0.2	4.0 ±0.2	AI MS-2
3.Absorbed asphalt: %, Range*	0-1.5	0-1.5	0-1.5	AI MS-2
4.Dust to Eff. Asphalt Ratio, Range **	0.6-1.4	0.6-1.4	0.6-1.4	AI MS-2
5.Tensile Strength Ratio: % Min.	65	65	65	ASTM D4867
6.Dry Tensile Strength: psi, Min.	100	100	100	ASTM D4867
7.Stability: pounds, Minimum	2,000	2,500	2,500	AASHTO T-245
8.Flow: 0.01-inch, Range	8-16	8-16	8- 16	AASHTO T-245
9.Mineral Aggregate Grading Limits				AASHTO T-27
Percent Passing with Admix				
Sieve Size	3/8 inch Mix	1/2 inch Mix	3/4 inch Mix	
1-1/4 inch				
1 inch			100	
3/4 inch		10 0	90 – 100	
1/2 inch	100	85 – 100	---	
3/8 inch	90-100	62 – 85	62 – 77	
No. 8	45-60	40 – 50	35 – 47	
No. 40	10-22	10 – 20	10 – 20	
No. 200	2.0 – 10.0	2.0 – 10.0	2.0 – 8.0	

* Unless otherwise approved by the Engineer.

** The ratio of the mix design composite gradation target for the No. 200 sieve, including admixture, to the effective asphalt content shall be within the indicated range.

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SECTION 743.5 (revised 2004) *Vitrified Clay Pipe, Joints:*

Flexible compression couplings for plain end pipe will be allowed only at repair locations, points of connection to existing lines, and at sewer stub-outs (COK Detail 443). Flexible compression couplings shall be encased in concrete for a minimum of 1 foot on each side of the joint; the depth of encasement shall be a minimum of 6-inches around the complete diameter of the pipe.

SECTION 750.2 (revised 2010) *(remove blue color requirement from this paragraph)*

Add the following paragraph: "All ductile iron pipe shall be encased in polyethylene in accordance with AWWA C-105/ANSI A21.5. Polyethylene shall be 8 mil minimum thickness and tubular collapsed folded or accordion type. Polyethylene shall be secured to the pipe with water proof tape at approximately 2 foot intervals."

SECTION 750.3 (revised 2010) *Add acceptable restrained joint gasket for DIP:*

Acceptable restrained joint gasket for Ductile Iron Pipe is: Field Lok 350 Gasket manufactured by U.S. Pipe. All restrained joint fittings must be approved prior to use.

**CITY OF KINGMAN STANDARD SPECIFICATION
SECTION 751
POLYVINYL CHLORIDE (PVC) WATER PIPE AND FITTINGS**

SECTION 751 (revised 2004) City of Kingman Specification 751 covering the use of PVC water pipe is added.

SECTION 751.1 (revised 2004) *General:*

These specifications cover polyvinyl chloride (PVC) pressure pipe for use in supply lines and distribution systems that carry water under pressure. All PVC water pipe shall bear the National Sanitation Foundation (NSF) Seal for use with potable water.

SECTION 751.2 (revised 2010) *Modify to reflect 2007AWWA Standards for new pressure classes for PVC Pipe:*

PVC pipe shall be manufactured and tested in accordance with the latest revision of AWWA C-900 or AWWA C-905, except as modified herein, for pipe intended for use in water service at maximum operating pressure of 165, 235, or 305 respectively for AWWA C-900, and operating pressures of 100, 125, 160, 165, 200, 235 for AWWA C-905, for the corresponding maximum operating pressures, unless shown otherwise on the plans or specified in the special provisions the minimum acceptable shall be class 235 for AWWA C-900 and Class 235 for AWWA C-905. Only pipe with Cast Iron Pipe Equivalent outside diameter will be allowed.

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SECTION 751.3 (revised 2004) *Materials:*

SECTION 751.3.1 (revised 2004) *Pipe:*

Pipe shall be manufactured from Class 12454-A or Class 12454-B polyvinyl chloride.

SECTION 751.3.2 (revised 2004) *Gaskets:*

Rubber gaskets shall be manufactured from a synthetic elastomer and shall comply in all respects with the physical requirements specified in ASTM F-477.

SECTION 751.3.3 (revised 2004) *Lubricant:*

The lubricant used for assembly shall be compatible with the gaskets and the pipe materials and shall not support bacteria growth or otherwise affect potable qualities of the water.

SECTION 751.4 (revised 2004) *Joining Systems:*

Joints for the piping system and fittings shall consist of an integral bell gasketed joint designed so that when assembled, the elastomeric gasket located within the bell is compressed radially on the pipe or fitting spigot to form a positive seal. The joint shall be designed to prevent displacement of the gasket from the joint during assembly and when in service. Solvent weld joints will not be allowed. The joint assembly shall meet laboratory performance requirements specified in ASTM D-3139. All pipe shall have a home mark on the spigot to indicate proper penetration when the joint is made. Deflection of joints and longitudinal bending shall be no more than half the maximum recommended by the manufacturer.

SECTION 751.5 (revised 2004) *Fittings:*

SECTION 751.5.1 (revised 2004) *Pipe Fittings:*

Fittings shall be cast (gray) iron or ductile iron and conform to AWWA C-110 or C-153 for 250 psi minimum working pressure rating cast on fittings. Fittings to be mechanical joint

conforming to the above specifications. All fittings shall be cement lined in accordance with AWWA C-104.

SECTION 751.5.2: (revised 2004) *Service Connection Fittings:*

Taps to PVC pipe shall be made with rigid, full circle, wide body bronze clamps made specifically for use on AWWA C-900 - PVC pipes. Service connections to AWWA C-905 PVC pipe are not allowed unless approved by the Utilities Superintendent.

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SECTION 751.6 (revised 2004) *Excavation, preparation of trench and backfilling:*

All trenches shall comply with the requirements for trench excavation, backfilling and compaction, per Section 601 of these standard specifications.

Bedding and backfill material shall conform to City of Kingman Detail No. 392 or 400.

SECTION 751.7 (revised 2004) *Preparation of trench bottom:*

The trench bottom must be shaped to provide continuous contact with the pipe. Whenever boulders, rocks or ledge rock are encountered, the trench shall be excavated as heretofore specified and the trench bottom backfilled and compacted with select granular material.

SECTION 751.8 (revised 2004) *Joining of Pipe:*

Such assembly will be made in accordance with the manufacturer's recommendations. Each length of pipe and fitting shall be thoroughly cleaned and inspected prior to jointing.

When pipe laying is not in progress, the open ends of the pipe shall be closed by a suitable plug or cap to prevent the entrance of trench water, insects, rodents or other small animals, and other foreign materials.

SECTION 751.9 (revised 2004) *Connections to asbestos-cement and other pipe materials:*

All connections between polyvinyl chloride (PVC) plastic pipe and asbestos-cement, cast iron, steel and other pipe materials shall be made in accordance with the manufacturer's recommendations using special adapters made for the type of connection involved.

SECTION 751.10 (revised 2010) *Modify pressure and leakage test requirements:*

Hydrostatic pressure and leakage testing for PVC pipe shall be per applicable portions of M.A.G. Sect. 611. ~~or as modified herein and shall be performed concurrently for a minimum of 2 hours, as directed by the Engineer. Allowable leakage shall be in U.S. Gallons per hour. The following formula shall be used:~~

$$L = \frac{2 \cdot ND \cdot \sqrt{P}}{7400}$$

~~WHERE: L = testing allowance (makeup water) in gallons per hour
N = Number of joints being tested
D = Nominal diameter of pipe in inches~~

~~P = Average observed test pressure of the pipe measured at the lowest end of test section shall be a minimum of 200 psi or lines smaller than 16 inches or larger unless specified otherwise in the special provisions, plans or by the City of Kingman Engineer.~~

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SECTION 751.11 (revised 2010) *Add to the end of last sentence:*

All Joint Restraint Systems shall be manufactured in accordance with ASTM, ANSI, and AWWA Standards. The Joint Restraint Systems designed and distributed by the Uni-Flange Corporation of Jacksonville, Florida are acceptable for use on C-900 and C-905 PVC pipe in the City of Kingman. Use of other manufacturer's brands requires prior approval from the Utilities Superintendent. Restraint devices for PVC pipe shall incorporate a series of machined serrations (not "as cast") on the inside diameter of the ring to provide positive restraint, exact fit and 360 contact and support of the pipe wall. The use of Mega Lug type restraints is prohibited on PVC. Restraint devices shall be placed on the pipe at the locations specified by the Engineer.

SECTION 755 (revised 2017)

All materials shall be submitted to the City for review and acceptance prior to construction including the manufacturers recommended method for butt fusing joints.

Butt Fusion: The pipe shall be joined by the butt fusion procedure outlined in ASTM F 2620 or PPI TR-33. All fusion joints shall be made in compliance with the pipe manufacturer's recommendations.

Fusion joints shall be made by a qualified fusion technician per PPI TNN-42 which has been certified by the equipment supplier within the preceding 12 months.

SECTION 765.3 (revised 2004)

The first sentence of MAG Section 756.3 is revised to read: "Fire hydrants shall be dry barrel of the manufacturer shown on the City of Kingman Standard Detail 360."