TOWN OF GILBERT

2024

SUPPLEMENT TO
MAG UNIFORM STANDARD SPECIFICATIONS
FOR PUBLIC WORKS CONSTRUCTION

Effective April 4, 2024

Amendments	*Section No. and Title*	*Effective Date*
Revised one-year warranty period to reflect change from TRMSS to PMM Seal coat	Section 321.8.11 – Preservative Seal	11/20/2017
Revised backfill requirements to maximum aggregate size of 1.5”, maximum lift thickness of 16” and removed consolidation in its entirety	Section 601.4.4 – Final Backfill	01/07/2018
Revised sign sheeting requirements	Section 402.4.2 Materials	03/03/2018
Revised to specify only ASTM D4956 Type XI – 3M 4000, or approved equal sign sheeting to be used. Removed ASTM D4956 Type IV (High Intensity) – 3M 3930 or approved equal from use.	Section 402.4.2 Materials	05/19/2018
Revised to require that all streetlights shall be foundation mounted	Section 370.2 General Requirements	5/18/2019
Revised to remove stamped asphalt from raised medians	Section 322.3.2	9/15/2019
Added new supplement regarding Utility Potholes – Keyhole method	Section 355	9/10/2020
Misc. updates to Inspections and coordination information.	Section 403.2.3	5/12/2022
Misc. updates to material requirements.	Section 403.3	5/12/2022
Removed Polypropylene pipe materials from use in the ROW unless approved by the Town Engineer	Section 738.1	5/12/2022
Revised #5 – Conduit and Pull Boxes requirements	Section 403.3 Materials	5/18/2023
Updated asphalt concrete acceptance criteria	Section 710.1 General	5/18/2023
Added a new control valve subsection	Section 616.4.5 Reclaimed Water Service Control Valves	4/4/2024
Removed “Polyproplyene (PP)” to now allow material to be within TOG rights-of-way	Section 738.1 General	4/4/2024
Added new polypropylene pipe for storm drain	Section 740.1 General	4/4/2024

GENERAL CONSTRUCTION NOTES
FOR PUBLIC WORKS CONSTRUCTION
IN THE TOWN OF GILBERT

1. ALL CONSTRUCTION IN THE PUBLIC RIGHTS-OF-WAY OR IN EASEMENTS GRANTED FOR PUBLIC USE SHALL CONFORM TO THE LATEST MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) UNIFORM STANDARD SPECIFICATIONS AND UNIFORM STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION AS AMENDED BY THE LATEST EDITION OF THE TOWN OF GILBERT (TOG) SUPPLEMENTAL STANDARD SPECIFICATIONS AND SUPPLEMENTAL STANDARD DETAILS. IF THERE IS A CONFLICT, THE LATTER SHALL GOVERN.

2. WHENEVER EXCAVATION IS TO BE DONE, CALL THE ARIZONA 811, ARIZONA BLUE STAKE, INC. AT **811** TWO WORKING DAYS BEFORE EXCAVATION IS TO BEGIN. ARIZONA 811 CAN ALSO BE REACHED AT 1-800-STAKE-IT (1-800-782-5348) OR 602-263-1100.

3. THE CONTRACTOR SHALL NOTIFY THE TOWN OF GILBERT INSPECTION & COMPLIANCE DIVISION AT LEAST 24 HOURS IN ADVANCE OF ANY CONSTRUCTION WORK AND AT THE BEGINNING OF ANY NEW PHASES OF CONSTRUCTION IN ORDER TO SCHEDULE INSPECTIONS. CALL THE INSPECTOR ASSIGNED TO THE PROJECT AT THE PHONE NUMBER SHOWN ON THE ENGINEERING PERMIT.

4. APPROVAL OF THESE PLANS IS VALID FOR ONE (1) YEAR. IF AN ENGINEERING CONSTRUCTION PERMIT FOR THESE IMPROVEMENTS HAS NOT BEEN ISSUED WITHIN ONE (1) YEAR, THE PLANS SHALL BE RESUBMITTED TO THE TOWN FOR REVIEW AND REAPPROVAL.

5. THESE PLANS ARE APPROVED BY THE TOWN IN SCOPE AND NOT IN DETAIL. IF CONSTRUCTION QUANTITIES ARE SHOWN ON THESE PLANS, THEY HAVE NOT BEEN VERIFIED BY THE TOWN.

2024

TOWN OF GILBERT SUPPLEMENT
TO
MAG UNIFORM STANDARD SPECIFICATIONS
FOR PUBLIC WORKS CONSTRUCTION

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SECTION 101
ABBREVIATIONS AND DEFINITIONS

101.1 ABBREVIATIONS:

Add the following abbreviations:

ADWR	Arizona Department of Water Resources
APS	Arizona Public Service Company
AZPDES	Arizona Pollutant Discharge Elimination System
EPA	Environmental Protection Agency
GRIC	Gila River Indian Community
IES	International Electrical Society
MCESD	Maricopa County Environmental Services Department
NPDES	National Pollutant Discharge Elimination System
PVC	Polyvinyl Chloride
RWCD	Roosevelt Water Conservation District
SRP	Salt River Project
SWG	Southwest Gas
TOG	Town of Gilbert

101.2 DEFINITION AND TERMS:

Insert the following definition:

Design Engineer: The Engineer who has sealed the plans.

Delete the definition of "Engineer" and substitute the following:

Engineer/Town Engineer: The person, appointed as the Town Engineer by the Town Council, acting directly or through a duly authorized representative. The Town Engineer's duly authorized representative shall include, but not be limited to, the Town Inspector on the project. In some cases, "Engineer" in these documents and in the Construction Documents may refer to the Design Engineer for the project. In the case where it is unclear whether "Engineer" is referring to the Town Engineer or the Design Engineer, the Town Engineer shall make that determination. The Town Engineer, at the Town Engineer's discretion, may defer any authority or obligation under these Specifications and Details to the Design Engineer.

Delete the definition of "Inspector" and substitute the following:

Inspector/Town Inspector: The Town Engineer's duly authorized representative assigned to make detailed inspections of contract performance.

Insert the following definition:

Municipal Code: The complete codification of the general and permanent ordinances of the Town of Gilbert, Arizona, maintained and available from the Town Clerk at the following website:

http://library.municode.com/index.aspx?clientId=12036

101.3

Delete this section in its entirety and replace it with the following:

In order to avoid cumbersome and confusing repetition of expressions in these specifications and details, it is provided that;

(A) Whenever these Specifications state that anything is done, or is to be done, and phrases such as if, as, or, when, or where contemplated, required, determined, directed, specified, authorized, ordered, given, designated, indicated, considered necessary, deemed necessary, permitted, reserved, suspended, established, approval, approved, disapproved, acceptable, unacceptable, suitable, accepted, satisfactory, unsatisfactory, sufficient, insufficient, rejected, or condemned are used to clarify the item that is done or is to be done, it shall be understood as if that expression were followed by the words "by the Engineer" or "to the Engineer."

(B) Whenever a MAG Uniform Standard Specification (or Detail) for Public Works Construction is referenced using, for example, such phrases as MAG Detail No. _____, MAG Standard Detail No. _____, MAG Standard Specification Section _____, MAG Section No. _____, etc., it shall be understood as if the phrase were followed by the words, "as amended by the TOG Supplement, latest edition." Similarly, it is provided that whenever a TOG Supplement to MAG Uniform Standard Specifications (or Details) for Public Works Construction is referenced using, for example, such phrases as TOG Detail No. _____, TOG Supplemental Detail No. _____, TOG Supplemental Specification Section _____, TOG Section No. _____, etc., it shall be understood as if the phrase were followed by the words, "as it amends the MAG Uniform Standard Specifications (or Details) for Public Works Construction, latest edition."

(C) Whenever a standard or supplemental reference is cited within these specifications, such as ASTM, AWWA, ADOT, etc., it shall be understood as if the phrase "latest edition" follows this citation.

For purposes of these specifications, requirements of the Contractor shall also apply to any and all Subcontractors performing portions of the work.

SECTION 104
SCOPE OF WORK

104.1.1 General:

Add the following paragraph to the end of this section:

All work shall be performed in a logical sequence and required approvals and/or inspections shall be obtained prior to moving on to subsequent portions of the work. The following are TOG requirements in relation to construction sequencing:

- Roadway base course shall not be placed on subgrade until subgrade requirements have been met and the subgrade has been accepted by the Town Engineer. For larger projects, placement of roadway base course on accepted subgrade may be divided into phases as approved by the Town Engineer.
- Roadway paving shall not be started until all underground utilities within that segment of roadway prism have passed their testing requirements. Unusual circumstances may warrant certain installations to be performed out of sequence, but this shall only be done with prior written approval from the Town Engineer.

104.1.3 WATER SUPPLY:

Delete the 3rd paragraph in its entirety and replace it with the following:

To obtain construction water from a TOG fire hydrant, a Contractor is required to submit an application to the Public Works Water Division. A security deposit is required to receive a fire hydrant meter and water usage shall be billed to the Contractor at the prevailing construction water rate. The Town reserves the right to specify the time and location that construction water can be delivered. Construction water used on parcels or lots ten acres or more in size shall be from a non-potable source unless it meets the requirements contained in TOG Ordinance No. 1437. Refer to the following:

Gilbert Construction Hydrant Meter Application and Agreement

Town of Gilbert Ordinance No. 1437

Town Water Conservation and Reclaimed Water Contacts
Website: http://www.gilbertaz.gov/departments/town-hall/water-conservation
Phone Number: (480) 503-6098

SECTION 105
CONTROL OF WORK

105.3 CONFORMITY WITH PLANS AND SPECIFICATIONS:

Add the following paragraphs to the end of this section:

Utilities shall be placed and bedded in accordance with approved plans and details. Any change from the original plans shall be approved by the Town Engineer prior to construction. For purposes of these specifications, utilities shall include, but not be limited to, water, reclaimed water, sewer, liquid and natural gas, electrical, fiber optic, telephone, television, and sleeves or conduits for future utilities.

All utilities shall be backfilled in accordance TOG Section 601.4.3.

105.5 COOPERATION OF CONTRACTOR:

At the end of the first paragraph, add the following:

Any contractor found working on a project without an official set of drawings approved by the Town of Gilbert Development Services Department, including the SWPPP, may be shut down until commencement of work is approved by the Town Engineer.

Section 105.6 shall be renumbered as follows:

105.6(A) COOPERATION WITH UTILITIES:

Delete the first paragraph and replace it with the following:

The Contracting Agency shall notify all utility companies, all pipe line owners, or other parties affected by the project and endeavor to have all necessary adjustments and relocations of public or private utility fixtures, pipe lines, and other appurtenances within or adjacent to the limits of construction made as soon as possible. The Contractor shall assist and cooperate in the scheduling and the coordination of the relocation of utilities that are in conflict with construction. The Contractor shall be responsible for coordinating the relocation of utilities that are requested solely for the convenience of the Contractor's construction operation, including power poles. All utility conflicts and relocations that are required or requested by the Contractor, or are discovered during construction, shall be communicated to the Contracting Agency, Design Engineer, and Town Engineer as soon as they are identified. Unforeseen utility conflicts may qualify for an adjustment in contract time and/or additional compensation in accordance with Sections 108 and 109.

After the first paragraph, add the following:

The Contractor shall notify the Design Engineer and Town Engineer if the placement of any utility service is in conflict with a driveway location as soon as that conflict is identified. The Contractor shall not install any utility service that is in conflict with a driveway location until that conflict has been resolved or until

directed by the Town Engineer. The Contractor shall cooperate with the Design Engineer and Town Engineer in resolving any identified driveway conflict.

After the second paragraph, add the following two paragraphs:

The Contractor is responsible for locating all valves, manholes and blow offs in advance of construction and replacing these to finished grade. The location of all water valves within and adjacent to the project boundaries shall be referenced at all times during construction and made available to the TOG Public Works Department. Only Town employees are authorized to operate water valves and fire hydrant connections to the Town's water system.

The Contractor shall notify the El Paso Natural Gas District Superintendent and the Southwest Gas District Superintendent forty-eight (48) hours prior to commencing construction in the vicinity of the rights-of-way so that they may have a representative present at all times.

*Modify the 5th paragraph as follows (modified text is shown in **bold**):*

It is understood and agreed that the Contractor has considered in his proposal all of the permanent and temporary utility appurtenances in their present or relocated positions as shown on the plans and that no **responsibility,** additional compensation**, or liability shall be accrued on the part of the Town of Gilbert** for any delays, inconvenience, or damage sustained by the Contractor due to any interference from the said utility appurtenance or the operation of moving them. If delays are encountered because utility owners have not relocated or adjusted their facilities, the contract time **may** be adjusted in accordance with Section 108. **The Town will not provide additional cost participation for the construction of utility relocations beyond those detailed in the Contract.**

Add the following section after Section 105.6:

105.6(B) WORK WITHIN OTHER JURISDICTIONS:

Work within the boundaries of other jurisdictional agencies shall be in accordance with the latest edition of the construction requirements for that jurisdiction. For example, work within City of Mesa rights-of-way shall be in accordance with Mesa's Supplemental Specifications and Details to MAG Uniform Standard Specifications and Details. Similarly, backfill and compaction within Maricopa County rights-of-way shall be in accordance with Maricopa County's Special Provisions for the installation of underground utilities, latest edition. Where there is a conflict between the jurisdictional agency's requirements and the TOG requirements, the Town Engineer shall determine which governs.

105.8 CONSTRUCTION STAKES, LINES AND GRADES:

Delete the first paragraph of this section and replace it with the following:

The Contractor shall be responsible for setting construction stakes and for establishing lines and grades for all road work, curbs, gutters, sidewalks, structures, utilities, and appurtenances as the Contractor may deem necessary to comply with the construction drawings. The Contractor may use their own forces or non-registered land surveyors to establish rough lines and grades. Final lines and grades shall be

established using a Registered Land Surveyor or using crews operating under the direction of a Registered Land Surveyor. The Surveyor shall furnish the Contractor with all necessary information relating to the final lines and grades.

*Modify the second paragraph of this section as follows (modified text is shown in **bold**):*

The Contractor shall perform the work in accordance with the **Surveyor's** stakes and marks, and shall be charged with full responsibility for conformity and agreement of the work with such stakes and marks. **The stakes and marks provided by the Surveyor shall constitute the field control by, and in accordance with, which the Contractor shall establish other necessary controls and perform the work.**

Add the following at the end of the third paragraph:

The Contractor shall be responsible for replacing all existing survey monuments and benchmarks that are disturbed by construction, including replacing both monuments that are shown on the plans to be replaced and those monuments not shown on the plans but disturbed by construction. Monument construction shall comply with Section 405. New survey monument/benchmark data shall be collected by the Contractor's/Project's Surveyor and shall be reported to the appropriate agency in compliance with the standards and survey practices that are applicable to that monument. All replaced survey monument/benchmark information shall be summarized on the Town's Project Survey Monument Summary Sheet included at the end of this section which shall be submitted to the Town prior to Final Acceptance being issued on the project. When re-establishment of a monument/benchmark is completed, Contractor's surveyor shall make a check for horizontal and vertical accuracy of re-established monument to a nearby undisturbed monument.

Delete the fourth paragraph of this section.

*Modify the fifth paragraph of this section as follows (modified text is shown in **bold**):*

The Contractor shall set the construction stakes for buildings establishing lines, grades, and elevation to include necessary utilities and appurtenances and shall be responsible for their conformance with plans and specifications. The **Surveyor shall** establish or designate a control line or bench mark of known location and elevation for use as a reference.

At the end of this section, add the following paragraph:

For grades of two tenths of one percent (0.2%) or less, the maximum staked interval shall be twelve and one-half (12.5) feet for hand-placed/hand-formed concrete work and twenty-five (25) feet for asphalt roadway sections and self-propelled concrete laying machines. All curb returns shall be staked at the Point of Curvature (P.C.), at the Point of Tangency (P.T.), and at the midpoint of the return.

105.15 ACCEPTANCE:

Delete this section in its entirety and replace it with the following paragraphs:

(A) Partial or Conditional Acceptance: If at any time during the prosecution of the project, the Contractor substantially completes a unit or portion of the project, such as a structure, utility service, or a section of

road or pavement, the Contractor may request the Town Engineer to make final inspection of that work. If the Town Engineer finds, upon inspection, that the work has been satisfactorily completed in compliance with the contract, the Town Engineer may accept the work as being completed and the Contractor may be relieved of further responsibility for that work except as noted herein or in the Partial/Conditional Letter of Acceptance. Such partial or conditional acceptance shall in no way void or alter any warranty or terms of the contract. The Town Engineer, at the Engineer's discretion, may require that any or all of the requirements listed below under subparagraph (B) Final Acceptance be completed prior issuing a Partial or Conditional Acceptance.

Conditional Acceptance may be issued on the water and sewer improvements when the following have been completed.

Water System

W1. Compaction tests have been taken and approved on the trench backfill for the entire system.
W2. Pressure and bacteria tests have been taken and approved for the entire system.
W3. Meter and valve boxes have been set per a blue stake for each box, or the Town receives a letter from the Contractor stating that the meter and valve boxes will be set after the concrete surface work is done.

Sewer System/Reclaimed Water

S1. Compaction tests have been taken and approved on the trench backfill for the entire system.
S2. Pressure testing (sewer line and manhole), mandrel testing, and closed circuit televising of the system have been completed and approved.

If a Conditional Letter of Acceptance is issued for any water or sewer improvements, or any other Town-owned utilities, the following shall apply:

C1. No other permits will be issued until the above mentioned tests and conditions are met.
C2. The original Contractor will make all repairs on the improvements they have installed until the Town issues a Final Letter of Acceptance.
C3. The original Contractor will do all bluestake "locates" for the utilities they have installed, adjusted, or relocated until the Town issues a Final Letter of Acceptance.

(B) Final Acceptance:

The following shall be requirements of issuance of Final Acceptance for a project:

General (Applies to all projects)

G1. Restoration of all on- or off-project roads affected by the project to their previous condition or better.
G2. Landscaping, planting, and sprinkler systems have been installed per the plans or replaced in-kind.
G3. Survey monuments are installed or replaced, punched, and dated, and this information has been summarized on the Town's Project Survey Monument Summary Sheet included at the end of this section.
G4. Record Drawings have been received and approved by the Town. Record Drawings shall be submitted to the Town in standard pdf format on Compact Disc (CD) or DVD media.
G5. Final Inspection has occurred as detailed below.

Paving Projects

P1. All concrete and asphalt work has been completed and approved.
P2. Manhole rings and valve box covers have been brought to grade and approved.
P3. Curb, pavement, and sidewalks have been swept clean of all dirt.
P4. Installation of all applicable signing and pavement markings and acceptance by the Traffic Engineering Section have been completed.
P5. Street lighting has been installed and tested.
P6. Traffic signals have been installed and approved.

Water Projects

W1. All required pressure tests and/or bacteria tests have been taken and accepted.
W2. If deemed necessary by the inspector because of damage by the Contractor, damage by other contractors, or for other reasons, additional pressure and/or bacteria tests have been taken and accepted.
W3. All fire hydrants, valves, and meter boxes have been raised to grade.

Sewer/Reclaimed Water Projects

S1. The entire system has been cleaned and deflection tested, as applicable.
S2. Manholes have been cleaned, sprayed with insecticide laden paint, and all plugs have been removed.

Retention Facilities

R1. All facilities are complete and functional.
R2. Drywell driller's log, including strata encountered and depth, have been submitted to and accepted by the Town.
R3. A list of approved ADEQ drywell registration numbers and registered owners has been submitted to, and received, by the Town.
R4. A tabulation showing the drywell number from the construction plans, the drywell registration number, the design percolation rate (typically 0.5 cfs), and the tested percolation rate added to the Grading Plan and submitted as part of the Record Drawings.

NOTE: All Record Drawing measurements and data are to be taken and collected by a registered land surveyor or engineer.

Upon due notice from the Contractor of presumptive completion of the entire project, the Engineer will make an inspection. If all construction provided for and contemplated by the contract is found complete to his satisfaction, that inspection shall constitute the final inspection and the Engineer, upon fulfillment of all requirements listed above, will make the Final Acceptance. The Contractor will be notified in writing of this acceptance as of the date that all requirements are met.

If, however, the inspection discloses any work, in whole or in part, as being unsatisfactory, the Engineer will give the Contractor the necessary instruction for correction of same, and the Contractor shall immediately comply with and execute such instructions. Upon correction of the work, another inspection will be made which shall constitute final inspection, provided the work has been satisfactorily completed. In such event, and upon fulfillment of all requirements listed above, the Engineer will make the Final Acceptance and notify the Contractor in writing of this acceptance as of the date that all requirements are met.

Contractor shall maintain and perform all repairs on the project features until the Letter of Final Acceptance is issued.

TOWN OF GILBERT
PROJECT SURVEY MONUMENT SUMMARY SHEET

Name of Project: _____

Project Owner/Telephone: _____

Project Engineer (Firm)/Telephone: _____

Project Contractor (Firm)/Telephone: _____

Project Location

General Description in Relation to Major Intersections:

_____

_____

_____

Township: _____ Range: _____ Section: _____ (List multiple if necessary)

Monument No. or Identifier	Agency	Monument Description	Northing	Easting	Elevation	Impacted by Construction? (Y/N)	Replaced? (Y/N)*	Agency Notified? (Y/N)

*** If replaced, note the new northing, easting, and elevation**

SECTION 106
CONTROL OF MATERIALS

106.2 SAMPLES AND TESTS OF MATERIALS:

Delete the first two paragraphs of this section and add the following:

All materials to be incorporated in the work may be subject to sampling, testing, and approval, and samples furnished shall be representative of the materials used or to be used. If not specified herein, the Town Engineer shall determine the type, location, and number of tests needed. The Contracting Agency shall pay all costs associated with sampling and testing, except those re-test costs discussed below, and shall utilize a testing laboratory listed in the ADOT "Directory of Approved Materials Testing Laboratories" published by the ADOT Materials Group, 1221 N. 21st Avenue, Phoenix, AZ 85009, 602-712-8206, or other testing laboratory acceptable to the Town Engineer.

The Contractor shall notify the testing laboratory of the needed tests in coordination with the Town Inspector. The Town Engineer may select and collect samples for delivery to, and testing by, the approved testing laboratory, the cost of which shall be paid for by the Contracting Agency. Additional tests required due to the failure of the initial or normal test(s) shall be paid for by the Contractor. The Town Engineer may designate a different laboratory at which to perform any re-test.

106.7 UNACCEPTABLE MATERIALS:

*Modify this paragraph to read as follows (added text is shown in **bold**):*

All materials and/or equipment not conforming to the requirements of the specifications, whether in place or not, may be rejected. Rejected materials and/or equipment shall be removed immediately from the site of work**,** unless otherwise permitted by the Engineer, **at the Contractor's expense**. No rejected material and/or equipment, the defects of which have been subsequently corrected, shall be used until approved in writing by the Engineer.

SECTION 107
LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC

107.1 COMPLIANCE WITH LAWS

Add the following paragraph at the end of this section:

If the project is subject to the AZPDES program's permit requirements (Arizona Administrative Code R18-19-A902) under the EPA General Permit for Arizona construction sites, or is subject to NPDES regulations (40 CFR Part 122) under the Clean Water Action (33 United States Code 1251 et. seq.), then the Contractor shall be responsible for obtaining the applicable permits and/or filing the appropriate Notice of Intent to Discharge and Notice of Termination to comply with the permit requirements.

107.2 PERMITS:

Add the following paragraph at the end of this section:

For subdivision construction, all flood retention basins that accept roadway runoff shall be rough graded with adequate volume before a paving permit will be issued.

107.5 SAFETY, HEALTH AND SANITATION PROVISIONS:

Add the following subparagraph:

107.5.3 Air Quality and Dirt Hauling: The Contractor is advised that prior to any excavation and dirt moving, a Dust Control Permit is required from the Maricopa County Air Quality Department. Prior to, and as a condition of, the issuance of any TOG grading permit, the Contractor shall submit evidence that the required County Dust Control Permit has been issued. At the same time, and if required, the Contractor shall submit an application to the Town for a Haul Route Permit and any necessary Traffic Control Plans. Upon approval of the proposed haul route, the off-site inspector and a Contractor representative shall inspect the roadways to be used by the Contractor and take photographs to document their existing condition. After all grading is complete, the off-site inspector and the Contractor will again inspect the haul route and if, in the opinion of the Town Engineer, any roadway damage has occurred, the Contractor shall be responsible for restoring the roadways to their previous condition or better.

107.11 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTY AND SERVICES:

Add the following as the first paragraph of this section:

The utilities depicted on the plans represent the best information available at the time of plan preparation and/or field survey. Call the "Arizona 811" at 811 (also 1-800-STAKE-IT or 602-263-1100) at least two working days prior to the start of construction to field verify locations of all utilities. The Contractor shall locate or have located in advance of construction, by means of potholing and other approved methods, all existing underground and overhead utilities, including, but not limited to, pipelines, communication

and electric conduits and cables, gas lines, irrigation lines, and structures, and will observe all precautions to avoid damage to these facilities. If discrepancies exist between utility locations shown on the plans, blue staked in the field, and verified by the Contractor, the Contractor shall immediately notify the Engineer and the utility company. See the cover sheet of the plans for utility contact information.

PART 200 – EARTHWORK

SECTION 211
FILL CONSTRUCTION

211.3 COMPACTING:

*Modify the 4th paragraph of this section to read as follows (added text is shown in **bold**):*

Areas over which fills are to be placed shall be cleared **of vegetation, debris, and/or rubble** and scarified to a depth of 6 inches to provide a bond between the existing ground and the material to be deposited thereon. Unless otherwise specified **in a soils report that has been accepted by the Town Engineer**, the original ground area upon which fills are to be constructed shall be compacted to a uniform density of not less than 95 percent **determined in accordance with ASTM D698 or ASTM D6938**.

PART 300 – STREETS AND RELATED WORK

SECTION 301
SUBGRADE PREPARATION

301.2 PREPARATION OF SUBGRADE:

Add the following paragraph at the end of this section:

The subgrade, or base, on which the asphalt concrete is to be placed, as prepared by the Contractor, shall be smooth, firm, and true-to-grade and cross-section as shown on the plans and within the tolerances contained herein and shall be so maintained throughout the period of asphalt concrete placement. All irregularities such as humps or high spots shall be removed in order to provide a smooth base of uniform grade and cross-section so that subsequent asphalt surfacing will be of uniform thickness. All work to correct irregularities in the subgrade shall be considered incidental and included in the contract price.

301.3 RELATIVE COMPACTION:

Modify this section as follows (modified text shown in **bold***):*

The subgrade shall be scarified and loosened to a depth of 6 inches. Rock 6-inches or greater in size that becomes exposed due to scarification shall be removed from the scarified subgrade. When fill material is required, a layer of approximately 3 inches may be spread and compacted with the subgrade material to provide a better bond. The subgrade cut and fill areas shall be constructed to achieve a uniform soil structure having the following minimum compaction, measured as a percentage of maximum dry density when tested in accordance with **ASTM D698** or ASTM D6938 with the percent of density adjusted in accordance with the rock correction procedures for maximum density determination, ARIZ-227c, to compensate for the rock content larger than that which will pass a No. 4 sieve. Unless otherwise noted in the project plans or project specifications, compaction shall be performed within 2 percentage points of the optimum moisture content.

Moisture content of subgrade materials shall be brought to that required for compaction by the addition of water, by the addition and blending of dry, suitable material, or by the drying of existing material. The Contractor shall provide means to proof-roll roadway subgrade at the direction of the Town Engineer utilizing a minimum eighteen thousand (18,000) pound live axle load. Areas containing highly expansive clays within the roadway cross section may be compacted in place without scarification as directed by the Town Engineer. Subgrade containing soft or excessively wet areas shall be removed and replaced with suitable materials under the direction of the Town Engineer. In this event, the Soils Engineer shall also be notified. All subgrade shall be approved by the Town Engineer prior to placement of ABC or select materials.

	Subgrade Area	Minimum Relative Compaction
(A)	Below pavement, curb and gutter, attached sidewalk, roadway shoulders, and other areas within the right-of-way subject to vehicular traffic	95 percent
(B)	Below detached sidewalk not subject to vehicular traffic	**90 percent**

SECTION 310
UNTREATED BASE

310.1 DESCRIPTION:

Replace this paragraph with the following:

Untreated base, i.e., select or aggregate base course, shall comply with MAG specifications, including Subsection 702.2, unless the use of a different type of material is specifically authorized by the Town Engineer.

310.2 PLACEMENT AND CONSTRUCTION:

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

After distributing, the aggregate base course material shall first be uniformly watered and then graded to a uniform layer that will net, after compacting, the required thickness. The grading operation shall be continued to such extent as may be necessary to minimize segregation. The quantity of water applied shall be that amount which will assure proper compaction resulting in the density required by Section 310.3 **and in accordance with ASTM D698**. **Care shall be exercised in connection with watering operations to avoid wetting the subgrade or any lower base course to a detrimental extent. Upon completion, the base surface shall be true, even, and uniform conforming to the grade and cross-section specified in the plans and specifications.**

SECTION 321
ASPHALT CONCRETE PAVEMENT

321.3 WEATHER AND MOISTURE CONDITIONS:

*Modify this paragraph as follows (added or modified text shown in **bold**):*

Asphalt concrete shall be placed only when the surface is dry and when the **ambient air** temperature in the shade is 40 degrees Fahrenheit (50 degrees F for Asphalt Concrete lifts less than 2 inch thick) **and rising**. No asphalt concrete shall be placed when the weather is foggy or rainy, or when the **untreated base (aggregate base course, select material, etc.)** or sub base on which the material is to be placed is unstable. Asphalt concrete shall be placed only when the **Town** Engineer determines that weather conditions are suitable.

321.8 PLACEMENT:

Add the following subsection at the end of this section:

321.8.11 Preservative Seal: A preservative seal surface treatment per MAG Sections 334 shall be required on streets other than arterials. The surface treatment shall be PMM (Polymer Modified Masterseal) or approved equal and shall be applied in two coats immediately prior to the end of the construction warranty period, but no later than three (3) years after the date of placement. The application of PMM shall be in accordance with the manufacturer's recommendations. This preservative seal surface treatment shall be the responsibility of the Contracting Agency, shall be at no cost to the Town, and shall include any necessary traffic control and restriping of all pavement markings that are impacted by the preservative seal placement. An End of Warranty Letter will not be issued until the preservative seal surface treatment has been completed.

321.10 ACCEPTANCE:

321.10.4 Asphalt Pavement Thickness:

Delete subparagraphs (2) and (3) under the 2nd paragraph in this section, and replace them with the following:

(2) If the pavement thickness from step one above deviates from the target thickness by more than 0.25 inch, but not more than 0.50 inch, corrective action will be required. For arterial and collector streets, this corrective action shall consist of microsurfacing in conformance with the MAG Section 331. Microsurfacing aggregate gradation shall be Type III in accordance with International Slurry Seal Association (ISSA) publication A143, Section 4.2.3 Gradation. For local streets, this corrective action shall consist of application of a Type II slurry seal coat in accordance with MAG Section 715. The Contractor may present an engineering analysis outlining other proposed remedial measures for the consideration of the Engineer. The Engineer will review the engineering analysis and decide within 30 working days whether to accept the proposed remedial measures.

(3) If the pavement thickness from step one above deviates from the target thickness by more than 0.50 inch, corrective action will be required. The deficient area shall be overlaid for the full width of the pavement with a new mat of material as specified by the Town Engineer, equal in thickness to the deficiency but not less than 1.5 inch in any instance. Deficiencies of more than 0.5 inch but less than 1.5 inch shall be milled to accommodate the minimum overlay thickness of 1.5 inches. The length of the overlay shall be for the entire affected area as determined by coring, but in no case shall the overlay be less than one city block or six-hundred-sixty (660) feet, whichever is less. This corrective work shall be done at no cost to the Town.

When the pavement is deficient in thickness by more than 0.25 inch, all coring done to establish this premise shall be at the expense of the Contractor.

Add the following Section to Part 300 – STREETS AND RELATED WORK

SECTION 322
ASPHALT STAMPING

322.1 DESCRIPTION:

The work under this item will provide stamped asphalt which shall include surface patterning and/or asphalt surfacing (painting) as described herein in accordance with TOG Standard Details and as shown on the plans and called out in the Special Provisions.

322.2 GENERAL REQUIREMENTS:

A Contractor shall meet the following qualifications in order to perform asphalt stamping in the TOG:

> The Contractor shall have completed a minimum of three (3) asphalt stamping projects in the past year (from the date of bid) in the State of Arizona and totaling at least 50,000 S.F. The Contractor shall furnish evidence of meeting these experience requirements to the Town Inspector or designee.

The Contractor shall submit for review and approval all manufacturer product and technical data for materials proposed to be installed in the right-of-way. The Contractor shall also submit for review and approval a sample of the stamped asphalt material prior to installation. These submittals shall be to the Town's Inspector or designee.

Prior to acceptance of the project, the Contractor shall repair all damaged or unsuitable areas, as determined by the Town's Inspector or designee, at no expense to the Town.

322.3 MATERIALS:

322.3.1 Asphalt Concrete: All roadway construction materials and asphalt thicknesses shall conform to the applicable requirements of MAG Section 321 and the project plans and specifications. Aggregate base course (ABC) shall be clean, well-graded sand and gravel compacted and placed per MAG Section 321.5.1 and the project plans and specifications.

322.3.2 Surface Patterning: The patterning equipment shall be metal templates that shall correspond to the patterns shown in TOG Details GIL-250 and GIL-251. Refer to the project plans and specifications for the pattern type to be used.

322.3.3 Surfacing System (Painted Asphalt): All products used in the surfacing system shall meet the minimum physical and performance properties in Tables 322-1 and 322-2. The Contractor shall submit a Certificate of Compliance to the Town's Inspector or designee indicating that the materials to be included in the work meet these specification requirements. The color used for painted asphalt shall be terracotta or as approved by the Town Inspector or designee.

TABLE 322-1		
ASPHALT STAMPING SURFACING SYSTEM PHYSICAL PROPERTIES		
Characteristic	**Test Specification**	**Base**
Solids by Volume (%)	ASTM D2697	55%
Solids by Weight (%)	ASTM D2369	68%
Density	ASTM D1475	13.0 lbs/gal

TABLE 322-2		
ASPHALT STAMPING SURFACING SYSTEM PHYSICAL PROPERTIES		
Characteristic	**Test Specification**	**Test Result**
Dry-Time (To Recoat)	ASTM D5895	35 Min
Taber Wear Abrasion Dry H-10 Wheel	ASTM D4060 1 day cure	0.98 g/1000 cycles
Taber Wear Abrasion Wet H-10 Wheel	ASTM D4060 7 days cure	3.4 g/1000 cycles
QUV E Accel.	ASTM G154 Delta	0.53
Hydrophobicity Water Absorption	ASTM D-570	8.3 %(9 Day Immersion)
Shore Hardness	ASTM D2240	63 Type D
Mandrel Blend	ASTM D522-93A	1/4" @ 21 Degree C Pass
Permeance	ASTM D1653	3.77 g/m2 /hr (52 mils)
VOC	Per MSDS	23 g/l
Adhesion to Asphalt	ASTM D4541	Substrate Failure
Friction Wet	ASTM E303 British Pendulum Tester	WP * Coated- 62 WP* Uncoated - 57 AC ** Coated - 70 AC ** Uncoated - 60

322.4 INSTALLATION:

322.4.1 Asphalt Concrete: All asphalt concrete construction materials shall be transported to the job site in clean trucks and in a manner to prevent segregation of materials or inclusion of foreign substances. During transport, the hot-mix asphaltic concrete shall have a minimum temperature of 285^{o} F and a maximum temperature of 350^{o} F.

The hot-mix asphaltic concrete shall be placed per the project plans and specifications. The hot-mix asphaltic concrete shall be placed on a dry base course and when the ambient temperature in the shade is 45° F and rising. The hot-mix asphaltic concrete shall not be placed when the weather is foggy, rainy, or when the base course is wet or frozen.

The Contractor shall contact the Town's Inspector for roadway compaction approval prior to beginning asphalt stamping. Asphalt shall be fully compacted prior to positioning the patterning template.

322.4.2 Surface Patterning: After application and compaction of the asphaltic concrete, while it is still hot, templates shall be positioned on the surface in the required orientation. Templates shall be set in place using a plate compactor and fully embedded using the same compaction equipment used in placing the asphalt (minimum static weight shall be 700 lbs.

The template print depth shall be 3/8" over the patterned area. All hand tooling shall be complete, full depth, straight in manner, and to the edge of the asphalt pavement, common edge, concrete curb, gutter, or other border. There shall be no overprint of patterns and no remnants of excess print on surrounding unintended areas.

322.4.3 Surfacing System (Painted Asphalt): The air temperature shall be at least 50° F and rising before the application of surface system products begins. There shall also be no precipitation expected within 24 hours of the anticipated surfacing completion in order for the application to be authorized by the Town.

The surfacing system products shall be spray-applied. Where required to cover small areas, the surfacing system may be painted on using brooms or brushes. When complete, the entire asphalt surface shall be covered with the surfacing product with no exposed asphalt present.

The Contractor shall use sufficient masking to ensure that the surface system products are applied only where specified. Masking shall be complete and no overspray onto surfaces not designated as coated surfaces shall be allowed.

The Contractor shall apply the surface system products with a minimum of four complete passes on a roadway surface. Three complete passes shall be allowed on medians, walkways, pathways, and bike paths where traffic is primarily pedestrian with minimal or no automobile traffic as determined by Town Inspector. Thickness of the surfacing product shall be 20 mils or greater.

After the surfacing system products have been applied, the treated asphalt shall not be exposed to vehicular traffic for eight (8) hours, overnight, or as approved by the Town Inspector or designee.

322.5 MEASUREMENT:

Asphalt stamping shall be measured by the square foot, which shall include surface patterning and/or asphalt surfacing (painting).

322.6 PAYMENT:

Asphalt stamping shall be measured as provided above shall be paid for at the contract price per square foot which price shall be full compensation for the item complete as described and specified herein. Payment for asphalt concrete pavement shall be per MAG Section 321.13 and separate from asphalt stamping.

SECTION 336
PAVEMENT MATCHING AND SURFACE REPLACEMENT

336.2 MATERIALS AND CONSTRUCTION METHODS:

Add the following paragraph after the first paragraph of this section:

In areas where existing asphalt has been altered for trenching, potholing, or for any other reason, MasterSeal MTR – Plus, manufactured by SealMaster, or approved equal, shall be applied to the altered asphalt and at the joint/interface between the existing and altered asphalt. Application shall be spray or squeegee**.**

Add the following subparagraph to this section:

336.2.5 Pothole Repair: Pavement repair from utility potholing shall be performed in accordance with MAG Detail 212, Type B. Type A may be utilized if the pavement plug is in poor condition and if approved by the Town Inspector. Backfill material shall be ½-sack CLSM per MAG Section 728 only.

SECTION 340
CONCRETE CURB, GUTTER, SIDEWALK, SIDEWALK RAMPS, DRIVEWAY AND ALLEY ENTRANCE

340.2 MATERIALS:

Delete the first two paragraphs of this section and add the following:

All sidewalks, curbs and gutters, vertical curbs, valley gutters, footings for valley gutters, aprons, and driveway entrances shall be Class "A" concrete conforming to applicable requirements of MAG Section 725. Calcium chloride will not be permitted when ambient air temperature is ninety (90) degrees Fahrenheit or above and rising, or when the temperature falls below thirty-two (32) degrees Fahrenheit.

Driveways and entrances for commercial and industrial buildings and complexes shall have a minimum thickness per Town of Gilbert Standard Detail GIL-210.

Private and residential entrances and driveways other than rolled curb shall be constructed per MAG Standard Detail 250.

Delete Section 340.3 in its entirety and replace it with the following.

340.3.1 Subgrade: All subgrade shall be constructed and compacted true to grades and lines as shown on the plans and as specified in Section 301. All soft or unsuitable material shall be removed to a depth of not less than 6 inches below subgrade elevation and replaced with material satisfactory to the Town Inspector.

In no case shall curb subgrade consist of existing base materials and/or surfacing material already in place. Granular base materials or clean sands shall not be permitted for use as curb subgrade or be utilized as fill below bottom of curb, unless approved by the Town Engineer in writing.

(a) *Non-Expansive Subgrade Materials*. Non-expansive subgrade materials shall be moistened or dried to optimum moisture content plus or minus two (2) percent for a depth of eight (8) inches and shall be compacted to a minimum of ninety-five (95) percent of the maximum density in accordance with ASTM D698 or ASTM D6938.

(b) Expansive Subgrade Materials. Materials having expansive potentials of four (4) percent or less shall have a moisture content of two percent (2%) to four percent (4%) above optimum for a minimum depth of eight (8) inches and compacted to a density of ninety to ninety-five percent (90-95%) a minimum of twenty-four (24) hours prior to concrete placement. The subgrade shall be firm and unyielding prior to the placement of concrete. These subgrade conditions shall be maintained until the time of concrete placement.

Subgrade materials having an expansive potential greater than four (4) percent shall be moisture conditioned two percent (2%) to five percent (5%) above optimum for a minimum depth of twelve (12) inches and compacted to a density of ninety to ninety-five percent (90-95%), between twenty-four (24) and forty-eight (48) hours prior to concrete placement. The subgrade shall be firm and unyielding prior to the placement of concrete. These subgrade conditions shall be maintained until the time of concrete placement.

340.3.2 Concrete: Existing pavements and concrete that are joined by new construction, shall be cut in accordance with Section 601.

Material displaced in the construction shall not be placed on the base and/or surfacing material already in place on the roadway nor shall the excavated material be placed in such a manner as to interfere with access to property or traffic flow in the street.

Existing concrete sidewalks and driveways which abut the new sidewalks and driveway entrances may be required to be sawcut in the immediate area of the project based on field conditions in order to have an appropriate tie-in available for the new feature. Localized adverse conditions which may require sawcutting include heaving and concrete chipping, spauling, or cracking. Sawcutting is required at the match lines and payment will be made under the respective pay items as provided in the Contract Documents.

Concrete curbs, gutters and sidewalks shall be constructed by the conventional use of forms, or an appropriate machine upon approval of the Town Engineer. Forms shall be thoroughly cleaned prior to each use and shall be coated with a light oil or other releasing agent of a type which will not discolor the concrete. The concrete shall be thoroughly spaded away from forms so that there will be no rock pockets next to the forms. The concrete may be compacted by mechanical vibrators as approved by the Town Engineer. Tamping or vibrating shall continue until the mortar flushes to the surface and coarse aggregate is below the concrete surface.

No concrete shall be placed when ninety (90) minutes or more has elapsed from time the transit mixer was loaded or if the temperature of the concrete reaches or exceeds ninety (90) degrees Fahrenheit.

If machines designed specifically for such work and approved by the Engineer are used, the results shall be equal to or better than that produced by the use of forms. If the results are not satisfactory to the Engineer, the use of the machine shall be discontinued and the Contractor shall make necessary repairs at his own expense. All applicable requirements of construction by use of forms shall apply to the use of machines.

Forms conforming to the dimensions of the curb, gutter, sidewalk, sidewalk ramps, driveway, and alley entrance shall be carefully set to line and grade, and securely staked in position. The forms and subgrade shall be watered immediately in advance of placing concrete.

Forms shall be thoroughly cleaned each time they are used, and shall be coated with a light oil, or other releasing agent of a type which will not discolor the concrete. The concrete shall be thoroughly spaded away from the forms so that there will be no rock pockets next to the forms. The concrete may be compacted by mechanical vibrators approved by the Engineer. Tamping or vibrating shall continue until the mortar flushes to the surface, and the coarse aggregate is below the concrete surface.

Expansion joints, unless otherwise specified, shall be constructed in accordance with MAG and TOG Standard Details and in a straight line and vertical plane perpendicular to the longitudinal line of the sidewalk or curb and gutter, except in cases of curved alignment, when they will be constructed along the radial lines of the curve. They shall be constructed to the full depth and width of the concrete and shall match the joints in the adjacent pavement, sidewalk or curb and gutter. Joints shall be constructed at all radius points, driveways, alley entrances and at adjoining structures with a maximum interval of fifty (50) feet between joints. Expansion joints shall extend one inch into the subgrade with the top of the

expansion joint material one-quarter inch below the top surface as depicted in MAG Detail 230. Expansion joint material shall be secured in place prior to placement of concrete. Unless otherwise specified, all expansion joints installed against newly placed concrete, sawcut or other smooth surfaces shall comply with MAG Section 729.1 - Premolded Joint Filler per ASTM D1751, ½ inch, Bituminous Type. Expansion joints installed against existing uneven surfaces shall be per Section 729.2 - Pour Type Joint Filler.

Contraction joints, unless otherwise specified, shall be constructed in accordance with the MAG and TOG Standard Details and in a straight line and vertical plane perpendicular to the longitudinal line of the sidewalk or curb and gutter, except in cases of curved alignment when they will be constructed along the radial lines of the curb. Contraction joints shall be constructed to a depth of one (1) inch and at ten (10)-foot intervals for all sidewalk and curb & gutter. Sidewalk score marks, at least ½ inch deep, are required every five (5) feet. The front face form shall not be removed before the concrete has taken its initial set and has sufficient strength to carry its own weight.

Sidewalk or sidewalk ramp score marks, unless otherwise specified, shall be constructed in accordance with the standard detail.

All edges shall be shaped with a suitable tool so formed as to round the edges to a radius as indicated on the standard details.

The Contractor shall stamp his name and year on all work done by him, on each end of the sidewalk or sidewalk ramp. The letters shall not be less than 3/4 inch in height.

The front face form shall not be removed before the concrete has taken the initial set and has sufficient strength to carry its own weight. Gutter forms and rear forms shall not be removed until concrete has hardened sufficiently to prevent damage to the edges. Special care shall be taken to prevent any damage. Any portion of concrete damaged while stripping forms shall be repaired, or if the damage is severe, replaced at no additional cost to the Contracting Agency. The face, top, back, and flow line of the curb and gutter shall be tested with a 10-foot straightedge or curve template, longitudinally along the surface. Any deviation in excess of 1/4 inch shall be corrected at no additional cost to the Contracting Agency.

The surface of concrete sidewalk or sidewalk ramp shall be tested with a 5-foot straightedge. Any deviation in excess of 1/8 inch shall be corrected at no additional cost to the Contracting Agency.

Prior to final approval by the Town Engineer, all gutters shall be water tested in the presence of the Town Engineer or his authorized representative to verify proper drainage. Water testing shall consist of establishing flow in the length of gutter to be tested by supplying water from a hydrant, tank truck or other source. One hour after the supply of water is shut off, the gutter shall be inspected for evidence of ponding or improper shape. In the event water is found ponded in the gutter to a depth greater than ½ inch, or on the adjacent asphalt pavement, the defect or defects shall be corrected in a manner acceptable to the Engineer without additional cost to the Contracting Agency.

Any section of the work deficient in depth or not conforming to the plans or specifications shall be removed and replaced by the Contractor at no additional cost to the Contracting Agency.

Finishing and Curing of the concrete shall be done in the manner specified in Section 505.

Grinding and/or epoxy patching of curbs, gutters, sidewalks, sidewalk ramps, driveways, aprons, scuppers, or any concrete structure to correct deficiencies that result from improper grade setting, construction methods, or breakage is not permitted.

340.3.3 Detectable Warnings: The detectable warning surface shall be located so that the edge nearest the curb line is 6 inches minimum and 8 inches maximum back from the face of curb. Detectable warning surfaces for railroads shall be located so that the edge nearest the rail crossing is 6 feet minimum and 10 feet maximum from the vehicle dynamic envelope.

Detectable warnings shall be installed perpendicular to the direction of pedestrian/wheelchair travel and have a minimum width of 24 inches measured perpendicular to the edge of the roadway entry or rail crossing. The base surface of detectable warnings shall be installed flush with the adjacent walkway surface, the truncated domes shall extend above the walkway surface. The boundary between detectable warnings and the adjacent walkway shall provide a flush uniform surface that will not cause ponding of water nor present a tripping hazard. Partial domes at the edge of the detectable warning shall be made flush to match the base surface of the detectable warning. Detectable warnings installed on curb ramps shall extend the full width of the ramp depression.

Detectable warnings installed on sidewalk ramps shall modify the sidewalk concrete thickness at the detectable warning to provide a minimum thickness of four-inches (4”). When detectable warnings are modules inset into the sidewalk ramp, the bottom surface of the sidewalk shall be lowered a distance equal to or greater than the module thickness to maintain the minimum sidewalk thickness. The sidewalk bottom surface shall have a minimum transition taper length of 12” between the thickened and normal depth sections of sidewalk.

SECTION 345
ADJUSTING FRAMES, COVERS, VALVE BOXES AND WATER METER BOXES

345.5 ADJUSTING MANHOLE AND VALVE COVERS WITH ADJUSTMENT RINGS:

Add the following sentence at the end of the third paragraph:

Adjustments to manholes, pull boxes, or other similar structures shall be in accordance with MAG Details 270 and 422, as applicable.

SECTION 355
UTILITY POTHOLES – KEYHOLE METHOD

355.3.1 BACKFILL USING MECHANICAL COMPACTION:

Delete Section 355.3.1 in it's entirety:

355.3.2 SLURRY BACKFILL:

Delete Section 355.3.2 in it's entirety and replace with:

Contractor shall use ½ sack CLSM as backfill in accordance with Section 728.

Add the following Section at the end of Part 300 – Streets and Related Work

SECTION 370
STREET LIGHTS

370.1 DESCRIPTION:

The work under this section shall consist of furnishing and installing those street lights in the right-of-way that are to be owned, operated, and maintained by the Town of Gilbert. Street lights shall include, light poles and mast arms, luminaires, foundations, wiring and conduits, pull boxes, connections and grounding, and all other appurtenances necessary to provide a fully functioning street light. Installation shall include, but not be limited to, trenching, embedment, foundation preparation, erection, and testing.

370.2 GENERAL REQUIREMENTS:

The Contractor shall obtain an underground utilities (right-of-way) permit and a street lights permit from the TOG prior to construction. The electrical contractor/subcontractor shall comply with all licensing requirements set forth by the State Register of Contractors Office required to perform work related to street light installation in TOG rights-of-way.

The Contractor's responsibility shall be all portions of the street light installation up to, and including, the pull box, and pulling the wiring through the conduit from the street light to the pull box. Inspection of all portions of the Contractor performed street light installation shall be the responsibility of the Town of Gilbert. The Contractor shall be responsible for contacting the power provider prior to, and during, construction to ensure that electrical service has been adequately coordinated and that electrical service will be available to power the street lights at the end of construction.

Street lights shall be base mounted

The Contractor shall provide design calculations and working plans to the Town for street light poles in accordance with the design specifications listed below. The design calculations and working plans shall be sealed by a Registered Professional Engineer licensed in the State of Arizona. Material thicknesses shown in the standard details are minimum. In no case shall pole materials submitted be less than those shown in the standard details.

Street lights shall be designed in accordance with AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals", latest edition, with the following modifications/clarifications.

1) Design wind pressures shall **not** be computed per Appendix C of the 1994 AASHTO Specifications. Design wind pressures should be calculated based on the current applicable codes and standards.
2) The design life of the structures and the recurrence interval shall be 50 years.
3) Street lights along major and minor arterials shall be designed with a Fatigue Importance Factor based on a Category II structure. Vortex shedding and natural wind gust shall be accounted for in the design.

370.3 MATERIALS:

Street lights shall be provided as shown on the plans and as provided for in TOG Details Series 900. Contractor shall comply with manufacturer's recommendations on supplemental materials to be used in conjunction with street light installations.

370.3.1 Street Light Poles and Mast Arms: Street light poles and mast arms shall be provided as shown on the plans and as shown in TOG Details Series 900. All hardware shall be furnished with the pole and mast arm and shall be corrosion resistant.

All tubular structural frame pipe (tapered) shall be seamless steel pipe and shall conform to ASTM A570, Grade 45, or ASTM A572, Grade 42, or ASTM A595, Grade A.

Welding of structural tubing shall conform to the requirements of the American Welding Society, Structural Welding Code, D1.1, latest edition, except as modified by the AASHTO Standard Specifications for Welding of Structural Steel Highway Bridges, latest edition. All other welding shall conform to the requirements of the American Welding Society, Structural Welding Code, D1.5, latest edition. All welding shall be continuous unless noted otherwise. All butt welds shall be full penetration using prequalified welding procedures. All butt welds shall be tested by ultrasonic testing. All butt welds shall be ground flush, full width. Grinding striations shall be parallel to the length of the member.

The pole to base plate weld shall be tested by ultrasonic testing.

370.3.4 Pull Boxes: Pull box material specifications shall be per the applicable electric utility company standards.

370.4 INSTALLATION:

Contractor shall comply with manufacturer's recommendations for the installation of all street light components.

370.4.1 Street Light Pole–Base Mounted: Street light poles shown on the plans and required in this Section to be base mounted shall be mounted on a concrete foundation in accordance with TOG GIL- 932.

Concrete foundation reinforcing steel shall meet the requirements of ASTM A615, Grade 60, except #3 bars which may be Grade 40.

Base plates shall conform to ASTM A36 unless otherwise noted. All bolts, nuts, and washers, including anchor bolts and nuts, shall be galvanized in accordance with the requirements of ASTM A153. The pole to base plate weld shall be tested by ultrasonic testing.

Concrete shall be Type A in accordance with MAG Section 725, 3000 psi minimum compressive strength, and shall be placed in accordance with MAG Section 505. Concrete shall not be allowed to freefall more than five (5) feet during placement. A vibrator shall be used to distribute the concrete within the foundation excavation and reduce air voids. Maximum concrete slump shall be five (5) inches.

The concrete foundation shall be allowed to cure a minimum of 72 hours before installation of the street light pole. The Contractor shall install light poles plumb, adjust light poles to provide proper alignment to the roadway being lighted, and properly ground the light poles when the installation is completed.

370.4.2 Trenching: The Contractor shall install trenches per the applicable utility company standards. The use of a common electric utility company trench is permitted. It is the Contractor's responsibility to contact the utility company for coordination of the trenching and the installation of conduit.

370.4.3 Wiring and Conduit: The Contractor shall install wiring per applicable utility company standards. The Contractor shall install conduit at the depth specified on the plans. Conduit shall be one-inch (1") Liquid-Tight flexible steel conduit with PVC jacket. The conduit shall be UL rated and suitable for underground use.

All street light conductors and bond wires shall be copper. Conductors from the pull box to the luminaire shall be AWG Type THHN/THWN. All conductors shall be stranded and all bond wires shall be solid.

All poles shall be wired using two (2) #12 AWG Type THHN/THWN stranded copper conductors, 600 Volt, NEC approved and one (1) #12 solid bare or green copper bond wire. Bond wire shall run from the luminaire to a minimum of twelve (12) inches below the pole hand hole for termination. Conductors shall run from the luminaire to the pull box.

370.4.4 Connections and Grounding: All connections shall be per applicable utility company standards. The Contractor shall install each pole with an 8' x ⅝" copper clad ground rod driven beneath pull box. The Contractor shall install a #8 bare copper lead from the ground rod in the pull box to the landing lug in street light pole hand hole.

370.4.5 Splicing: All splicing shall be done using a Blackburn WR-7, WR-9, WR-189, OR WR-279 H Type crimp connector. Crimping shall be done using a Burndy Tool No. OS-50 with a 5/8" die to crimp the WR-7 and WR-9 crimp connectors. A Burndy Tool No. MD6-8 with O die shall be used to crimp the WR-189 crimp connector. A Burndy Tool No. MD6-8 with D3 die shall be used to crimp the WR-279 crimp connector.

370.4.6 Pull Boxes: Excavation for, and installation of, pull boxes shall be per the applicable electric utility company standards.

370.4.7 Luminaires: Luminaires and mast arms shall be installed by the Contractor prior to, or immediately after, pole erection. The Contractor shall install luminaires level and include a lamp and photocell. The Contractor shall install luminaires free of dust, dirt, or any other material that would impair the output of light.

370.5 STREET LIGHT POLE AND MAST ARM FINISHING:

After fabrication, all pole and mast arm welds shall be smooth and all burrs and sharp edges shall be removed prior to painting or galvanizing. All surfaces shall be painted or galvanized as specified and shall be cleaned of all rust, scale, foreign material, oil, and grease prior to painting or galvanizing. Finish coats shall be as shown on the plans or in the TOG Details in accordance with Table 370-2 below.

TABLE 370-2
STREET LIGHT POLE AND MAST ARM FINISHES

Finish Type	Primer Coat (or approved equal)	Finish Coat (or approved equal)
Type 1 [A2]	-	Hot galvanized zinc coating per ASTM A123
Type 2 [A1]	-	Valspar 54 Series Urethane (Bronze)
Type 2P [P2, P3, P8, P9, P9A, P10, and P10A]	Intergard 475 Epoxy – (Min. dry coat thickness – 2 mils)	Valspar 54 Series Urethane (Bronze or Black as specified) (Min. dry coat thickness – 4 mils)
Type 3P [A4]	Urecal No. 1001 - (Min. dry coat thickness – 1 mil)	Urecal 9179 (Gray) or 96104 (Black)

370.6 STREET LIGHT POLE IDENTIFICATION:

Directly above the hand hole opening, the following information shall be provided by the pole manufacturer on a permanently attached metal/aluminum tag:

- Manufacturer
- Date of Fabrication
- Pole Style
- Inspection Number or Inspector Identification

This information shall be stamped in the metal/aluminum tag. The minimum tag dimensions shall be 3.5" x 2". Method of attachment to the pole shall be tack welding or other approved method.

In addition, the Contractor shall coordinate with the power provider to ensure that street light pole numbers are in place prior to Final Acceptance of the project. The power provider may number each pole; however, if the power provider does not perform the pole numbering, the Contractor shall be required to do so under the following guidelines: Place the street light pole number on the street side of each pole in vinyl letters or in flat white enamel paint that is stenciled on the pole. The pole number shall appear in the vertical direction, reading from top to bottom, with the last character being placed 8'-0" above the top of curb elevation. Pole numbers shall be one (1) inch in height (each character) and shall be spaced one (1) inch apart.

370.7 STREET LIGHT SYSTEM TESTING:

Prior to acceptance, the Contractor shall energize and operate the entire roadway lighting system, for two (2) consecutive days (48 hours) without interruption or failure. Lamps or ballasts that fail within this time period shall be immediately replaced by the Contractor at Contractor's expense. The Contractor shall be responsible for furnishing all personnel and equipment necessary to successfully perform street light system testing.

370.8 RESTORATION:

The Contractor shall be responsible for restoring all property, landscaping, paving, and driveways that are disturbed during street light construction to their original condition in conformance with MAG Section 107.9.

370.9 WARRANTY:

The Contractor shall guarantee all work against imperfect workmanship, failure, and malfunction of materials and/or equipment due to faulty or imperfect workmanship or any other reason until Final Acceptance by the Town Engineer. This guarantee shall be provided in writing to the Town prior to issuing Final Acceptance. Work found to be defective within the warranty period shall be replaced by the Contractor without cost to the Town.

370.10 MEASUREMENT:

Street lights shall be measured by the unit (each), which shall include light poles and mast arms, luminaires, foundations, wiring and conduits, pull boxes, connections and grounding, and all other appurtenances and the installation necessary to provide a fully functioning street light.

370.11 PAYMENT:

Street lights shall be measured as provided above shall be paid for at the contract price per unit (each), which price shall be full compensation for the item complete as described and specified herein.

PART 400 – RIGHT-OF-WAY AND TRAFFIC CONTROL

SECTION 401
TRAFFIC CONTROL

401.1 DESCRIPTION:

Add the following at the end of this paragraph:

All traffic control within the TOG shall be performed with a valid Traffic Engineering Permit and shall be done in accordance with the latest edition of the Manual on Uniform Traffic Control Devices handbook (MUTCD) as supplemented and modified by the Arizona Supplement published by ADOT. All traffic controls, including striping and required signage, shall be installed within five (5) working days from final lift of asphalt. Temporary striping shall be submitted to, and approved by, the TOG Traffic Engineering Inspector prior to placement.

References:

Arizona Supplement to the Manual on Uniform Traffic Control Devices for Streets and Highways, 2009 Edition, Revised May 2012

TOG Traffic Engineering Application

TOG Ordinance Section 42-61

TOG Ordinance Section 10-5

Add the following Section to Part 400 – RIGHT-OF-WAY AND TRAFFIC CONTROL

SECTION 402
PAVEMENT MARKINGS AND SIGNING

402.1 DESCRIPTION:

The work under this item will provide the final striping and marking of all pavements and the installation of traffic control signs as described herein in accordance with TOG Standard Details and as shown on the plans and called out in the Special Provisions.

402.2 GENERAL REQUIREMENTS:

402.2.1 Standards, Timing, and Field Conditions: Any striping and signing, other than the replacement of pre-existing striping or signing, shall be done in accordance with a plan prepared by a Registered Engineer and approved by the TOG Traffic Engineering Division. All construction shall conform to Arizona Department of Transportation (ADOT) Standard Drawings and Specifications unless otherwise specified in TOG Standard Specifications and Details, the Manual on Uniform Traffic Control Devices (MUTCD), latest edition, or the approved plan.

All pavement markings and signing shall be installed within five (5) working days of completion of the final lift of asphalt or as required by the Engineer. Temporary traffic control may be required between final paving and completion of signing and striping.

Should field conditions change due to construction on adjacent pieces of roadway, the Contractor shall be responsible for notifying the TOG Traffic Engineering section at (480) 503-6739. Under this situation, the Contracting Agency will be required to submit for review an updated striping and signing plan 21 days prior to paving. The Contractor shall stripe/re-stripe the project based on the approved updated striping and signing plan. Changes in the project cost due to the updated striping and signage plan shall be borne by the Contracting Agency as mutually agreed upon with the Contractor.

Should field conditions dictate, as determined by the Town's Traffic Engineer, the Contractor may be required to add asphalt concrete pavement to facilitate smooth traffic flow and to accommodate required pavement markings and signing. Changes in the project cost due to added asphalt concrete pavement shall be borne by the Contracting Agency as mutually agreed upon with the Contractor.

402.2.2 Permits: The Contractor shall obtain a striping permit and/or signing permit five (5) days prior to any installation of pavement markings or street signing within the Town's rights-of-way. Permit applications can be obtained from the Development Services Department located at 90 E. Civic Center Dr, Gilbert, AZ. 85296, or by calling (480)503-6700.

402.3 PAVEMENT MARKINGS:

Pavement marking dimensions shown on the plans may be schematic and not to scale. The dimensions shown to pavement marking stripes are to the center of the stripe, or in the case of a double stripe, to the center of the two lines.

The Contractor shall follow all standard details that are noted on the plans when installing pavement markings. All pavement markings shown on the plans are subject to change by the Engineer based on field conditions.

Striping quantities may therefore vary based on actual dimensions and field conditions and shall be paid in accordance with TOG Section 402.3.4, Measurement and Payment.

402.3.1 Inspections and Coordination: The Contractor shall spot mark the entire project before applying any markings. When the spotting is complete the Contractor shall contact the Traffic Engineering Section at (480) 503-6739 to make arrangements for inspection prior to applying any paint (3 business days advance notice is required). The permanent marking plans may be modified as directed by the Engineer. The Contractor shall refer any questions concerning pavement markings to the Town of Gilbert Traffic Engineering Section.

Any pavement markings applied prior to field coordination/inspection by the Town of Gilbert's Traffic Engineering Section shall be removed and re-striped at the Contractor's expense.

402.3.2 Materials:

(1) Paint: All paint used on streets and roadways within Town of Gilbert rights-of-way shall meet the requirements contained in TOG Section 791, Paint Markings for Streets.

(2) Thermoplastic Markings: All thermoplastic used on streets and roadways within the Town of Gilbert rights-of-way shall meet the requirements contained in TOG Section 793, Thermoplastic Markings for Streets.

(3) Raised Pavement Markers (RPM's): RPM's shall meet the requirements contained in ADOT Standard Detail M-19 (Sheets 1 through 10) and shall be non-adhesive with an abrasive resistant surface.

402.3.3 Installation:

(1) Obliteration: When striping obliteration is necessary, it shall be accomplished by water blasting. Other methods may be allowed with prior approval of the Town Traffic Engineer. If obliteration causes shadowing or, in the opinion of the Engineer, will cause confusion on the part of the driver, the Contractor shall seal the area with Master Seal MTR – Plus, manufactured by Seal Master, or approved equal. Application shall be spray or squeegee. Applying paint over striping does not constitute stripe obliteration. Striping obliteration may be required to go beyond the project limits so that the new striping will match existing. The TOG's Traffic Engineer may require the Contractor to adjust the striping and signing as necessary. Removal of raised pavement markers (RPM's) within obliteration limits is incidental.

(2) Striping: All striping shall be applied initially in paint, including all items specified to be applied as thermoplastic. The Contractor will be required to re-stripe the entire project 30 to 45 days after initial striping. At this time transverse markings, holding bars, and long lines, as required,

shall be re-striped using thermoplastic. Any other portions of the project shall be restriped in paint. The following final stripings are required to be 90 mil thickness thermoplastic:

- Arterial Streets – All Striping (Transverse Lines, Holding Bars, and Long Lines)
- Collector Streets – All Transverse Lines and Holding Bars at Arterial Street Intersections
- Striping within 200 feet of a signalized intersection, regardless of street classification

All striping shall be a minimum of 4" wide except where noted on the plans, or as noted below:

A. All edgelines shall be 6" wide
B. All holding bars shall be 8" wide
C. All crosswalk lines shall be 12" wide
D. All STOP bars shall be 18" wide

Painted pavement markings shall be placed on the pavement by a spray-type, self propelled pavement marking machine designed for application of paint and beads. All permanent painted pavement markings parallel to the flow of traffic shall be a minimum of 15 mils in thickness and shall be placed in accordance with the latest edition of ADOT Standard Specifications, Division VII, Section 708 – Permanent Pavement Markings.

Thermoplastic pavement markings shall be accomplished using hand cart extrusion, long line ribbon extrusion, or long line spray dispensing devices of the required shape and thickness to the prepared pavement surface. This work shall be performed in accordance with the manufacturers' specifications, the requirements of these specifications, and as directed by the Town of Gilbert. The marking configuration and thickness shall be as specified herein and on the plans.

(3) Other Markings: All symbols are to be placed with extruded thermoplastic per the Plan documents.

Turn lane arrows shall be installed per ADOT Standard Details M-10 and M-11 with the exceptions that only one arrow symbol is required at the beginning of the turn lane and that the word "ONLY" shall not be used. Additional arrows to be added only as requested by the Town Traffic Engineer.

Raised median curbs shall be painted in accordance with the TOG Details GIL-240.

(4) Raised Pavement Markers (RPM's): RPM's shall be installed on all new pavement associated with arterials and major collectors in accordance with ADOT Standard Detail M-19 (Sheets 1 through 10) and shall be secured to the pavement with a hot, flexible marker adhesive. All RPM's shall be installed so that the reflective face of each marker is facing the direction of traffic and is perpendicular to the direction of traffic flow.

Where raised pavement markers are placed along solid striping, the nearest edge of each marker shall be offset no less than 4 inches and no more than 6 inches from the nearest edge of the striping.

402.3.4 Measurement and Payment: Pavement striping and markings shall be measured and paid as described in (ADOT) Standard Drawings and Specifications. Striping shall be paid on linear feet of

equivalent four (4) inch wide stripes, excluding lengths of skips. Pavement markings and markers shall be measured each, as designated in the bid schedule. Costs for temporary markings and signs are not included in this item and shall be included in the bid price for traffic control.

402.4 SIGNING:

All signing shall conform to the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD) handbook as modified by ADOT's Arizona Supplement, latest edition, with regard to size, color, shape, and placement. A TOG sign permit is required prior to the installation of any signs within the right-of-way. See Section 401 which contains a link to the TOG's Traffic Engineering Application.

402.4.1 Inspections and Coordination: A pre-installation meeting with Town staff is required prior to installing any signs or posts within the right-of-way. Permits may be issued prior to this meeting but will not be valid until after the pre-installation meeting is held. To schedule a pre-installation meeting, contact the Traffic Engineering Section at (480) 503-6739 a minimum of two business days prior to the proposed meeting date. Signing quantities and installation locations are subject to change based upon the pre-installation meeting, conditions at the time of installation, and current accepted practice.

A Certificate of Compliance verifying that the signage materials used meet the requirements of these specifications shall be submitted to the Town's Inspector prior to Final Acceptance of the project. The Town may perform material verification on any sign installation project at the Town's discretion. The Town may remove random signs to verify that proper materials have been used, not to exceed ten percent (10%) of the total number of signs installed on the project. Any sign removed by the Town as part of the initial material verification shall be replaced by the Contractor at no cost to the Town.

If the initial material verification determines that improper materials have been used, the Town Engineer shall determine the extent of the required sign removal or the extent of further material verifications. All signs required to be removed/verified after the initial material verification due to a determination that improper materials were used shall be replaced by the Contractor at no cost to the Town.

402.4.2 Materials: Sign sheeting, including street name sign sheeting, shall meet the following requirements:

ASTM D4956 Type XI – 3M 4000, or approved equal, for the following signs:

(a) All yellow series WARNING signs (shall be fluorescent yellow).
(b) All regulatory signs.
(c) All school area signing (shall be fluorescent yellow-green).
(d) All street name signs.
(e) All overhead internally illuminated street name signs (shall be translucent sheeting).

Approved equals shall include the same warranty period as the 3M product. Any requests for approved equals shall be made in writing 30 days prior to installation and no materials shall be purchased until written approvals have been received.

Sign imaging shall be in compliance with the reflective sheeting manufacturers matched component system. Sign imaging shall consist of acrylic based electronic cuttable film (3M 1170 Series or equivalent) or silk screened, depending upon the quantity of signage, with standard highway colors.

402.4.3 Installation: All signing installed within the TOG's rights-of-way shall be installed by an individual that has current certification in signing installation or inspection from the International Municipal Signal Association (IMSA) or the American Traffic Safety Services Association (ATSSA). Equivalents will be considered, but shall be submitted in writing to the Town's Traffic Engineer for review and acceptance at least 30-days prior to the installation of any signing.

Signs that need to be removed during construction shall be done so by the Contractor at the Contractor's expense and shall be reinstalled by the Contractor at the Contractor's expense in accordance with TOG Detail GIL-227.

(1) Traffic Signing: All signing to be installed in the TOG, including signing that is to be relocated and reinstalled, shall be done in accordance with TOG Detail GIL-227 using 1-¾" or 2" square tubing. Signs shall be secured to the tubing using 3/8" x 2-½" plated hex head bolts with flat washers (2 each), a nylon washer against the sign, and nylon stop nuts.

The Contractor shall allow the concrete in the posthole to cure for at least 24-hours prior to standing the pole and hanging any signing.

Any sign that is to be installed within 25 feet of an existing street light pole shall be installed on that pole and not on a separate support. Any signing that is affixed to a street light pole shall be done so using ¾" stainless steel banding with appropriate fasteners.

The Contractor shall ensure that at no time a traffic sign is installed in such a way as to be blocked by trees or vegetation. In these cases the Contractor shall contact the Traffic Engineering Section to provide an alternate location for the installation of signing in question.

(2) Street Name Signs: Street name signs shall be installed at each intersection. If street name signs are to be installed on an existing or proposed street light pole, each sign shall be installed on a separate bracket. Street name sign brackets shall be sized in accordance with Table 402-1 below.

TABLE 402-1

STREET NAME SIGN BRACKET SIZING

Sign Blade Length	Bracket Size
Less than 24"	12"
24" to less than 36"	18"
36" and greater	24"

402.4.4 Measurement and Payment: All signing will be measured as the total square footage of reflective signing material and linear footage of square tubular steel sign post material. Sign anchor/sleeves will be measured each.

Payment for signing will be at the unit costs as indicated in the bid schedule and will be considered full compensation for the work as described herein and as shown on the plans.

Add the following Section to Part 400 – RIGHT-OF-WAY AND TRAFFIC CONTROL

SECTION 403
TRAFFIC SIGNALIZATION AND FIBER INTERCONNECT (ITS)

403.1 DESCRIPTION:

The work under this section shall consist of furnishing and installing traffic signal equipment and interconnect. Traffic signal equipment and interconnect shall include the equipment listed in this section along with all other accessories necessary to provide fully functioning traffic signal system. Installation shall include, but not be limited to trenching, embedment, foundation preparation, concrete and asphalt work, equipment placement and assembly, wiring and electrical work, painting and finishing, and testing.

403.2 GENERAL REQUIREMENTS:

403.2.1 Standards/Qualifications: In addition to MAG Standard Specifications and Details and TOG Supplemental Specifications and Details, all materials and installation shall conform to ADOT "Standard Specifications for Road and Bridge Construction" and "Traffic Signals & Lighting Standard Drawings," latest editions, and the Manual on Uniform Traffic Control Devices Handbook (MUTCD), latest edition.

Electrical Contractors/Subcontractors shall comply with all licensing requirements set forth by the State Register of Contractors Office to perform work related to traffic signal installation in TOG rights-of-way. The TOG requires an IMSA Level II Traffic Signal Technician on site when any signal work is being performed.

403.2.2 Permits: The Contractor installing a traffic signal or traffic signal interconnect shall obtain the necessary Traffic Engineering Permits from the TOG Development Services Department prior to beginning any work within the TOG right-of-way. The Contractor shall obtain an underground utilities (right-of-way) permit from the TOG prior to construction.

403.2.3 Inspections and Coordination: Any questions concerning traffic signals, fiber interconnect, or traffic signal inspections, can be directed to the TOG Traffic Operations Section at 480-503-6981 or 6627. During the installation of traffic signals or interconnect, the Contractor shall be responsible for contacting the TOG Traffic Operations Section at the phone number shown above to arrange/coordinate the following items:

(1) **Inspections.** Inspections shall be scheduled a minimum of 48-hours (2 business days) in advance. (Note: At no time shall conduit be backfilled in the Town's right-of-way without an inspection.)

(2) **Pull Box Locations.** See approximate station and offsets in the Pull Box Schedule of the plans, if included. Exact locations shall be coordinated with the TOG Traffic Operations Section.

(3) **Emergency Pre—Emption Detector Line of Sight.** Exact locations shall be coordinated with the TOG Traffic Operations Section.

(4) **Radio Interconnect System Including Radio Antennas.** Prior to the installation of the radio antennas, the Contractor shall contact TOG Traffic Operations for part numbers and to coordinate installation and configuration. Radio Interconnect System should be delivered to the TOG Traffic Operations Center for configuration before installation.

(5) **Closed-Circuit Television (CCTV) Installation.** PTZ Cameras should be delivered to the TOG Traffic Operations Center for configuration before installation.

(6) **Detection System Mounting Location.** This coordination shall be performed prior to installation.

(7) **ITS Equipment Details.** Prior to installation of the associated ITS equipment (switch, video encoder, video decoder, etc.), the Contractor shall contact the TOG Traffic Operations for parts number, configuration and to coordinate installation.

The Contractor shall contact SRP at 602-236-6326 a minimum of three (3) weeks prior to construction for power source point of delivery (POD) location and installation requirements. Note that Arizona Public Service (APS) provides power service in limited portions of the Town.

403.3 MATERIALS:

The Contractor shall supply all of the following materials that are necessary to provide fully functioning traffic signal systems as described in the project plans and special provisions. For Capital Improvement Projects (projects where the Town is the Contracting Agency), contact the Traffic Operations Section at 480-503-6981 or 6627, as some of the following materials may be supplied by the Town.

(1) **Controller and cabinet assembly (complete).** Contact the Traffic Operations Section for the latest controller and cabinet specifications. The complete controller and cabinet assembly shall be delivered to the Traffic Operations Section at least 30 days prior to installation for testing.

(2) **Signal poles, anchor bolts, signals, and luminaire mast arms.** See TOG Standard Details (800 Series) for signal pole, signal, and luminaire mast arm requirements. See ADOT "Traffic Signal & Lighting Standard Drawings" (latest version) for anchor bolt and foundation requirements.

(3) **LED Signals and Pedestrian Heads.** See TOG Standard Details (800 Series) and ADOT "Traffic Signal & Lighting Standard Drawings" (latest version) for LED signal and pedestrian head requirements.

(4) **Pedestrian Push Buttons.** See TOG Standard Details (800 Series) and ADOT "Traffic Signal & Lighting Standard Drawings" (latest version) for audible pedestrian system (APS) pedestrian push button requirements.

(5) **Conduit and Pull boxes.**

(A) General Requirements

(a) The Contractor shall use polyvinyl chloride (PVC) conduit except for multi-duct conduit. Multi-duct conduit shall be High-Density Polyethylene (HDPE). Any variance from the conduit material needs to be approved by the Town.

(b) Contractor shall provide and install two (2) four-inch conduits on each leg of the intersection and pull box at each corner of the intersection for future traffic signal installation ("Boxed-in").

(c) On Arterial Roads, the Contractor shall install pull boxes with a space range of 1,000 to 1,300 feet or as noted by the Town Traffic Engineer and one (1) 4-inch fiber optic conduit and one (1) 4-1 ¼" Multi-Duct for the Interconnect Conduit along the corresponding property frontage. Closer spacing may be required for future fiber splice points as determined by the TOG.

(d) On Non-Arterial Roads, Pull boxes shall have a maximum spacing of 1,000 feet and one (1) 4-1 ¼" Multi-Duct for the Interconnect Conduit along the corresponding property frontage. Closer spacing may be required for future fiber splice points as determined by the TOG.

(e) Do not exceed the minimum bending radius or the maximum pulling tension recommended by the manufacturer's specifications for any cables at any time.

(B) Conduit

Conduit shall meet the following specifications:

(a) Minimum schedule 40 PVC rated at 194 degrees F as specified in NEMA TC-2, NEMA TC-3, ASTM D 3005, UL Listed.

(b) High Density Polyethylene (HDPE) SDR11 rated as specified in ASTM D 3035.

(c) Use only clamp style coupling (Shur-Lock II or approve equivalent) for connection of HDPE conduit to PVC conduit or HDPE conduit to HDPE conduit. Glued fittings will not be accepted.

(C) Conduit Inner Duct Plugs

Conduit plugs, caps, or sealing fittings for sealing empty conduit and occupied conduit shall be durable, easily removable, reusable, and produce a watertight seal. Plugs, caps, and sealing fittings shall be designed for the diameter of the conduit and cable, shall cause no damage to the cable when installed, and shall have a rope tie on the inside end for connection of a pull rope. Plugs, caps, or sealing fittings used for fiber optic conduit shall provide a watertight and airtight seal of at least 20 psi. Plugs that seal conduits containing fiber optic cable shall be of the split design to allow installation and removal around in-place cables. Plugs, caps, or sealing fittings shall be approved by the Town.

(D) Fiber Optic Conduit Warning Tape

Fiber optic conduit warning tape shall be a four (4) mil inert plastic film specially formulated for prolonged use underground and shall be a minimum of 3 inches wide. All tape shall be highly resistant to alkalis, acids, and other destructive agents found in the soil. Tape shall have a continuous printed message warning that will bear the words "CAUTION FIBER OPTIC" in black letters on an orange background, or approved equivalent. Fiber optic conduit warning tape shall connect into pull boxes.

(E) Pull Tape, Tracer Wire, & Ground-Rod

Pull Tape, Tracer Wire, & Ground-Rod shall meet the following specifications:

(a) All occupied four-inch conduit and conduit for future use shall be installed with 12 AWG Green tracer wire for detection and pull tape with a minimum pulling capacity of 2500 lbs.

(b) Only one of the 1¼ inch ducts from the four (4) multi-ducts shall be installed with pull tape with a minimum pulling capacity of 2500 lbs. Only one #12 AWG Green tracer wire shall be installed in the ducts as shown on the plans. Both the tracer wire and the #12 AWG Green tracer wire shall be installed the same duct. The other three ducts shall have jetline pull string in each ducts.

(c) Pull tape shall be NETPCO MULETAPE WP2500P or approved equal. Ground rods shall be installed inside each No. 7 pull box and No. 9 vault. Each ground rod shall be a one-piece solid rod of the copper weld type or approved equal and shall be a minimum of 5/8 inches in diameter and 8 feet long.

(F) Traffic Signal and Fiber Interconnect Pull Boxes.

Pull boxes shall meet the following specifications:

(a) A certificate shall be supplied for structural capabilities and materials used in manufacture.

(b) All pull box covers shall have the message "TRAFFIC SIGNAL" for traffic signal pull boxes and "TOWN OF GILBERT FIBER OPTIC" for fiber interconnect pull boxes cast in one-inch (1") letters.

(c) Pull boxes shall not be installed in travel or parking lanes unless prior approval is obtained from the Engineer.

(d) No. 7 pull boxes shall be precast, polymer concrete, fiberglass reinforced, pull boxes, with ASTM Tier 22 rating. Concrete pull box lids shall not be used.

(e) No. 7 pull boxes shall be 12 inches in depth with an additional 12-inch extension stacked below it, for a total of 24 inches depth.

(f) No. 9 pull boxes shall be fabricated of concrete and provide conduit access ports as shown on Gilbert Detail GIL-844.

(g) The No. 9 pull box lid shall have a square, hinged lid that opens a full 180 degrees. Opening of the lid shall be spring assisted from both the open and

closed positions via a torsion bar lift system. The lid shall lock down with at least one stainless steel security type penta-head bolt that shall be captive to the lid. The lid shall have provisions for an externally mounted padlock for extra security. The padlock shall mount in a cavity in the pull box cover, so no part of the padlock is exposed.

(h) All installed pull boxes or pull box covers shall be new. Pull boxes shall not be reused or relocated unless prior approval from the Engineer.

(6) **Wire and Meter Pedestals.** All wiring shall include proper IMSA wire, camera wire, antenna wire and any other wiring for specific jobs. The Contractor shall provide the materials for and install conduit runs from the SRP power source POD to the meter pedestal. SRP will install the service wire from the SRP power source POD to the meter pedestal. Contact TOG Traffic Operations on specific meter pedestal details.

(7) **Luminaire Heads and Internally Illuminated Street Name Signs (ISNS).** All luminaires shall have shorting caps installed. Individual inline fuse holders shall be installed for both luminaires and ISNS in the pull box at the base of each pole. All ISNS shall conform to the Town of Gilbert Standards. Contact the Traffic Operations Section for details.

(8) **Emergency pre-emption equipment**. Emergency pre-emption equipment shall be as shown in the Plan documents or approved equal.

(9) **Radio interconnection systems including radio antennas.** Radio interconnection systems shall be in accordance with TOG Detail GIL-862. Contact the TOG Traffic Operations for further details.

(10) **CCTV system.** The CCTV system shall be in accordance with the project plans, special provisions, and TOG Detail GIL-861. Contact the TOG Traffic Operations for further details.

(11) **Detection System.** The detection system shall be in accordance with the project plans and special provisions.

(12) **ITS Ruggedized Switch.** The ruggedized switch shall be shelf-mount unit with power supply.

403.4 INSTALLATION:

403.4.1 Utilities and Irrigation Facilities: Prior to the installation of any traffic signal conduit, the Contractor shall pothole at locations where the conduit will be crossing or in proximity of existing utilities. Contact the TOG Street Department at 480-503-6400 for information on locations of Town owned/Town maintained irrigation equipment. The Contractor shall replace, at Contractors expense and in a timely manner, all landscaping and irrigation facilities that are disturbed or damaged during traffic signal construction.

403.4.2 Clearances: All traffic signal and traffic interconnect facilities, including conduit, shall maintain at least two (2) feet of clearance from RWCD utility lines, four (4) feet of clearance from structures or

drainage "V" ditches, and one (1) foot of clearance from all other utilities. The Contractor is responsible to confirm with the respective utilities.

403.4.3 Construction Requirements: The Contractor shall install the items necessary to provide functioning traffic signal and traffic interconnect facilities in a professional and workman-like manner consistent with industry standards. The installation of all conduit, pull boxes, traffic signal interconnect, conductors, detector cameras and emergency vehicle preemption shall be done in accordance with TOG Details, 800 Series (Traffic Signal Details). The following shall supplement, but are not intended to replace, the requirements contained in the project plans and special provision.

(1) **Traffic Signal Conduit and Pull Boxes.** Traffic signal conduit and pull boxes shall be installed in accordance with TOG Detail Nos. GIL-841 thru GIL-844. All conduit runs under existing pavement and driveways shall be installed by directional boring unless prior written approval is provided by the Town Engineer.

Where an existing pull box is to be removed and replaced with a new pull box or splice vault, the Contractor shall adjust the existing conduit sweeps to enter the new pull box or spice vault installation in accordance with TOG Detail Nos. GIL-841 thru GIL-844.

(2) **Foundation and Concrete Work.** All signal pole foundations and sidewalk ramps shall be modified per TOG Detail No. GIL-871. The tops of all pole foundations shall be at the same elevation as that of the adjacent sidewalk or flush with the sidewalk. No grout is allowed between top of foundation and bottom of base plate. Concrete pole aprons shall be installed around pole bases per Plans. If no sidewalk is present, the elevations shall match the top of the adjacent curb. Control cabinet foundations shall be installed in conformance with TOG Detail No. GIL-872.

(3) **Traffic Signal/Fiber Optic Interconnect.** Traffic signal interconnects shall be installed in accordance with TOG Detail Nos. GIL-831, GIL-841, and GIL-844. Pull boxes are to be spaced every 1,000 feet on a conduit run. Closer spacing may be required for future fiber splice points as determined by the TOG. Installations involving 3rd party shall follow detail GIL-845 or as directed by the TOG.

(4) **Finishing.** The Contractor shall paint all poles, mast arms, and luminaires brown per the current TOG Details and Specifications.

403.4.4 Equipment Installation Requirements: All equipment required to be provided by the Contractor, or furnished to the Contractor by TOG, shall be installed by the Contractor in accordance with the manufacturer's recommendations. Only equipment specifically identified as spare equipment shall be provided without installation services. The following are supplemental installation requirements:

(1) **Radio Interconnection System.** Radio antennas shall be mounted in accordance with TOG Detail No. GIL-862.

(2) **Signal Cabinet.** The signal cabinet shall be installed such that maintenance personnel facing the door of the cabinet shall be able to view the intersection.

(3) **APS Pedestrian Push Buttons (PPB's).** New PPB's shall be installed in accordance with the current Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG) and ADOT Standard T.S. 11-1. The PPB shall be mounted in accordance with ADOT Standard T.S. 4-21 except that the center of the push button shall be 42" above the finished sidewalk.

(4) **CCTV Systems.** CCTV systems shall be installed in accordance with the project plans and special provisions. CCTV cameras shall be mounted in accordance with TOG Detail No. GIL-861.

(5) **Traffic Signal Phasing and Preemption.** The Contractor shall follow traffic signal phasing, preemption wiring, and termination in accordance with TOG Detail No. GIL-850. The Contractor shall identify all wiring in accordance with TOG Detail No. GIL- 851.

403.5 MEASUREMENT AND PAYMENT:

Traffic signalization shall be measured and paid as detailed in the Contract Documents and shall include all work necessary to provide a fully functioning traffic signal system.

Payment for traffic signalization will be as indicated in the bid schedule and will be considered full compensation for the work as described herein and as shown on the plans.

Retitle Section 424 as follows:

SECTION 424
PARKWAY GRADING AND DRAINAGE FACILITIES

424.1 Description:

*Modify and add to this section as follows (modified and added text shown in **bold**):*

Parkway grading shall include all work necessary to bring the surface of the parkway, between the back of curbs and sidewalks and/or the parkway between sidewalks and the right-of-way line, to the grade and cross-section shown on the plans or as directed by the Engineer. It shall also include median islands between divided roadways.

Drainage facilities shall include any of the following:

- **Facilities intended to pass stormwater flows, such as open channels, catch basins, and storm drains.**
- **Facilities intended to retain or detain stormwater flows, such as retention and detention basins.**
- **Facilities intended to dispose of stormwater flows, such as drywells.**

424.3 FINE GRADING:

*Modify subparagraph (A) to read as follows (modified text shown in **bold**):*

(A) The finished surface shall be free from stone and all debris and be true to grade and cross-sections after compaction **to a minimum of eight-five (85) percent of maximum density**, as determined in accordance with ASTM D698 or ASTM D6938.

Add the following Section 424.4, and renumber the Payment Section to 424.5:

424.4 DRAINAGE FACILITIES:

All drainage facilities shall be constructed as shown on the plans and as detailed in other sections of the MAG Specifications and this document.

Drywells shall be installed in accordance with the plans and shall comply with ADEQ drywell requirements. A Contractor or Subcontractor installing drywells shall be registered with the Arizona Registrar of Contractors. At the end of construction, the Contractor and/or Contracting Agency shall register the drywell with the ADEQ. The Contractor or Contracting Agency shall provide all of the ADEQ drywell registration information, including registration number and the registered owner, to the Town for all project drywells prior to final acceptance of the project. In addition, all drywell drilling logs shall be submitted to the Town of Gilbert prior to final acceptance of the project as required under Section 105.15. Only drywells drilled within the right-of-way and pre-authorized prior to drilling by the Town's Environmental Compliance Officer, shall be registered with the Town of Gilbert as the Owner. Drywells located outside the public right-of-way shall not be registered to the Town and shall be registered to the owner of the property where the drywell is located.

Renumber the Payment Section to 424.5 as shown below and add the following paragraph at the end of this section:

424.5 PAYMENT:

Drywells shall be measured and paid on a per drywell basis which shall include all work necessary to provide a fully functioning drywell installation. Unless otherwise provided in the special provisions or proposal, payment for other drainage facilities shall be made as specified in other portions of the MAG and TOG Specifications (e.g., storm drain pipe, catch basins, etc.) or may be incidental to other portions of the work and shall be included in the cost thereof (e.g., open channels, retention basins, etc.).

SECTION 430
LANDSCAPING AND PLANTING

430.2 GENERAL:

Add the following paragraph at the beginning of this section:

A TOG permit is required for the installation of any landscaping within the right-of-way. In order to be issued Final Acceptance for a landscaping project, Record Drawing information shall be provided in accordance with TOG Section 105.15.

SECTION 440
SPRINKLER IRRIGATION SYSTEM INSTALLATION

440.2 GENERAL:

Add the following paragraph at the beginning of this section:

A TOG permit is required for the installation of any sprinkler irrigation system. In order to be issued Final Acceptance for a sprinkler irrigation project, Record Drawing information shall be provided in accordance with TOG Section 105.15.

440.5 TRENCH EXCAVATION AND BACKFILL:

Modify the 3rd paragraph of this section as follows (added text is shown in **bold***):*

Irrigation lines shall be inspected before backfilling. After irrigation lines have passed inspection, trenches and excavations shall be backfilled so that the specified thickness of topsoil is restored to the upper part of the trench. Compaction shall be in accordance with MAG and TOG Section 301.

PART 500 – STRUCTURES

SECTION 505
CONCRETE STRUCTURES

505.9 FINISHING CONCRETE:

Delete the last paragraph in this section in its entirety and replace it with the following paragraph:

Grinding and/or patching of any portion of a concrete structure to correct deficiencies that resulted from improper grade setting, construction methods, or breakage is not permitted unless approved by the Town Engineer. No finishing or patching shall be permitted until the surface has been inspected and approved for finishing/patching by the Town Engineer.

PART 600 – WATER AND SEWER

SECTION 601
TRENCH EXCAVATION, BACKFILLING AND COMPACTION

601.1 DESCRIPTION:

Add the following paragraph at the end of this section:

All pipe embedment (foundation and bedding) shall be in accordance with TOG Supplemental Details GIL-301, GIL-302, GIL-401, GIL-402, and GIL-701, as applicable. All trenching, backfill, and pavement and surface restoration shall be in accordance with MAG Detail 200-1 as follows:

- "T-Top" for transverse trenches under existing roadways and other existing roadway facilities. "T-Top" shall be used at all street intersections and at all major driveway locations as determined by the Town Engineer.
- Type "A" for longitudinal trenches under existing roadways and other existing roadway facilities
- Type "E" for trenches under new or future roadway construction and areas outside of future or existing roadway prisms.
- Other trench repair details may be used in the TOG as applicable.

Asphalt concrete (AC) repair thickness, where required, shall match existing, but shall be no less than 4 inches.

601.2 EXCAVATION:

601.2.2 Trench Widths:

*Modify the first sentence of this section to read as follows (modified text shown in **bold**):*

Trenches for a single pipe shall conform to the dimensions in Table 601-1, **unless otherwise specified in TOG Supplemental Details and Specifications, specified in the Special Provisions, indicated on the plans, and/or approved by the Engineer.** Multiple pipe installations in a single trench shall be installed in accordance with details on the plans or in the Special Provisions.

601.4 FOUNDATION, BEDDING, BACKFILLING, AND COMPACTION:

601.4.3 Haunching:

Delete this section in its entirety.

601.4.4 Initial Backfill:
Delete this section in its entirety.

601.4.4 Final Backfill:

Delete this section in its entirety and replace with the following:

Backfill shall meet the requirements of the following Table 601-2(A):

TABLE 601-2(A)		
BACKFILL MATERIAL REQUIREMENTS		
Trench Zone	**Allowable Backfill Materials**	**MAG/TOG Applicable Specs.**
Under and Within 2 Feet of Existing Roadway or Roadway Facilities*	½-Sack CLSM	604 & 728
Under Areas 2 Feet or More From Existing Roadway or Roadway Facilities*	Native	601
	Aggregate Base	601 & 702
	Select	601 & 702
	½-Sack CLSM	604 & 728
Under New Roadway or New Roadway Facilities* (Not Yet Constructed)	Native	601
	Aggregate Base	601 & 702
	Select	601 & 702
	½-Sack CLSM	604 & 728

* Roadway facilities include sidewalk, single curb, curb & gutter, medians, driveways, valley gutters, etc.

Native material used as backfill shall be of sound earthen material free from broken concrete, broken pavement, wood, or other deleterious material and with no piece larger than one and one half (1.5) inches. Backfill compaction and moisture requirements shall be in accordance with TOG Table 601-2(B).

The top three (3) feet below subgrade shall be mechanically compacted in lifts not to exceed eight (8) inches unless otherwise approved by the Town Engineer.

Where mechanical compaction is used, backfill lifts shall be placed at heights that can be effectively compacted to the required density taking into account the type of material, the type of compaction equipment, and the methods used. Under no circumstances shall backfill lift heights for mechanical compaction exceed 16 inches.

Backfill around utilities that are exposed during trench excavation shall be placed in accordance with the bedding methods.

601.4.6 Compaction Densities:

Delete this section in its entirety and replace it with the following:

601.4.6 Compaction Densities and Moisture Content: Unless otherwise provided in the plans and/or Special Provisions, trench backfill, bedding, and foundation material shall be thoroughly compacted to not less than the densities and moisture content shown in Table 601-2(B) when tested and determined in accordance with ASTM D698 or ASTM D6938.

TABLE 601-2(B)				
MINIMUM TRENCH COMPACTION DENSITIES AND [MOISTURE CONTENT]				
Type	**Location**	**From Surface/Bottom of Subgrade to 3 ft. Below Surface/Bottom of Subgrade**	**From 3 ft. Below Surface/Bottom of Subgrade to 1 ft. Above Top of Pipe**	**From 1 ft. Above Top of Pipe to Bottom of Trench**
I	Under or within 2 ft. of any existing or proposed pavement, curb, gutter, sidewalk, or similar construction	100% for granular, 95% for non-granular [Optimum ± 2%]	Not Applicable (½-sack CLSM required)	95% [Optimum ± 2%]
II	In any easement or right-of-way outside the limits detailed under Type I above.	90% [Optimum to Optimum + 2%]	90% [Optimum to Optimum + 2%]	95% [Optimum ± 2%]
III	Around any structure or exposed utility.	95% in all cases [Optimum ± 2%]		

Note: The "Type" required will generally be shown on the plans and the plans will govern. Where no "Type" is shown on the plans, the "Type" shall comply with Table 601-2(B).

A consideration in determining the backfill "Type" as shown on the plans is based on trench widths as shown in the Contract Documents. If these trench widths increase beyond those widths referred to in MAG Table 601-1 and fall within the 2-foot limit of paved surfaces and other improvements due to construction exigencies, the backfill designation for that portion within the 2-foot limit of such improvements shall be Type I even though Type II backfill is shown on the plans.

601.4.8 Specifications for Granular Material and Native Backfill:

Delete the first paragraph in its entirety and replace it with the following:

For purposes of water, sewer, and storm drain pipe installations, granular material shall be defined as 3/8" minus "chips" meeting the requirements of ASTM C33 and the following gradation:

TABLE 601-3	
3/8" MINUS CHIPS – GRADATION	
Sieve Size	**Percent Passing**
1/2"	100
3/8"	85-100
No. 4	25-55
No. 8	0-30
No. 16	0-10
No. 50	0-5

Placement of 3/8" minus chips shall be performed in manner so that the material fills all of the voids within the pipe trench, including the area around the haunches of the pipe. The material does not require major compactive effort, however, placement of the 3/8" chip material without compactive effort is not acceptable and shall not be backfilled. Manual and mechanical compaction efforts are acceptable for 3/8" chip material, however, direct water settling and jetting are not.

For all other purposes, granular material shall be defined as material for which the sum of the plasticity index and the percent of the material passing a No. 200 sieve shall not exceed 23. The plasticity index shall be tested in accordance with AASHTO T-146 Method A (Wet Preparation), T-89, and T-90.

Delete Section 601.7 in its entirety and replace with the following:

601.7 MARKING OF UNDERGROUND FACILITIES:

All underground pipelines and other facilities installed by the Contractor shall be marked with a #12 AWG tracer wire with color coded insulation rated for direct burial use at 30 volts and meeting the requirements of Table 601-4.

TABLE 601-4		
TRACER WIRE REQUIREMENTS		
	Installation Method	
Property	**Direct Bury**	**Bore and Jack**
Tracer Wire Designation	HS-CCS	EHS-CCS
Insulation	30-mil HDPE (Color Coded)	45-mil HDPE (Color Coded)
Conductivity	21%	21%
Break Load (Min.)	380 lb.	1150 lb.

All tracer wires shall be grounded at dead end points. Grounding shall be accomplished using a magnesium anode with a protective cap that is driven into the ground a minimum of 18". Anode shall have a minimum 14 AWG, 30-mil HDPE insulated, factory installed connector wire for use in splicing to the main tracer wire. Connector wire shall be rated for direct burial use at 30 volts.
The number of tracer wire connections/splices shall be minimized, but where required shall be accomplished using moisture and corrosion resistant connectors meeting the manufacturer's recommendations. Methods shall be used at each splice/connection point to ensure that no pull pressure is transferred to the connector/splice itself.

Test stations shall be installed per manufacturer's recommendations or as shown on the plans. Test stations shall include an encapsulated magnet, corrosion-resistant insulated brass wire lug, wax pad to cover wire connections, and color coded locking lid. Test station boxes shall be HS20 highway rated for all installations.

Tracer wire systems shall be Copperhead meeting the above requirements, or approved equal.

Testing of the completed tracer wire shall be accomplished prior to Final Acceptance of the project. Testing shall be done to assure traceability/connectivity through the entire wire system. This shall be accomplished through conductivity testing or by actual facility location testing. The TOG Inspector must be present during the tracer wire testing.

Add the following section after new Section 601.7

601.8 PAYMENT:

No pay item will be included in the proposal or direct payment made for trench excavation, backfilling, compaction, **marking of underground facilities,** or placement of temporary pavement. The cost of these features of the work shall be included in the unit price per linear foot for furnishing and laying pipe.

SECTION 603
INSTALLATION OF HIGH DENSITY POLYETHYLENE PIPE

603.1 DESCRIPTION:

Add the following paragraph at the beginning of this section:

High Density Polyethylene (HDPE) pipe shall not be installed within TOG rights-of-way and easements unless approved in writing by the Town Engineer.

SECTION 610
WATER LINE CONSTRUCTION

610.3 MATERIALS:

Delete this section in its entirety and replace it with the following:

All water line pipe shall be the following materials:

(A) Water pipe sizes six (6) inches to twelve (12) inches shall be either ductile iron or PVC. Ductile iron pipe shall conform to the requirements contained in MAG Section 750. PVC pipe shall conform to the requirements contained in TOG Section 751.

(B) Water pipe sizes greater than twelve (12) inches shall be either ductile iron or concrete pressure pipe-steel cylinder type. Ductile iron pipe shall conform to the requirements contained in MAG Section 750. Concrete pressure pipe-steel cylinder type shall conform to the requirements contained in MAG Section 758.

610.4 CONSTRUCTION METHODS:

Add the following paragraph at the beginning of this section:

Contractor shall uncover and verify the location and elevation of all existing water lines and water stubs that are being tied into as part of the project prior to trenching. Any discrepancy with locations and/or elevations shown on the plans shall be reported to the Town Engineering and the Engineer of Record.

610.4.1Trenching/Cover:

Modify the 3rd paragraph of this section to read as follows (added text is shown in **bold***):*

Except as otherwise required in this Specification, the Special Provisions, or by the Engineer, trench excavation, backfilling and compaction shall be in accordance with the requirements of **MAG** Section 601 **and TOG Details GIL-301 and GIL-302, as applicable. Backfilling shall not be started until the lines have been inspected by the Town Engineer and backfilling has been authorized. All pavement and surface restoration shall be in accordance with MAG Detail 200-1. Asphalt concrete (AC) repair thickness, where required, shall match existing, but shall be no less than 4 inches.**

610.4.2 Laying Pipe:

Modify the last paragraph of this section to read as follows (added text is shown in **bold***):*

PVC pipe shall be installed in accordance with **this Section, TOG Section 751, AWWA Standard C605 (Underground Installation of PVC Pressure Pipe and Fittings for Water), and AWWA Manual M23 (PVC Pipe-Design and Installation).**

Add the following paragraph at the end of this section:

In the event of an unexpected vertical realignment that creates a high point in the water line, the Contractor shall install an air/vacuum release valve or a fire hydrant as determined by the Town Engineer.

610.9 FIRE HYDRANTS:

Delete the first paragraph of this section in its entirety and replace it with the following:

The Contractor shall furnish all labor, materials, and equipment necessary to install fire hydrants complete in place at locations shown on the plans in accordance with the Standard Details and Special Provisions. Fire hydrants furnished by the Contractor shall conform to the requirements of MAG Section 756 and TOG Details GIL-320 and 321, with a 3.5 ft. bury depth. Adjustments to the fire hydrant grade shall be accomplished using a "Gradelok" offset. Extensions on fire hydrants will not be permitted. A black, heavy duty bag with a tie-down or an "Out-of-Service" ring shall be placed over/on all new hydrants and shall be left in-place until the system has been approved by the Town Inspector.

610.11 CONNECTION TO EXISTING MAINS:

Modify the third paragraph of this Section to read as follows (added text is shown in **bold***):*

Before connecting to an existing water system where there is no valve, the Contractor shall install a temporary plug or valve in order to facilitate the testing of the new line and isolate it from the existing system. New or existing valves connecting new work to the existing system shall be kept closed at all times.

610.13 METER SERVICE CONNECTIONS:

Add the following paragraph at the end of this section:

All meter boxes and meter box covers shall be in accordance with the following Table 610-2:

TABLE 610-2		
METER BOXES AND METER BOX COVERS		
Meter Size	**Box No.**	**Box Cover No.**
¾"	A6000485*	A6000484*
1"	A6000485*	A6000484*
2"	MAG Det. 320, Box No. 4	MAG Det. 313

* Armorcast Products Company; meter box cover to incorporate a hole for touch pad installation

SECTION 611
WATER, SEWER AND STORM DRAIN TESTING

611.2.5 Chlorine-Bearing Compounds in Water:

Delete this section in its entirety and replace it with the following:

On approval of the Engineer, a mixture of water and chlorine-bearing compound of known chlorine content may be substituted for liquid chlorine.

(A) Compound to be used: The chorine-bearing compound that shall be used is calcium hypochlorite (comparable to commercial products known as HTH, Perchloron, and Pittchlor).

(B) Application: Calcium hypochlorite shall be added to all new water mains/fire lines for disinfection in accordance with the following Table 611-1

TABLE 611-1		
CALCIUM HYPOCHLORITE APPLICATION RATE		
	Application Rate	
Water Main Size	Ounces/100 ft.	Pounds/100 ft.
6”	0.48	0.08
8”	1.92	0.12
12”	5.60	0.35

For other water line sizes, high-test calcium hypochlorite shall be prepared as a water mixture for introduction into the water main. The powder should first be made into a paste and then thinned to approximately a 1 percent chlorine solution (10,000 ppm) for introduction into the water line. High-test calcium hypochlorite (65 – 70% Cl) requires one (1) pound of calcium hypochlorite compound mixed with 7.50 gallons of water.

611.2.9 Retention Period:

Delete the first paragraph of this section and replace it with the following:

The initial chlorine dose (recommended to be 50 mg/l (ppm)) shall remain in contact with the water main for a minimum of 24 hours during which time all valves and hydrants in the treated section shall be operated to ensure disinfection of the appurtenances. The final measured chlorine disinfectant residual at the end of the disinfection/retention period shall not be less than 10 mg/l (ppm) at the extreme end of the water main being disinfected. Water mains not meeting the 10 mg/l (ppm) residual requirement at the end of the disinfection/retention period shall be re-disinfected at no cost to the Town.

611.3 SEWER LINE TESTING:

Delete the second paragraph of this section replace it with the following:

Sewers and pipe lines shall be subject to acceptance testing after all dry utility trenching and after backfilling has been completed, but prior to the placement of the surface course of the asphalt paving. Laying of the surface course of the asphalt paving prior to sewer line and pipe line acceptance testing shall only be done with the approval of the Town Engineer and shall be done at the Contractor's risk.

Modify the third paragraph of this section to read as follows (modified text is shown in **bold***):*

The **TOG** reserves the right to require testing of the entire installation. **One hundred percent (100%) of the sewer lines shall be air tested in accordance with Subsection (A) below.** Cost of repairs or corrections necessary to conform to the following testing requirements will be borne by the Contractor at no additional cost to the **Town**.
Revise the title of subsection (C) as follows, and delete all paragraphs under this subsection in their entirety and replace them with the following:

(C) Deflection Test for PVC Pipe:

In addition to the tests prescribed above, the Contractor shall perform a deflection test on the system a minimum of twenty (20) days after completion and acceptance of backfilling of the sewer line. Laying of the surface course of the asphalt paving prior to sewer line deflection testing shall only be done with the approval of the Town Engineer and shall be done at the Contractor's risk.

The Contractor shall have a string placed through all sewer lines prior to calling for a deflection test. A five percent (5%) deflection testing device (5% of the average inside diameter per ASTM D3034) will then be pulled through the entire length of the installed sewer line. This will be a go/no-go test. Any section failing to pass this test shall be repaired and retested at no expense to the Town. The minimum diameter of the testing device shall be in accordance with Table 611-2 below.

After acceptance but prior to the termination of the warranty period, the TOG may test the long-term deflection of the sewer. If the Town determines that the deflection has exceeded seven and one-half percent (7-1/2%) of the average inside diameter per ASTM D3034, that portion of the installation shall be corrected by the Contractor at no cost to the Town. The minimum diameter of the testing device shall be in accordance with Table 611-2 below.

TABLE 611-2

DEFLECTION TESTING DEVICE SIZE

	Minimum Diameter	
Pipe Size	**5% Deflection**	**7-1/2% Deflection**
8"	7.49"	7.29"
10"	9.37"	9.12"
12"	11.15"	10.86"
15"	13.66"	13.30"

Delete all paragraphs under subsection (D) and replace them with the following:

(D) Closed Circuit T.V. Inspection

The Contracting Agency shall pay for all new sewer lines and sewer service lines to be visually inspected using closed circuit television cameras. Any defects revealed in the pipe or as a result of construction methods shall be corrected by the Contractor at no additional cost to the Town or Contracting Agency. Re-inspection of lines initially failing inspection shall be paid for by the Contractor.

SECTION 615
SANITARY SEWER LINE CONSTRUCTION

Add the following after **615.1 Description:**

615.1(A) REQUIREMENTS OF NEW CONSTRUCTION

New sewer construction shall be isolated from the existing sewer system by placing a reinforced mechanical plug in the outlet of the most downstream manhole(s) in the system under construction. Prior to placement of any plug, a Sewer Plug Permit, included at the end of this Section, shall be submitted to the TOG Inspector for review and acceptance. No sewer plug shall be installed until an accepted Sewer Plug Permit has been returned to the Contractor. The Contractor shall keep copies of all Sewer Plug Permits applicable to the project onsite and available for inspection as requested by Town staff. Sewer plugs shall not be removed until the following has occurred:

1. All paving and manholes have been completed and all manhole rings and covers have been set at the correct and final grades.
2. All manholes have been sprayed with insecticide laden paint.
3. The Inspector has issued written permission to remove the plug.

The TOG Inspector shall be present when the Contractor removes any sewer plug.

615.2 MATERIALS:

Add the following sentence at the end of this Section:

Vitrified clay pipe (VCP) and High Density Polyethylene (HDPE) pipe shall be used only upon written approval from the Town Engineer.

615.3 TRENCHING:

Delete this section in its entirety and replace it with the following:

Contractor shall uncover and verify the location and elevation of all existing sewer lines and sewer stubs that are being tied into as part of the project prior to trenching. Any discrepancy with locations and/or elevations shown on the plans shall be reported to the Town Engineer and the Engineer of Record.

Excavation of trenches shall be accomplished in accordance with Section 601. The Contractor shall provide alignment and elevation stakes at agreed upon intervals and offsets together with cut sheets showing the difference in elevation from the top of the stakes to the flow line of the pipe.

After trenching has been completed, a four-inch layer of granular material (the “foundation material”) shall be placed on the bottom of the trench and hand leveled. The trench shall be dry when the fine grading of the top of the foundation material is accomplished. The fine grade shall be carefully checked by use of a string line, laser beam, or other means so that when, in final position, the pipe will be true to line and grade.

615.5 PIPE INSTALLATION:

Add the following at the beginning of the second paragraph in this section:

The pipe shall be placed in accordance with Town of Gilbert Detail No. GIL-401 or GIL-402, as applicable.

Add the following at the end of the third paragraph in this section:

A sewer line inspection by the Town shall be required after placement of the pipe and prior to bedding. Grade tolerances shall be as shown in the following Table 615-1:

Table 615-1	
SEWER PIPE GRADE TOLERANCES	
Pipe Size	**Grade Tolerance**
8" thru 12"	± 0.05 ft.
15" and Greater	± 0.10 ft.

Add the following paragraphs at the end of this section:

PVC pipe and fittings shall be installed in accordance with ASTM D2321. PVC pipe bedding shall be granular material and shall be placed in two lifts. The first lift shall be from the top of the foundation material to the spring line of the pipe and shall be carefully placed by hand. The granular material shall fill all the voids around the pipe and shall be placed in a manner that will ensure uniform support under the haunches of the pipe. Care shall also be taken during the bedding operation to ensure proper alignment of the pipe is maintained and to prevent any later movement of the pipe. The second lift of granular material shall be from the spring line of the pipe to six (6) inches above the top of the pipe. Separate inspections shall be required on each lift. Compaction tests may be required by the Town Engineer, and if so, the tests shall be paid by the Contractor.

VCP pipe bedding shall be granular material and shall be carefully placed by hand in one lift from the top of the foundation material to the spring line of the pipe. The granular material shall fill all the voids around the pipe and shall be placed in a manner that will ensure uniform support under the haunches of the pipe. Care shall also be taken during the bedding operation to ensure proper alignment of the pipe is maintained and to prevent any later movement of the pipe. A separate VCP bedding inspection shall be required. Compaction tests may be required by the Town Engineer, and if so, the tests shall be paid by the Contractor.

The Town will not accept sewer lines with less than five (5) feet of cover unless approved by the Town Engineer.

615.7 JOINTING:

Add the following paragraph to this section:

No flexible couplings shall be allowed in sanitary sewer line installations.

615.8 SANITARY SEWER SERVICE TAPS:

Re-title this section as follows and delete the first two paragraphs of this section in their entirety and replace them with the following:

615.8 SANITARY SEWER SERVICE TAPS AND SERVICE LINES:

All sanitary sewer taps shall be wye-type connections as shown in MAG Detail 440-1, Type 'A'. Sewer service lines shall be constructed in accordance with TOG Standard Detail No. GIL-410. All service lines shall be a minimum of five (5) feet deep at the property line/edge of the Public Utility Easement (PUE) unless approved by the Town Engineer. A 1" diameter flexible green conduit or wood 2x4 shall be used to mark the sanitary sewer tap. The flexible conduit shall be located within one (1) foot of the end of the sewer service line and shall be firmly set into the ground by attaching it to a minimum two (2) foot long No. 4 or larger rebar which shall be buried a minimum of one (1) foot below the ground surface. The green flexible conduit shall extend a minimum of two (2) feet above the ground surface elevation. If approved by the Inspector, the ends of each sewer service line may be left exposed for visual locating, but for no longer than five (5) working days.

615.11 BACKFILLING:

Delete this section in its entirety and replace it with the following:

Sewer line backfilling shall not be started until all lines are inspected by the Town Engineer and backfilling is authorized. Backfill for PVC sewer lines shall be in accordance with TOG Standard Detail No. GIL-401. Backfill for VCP sewer lines shall be in accordance with TOG Standard Detail No. GIL-402. All pavement and surface restoration shall be in accordance with MAG-200-1. Asphalt concrete (AC) repair thickness, where required, shall match existing, but shall be no less than 4 inches. Sewer line backfilling and compaction shall also be in accordance with MAG Section 601.

616 RECLAIMED WATER LINE CONSTRUCTION:

Add the following Section to after 616.4.4 – Valve and Manhole Cover

616.4.5 Reclaimed Water Service Control Valves:

The following shall be requirements to the installation and maintenance of the valves:

Reclaimed water customer shall be responsible for all lake fill operations. The Town of Gilbert will set upstream infrastructure to limit the flow. The Reclaimed water customer shall have at a minimum two float or altitude valves. Both valves shall be slow closing with a close not to be less than 10 seconds. Valve open and valve close setting on the first valve shall allow for typical use within the working volume of the lake. The second float valve shall be in series with the first float valve. Should the water surface elevation of the lake rise above the maximum level allowed of the first float valve and continue to fill, the second float valve shall act as a redundant lake fill shut off.

TOWN OF GILBERT - SEWER PLUG PERMIT

Name of Project: _____

Project Owner/Telephone: _____

Project Engineer (Firm)/Telephone: _____

Project Contractor (Firm)/Telephone: _____

Project Location

General Description in Relation to Major Intersections:

_____

Township: _____ **Range:** _____ **Section:** _____

EMERGENCY CONTACT INFORMATION (NAME AND 24 HOUR MOBILE NUMBER):

_____

Sewer Manhole Number (From Plans): _____

Description of MH Location (Street, Intersection, Address, etc.) – Attach Map or Drawing:

_____

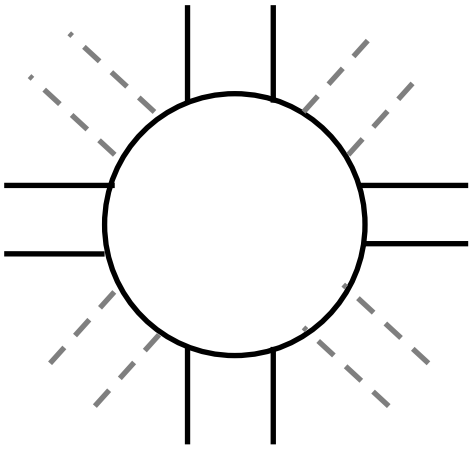
_____

Line/Plug Size: _____

Proposed Installation Date: _____

Estimated Days To Be Left In-Place: _____

Location of Plug in MH, Direction of Flows, and Line Sizes (Indicate on Drawing)



Special Provisions/Precautions (regular monitoring, pump-around plan, limited time, night-time only, etc.). Attach separate sheet if necessary. _____

_____

By signing this form, I request that the TOG allow the installation of the above described sewer plug. I hereby certify that I am an authorized representative for the Project Contractor listed above, and by signing this form, the Contractor accepts all responsibility for the proper installation and monitoring of the plug. The Project Contractor also accepts all liability for any damages, clean-up, or other costs that may result from the installation and operation (both proper and improper) of this plug.

_____	_____	_____	_____
Printed Name	**Signature**	**Title**	**Date**

FOR TOWN USE ONLY: Permit Approval Date/Inspector's Initials: _____

Date Installed/Initials: _____ **Date Removed/Initials:** _____

COPY TO: Richard Walker, Wastewater Collection Supervisor @ Approval, Installation, and Removal

SECTION 625
MANHOLE CONSTRUCTION AND DROP SEWER CONNECTIONS

625.1 DESCRIPTION:

625.1.1 Manholes:

Delete this paragraph in its entirety and replace it with the following:

625.1.1 Manholes: Construction shall consist of furnishing all materials and constructing manholes complete and in place, as detailed on the plans and at the locations shown on the plans, including foundation, walls, manhole frames, covers, coating, painting, and any incidentals thereto. Sanitary sewer manholes shall be MAG-420-1 unless the use of an alternate detail is approved by the Town Engineer.

625.2 MATERIALS:

Delete the last two paragraphs of this section and replace them with the following:

Manhole frames and covers (sanitary and storm) shall comply with the following Table 625-1 and shall be cast in accordance with MAG Section 787 and the standard details.

TABLE 625-1		
TOG MANHOLE FRAMES AND COVERS		
Type	**East Jordan Iron Works**	**Neenah**
4-ft. Manholes	00222459	NF-Deeter-1295
5-ft. Manholes	00223124	NF-Deeter-1296

No steps shall be placed in any TOG manhole regardless of the material.

Any sanitary sewer manhole that connects a 12" or larger sewer pipe must be lined with epoxy corrosion protection. Any sanitary sewer manhole coated with epoxy corrosion protection shall have “Insecta” insecticide laden spray paint applied after coating. Coating materials shall be one of the following pre-approved products:

(1) Sauereisen corrosion-clad polymer lining No. 210, and Sauereisen underlayment. No. F-120, as manufactured by Sauereisen Cements, Pittsburgh, PA 15238. The underlayment shall be used to repair and reprofile corroded areas of manhole surfaces. Manhole surfaces shall be cleaned and prepared in accordance with the manufacturer’s recommendations and requirements herein prior to application of any underlayment and coating.

(2) Sewer shield 100 topcoat as manufactured by Environmental Coating, Mesa, AZ 85207. An underlayment recommended by the manufacturer shall be used to repair and reprofile corroded areas of manhole surfaces. Manhole surfaces shall be cleaned and prepared in accordance with the manufacturer’s recommendations and requirements herein prior to application of any underlayment and coating.

(3) Raven 405, as manufactured by Raven Living Systems, 1024 North Lansing Avenue, Tulsa, OK, 74106. An underlayment recommended by the manufacturer shall be used to repair and reprofile

corroded areas of manhole surfaces. Manhole surfaces shall be cleaned and prepared in accordance with the manufacturer's recommendations and requirements herein prior to application of any underlayment and coating.

All sanitary sewer manholes shall be painted with "Insecta" insecticide laden spray paint for manholes, or approved equal. The paint shall be latex based with the insecticide pre-mixed as supplied by the manufacturer. Paint that is mixed with insecticide at the site shall not be allowed. The insecticide (chlorpyrifos or approved equal), shall be encapsulated within the paint mixture and the paint mixture shall be applied evenly over the entire manhole, covering all surfaces at a recommended thickness of 3 mils. A maximum of 48 ounces of the paint mixture shall be applied per manhole. This maximum application amount per manhole may impact the actual coating thickness within any particular manhole.

625.3 CONSTRUCTION METHODS:

625.3.1 Manholes:

Delete the first sentence of the first paragraph in this section and replace it with the following:

Manholes shall be constructed of brick, precast concrete sections, or cast-in-place concrete, with frames and covers, in accordance with the standard details. Precast concrete manholes shall have impression ring type bases and shall use grout or Ram-nek between each precast section.

Add the following paragraph after the second paragraph:

Grinding and/or patching of manhole inverts and bases, or any portion of the concrete structure to correct deficiencies that resulted from improper grade setting, construction methods, or breakage is not permitted.

Add the following Section prior to **625.4 MEASUREMENT***:*

625.4 TESTING

All manholes constructed or modified as part of the project shall be vacuum tested in accordance with ASTM C1244 except as modified herein. Vacuum testing shall be performed at the top of the manhole cone for manholes located in paved areas. Manholes outside of paved areas shall be vacuum tested at the ring and cover. A vacuum of 10 inches of mercury negative pressure shall be drawn on the manhole. The time shall be measured for the vacuum to drop to 9 inches of mercury negative pressure. The manhole shall pass the vacuum test if the time for the vacuum reading to drop from 10 to 9 inches of mercury negative pressure meets or exceeds the values contained in Table 625-2 below.

TABLE 625-2		
MANHOLE VACUUM TESTING REQUIREMENTS (Time to drop from 10 to 9 inches of mercury negative pressure – seconds)		
Manhole Depth	**48" Diameter Manhole**	**60" Diameter Manhole**
10 ft. or less	60	75
Greater than 10 ft. to 15 ft.	75	90
Greater than 15 ft. to 20 ft.	90	120
Greater than 20 ft.	120	150

Any manhole not passing this pressure test shall be repaired and retested at no cost to the Town. If manhole joint compound is pulled out during the vacuum test, the manhole shall be disassembled and the joint repaired or replaced, as necessary. The vacuum test shall be repeated until the manhole passes the test.

Testing of sanitary sewer manholes is considered incidental to the price bid for manhole installation and no additional payment shall be made.

Renumber the following Sections:

625.4 MEASUREMENT*:* becomes **625.5 MEASUREMENT***:* (No Other Changes)

625.5 PAYMENT: becomes **625.6 PAYMENT:** (No Other Changes)

SECTION 630
TAPPING SLEEVES, VALVES AND VALVE BOXES ON WATER LINES

630.2 GENERAL:

Add the following paragraph at the beginning of this Section:

All valves installed within the TOG shall be gate valves unless otherwise noted on the plans and approved by the Town Engineer.

630.3 GATE VALVES:

630.3.1 General:

Add the following before the first sentence of this Section:

All gate valves shall be Mueller, Clow, Waterous, or approved equal.

SECTION 631
WATER TAPS AND METER SERVICE CONNECTIONS

631.1 DESCRIPTION:

Modify the first paragraph of this section to read as follows (added text is shown in **bold***):*

This specification covers work by Contractors installing water services in new subdivisions by Permit and in projects under Contract. All materials used shall comply with applicable standard specifications and the work performed in accordance with these specifications and standard details, **including TOG Standard Detail No. GIL-310.** The service connections shall be complete and all material shall be furnished by the Contractor except for the water meter.

631.3 INSTALLATIONS:

Delete **631.3.1 General:** *in its entirety and replace it with the following:*

631.3.1 General: Installation of copper tubing for meter service connections shall be in accordance with MAG Section 754.

Meter service connection with copper tubing shall be in accordance with standard details.

The water service connection shall include the tap on the main, corporation stop, saddle (if applicable), service pipe, appurtenant fittings, curb stop, meter box and meter box cover, and backflow prevention device as required in accordance with standard details. Water service connections installed without meter boxes and covers shall be marked with a 1" diameter flexible blue conduit. The flexible conduit shall be located within one (1) foot of the end of the water service line and shall be firmly set into the ground by attaching it to a minimum two (2) foot long No. 4 or larger rebar which shall be buried a minimum of one (1) foot below the ground surface. The blue flexible conduit shall extend a minimum of two (2) feet above the ground surface elevation.

Backflow prevention devices shall be provided in accordance with, and shall meet, the requirements of TOG Backflow Protection Ordinance No. 869, codified as Chapter 10, Article III of the TOG Municipal Code: Cross Connection Control. Water meter boxes shall be installed in accordance with standard details to line and grade set by the Design Engineer.

Upon acceptance of the water service line and appurtenances, the Contractor shall be responsible for damage to water meter boxes and covers until such time as the meters are installed and accepted by the TOG.

All water meter registers furnished to, or installed in, the TOG shall meet AWWA new meter test standards, latest editions, and shall meet the following requirements:

1) Meters shall have an encoded output and shall utilize Sensus protocol.
2) Meters shall have electronic touch read and radio read capability and shall be entirely compatible with current TOG meter reading equipment.
3) Meter resolution shall be 1,000 gallons.

4) Meter manufacturer shall be Metron Farnier or approved equal.
5) Meter type for 1” meters and smaller shall be multi-jet or single-jet. Meter type for 1-1/2” meters and larger shall be single-jet only.

631.4 TESTING:

Add the following paragraph at the end of this section:

All backflow prevention devices shall be tested by a State Certified Backflow Tester selected from a list of testers that are registered with the Town of Gilbert. Contact the Town’s Backflow Prevention Specialists at 480-503-6715 or 6714 to obtain a list of Town registered testers. Test results shall be forwarded to the TOG Backflow Specialist. Testing fees shall be paid by the Contractor/Contracting Agency.

PART 700 – MATERIALS

SECTION 710
ASPHALT CONCRETE

710.1 GENERAL

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

Asphalt concrete shall be **an East Valley Asphalt Committee (EVAC) approved Modified** Mixture of asphalt cement and mineral aggregates **unless specifically allowed herein or approved in writing by the Town Engineer**. Acceptance criteria for Asphalt Concrete shall be per MAG Specifications as amended by the Town of Gilbert. Mineral admixture shall be included in the mixture when required by the mix design or by the Engineer. Asphalt concrete shall be produced in accordance with Section 321. **Where there is a conflict between these specifications and an EVAC approved mixture, the Town Engineer shall make the determination as to which governs.**

Delete the second paragraph and replace it with the following:

The designation for asphalt concrete mixes shall be based on the nominal maximum aggregate size of the mix. The applicable mix designations are as follows:

½" → EVAC A-1/2 and EVAC R-1/2
¾" → EVAC A-3/4 and EVAC R-3/4

MAG 3/8" and Base asphalt concrete mixes may be used for certain applications specifically allowed within these TOG Supplemental Specifications or if approved in writing by the Town Engineer.

Insert the following Table 710-1(A) at the end of this Section:

TABLE 710-1(A)
ASPHALT CONCRETE MIX DESIGN AND THICKNESS BY STREET CLASSIFICATION

	Street Classification			
	Arterial (Major and Minor)		All Other Street Classifications	
	Mix Design	Thickness	Mix Design	Thickness
Surface Paving	A-1/2	2"	-	-
Base Paving	A-3/4	3"	-	-
Total	-	5"	R-3/4	3"

Add the following paragraph at the end of this section:

710.4 TESTING:

Testing of asphalt and asphaltic products shall be done at the direction of the Town Engineer at prescribed intervals and as specified in MAG Section 321. The cost for testing asphalt concrete shall be the responsibility of the Contracting Agency, except for retesting of failed materials, the cost for which shall be the responsibility of the Contractor.

SECTION 738
HIGH DENSITY POLYETHYLENE PIPE & FITTINGS FOR STORM DRAIN & SANITARY SEWER

738.1 General:

Add the following paragraph to the beginning of this section:

High Density Polyethylene (HDPE) pipe shall not be used within TOG rights-of-way and easements unless approved in writing by the Town Engineer.

SECTION 740
POLYPROPLENE PIPE & FITTINGS FOR STORM DRAIN

740.1 General:

Add the following paragraphs to the beginning of this section:

Polypropylene pipe (PP) will be allowed within TOG Rights-of-Way and easements per ASTM F2881 and AASHTO M330 for storm drain. PP is allowed for 12-inch through 60-inch diameter. Trench excavation, backfilling, compaction, construction, and installation shall be in accordance with the appropriate MAG section and the amended associated sections in the TOG supplement. For minimum and maximum cover, please refer to the manufacturer's recommendations.

Per Agency discretion, mandrel testing may be required. Deflection testing shall be performed not less than thirty days after installation, maximum allowable deflection shall be 5.0%.

Add the following Section to Part 700

SECTION 751
POLYVINYL CHLORIDE (PVC) WATER PIPE

751.1 GENERAL:

This specification covers the requirements of polyvinyl chloride (PVC) plastic water pipe and fittings for water systems. When noted on the plans or in the Special Provisions, pressurized water systems may be constructed using PVC pipe for diameters not exceeding twelve (12) inches. Pipe and fittings shall be in conformance with the requirements of this Section.

751.2 MATERIALS:

(A) PVC water pipe sizes less than twelve (12) inches shall conform to the requirements of AWWA C900, latest edition, and shall have a minimum dimension ratio (DR) of 18 and a minimum pressure class of 235.

All PVC pipe used for potable applications shall meet the requirements of ANSI/NSF 61.

751.3 LAY LENGTH, JOINTS, FITTINGS, AND RESTRAINING:

Standard lay length for all PVC water pipe shall be twenty (20) feet for all sizes.

All PVC water pipe shall be manufactured with integral bell and spigot joints conforming to the requirements of ASTM D3139. Joint seals shall meet the requirements of ASTM F477.

All fittings and valves used on PVC water pipe installations shall be mechanical joint type fittings except as shown on TOG Details GIL-320-1 and GIL-320-2.

PVC water lines shall properly restrained using EBBA Iron's Megalug restraining system or approved equal. Thrust blocks are not allowed in the Town of Gilbert except for tapping sleeve and valve installations or where approved by the Town Engineer.

751.4 STORAGE AND HANDLING:

Storage and handling of PVC water pipe shall be done in accordance with AWWA Manual M23 (PVC Pipe-Design and Installation).

SECTION 756

DRY BARREL/FIRE HYDRANTS

756.3 HYDRANTS:

Delete the first paragraph of this section in its entirety and replace it with the following:

TOG fire hydrants shall be Clow Medallion, Waterous WB67, Kennedy K-81, or approved equal. The diameter of the main valve seat opening shall not be less than 5 inches in diameter. The entire valve assembly shall be effectively sealed against moisture.

Add the following Section to Part 700

SECTION 791
PAINT MARKINGS FOR STREETS

791.1 GENERAL:

This specification covers the requirements for waterborne paint marking (WPM) materials for streets and roadways.

791.2 MATERIALS:

791.2.1 General: WPM material shall be a ready-mixed, one component, lead-free paint that is specifically compounded for pavement/street marking. WPM's shall be specifically designed for either roadway surfaces or curb painting, depending upon their application.

The characteristics of the material shall be such that complete and even coverage of a line at a specified thickness of 15 wet mils for roadway striping and 10 wet mils for curb painting, can be achieved at the specified width and configuration under the approved application method.

With glass beads applied and upon drying, this material shall produce an adherent reflectorized marking capable of resisting deformation and wear presented by roadway environment and conditions.

791.2.2 Composition and Quantitative Requirements: The composition of the paint shall be determined by the manufacturer and shall be per their written requirements and specifications on file with The Town as a Class I paint. It will be the manufacturer's responsibility to produce a pigmented WPM containing all the necessary solvents, dispersants, wetting agents, preservatives and all other additives, so that the paint shall retain its viscosity, stability and all of the properties as specified herein.

The manufacturer shall certify that the product does not contain mercury, lead, hexavalent chromium, toluene, chlorinated solvents, hydrolyzable chlorine derivatives, ethylene-based glycol ethers and their acetates, and any carcinogen, as defined in 29 CFR 1910\1200. The lead content shall not exceed 0.06 percent by weight of the dry film and the test for chromium content shall be negative.

All WPM shall meet the quantitative requirements contained in Table 791-1 below.

TABLE 791-1		
QUANTITATIVE REQUIREMENTS FOR MIXED CLASS I PAINT (White and Yellow)		
Component	**Requirement**	**Allowable Variation from Qualifying Sample**
Pigment, percent by weight, ASTM D3727	56% minimum	±2.0%
Non-volatile content, percent by weight vehicle, ASTM D2369	72% minimum	±2.0%
Viscosity, Kreb units at 77 ± 1 °F, ASTM D562	80-95	
Weight, pounds per gallon at 77 ± 1 °F, ASTM D1475	13 minimum	±0.2
Vehicle composition, vehicle Infrared Spectra, ASTM D2621		None
pH, ASTM E70	10 minimum	±1.0
Fineness of dispersion, HEGMAN, ASTM D1210	3.0 minimum	
Volatile Organic Compounds, grams per liter, ASTM D3960 in accordance with 7.1.2	150 maximum	
Flash point, degrees F, ASTM D93, Method A	100 minimum	
Dry time to no pick up with no beads, minutes, ASTM D711	9 maximum	
Dry through time, minutes, ASTM D1640 except no thumb pressure is used when thumb is rotated 90 degrees on paint film	20 maximum	
Flexibility, TT-P-1952D	Pass	

If requested, the Contractor, via the manufacturer, shall furnish factory samples of paints. Additionally, the Contractor may also be required to furnish samples taken from existing stocks at the Contractor's yard or at a project site. The Town of Gilbert will test these samples. These samples will be used for comparison purposes for those paints actually used on the project and those furnished from the factory.

791.2.3 Dry Opacity: The Dry opacity for the paint will be determined using a black-white Leneta Chart, Form 2C Opacity and a Photovolt 577 Reflectance meter or equal. Using a gap doctor blade, a 5 mil film of paint shall be drawn that will cover both black and white portions of the chart. The film shall be allowed to dry 24 hours. After calibrating the reflectance meter according to the manufacturer's instructions, the reflectance will be measured over the white and black portions with a green Tristimulus filter. The dry opacity shall be calculated as follows:

Dry opacity = Reflectance over black/reflectance over white

Dry opacity for both white and yellow paint shall be a minimum of 0.93

791.2.4 Yellowness Index: The yellowness index for the white paint will be determined as described for dry opacity, only a 15 mil gap doctor blade will be used to draw down the paint. After drying 24 hours, the paint film's reflectance will be measured using the green and amber Tristimulus filters. The yellowness index is then calculated as follows:

Yellowness index = (amber- blue)/green x 100

Yellowness index for the white paints shall be a maximum of 10.

791.2.5 Static Heat Stability: The static heat stability for the paint will be determined as follows:

A one pint sample of the paint in a sealed can shall be place in a heated air circulation oven at 120 degrees F +/- 1 degrees F for a period of one week. The sample is then to be removed from the oven and the viscosity checked in Kreb units at 77 degrees F +/- 1 degree F according to ASTM D562. The measured viscosity shall be in the range from 68 to 90. The tested sample shall not show any signs of instability (e.g jelling).

791.2.6 Heat-Shear Stability: The heat shear stability for the paint shall be determined as follows:

A one pint sample of the paint shall be sheared at a high speed in a Waring blender that is heated to a temperature of 150 degrees F. The blender's lid shall be sealed to minimize the loss of volatiles. When the sample of paint reaches 150 degrees F the blender shall be stopped and the paint poured immediately into a sample can and covered. The sample is to be cooled overnight and then examined for jelling or other signs on instability. The viscosity of the sheared sample is to be measured according to ASTM D562 in Kreb Units at 77 degrees F +/- 1 degree F. The measured viscosity shall be in the range of 68 to 95. If not at the upper limit, run total solids on the sheared paint and adjust solids, if necessary, by adding water to reach the original solids content. If the solids content requires adjustment, again check the viscosity of the paint. The viscosity shall be in the range of 68 to 95.

791.2.7 Scrub Resistance: Scrub resistance shall be determined according to ASTM D2486. An appropriate doctor blade is to be used to obtain a dry film thickness of 3 to 4 mils. The sample shall be cured for 24 hours. The scrub test shall be performed at 77 degrees F +/- 1 degrees F at 50% +/-5% humidity. The sample shall withstand a minimum of 800 cycles.

791.2.8 Reflectance: The reflectance for both the white and yellow paint (per a lab test without beads) will be determined using a 15 mil draw down film sample. The same white sample used to determine the yellowness index as herein specified may also be used for this test. The reflectance of the paint films will then be measured using the green Tritimulus filter. The reflectance for the white paint shall be a minimum of 85. The reflectance for the yellow paint can range from 45 to 58.

791.2.9 Freeze-Thaw Properties: The paint viscosity or consistency shall not change significantly when the paint is tested for resistance to three cycles of freeze-thaw according to ASTM D2243.

791.2.10 Spray Properties: The paint shall be applied at a 15 mil wet film thickness in the field. The paint shall show the following properties:

- Dry to a no track time with 90 seconds or less when the line is crossed by a standard size automobile (77° F, less than 50% humidity, clear/partly cloudy and normal air flow).
- Produce a clean, smooth line with no overspray or puddling.
- The applied paint shall accept the glass beads with the specified coating so that the beads shall embed into the paint depth to the recommendations of the bead manufacturer.
- The paint, when heated to the temperature necessary to obtain the specified dry time, shall show no evidence of instability, such as viscosity increase, jelling, or poor spray application.

791.2.11 Toxicity: At no time shall WPM materials exude fumes which are toxic or injurious to persons or property.

791.2.12 Physical Properties: The paint pigment shall be well ground and evenly and uniformly dispersed in the paint solution. The pigment shall not cake or thicken in the container, and shall not become granular or curdled. Any settlement of pigment in the paint shall result in a thoroughly wetted soft mass that can be easily and successfully re-mixed into proper solution with a standard mixing paddle. Upon mixing the paint shall regain a smooth uniform product of the proper consistency. If the paint cannot be mixed back to a uniform, totally sprayable liquid state, then it shall be considered unfit for use and shall not be used. The Contractor shall secure replacement material that shall conform to the requirements as specified herein.

791.2.13 Color: The paint marking material shall meet the following color requirements:

- The yellow color shall closely match Federal Test Standard Number 595b, color chip No. 33538. The color will be checked visually, and will be checked against Tristimulus values for the color according to Federal Test Method Standard No. 141.

- The white color shall closely match Federal Test Standard Number 595, color chip No. 17925.

791.2.14 WPM Required Thickness: WPM wet thickness shall be 15 mils and the dry thickness shall be between 8 and 9 mils.

791.2.15 Glass Beads: The glass beads shall conform to the applicable requirements of the following:

- ADOT Standard Specifications for Road and Bridge Construction, latest edition, Subsection 708-2.02
- The WPM material and glass bead manufacturer's recommendations
- These specifications

Glass beads shall be dual coated for both moisture proofing (MP) and adhesion (AC). The coatings shall be per the bead manufacturer's specifications and recommendations for the type of paints specified. The glass bead and application rate will vary based on the type of application specified as follows:

- Pavement Striping: 8 lbs/gallon of paint
- Curb Painting or Similar: 10 lbs/100 square feet of painted surface

Add the following Section to Part 700

SECTION 793
THERMOPLASTIC MARKINGS FOR STREETS

793.1 GENERAL:

This specification covers the requirements for white or yellow thermoplastic reflectorized pavement marking materials for streets and roadways.

793.2 MATERIALS:

793.2.1 General: The thermoplastic reflectorized material shall consist of a 100% solid mixture of heat stable resins, white or yellow pigment, inter-mixed glass beads, filler, and other materials in granular or block form specifically compounded for reflectorized pavement markings to be applied to the pavement in a molten state. The characteristics of the liquefied material shall be such that complete and even coverage of specified width and thickness as a line, legend, or symbol is provided by the required application method and rate. Upon cooling to normal pavement temperature, this material shall produce an adherent reflectorized marking capable of resisting deformation and wear in the roadway.

793.2.2 Composition and Physical Characteristics: The composition of the thermoplastic reflectorized material shall conform to the following requirements: ·

TABLE 793-1

COMPOSITION REQUIREMENTS FOR THERMOPLASTIC REFLECTORIZED PAVEMENT MARKING MATERIAL

Component	Percent by Weight	
	White	Yellow
Binder (Hydrocarbon or Alkyd*)	18-28	18-28
White Pigment	10-15	--
Yellow Pigment	--	2-8
Reflective Glass Inter-Mix Beads	30-40	30-40
Calcium Carbonate or Equivalent Filler	20-42	24-45

*NOTE: Hydrocarbon shall only be used for long line applications. Alkyd can be used for short or long line applications.

The ingredients of the thermoplastic reflectorized pavement marking material shall be thoroughly mixed and in a solid block or free flowing granular form. The material shall readily liquefy when heated in a melting apparatus into a uniform solution. This solution shall be free from all skins, dirt, foreign objects, or any other ingredient which would cause bleeding, blotting, staining, or discoloration when applied to bituminous or concrete pavement surfaces.

The thermoplastic shall consist of one of the following binder types depending on the requirements of the pavement marking application:

• Hydrocarbon - shall consist mainly of synthetic petroleum hydrocarbon resins with appropriate fillers and pigments.

• Alkyd - shall consist of a mixture of synthetic resins, at least one of which is solid at room temperature and high boiling point plasticizers. At least one-third of the binder composition and no less than eight percent by weight of the entire material formulation shall be solid maleic-modified glycerol ester resin. The alkyd binder shall not contain any petroleum based hydrocarbon resins.

An alkyd thermoplastic formulation shall be used for all short line work such as symbols, legends, and transverse lines, including stop bars (or lines) and crosswalks. The formulation for these short line applications shall be configured primarily for the hand cart extrusion application method.

Either alkyd or hydrocarbon thermoplastic formulation may be used for longitudinal lines, including lane lines and edge lines, unless otherwise required by the Town. The formulation for these long line applications shall be either for spray or the ribbon extrusion application method. Additionally, the formulation used shall be in accordance with the requirements of the application equipment used to install the markings. Hydrocarbon binder based thermoplastic shall not be used for transverse lines, legends, or symbols.

The thermoplastic material shall not give off fumes which are toxic, injurious, or require specialized breathing apparatus when heated to the temperature range specified by the manufacturer for application. The material shall remain stable when held for four hours at this temperature, or when subjected to four reheatings, not exceeding a total of four hours, after cooling to ambient temperature. The temperature viscosity characteristics of the plastic material shall remain constant throughout reheatings and shall show like characteristics from batch to batch. There shall be no obvious change in color of the thermoplastic material as a result of reheating, and the color of the material shall not vary from batch to batch.

793.2.3 Reflective Glass Beads: The drop-on reflective glass beads shall conform to the requirements of Subsection 708-2.02 of the ADOT Standard Specifications, except the bead coating shall be as recommended by the bead manufacturer as suitable for thermoplastic reflectorized pavement marking material.

In addition to incorporating glass beads in the thermoplastic mix, glass beads shall be evenly applied (dropped on) to the surface of the molten material immediately after its application at a minimum uniform rate of 10 pounds of glass beads per 100 square feet of line or marking area (e.g. 200 linear feet of six inch line).

793.2.4 Filler: Filler shall be a white calcium carbonate or equivalent filler with a compressive strength of at least 5,000 pound per square inch.

793.2.5 White Pigment: White pigment shall be titanium dioxide and shall conform to the requirements of ASTM D-476 for Type II (92%). The white thermoplastic shall have a minimum of 10% by weight of titanium dioxide.

793.2.6 Yellow Pigment: Yellow pigment shall be as recommended by the manufacturer.

793.2.7 Color: After heating the thermoplastic material for four (4) hours (±five (5) minutes) at 425° F (±3°) and cooling it to 77° F (±3°), the material shall meet the following:

- White-daylight reflectance at 45° - 0° shall be 70% minimum.
- The white color shall match Federal Test Standard Number 595, color chip No. 17925.
- Yellow- daylight reflectance at 45° - 0° shall be 43% minimum.
- The yellow color shall match Federal Test Standard Number 595, color chip No. 13538.

793.2.8 Softening Point: After heating the thermoplastic material for four (4) hours (± five minutes) at 425° F (±3°) and testing in accordance with ASTM D36, the thermoplastic material shall have a softening point of 215° F (±15° F).

793.2.9 Water Absorption and Specific Gravity: The thermoplastic material shall not exceed 0.5% by weight of retained water when tested in accordance with the requirements of ASTM D570.

The specific gravity of the material, as determined by Section 11 of AASHTO T-250, shall be between 1.85 and 2.3.

793.2.10 Impact Resistance: After heating the thermoplastic material for four (4) hours (± five minutes) at 425° F (± 3°) and forming test specimens, the impact resistance shall be not less than 10 inch pounds when tested in accordance with Section 9 of AASHTO T-250.

793.2.11 Bond Strength: After heating the thermoplastic material for four (4) hours (± five minutes) at 425° F (± 3°), the bond strength to Portland Cement Concrete shall be not less than 180 pounds per square inch. The bond strength shall be determined in accordance with the procedures specified in Section 7 of AASHTO T-250.

793.2.12 Abrasion Resistance: The maximum loss of thermoplastic material during the abrasion resistance test herein specified shall be 0.5 grams. The abrasion resistance of the thermoplastic material shall be determined by forming a representative lot of the material at a thickness of 0.125 inch on a four inch square monel panel (thickness 0.050" ± 0.001"), on which a suitable primer has been previously applied, and subjecting it to 200 revolutions on a Taber Abraser at 25° C, using H-22 calibrated wheels weighted to 250 grams. The wearing surface shall be kept wet with distilled water throughout the test.

793.2.13 Cracking Resistance at Low Temperature: After heating the thermoplastic material for four (4) hours (± five minutes) at 425° F (± 3°), applying to concrete blocks, and cooling to 15° F (± 3° F) the material shall show no cracks when observed from a distance exceeding 12 inches. Testing for low temperature crack resistance shall be in accordance with the procedures specified in Section 8 of AASHTO T-250.

793.2.14 Flowability: After heating the thermoplastic material for four (4) hours (± five minutes) at 425° F (±3° F) and testing for flowability in accordance with Section 6 of AASHTO T-250, the white thermoplastic shall have a maximum percent residue of 18 and the yellow thermoplastic shall have maximum percent residue of 21.

793.2.15 Yellowness Index: White thermoplastic material shall not exceed a yellowness index of 0.12 when tested in accordance with Section 4 of AASHTO T-250.

793.2.16 Flowability (Extended Heating): After heating the thermoplastic material for eight (8) hours (±1/2 hour) at 425° F (± 3° F) with stirring the last six hours, and testing for flowability in accordance with Section 12 of AASHTO T-250, the thermoplastic shall have a maximum percent residue of 28.

793.2.17 Flash Point: The thermoplastic material shall have a flash point not less than 475° F when tested in accordance with the requirements of ASTM D92 "Flash and Fire Points by Cleveland Open Cup."

793.2.18 Storage Life: The materials shall meet the requirements of this specification for a period of one year from the date of manufacture. The month and year of manufacture shall be clearly marked on all packages of thermoplastic material. The thermoplastic shall also melt uniformly with no evidence of skins or unmelted particles for this one year period. Any material which does not meet the above requirements, or which is no longer within this one year period at the time of application, shall not be used. The Contractor shall replace the outdated material with new material at no additional cost to the Town of Gilbert.

793.2.19 Primer Sealers: The application of primer sealer on Portland Cement Concrete (PCC), hot mix asphaltic concrete (AC), asphaltic concrete friction course (ACFC), or chip seal coat surfaces prior to application of the thermoplastic material shall be as recommended by the thermoplastic material manufacturer. The primer sealer shall be specifically compounded for use with the particular thermoplastic material. The Contractor shall ensure that the primer sealer used has been approved for use by the thermoplastic manufacturer with their material.

The thermoplastic material supplied normally should not require the application of separate primer sealer on newly placed AC surfaces prior to application of the thermoplastic material. The application of primer sealer shall be required on all PCC surfaces after the removal of all curing compounds. The use of waterborne pavement marking paint as a replacement to the application of primer sealer is not acceptable.

793.2.20 Inter-Mix Glass Beads: The inter-mix beads shall be coated or uncoated and conform to AASHTO M247-81 (1986) Type I. The use or non-use of coatings shall be left to the discretion of the manufacturer. If non-coated beads are used, the thermoplastic formulation shall be configured to minimize settling of the intermixed beads when the material is heated and applied.