83rd Avenue Street & Drainage Improvements

100% Submittal
Special Conditions

Prepared For:

City of Peoria

Prepared by:

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	Initials	Date
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PM		

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SECTION I

STREET AND DRAINAGE IMPROVEMENTS

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SCOPE OF WORK

This project is located in the City of Peoria. The limits of improvements are:

- 83rd Avenue from Las Palmaritas Drive to Mountain View Road
- Butler Drive from 83rd Avenue to 79th Avenue

The work consists of the reconstruction and widening existing roadways to their ultimate width including pavement and concrete removal, subgrade preparation, placing of aggregate base and asphaltic concrete pavement; constructing curb and gutter, sidewalks and driveways, new raised medians and concrete bus bays; installation of pavement marking and signing; installation of traffic signal reconfiguration and conduit; installation of fiber optic lines for traffic signal interconnect system; installation of street lighting and conduits; installation of right-of-way landscaping and landscape irrigation system and other related incidental work. The work also consists of storm drain, irrigation, potable water and sanitary sewer improvements including the installation of storm drain pipe, catch basins and manholes; removal and replacement of irrigation pipe; installation of water lines and fire hydrants; installation of stub-outs from existing water lines; installation of sanitary sewer pipe and manholes and other related incidental work.

The work described in these Special Conditions and shown on the Plans for this project shall be performed in accordance with the City of Peoria Infrastructure Design Guidelines and Details, Maricopa Association of Governments (MAG) Uniform Standard Specifications and Uniform Standard Details for Public Works Construction, 1998 Edition and all revisions through 2011, including the City of Peoria amendments thereto and additional Special Conditions that follow.

In the event a conflict exists on the plans or between the plans and referenced specifications or these construction special conditions, the order of precedence shall be as follows:

1. Addenda
2. The Construction Special Conditions
3. City of Peoria Construction Contract General Conditions
4. The Project Plans
5. City of Peoria Infrastructure Design Guidelines and Details
6. City of Peoria Amendments to the MAG Uniform Standard Details
7. Maricopa Association of Governments (MAG) Uniform Standard Specifications for Public Works Construction, 1998 Edition and all revisions through 2011.
8. Maricopa Association of Governments (MAG) Uniform Standard Details for Public Works Construction, 1998 Edition and all revisions through 2011.
9. City of Phoenix Traffic Barricade Manual
10. Manual on Uniform Traffic Control Devices for Streets and Highways, latest edition.
11. Arizona Department of Transportation Standard Specifications for Road and Bridge Construction, latest revisions
12. Arizona Department of Transportation Signing and Marking Standard Drawings

The information written into these special provisions will:

1. Describe any special or unusual conditions.
2. Explain details of work not covered in the MAG Specifications and Details or the supplements thereto.
3. Relate certain work to specific bid items or payment quantities.
4. Contain the specifications and/or requirements of utility companies affected or included within the drawings and specifications of this project.

General construction notes for City of Peoria Capital Improvement projects are included in the plan set and shall be representative, unless noted otherwise, to all plan sheets.

GENERAL REQUIREMENTS

Sequence of Work:

At the intersection of 83rd Avenue and Olive Avenue, there are SRP overhead electrical lines that are being replaced underground as part of this project. The Contractor shall install the SRP conduit as the first order of work on the project. SRP shall install and energize the conductor and remove the overhead lines prior to the Contractor starting any of the traffic signal and related conduit work. These traffic signal conduits shall be installed using an open trench and not directional drilled or bored.

Construction Staking:

The Contractor shall be responsible for construction staking. As a first element of work, the contractor shall verify data and datum for geometric layout and basis of bearings. Any discrepancies shall be immediately brought to the attention of the Engineer prior to start of any construction activities included in these construction documents.

The Contractor shall carefully preserve all construction stakes, reference points and other survey points including City of Peoria control points and benchmarks. In the case of their loss or destruction, the Contractor shall replace them under the supervision of a licensed Arizona Land Surveyor. The replacement of all survey monuments will require that the surveyor reinstalls, certifies and completes the required forms as specified on the City's Horizontal and Vertical Control Network website.

The contractor shall also be responsible to hire an Arizona Land Surveyor to mark the location of the traffic signal poles and foundations.

Payment for construction staking shall be made on a lump sum basis under the item **Construction Staking and As-Built Surveying** in the bid schedule.

Geotechnical Investigations:

A copy of the geotechnical engineering-boring report is available for review at the offices of the City Engineer located at 9875 N. 85th Avenue. The report was prepared by Ninyo & Moore and dated September 2010. It is the Contractor's responsibility to review this document during preparation of their bidding documents to be cognizant of existing soil conditions discovered at those locations. The Contractor shall also make any other arrangements they deem necessary to become familiar with underground soils conditions prior to bidding. After an award of contract by the City of Peoria, the Contractor shall assume all responsibility for extra work due to the discovery of changed soil conditions.

Permits:

The Contractor shall be responsible for obtaining and paying for all required City of Peoria and other agency permits to complete the work and shall be in accordance with the latest edition of the City of Peoria Infrastructure Guidelines as included on the City of Peoria website. No additional payment will be made to the Contractor for obtaining the required permits for this project.

The following list contains some of the permits that will need to be obtained. It is the Contractor's responsibility to apply, pay for and obtain the following permits (this list may not be all-inclusive):

- Haul Permit (City fee waived)
- AZPDES Permit - Approved NOI and NOT(Fee)
- Traffic Control Plan approval
- MCESD Dust Control Permit – Copy of approval
- City of Peoria Right of Way Permit (Fee waived)
- Hydrant Permit (Fee)
- Maricopa County Haul Permit (Fee)
- Maricopa County Traffic Control Permit (Fee waived)

A Right of Way permit will be required for all work to be completed within the City of Peoria right of way. Permit applications forms and associated permit fees can be found on the City of Peoria's website.

A permit will be required for hauling materials over City of Peoria streets. Haul Permits may be obtained from the City of Peoria. In applying for a permit, the contractor shall be required to submit a Haul Plan addressing the following issues:

- Preferred haul routes and alternative
- A detailed plan for traffic control along the haul route
- Method of dust control along the haul route
- Number of trucks and hours of operation
- Anticipated duration of the hauling activities
- Method of cleaning up haul routes (may require street-legal sweeper)

This is not considered as all-inclusive, but is intended to provide a summary of key points considered. The contractor shall be familiar with the requirements of the City of Peoria for all permit requirements, fees, and inspections prior to bidding on this construction contract. The Contractor is further advised that the City of Peoria retains ultimate authority to approve or not approve a haul permit, impose additional restrictions, curtail hauling at certain times and require the use of specific routes.

Application for haul permits shall be made directly to the City of Peoria with a copy of the approved permit delivered to the Engineer prior to commencement of haul operations. Haul Route Permit applications are available on the City website.

Storm Water Pollution Prevention Plan and AZPDES Permit Requirements:

This project is subject to the Arizona Pollutant Discharge Elimination System (AZPDES) requirements under the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) program as administered by the Arizona Department of Environmental Quality (ADEQ). The Contractor shall also meet the requirements of the Storm Water Pollution Prevention Section of the City of Peoria Infrastructure Design Guidelines located on the City of Peoria Engineering Website, including the preparation and submittal of all SWPPP Plans and the completion of all forms and checklists required for City approval. Under the provisions of a permit, the Contractor shall be designated as co-permittee (with the City of Peoria), and shall be responsible for providing necessary materials; taking appropriate measures to ensure removal of at least 80 percent of the additional sediment generated in storm water runoff from the project (relative to pre-project sediment levels); and completing the following documents:

- Storm Water Pollution Prevention Plan (SWPPP) for the project including a certification-of-compliance form
- Notice of Intent (NOI) to be covered under AZPDES including certification of signature
- Notice of Termination (NOT) of coverage under AZPDES (upon project completion)

All Subcontractors must comply with AZPDES requirements under the supervision of the Contractor, and shall submit a completed, signed subcontractor certification form thereby designating themselves as co-permittees. The SWPPP shall be subject to approval by the City prior to implementation. The SWPPP shall be kept at the project site at all times and the final SWPPP shall be retained by the Contractor for three (3) years following project completion and final acceptance.

The Contractor shall submit a completed, signed NOI form (including signed subcontractor certification forms) to ADEQ at least 48 hours prior to the proposed Notice to Proceed date. The Contractor will send copies of the final submittal for distribution to the Engineering Department and the Arizona Department of Environmental Quality (ADEQ) Storm Water Coordinator.

Failure by the Contractor (or any applicable subcontractors) to submit the NOI form and certification by the time of the Pre-Construction meeting or to promptly make revisions to those forms as requested by the City which leads to delays in attaining ADEQ requirements will result in postponing the start of construction. The Contractor will not be entitled to any additional compensation for costs resulting from such delay.

The NOI shall be posted at the construction site along with the SWPPP. No construction activities shall begin until all applicable storm water pollution control devices are in place.

Any additional work caused by the Contractor's (or subcontractor's) failure to properly implement the SWPPP will not be compensated. In addition, the Contractor shall keep a copy of the STORM WATER CONSTRUCTION GENERAL PERMIT COVERAGE NOTICE received from ADEQ (after submittal of the NOI) at the job site at all times.

All SWPPP reports required under this contract shall be available to the public in accordance with requirements of the Clean Water Act—Section 308(b). The Contractor shall make plans available to the public upon a request from either the EPA or ADEQ.

No conditions of the AZPDES or the SWPPP shall release the Contractor from any responsibilities or requirements under other environmental statutes or regulations. Asphalt plant and concrete plants (including module plants) require separate AZPDES industrial permits.

Upon completion and acceptance of the work performed by a co-permittee, either the Contractor or other subcontractors shall absolve such subcontractor of any involvement in, or responsibility for, subsequent AZPDES violations on the project. Upon total project completion, acceptance and de-mobilization, the Contractor shall submit a completed, signed NOT form to the EPA, ADEQ and the City, thereby terminating all AZPDES permit coverage for the project.

The Contractor shall perform, at a minimum, a visual inspection of the construction site once every seven days and within 24 hours of rainfall greater than or equal to a half (1/2) inch. The Contractor shall prepare a report documenting his findings on the conditions of the SWPPP controls and note any erosion problem areas. The Contractor's report is to be submitted to the Engineering Inspector for review and approval and shall be maintained on site by the Contractor. Facilities shall be maintained as necessary to ensure their continued functioning. In addition, all temporary siltation controls shall be maintained in a satisfactory condition until such time that construction is completed, permanent drainage facilities are operational and the potential for erosion has passed as determined by the Engineer.

Measurement and payment for all work associated with the design of the SWPPP and with obtaining, implementing, monitoring and closing out the AZPDES permit will be based upon a Lump Sum under item **Storm Water Pollution Prevention Plan** in the bid schedule.

Storm Water Pollution Prevention – Best Management Practices:

Implementation of "Best Management Practices" (BMP's) to reduce storm water pollution shall be undertaken by the Contractor on a multi-tiered, most cost-effective approach. The Contractor shall utilize the lowest-cost acceptable BMP available to address each type of potential storm water pollution situation encountered on the project. Should this prove

ineffective in resolving a storm water pollution problem, additional, higher-cost BMP's may need to be practiced upon approval by the City.

Existing Storm Drains:

The contractor shall be responsible for keeping all existing storm drains open, clean and operational during the construction period. No measurement or direct payment will be made for this maintenance, the cost being considered as included in the price of other contract items.

Verification of Existing Features:

The locations and dimensions of existing roadway features shown on the plans are based on as-built plans, aerial photographs and field surveys. It shall be the contractor's responsibility to field-verify the information given on the plans wherever that information affects the new work. Significant differences between the measured and plan information shall be submitted to the Engineer prior to proceeding with the work. Minor adjustments to curb staking, catch basin locations, and other elements, to the extent they are required to match existing construction and do not affect disposition of other project features, will not require review or approval by the Engineer.

PM-10 Compliant Roadside Shoulders:

This work shall consist of the placement and rolling of a 2 inch section of asphalt millings obtained from this project in accordance with MAG Section 310. See Plans for locations. All shoulders shall be treated where curb and gutter is not being constructed. The location of these roadway shoulders is on the east side of 83rd Avenue from Las Palmaritas Drive to Butler Drive and on Butler Drive from 83rd Avenue to 79th Avenue. Payment will be made on a Square Yard basis under the item **AC Millings 2" Thick per MAG Section 310**.

As-Built Field Data Drawings:

The Contractor will be responsible for the surveying and the recording of as-build field data that is required in Section 7-3 of the City of Peoria Infrastructure Design Guidelines. Payment will be made on a Lump Sum basis under the item **Construction Staking and As-Built Surveying** in the bid schedule.

The Contractor shall keep a full size set of drawings on-site and continuously update them to reflect any and all field adjustments, changes, additions and deletions as they occur during the course of constructing the project. All changes to information shown on the original construction drawings shall be made by striking through the original information with a single line. As-built information shall be shown legibly using red pencil or red ink. All underground utilities shall be referenced to semi-permanent or permanent physical objects. The word "AS-BUILD FIELD DATA" with the as-built date shall appear in the lower right area of each sheet.

The “AS-BUILT FIELD DATA” redlines shall be made available for inspection by the City’s representative whenever requested during construction and shall be jointly inspected for accuracy and completeness by the Contractor, the City’s representative and consultant prior to each monthly pay application.

The Contractor shall deliver a complete and accurate set of preliminary final as-built field data drawings to the City within thirty (30) calendar days of the date of the City’s final acceptance of the work completed under this contract. Pending City review, if the City Inspector determines that the preliminary final as-builts contain errors and/or omissions the City Inspector will return the as-built to the Contractor for correction. The contractor shall make corrections and return the corrected as-builts to the City Inspector within 10 working days of receipt.

The City will not release any retention or make final contract payment to the Contractor until the Contractor’s as-built drawings have been accepted as accurate and complete by the City.

Multiple Bid Schedules

The work on this project has been divided into segments each with its own corresponding bid schedule. These multiple bid schedules have been established for the sole purpose of construction administration of the project by the City of Peoria, the Contractor and the Engineer. The contractor is required to submit all progress payments including constructed bid quantities in accordance with the established bid schedules and as further defined on the project plans. No additional payment will be made to the contractor for these construction administration efforts.

CITY AMENDMENTS TO MAG UNIFORM STANDARD SPECIFICATIONS AND DETAILS

SECTION 101 ABBREVIATIONS

101.2 DEFINITIONS AND TERMS :

This section is modified to add:

When the Contract indicates that work shall be "accepted, acceptable, approved, authorized, condemned, considered necessary, contemplated, deemed necessary, designates, determined, directed, disapproved, established, given, indicated, insufficient, interpreted, ordered, permitted, rejected, required, reserved, satisfactory, specified, sufficient, suitable, suspended, unacceptable, unsatisfactory," it shall be understood that these expressions are followed by the words "by the Owner".
Wherever the following abbreviations, terms or pronouns are used in these Specifications, Plans, or other Contract Documents, the intent and meaning shall be interpreted as follows:

Certified Invoice: An invoice from a supplier, which has been reliably endorsed by the Contractor guaranteeing that the material was purchased and received for the Project and establishes the value of the material.

CLSM: Controlled low strength material.

Completion Date: The date on which the contract work is specified to be completed.

Contract Item (Pay Item): A specifically described unit of work for which a price is provided in the Contract.

Contract Change Order: A written order issued to the Contractor by the Owner covering extra work, additions or alterations to the Plans and Specifications, and establishing the basis of payment and time adjustment for the work affected by the changes. The Contract Change Order is the only method authorized for changing the Contract.

Contract Time: The number of calendar days allowed for substantial completion of the Contract, including authorized time extensions. Where a calendar date of completion is specified, the Contract shall be completed on or before that date.

City or COP: City of Peoria.

Day: Unless otherwise defined shall mean "calendar" day.

Extra Work: Work not provided for the Contract as awarded but determined by the Owner to be essential to the satisfactory completion of the Contract within its intended scope.

Final Acceptance: The acknowledgment by the City that the Guaranty Period has expired and there are no outstanding items to be corrected under the provision of the guaranty.

Final Settlement Date: The date designated by the Owner in accordance with ARS 38-26-107, or as subsequently amended. Also defined as the date of “Initial Acceptance."

Gender And Number: References are made as if masculine in gender and singular in number unless neuter gender is appropriate in the context; however, the use of any gender shall be applicable to all genders and the use of singular number shall include the plural and conversely.

Good Repair: Good repair shall mean a condition free from any defect, functional or structural deterioration (except that from ordinary and reasonable use) which reduces the effectiveness or efficiency of the Work or improvement for the purpose intended, or any departure from the standards of original construction described in the Contract Documents.

Inspector: The Owner’s authorized representative assigned to make detailed inspections of contract performance.

MAG: Maricopa Association of Governments Uniform Standard Specifications and Details for Public Works Construction publication.

Materials: All components required for use in the construction of the Project.

May: Permissive

Method Of Measurement: The manner in which a “Pay Item” is measured to conform with the “Pay Unit”.

Notice To Proceed: Written notice to the Contractor to proceed with the contract work including, when applicable, the date of the beginning of contract time.

Owner: The City of Peoria or its designated representative. Also known as the Contracting Agency.

Proposal Guaranty: The security furnished with a proposal to guarantee that the bidder will enter into the Contract if the proposal is accepted.

Reference To Trade Contractors: When only a principal contract exists for all work covered by the Contract Documents, reference to trade Contractors in the Contract Documents shall not create any contractual relationship between the Owner and any trade Contractor with whom the principal Contractor may subcontract.

Salvageable Material: Material that can be saved or salvaged. Unless otherwise designated or directed by the Owner or shown on the Plans, all salvageable material shall become the property of the Contractor.

Samples: Samples and physical examples furnished or constructed by the Contractor to illustrate materials, equipment, workmanship or finishes, and to establish standards by which the Work will be judged.

"Shall" Implied: In the interest of conciseness, some sentences, statements, and clauses used in the Specifications exclude any form of the verb "shall" normally expressed in a verb phrase with verbs such as "furnish", "install", "provide", "perform" "construct", "erect", "comply" "apply", "submit", etc. But any such sentences, statements and clauses shall be interpreted to include the applicable form of the phrase "The Contractor shall" and the requirements described therein shall be interpreted as mandatory elements of the Contract.

Shall: Mandatory.

Shop Drawings: Shop Drawings, diagrams, illustrations, certificates, test reports, schedules, performances charts, brochures, shop layouts, fabrications layouts, assembly layouts, foundation layouts, wiring and piping layouts, specification and descriptive literature required by the Contractor Documents, which are prepared by the Contractor or any Subcontractor, manufacturer, supplier, or distributor, and which illustrate some portion of the Work.

Substantial Completion: When the work is sufficiently completed so it may be safely, conveniently, and beneficially utilized by the Owner for all of the purposes for which it was intended.

Superintendent: The Contractor's authorized representative in responsible charge of the work.

SECTION 105 CONTROL OF WORK

This section is modified to add:

105.2 PLANS AND SHOP DRAWINGS:

The Contractor shall submit shop drawings, product data and mix designs to the Engineer for review. This submittal shall be in an electronic .pdf format and shall include four hard copies. The shop and diagram drawings and schedules must show completely all the work to be done. Any error or omission in the construction work because of incomplete or erroneous shop drawings, diagram drawings and schedule shall be corrected by the Contractor at his own expense even though the work is in place. Unless specifically requested as an exception by the Contractor and approved by the Engineer in writing, the approval by the Engineer of any shop drawings, catalogs, schedule, sample, and related material is limited to the compliance with the Contract Drawings and Contract Specifications.

Such approval by the Engineer will not relieve the Contractor the responsibility of errors or failure to properly coordinate all elements of the Project affected by the submitted material. All submittals shall be clearly identified.

It is the responsibility of the Contractor to present all such submittals at least two (2) weeks in advance of his need for such approval and, in any event, the Engineer will entertain no request for a time extension to the Contract resulting from a delay by the Engineer in processing such submitted material unless the material is submitted in sufficient time to permit adequate review by the Engineer commensurate with the complexity of the specific submittal.

The following is a list that may not be all-inclusive of shop drawings, product data and mix designs that shall be submitted to the Engineer for review:

1) Concrete Mix Design for each classification
2) Asphalt Concrete Mix Design and Aggregate Materials Characteristics
3) Concrete Pipe (RGRCP)
4) Sleeves for irrigation services and future utility crossings
5) Protective Coatings
6) Manhole Frame and Cover
7) Survey Markers
8) Aggregate Base Course Material
9) Asphalt Concrete Mix Design
10) Decomposed Granite
11) Street Lights
12) Traffic Signal Equipment
13) Interconnect Conduit
14) Locating Tape
15) Striping and Signage
16) Pipe, Fittings and Restrained Joints
17) Polywrap
18) Valves
19) Fire Hydrants and Air/Vacuum Release Valves
20) Manholes, Frames and Covers
21) Imported Fill Material
22) Erosion Control Materials
23) Brick Pavers
24) Landscape Irrigation Materials
25) Steel Fencing
26) Quality Control and Material Testing Plan
27) Truncated Domes
28) Safety Plan
29) Construction Schedule

Material and equipment drawings, shop drawings, project data or samples transmitted by other than the Prime Contractor shall be returned to the Prime Contractor without action of any kind. Drawings will not be returned to Subcontractors. The cost of submitting shop drawings and submittals shall be in the cost of each of the contract bid items.

105.6 COOPERATION WITH UTILITIES:

The Contractor shall perform all requirements as prescribed in ARS 40-360.21 through 32. Contractor shall call BLUE STAKE CENTER for information relative to the location of buried utilities. The number to call is 602-263-1100.

The location of the underground and overhead utilities as shown on the Plans is based on the best available information obtained from utility companies and supplemented by surveying and potholing. The Contractor shall not assume that this represents an exact location of the line. No guarantee is made to the accuracy of the location shown on the Plans. The Contractor shall determine for himself the exact location of all utilities.

The Contractor is responsible for maintaining and supporting all utilities (not identified for relocation or removal) crossing the open trench for the length of the Project. All utilities crossing the open trench shall be protected to the satisfaction of the Utility Owner. Any damage to the existing utilities within the construction area shall be repaired by the Contractor to the satisfaction of the Utility Owner at no additional cost to the City.

Utility Companies:

Description	Representative	Phone
Arizona Public Service – Electrical	Ron Gandara	(602) 371-7546
Salt River Project – Electrical	George Herrera	(602) 236-8032
Salt River Project – Irrigation	Susana Ortega	(602) 236-5799
Qwest Communications	Ron Floyd	(602) 630-1392
Cox Communications	Benjamin Baich	(623) 328-3538
City of Peoria – Water & Sewer	Joe Kurrus	(623) 773-7753

Location of any underground water, sewer, CATV, electrical, or telephone lines shall be field verified by calling the **Blue Stake Center, Telephone: 800-782-5348**.

105.6.3 APS

APS has power poles and overhead lines on the west side of 83rd Avenue between Olive Avenue and Hatcher Road. APS will relocate these overhead lines to clear the proposed roadway improvements.

APS relocations are anticipated to be complete by completed prior to the start of this contract.

APS also has power poles and overhead lines on the south side of Butler Drive. These lines are not anticipated to be in conflict with the proposed improvements.

The Contractor shall install APS conduit and related work per the APS improvement plan sheets that are a part of the project plan set as listed below:

New Street Lights (APS Service Area)

To be provided and installed by the Contractor:

- All trench material and trench related work including, but not limited to; trenching, spoils removal, asphalt cutting, milling, boring, backfill material and compaction per APS Transmission and Distribution Construction Standards (T.A.D.C.S.) manual, section 8601. All surface restoration (i.e. landscaping, sidewalks, curbs, gutters, pavement, driveways, valley gutters, etc.) as it relates to work performed on this project by the Contractor.
- All conduit, conduit related material, and labor to install all associated conduit, including conduit sweeps, conduit caps, conduit plugs, primer, glue, conduit spacers, rebar, concrete encasement and mandrelling of the system.
- All street light related material, street light removal and work associated with the street lights including poles, mast arms, luminaires, flex conduit, and 10-amp in-line fuse in hand hole of street light pole.
- The Contractor is required to level all light fixtures prior to acceptance by City. Leveling may require steel plates/shims and longer fasteners and/or mounting hardware. All hardware shall be of equal strength, quality, color and finish equivalent to manufacturer's specifications for the street light. All leveling/mounting hardware shall be approved by the City prior to installation.
- All miscellaneous work including barricading, shoring, steel plating, and traffic control.
- Where duct banks are required: labor and 2-sack material for the concrete encasement of the duct bank, unless otherwise specified.
- Labor to install APS provided j-boxes and ground rods (or alternate grounding material).
- All conduits shown to be ending in energized APS equipment shall be stubbed 4 feet from either the equipment or the Blue Stake marking for underground

electric cables in the vicinity. The conduit is to be capped and marked for APS crews to connect to equipment.

- Labor to expose and attach to existing empty conduit. Re-routing of conduit presently in use shall be performed by the Contractor after the existing electrical cable has been removed by APS forces.
- Construction centerline staking, all vertical control and staking of depth requirements for all APS equipment and trenches. Trench alignment and depths shall be adjusted to provide a minimum of two feet vertical clearance from proposed conflicts, and one foot vertical clearance from existing conflicts. APS requires two feet horizontal clearance from all existing and proposed conflicts.

To be provided by APS and installed by the Contractor:

- Street light related materials – ground rods (or alternate grounding material), secondary j-boxes, pull line, plugs and electronic markers. The Contractor must schedule an appointment with the APS warehouse for material pickup (602-371-7758).

To be provided by and installed APS:

- Survey for horizontal control of APS related trenching and equipment.
- Conduit system inspection including trench work and conduit installation.
- All trench, bell holes, and backfill as required to splice APS cables from the point at which the Contractor ended to the APS equipment cabinet.
- Connections to the Contractor's conduit after the system has been mandrelled and accepted.
- All conduit and sweeps from the point at which the Contractor installed conduit ends to the existing energized electrical equipment.
- All secondary cable, primary cable, terminations, sweeps into energized transformers, mandrelling of conduit into energized equipment, and fuses in street light j-boxes.

Remove Street Light

Existing street lights which are intended to be removed and replaced shall remain in place and energized until such time as all new replacement street lights, conduits and equipment noted above have been installed by the contractor and APS has accepted the improvements, completed their portion of the work and are ready to complete the change over. The contractor is responsible for legally disposing of the existing street lights including bulbs and ballast transformers. Once the street light is removed, the hole shall be immediately backfilled with ½ sack CLSM slurry backfill up to 6 inches below finish grade. The Contractor is to coordinate the de-energizing and construction

sequencing for street light removal and change out with APS. Contractor shall provide APS 10 (ten) working days notice to properly schedule the de-energization of the existing street lights, and is to provide APS with a de-energizing letter identifying the affected street lights. Contractor to ensure the one sided lighting is maintained during construction.

105.6.3.1 Measurement and Payments

Measurement and payment shall be per the associated contract bid items and include all materials, equipment and labor necessary to perform all trenching, pad sub-base preparation, pull box and conduit installation.

Measurement and payment for the bid item **Remove Street Light** shall be lump sum shall include all materials, equipment and labor necessary to remove and dispose of the street light, foundation and any other appurtenances and includes all necessary coordination with APS.

For street light installation, no payment will be required for APS to provide the pull boxes to the contractor or for the installation of wiring and fuses.

105.6.4 SRP Power

SRP has power poles and overhead lines on the west side of 83rd Avenue between Las Palmaritas and Olive Avenue. These lines are not anticipated to be in conflict with the proposed improvements. There are several crossings of 83rd Avenue to the east from this facility. A couple of poles on the east side of 83rd Avenue will need to be relocated by SRP. This work will be done concurrent with the Project.

The Contractor shall install SRP conduit and related work per the SRP improvement plan sheets that are a part of the project plan set.

New Street Lights (SRP Service Area)

The Contractor shall be responsible for installing all street lights, poles, luminaries, sweeps, pull boxes, ground rods, conduits (including trenching and backfill) and foundations as shown on the plans and details. All of the materials shall be supplied by the Contractor as part of the bid schedule.

SRP will install all wiring and in-line fuses to energize the light once the underground conduit system has been placed and accepted by SRP.

The Contractor is required to level all light fixtures prior to acceptance by City. Leveling may require steel plates/shims, longer fasteners and/or mounting hardware. All hardware shall be of equal strength, quality, color and finish equivalent to manufacturers specs for the street light. All leveling/mounting hardware shall be approved by the City prior to installation.

105.6.4.1 Measurement and Payment

Measurement and payment shall be per the associated contract bid items and include all materials, equipment and labor necessary to perform all trenching, pad sub-base preparation, pull box and conduit installation.

105.6.5 SRP Irrigation

There is an 18" tailwater pipe on the east side of 83rd Avenue from Las Palmaritas Drive to Butler Drive. The Contractor shall remove the irrigation pipe and structure in the intersection of 83rd Avenue and Butler Drive and install new irrigation pipe to clear the northeast corner of the intersection.

There is a 54" irrigation line on the south side of Olive Avenue crossing 83rd Avenue, a 30" irrigation line on the east side of 83rd Avenue from Olive Avenue to Hatcher Road and a 24" irrigation line on the east side of 83rd Avenue from Hatcher Road to Mountain View Road.

There is a proposed 4 inch reclaimed water line in the intersection of 83rd Avenue and Olive Avenue that will cross the 54 inch and 30 inch irrigation lines. The City has applied for an SRP Construction License. The license can be found in Appendix A. The Contractor shall adhere to all requirements and provisions of the construction license.

There is an irrigation manhole on 83rd Avenue at the Hatcher Road alignment and at the northeast corner of the Olive Avenue Intersection that will need to be adjusted.

105.6.6 Qwest

There are multiple telephone conduits along the whole length of 83rd Avenue on the west side. Qwest will relocate conduits that are in conflict with the proposed catch basins between Las Palmaritas Drive and Olive Avenue. Qwest will also need to adjust a telephone manhole and relocate a couple of pedestals between Olive Avenue and Hatcher Road.

Qwest relocations are anticipated to be completed prior to the start of this contract.

105.6.7 Southwest Gas

There is a 2" – 4" gas line on the east side of 83rd Avenue from Las Palmaritas Drive to Olive Avenue that is not in conflict with the proposed improvements.

There is a 6" high-pressure gas line on the east side of 83rd Avenue from Olive Avenue to Mountain View Road. Southwest Gas will relocate a gas valve on the northeast corner of 83rd Avenue and Olive Avenue to clear the proposed curb and gutter.

There is a 2" gas line on the south side of the intersection of 83rd Avenue and Butler Drive. Southwest Gas will relocate a portion of this line that is in conflict with the proposed storm drain.

Southwest Gas relocations are anticipated to be complete prior to the start of this contract.

There is an abandoned 4" gas line on the west side of 83rd Avenue from Las Palmaritas Drive to Mountain View Road. This line parallels a proposed storm drain pipeline. Southwest Gas has confirmed that this abandoned line does not need to stay in place. However, this pipe may contain asbestos coating material. If during the trenching for the proposed storm drain the abandoned gas line is encountered and requires removal, the Contractor needs to contact Southwest Gas and they will have a crew come out and remove the fully exposed pipe and dispose of it properly at no cost to the Contractor. Contacts for Southwest Gas are: Keith Jones (Construction Supervisor) at (602) 763-9010 or Josh Heroux (Coordinator) at (602) 763-3642. There will be no additional payment or contract time extension given to the Contractor for coordination with SWG for fully exposing the existing gas line or for construction delays resulting from this pipeline removal process. Any additional cost to the Contractor for this work shall be considered incidental to the storm drain contract bid items.

Paving over existing natural gas pipelines can cause potential conflicts. Carefully evaluate every location of potential conflict by potholing and exposing the gas pipeline. Southwest Gas requires a minimum of thirty-six (36) inches from final grade. In addition, Southwest Gas system has regulator stations, pipeline valves, line locating stations, test points and underground vaults each with protective valves, line locating stations, test points and underground vaults each with protective valve box lids and vault manhole covers. These are designed to be flush with the existing ground. Under U.S. Department of Transportation's Pipeline Safety Regulations and Southwest Gas operating procedures, these facilities are required to be accessible at all times.

Southwest Gas will paint yellow all protective valve box lids and vault manhole covers. It will be the responsibility of the Contractor to make sure these are protected during construction. The Contractor will be responsible for adjustments to all valve box lids and vault manhole covers due to grading and paving per MAG Details 391-1 and 391-2. Contact Southwest Gas Construction at 43rd Avenue Operations 602-484-5350 for coordinating work and inspections. For emergencies, please call 602-271-GASS (4277)

Once mechanical trenching has begun, the Contractor shall not attempt to trench within two (2) feet of an active gas line or other structures such as manhole covers, valves, etc. This trenching shall be done by hand, at the marked locations, in order to prevent damage to the line. Care shall be taken to insure the small electrical tracer wire, which may be buried with the pipe, is not in any way damaged or broken.

In the event that the Contractor "hooks" or otherwise damages any Southwest Gas facility while excavating, the Contractor shall cease all operations and immediately contact Southwest Gas officials at 602-271-GASS (4277).

If it is discovered during excavation that the pipe coating is in need of repair, the Contractor will notify Southwest Gas so that the repairs can be made. This service shall be provided by the Utility Owner at no cost to the Contractor, Engineer or the Contracting Agency.

Protection and support (both temporary and permanent) for existing Southwest Gas facilities shall be performed in accordance with Section 601 of the MAG Uniform Standard Specifications except as modified herein.

(A) Any underground facility must maintain a minimum of 12 inches face-to-face clearance at the point of crossing.

(B) All trenches exceeding three (3) feet in width shall require that the gas line be supported in such a manner that in no way damages the existing pipe or its protective wrapping. The Contractor shall submit shop drawings to Southwest Gas (call 602-484-5306) in accordance with Section 105, Subsection 105.2 of the MAG Uniform Standard Specifications and as modified herein for all supports to be used on this Project.

Backfill and compaction around exposed Southwest Gas lines shall be performed in accordance with Section 601 of the MAG Uniform Standard Specifications except as modified herein.

(C) Before backfilling, six (6) inches of bedding and six (6) inches of shading with sand or material free of rocks and able to pass through a 3/8-inch sieve shall be installed along each exposed line. When backfilling, avoid dropping backfill directly on the exposed gas pipe.

(D) Extra care shall be taken when compacting backfill directly over a gas line to avoid any damage to the line.

105.6.8 Cox Communications

There are cable television conduits on the west side of 83rd Avenue between Las Palmaritas Drive and Olive Avenue that are not in conflict with the proposed improvements.

105.6.9 City of Peoria Traffic Signal Interconnect System

There are traffic signal interconnect conduits on the west side of 83rd Avenue between Olive Avenue and Mountain View Drive. The Contractor will need to adjust pull boxes to the final grade.

105.7 COOPERATION BETWEEN CONTRACTORS:

During the construction of this project, there may be construction occurring on the City of Peoria Community Park No. 2. This project is on the east side of 83rd Avenue between Butler Driver and Olive Avenue.

105.10 INSPECTION OF WORK:

Inspection services (Inspectors) will be provided by the City, APS, Cox, Qwest, and SRP.

Inspectors may be stationed on the work to report to the City Engineer or authorized representative as to the progress of the work, the manner in which it is being performed and also to report whenever it appears that material furnished and work performed by the Contractor fail to fulfill the requirements of the Specifications and Contract. The Inspector may direct the attention of the Contractor to such failure or infringement but such inspection shall not relieve the Contractor from any obligation as to furnish acceptable materials or to provide completed construction that is satisfactory in every particular.

In case of any dispute between the Inspector and the Contractor as to material furnished or the manner of performing the work, the Inspector shall have the authority to reject materials or suspend the work until the question and issue can be referred to and decided by the City Engineer or authorized representative. Inspectors are not authorized to revoke, alter, enlarge, relax or release requirements of these specifications, nor to issue instructions contrary to the Contract Drawings and Specifications. Inspectors shall in no case act as foremen or perform other duties for the Contractor or interfere with the management of the work by the Contractor.

Inspection by the City Engineer or authorized representative shall not be considered as direct control of the individual workman and his work. The direct control shall be the responsibility of the Contractor's foreman and superintendent.

The Contractor will be responsible for coordinating with the utility company inspectors for all the proposed conduits included with these contract documents including but not limited to trenching, bedding, shading, horizontal and vertical clearances with adjacent utilities, bedding and compaction.

The cost of all required inspection of work services is considered incidental to the unit bid price for each item included in the bid schedule.

SECTION 106 CONTROL OF MATERIALS

This sections is modified to add:

106.1 SOURCE OF MATERIALS AND QUALITY:

When requested by the Engineer or authorized representative, the Contractor shall submit a certificate executed by the manufacturer certifying that the materials or equipment to be incorporated in the work complies with the requirements of these Specifications. No additional measurement or payment will be made for this work, the cost will be considered as included in the cost of the contract items.

Acceptance of some materials such as ABC will be collected from samples taken on-site. Daily test reports must be delivered on-site and given to the Inspectors.

106.2 SAMPLES AND TESTING OF MATERIALS

In the first sentence of second paragraph, substitute The Contractor for the words ".. Contracting Agency…"

The Contractor shall furnish to the City on a weekly basis, written warranties and reports on the findings of all tests that are specifically required in the Specifications. Delivery of such warranties or test results shall not relieve the Contractor from any obligation assumed under any other provision in the contract. No additional measurement or payment will be made for this work, the cost will be considered as included in the cost of the contract items.

Measurement and Payment for Material Testing will be made on a Lump Sum basis under item **Quality Control and Material Testing** in the bid schedule and shall include all materials, equipment and labor necessary to provide all required sampling, testing and reporting.

Acceptance of materials shall be based upon testing conducted in compliance with the Materials Testing and Sampling Guide located on the City of Peoria website at www.peoriaaz.com/engineering/docs/sampleguideshortlist.pdf.

SECTION 107 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

This section is modified to add:

107.6.1 Contractor's Marshaling Yard:

The Contractor is responsible for securing any marshaling yards or staging area for this project. Any of these areas under consideration by the Contractor shall be pre-approved by the City.

107.6.4 Access for and Protection of Pedestrians:

At all times the contractor shall conduct their work to safeguard pedestrians within the vicinity of the project. Any holes or trenches left open overnight shall be protected with six-foot temporary chain link fence. If required or approved by the Engineer, the contractor shall provide Type II barricades and Type A flashing lights connected by warning tape, ribbon rope, a plywood covering or other protection over the holes. No measurement or direct payment will be made for work site protection (e.g., temporary chain link fence, plywood or other protection over holes, warning tape, Type II barricades, Type A flashing lights, ribbon rope, etc.). The cost is considered included incidental to associated contact items.

The contractor shall be responsible for restoring all staging areas for all construction phases to their existing conditions unless noted otherwise in the contract documents. Restoration of staging areas may include but shall not be limited to landscape irrigation, plants, ground cover (decomposed granite) and removal of temporary utilities. No

measurement or direct payment will be made for the restoration of staging areas and are considered incidental to associated contract items.

107.6.5 Protection of Adjacent Farm Land:

There is existing farm land on the west side of 83rd Avenue between Olive Avenue and Hatcher Road. Prior to any construction activity in this area, the Contractor shall secure this property from construction activities using temporary chain link fencing placed at the existing right-of-way line. The cost of this work shall be considered incidental to other contract bid items.

SECTION 108 COMMENCEMENT, PROSECUTION AND PROGRESS

This section is modified to add:

108.4 CONTRACTOR'S CONSTRUCTION SCHEDULE:

The Engineer will schedule and conduct a Preconstruction Conference with the Contractor's Project Manager and Superintendent within fourteen (14) days after notice of award to commence development of the required Project Schedule. At this meeting the requirements of this section, as they apply to the Contract, shall be reviewed with the Contractor. Representatives from all Utilities Companies will be invited to the Preconstruction Conference.

Seven (7) days after the Preconstruction conference the Contractor shall submit for City acceptance a complete construction schedule that also clearly depicts the sequence and interdependence of activities required to coordinate the construction of utilities under this contract.

The Engineer will review and make comments on the Project Schedule. However, comments made by the Engineer on the Project Schedule during review will not relieve the Contractor from compliance with the requirements of the Contract Documents. To the extent that there are any conflicts between the accepted schedule and the requirements of the Contract Documents, the Contract Documents shall govern.

At any time during the course of construction the Contractor shall revise and resubmit to the City an updated schedule for acceptance whenever any partial completion points listed in the schedule are delayed by one week or more. Such adjusted schedule will include a written explanation stating the reasons for the schedule change and a plan for getting back on schedule.

If requested by the Engineer at any time during the project, the Contractor shall provide a highly detailed, short-term schedule for specific crucial items (work-a rounds, coordination issues phasing / sequencing, etc.).

Contract work shall begin per the approved project schedule from receipt of the Notice to Proceed and shall be completed based upon the proposed construction schedule and the construction duration as outlined in the Notice to Proceed unless altered by Change Order.

108.5 LIMITATION OF OPERATIONS:

The Contractor shall be limited to the following construction work hours schedule unless an extended hours permit is applied for and approved as established by the City of Peoria Ordinance No. 98-04 and also according to section J-21 & J-22 of Chapter 1 of the City of Peoria Development Guide related to interference with traffic flow, construction hours and work hours within public rights of ways.

Construction Type	**April 2 - Sept 29**	**Sept 30 – April 1**
Concrete Work	5:00 a.m. to 7:00 p.m.	6:00 a.m. to 7:00 p.m.
Other Construction Work (within 500 feet of residential area	6:00 a.m. to 7:00 p.m.	7:00 a.m. to 7:00 p.m.
Other Construction Work (more than 500 feet of residential area	5:00 a.m. to 7:00 p.m.	5:00 a.m. to 7:00 p.m.

Concrete work shall be defined as forming and placement of new concrete only. Jack hammering and removal of concrete is not included.

SECTION 109 MEASUREMENTS AND PAYMENTS

109.10 PAYMENT FOR MOBILIZATION/DEMOBILIZATION

This section is modified to add:

The Contractor will be limited to requesting no more than 35% of the bid item amount on his first partial payment request. The second payment of not more than 60% of the bid item will be made when the total payments to the Contractor for the project pay items exclusive of payments for mobilization/demobilization equal greater than one-half of the initial contract amount exclusive of mobilization/demobilization. One hundred percent of the bid item will be paid on the final payment request.

SECTION 205 ROADWAY EXCAVATION

This section is modified to add:

205.1 DESCRIPTION:

Roadway Excavation shall include any required excavation of existing material as shown on the project plans. Excavation shall extend a minimum of 12 inches beyond the edge of pavement. Excavated material may be used for fill construction provided the material conforms with Section 211. Excavated material not suitable for fill construction, as defined by Section 205.2 and 211, shall be removed and legally disposed of.

Overexcavated native and surplus material located within the proposed roadway paving section shall be removed and backfilled with adequately moisture-conditioned and compacted suitable fill extending 12 inches or more below the bottom of the aggregate base layer. The new structural fill shall be placed in horizontal lifts approximately 9 inches maximum. in loose thickness and compacted by appropriate mechanical methods to 98 percent or more relative compaction in accordance with ASTM D 698-91 at a moisture content within two percent below and two percent above optimum.

The cost of overexcavating and disposal of unsuitable materials will be paid for as **Roadway Excavation**.

SECTION 225 WATERING

This section is modified to add:

225.2 WATER SUPPLY:

The City of Peoria has both potable water and reclaimed water available for use as construction water. The Contractor is encouraged to use reclaimed water if possible with the rate that is charged being substantially less than that of potable water. Arrangements for reclaimed water need to be made with the City Engineer's office a minimum of 14 days in advance.

The Contractor shall apply for a Hydrant Permit as the City of Peoria City Hall, and pay the required $1,000 deposit for any connections to City of Peoria owned fire hydrants for construction water. Within 96 hours following the application, the City of Peoria Meter Department will install the required hydrant meter and backflow prevention device. The Contractor shall be responsible for paying for all construction water utilized during construction. The City of Peoria will remove the existing hydrant meter and backflow prevention device upon completion of the project and/or directed by the Contractor.

The cost of providing construction water and a water supply shall be considered incidental to the project pay items for which the water will be used.

SECTION 301 SUBGRADE PREPARATION

This section is modified to add:

301.2 PREPARATION OF SUBGRADE:

In the roadway construction areas if pumping soils are encountered, these wetted soils shall be allowed to dry until they are workable or the settled areas can be removed and replaced with dried site soils.

The materials testing consultant shall carefully evaluate any areas of soft or wet soils prior to placement of grade-raise fill or other construction.

Any soils that are disturbed or over-excavated by the Contractor outside the limits of the roadway construction shall be replaced with suitable materials and compacted as specified below:

301.3 RELATIVE COMPACTION:

Material	Minimum Percent Compaction (ASTM D698 Max. Dry Density)
Subgrade below pavement areas	95%
AB material below pavement areas	100%
Backfill below pavement areas	95%
Subgrade under riprap and grouted riprap	95%
Subgrade under scuppers & concrete channels	95%
Subgrade under sidewalks	95%
Subgrade under decomposed granite	85%
Subgrade under Class II AB driveway paving	98%
AB driveway paving	100%

Moisture content of soil and base materials at the time of compaction shall be:

Material Type	Area of Use	Moisture Content
On Site	Pavement	2% below optimum or lower
Imported	Pavement	2% below optimum or lower
Base Material	Pavement	Optimum plus or minus 2%

301.6 PROTECTION OF EXISTING FACILITIES:

To reduce the potential damage to existing roadways due to high volume of heavy trucks carrying borrow or hauling other materials associated with the roadway construction, the Contractor shall limit the travel of heavy trucks carrying materials to the roads indicated on the **Truck Route Map** located on the City of Peoria website at: www.peoriaaz.gov/uploadedFiles/Peoriaaz/Departments/Engineering/Truck%20Routhe%20Brochure_2011_pgs1and2.pdf.

301.8 PAYMENT:

This section is replaced by the following:

No additional payment will be made for removal and replacement of wet or "soft" soils necessary to achieve the subgrade preparation requirements specified herein.

Payment will be made at the unit price bid per square yard under the item **Subgrade Preparation**, and such payment shall be compensation in full for the item complete in place, including stripping, scarifying, excavating, grading, hauling, filling, compacting, and disposing of excess or unsuitable materials, together with all costs incidental thereto.

Add the following section:

SECTION 316 CRACK SEALING

316.1 DESCRIPTION:

Crack Sealing shall consist of furnishing crack seal material and applying this material to cracks in asphalt concrete pavement, in accordance with these specifications.

316.2 MATERIALS:

316.2.1 Material Specifications:

The crack sealant material shall be a hot applied elastically polymer and rubber modified asphalt or rubber modified asphalt. The asphalt rubber sealant shall be a blend of asphalt cement, crumb rubber and/or virgin rubber, fillers, plasticizers, and/or polymers formulated for hot arid climates. The asphalt rubber modified compound shall:

(A) Be formulated to cure as it cools
(B) Sufficiently cure after a twenty-minute set time to resist pick up and tracking by vehicular traffic
(C) Not bleed or become tacky under traffic during summer temperatures.

The asphalt component shall be paving grade asphalt per MAG Section 711.

The supplied sealant material shall be formulated for using during hot climatic conditions and meet the following specifications:

PROPERTY	TEST METHOD	REQUIREMENT
Ductility @ 77°F, cm	ASTM D113	15 Min
Flash Point, Degrees F	ASTM D92	450 Min.
Softening Point, Degrees F	ASTM D36	200 Min.
Cone Penetration @ 77° F, dmm	ASTM D5329	25-40
Resilience, %	ASTM D5329	30 Min.
Bitumen Content, %	ASTM D4	60 Min.
Brookfield Viscosity @ 375° F, Poise	ASTM D2196	40-90
Asphalt Compatibility	ASTM D5329	Pass
Material Unit Weight @ 60° F, lbs/gal	ASTM D70	10 Max.
Pouring Consistency		Self-Leveling
Safe Heating Temperature, Degrees F		400
Recommended Pour Temperature, Degrees F		380

Additionally, the specific gravity of the crumb rubber shall be 1.15 +/- 0.02 and free from fabric wire, and other contaminating materials. The material shall contain a minimum of 18 percent crumb rubber by weight of asphaltic components. The material containing crumb rubber shall be reacted at the plant to provide a homogenous mix of components. A maximum of 4 percent calcium carbonate may be added to prevent particle clumping.

The crumb rubber shall comply with the following table:

SIEVE (see Note)	PERCENT PASSING
#8	100
#2-	98-100
#40	0-10

Note: The sieves shall comply with the requirements of AASHTO M-92

The Contractor shall not change the crack sealant material or supplier unless authorized by the Engineer.

The Contractor shall submit copies of all invoices for crack sealant material to the Engineer within 24 hours of material receipt.

316.2.2 Material Testing:

Crack sealant material will be sampled and tested for compliance. A box sample and a kettle/wand sample shall be obtained for testing at the beginning of the first day of production and for each new lot of material. Additional kettle/wand samples shall be taken and tested at a frequency of not less than one per each two week period. The complete lot will be rejected if the material fails to comply. No payment will be made for pavement area in which the rejected material was used.

316.3 CONSTRUCTION METHODS:

316.3.1 Equipment:

The Engineer must approve all equipment designated for use by the Contractor. The equipment shall comply with all applicable OSHA, industry and local government safety procedures, rules, and regulations. The Contractor must use safe and serviceable equipment capable of transporting required material and equipment to each job site.

316.3.1.1 Melter Applicator:

The melter applicator unit shall be capable of heating and applying without any further equipment modification, all grades of asphalt rubber sealant, specification joint sealant, and fiber modified sealant. The machine shall be capable of starting at ambient temperature and bringing the sealing material up to application temperature in one hour or less. All qualified bidders must have and maintain a complete inventory of repair parts as well as having experienced service personnel for this equipment. The tank shall be well insulated and equipped with suitable heating devices (burners and flues) to assure a uniform specified application viscosity and temperature. It shall have an internal mixing device to keep asphalt rubber from separating from the compound. It shall have a double boiler type jacket to create a reservoir, which shall hold a minimum capacity of 200 gallons at ambient temperature. The machine, heating chamber and wand shall be so designed and constructed that under day-to-day operation no clean-out procedure is required. Diesel fuel or any other cleaning materials detrimental to the crack sealant product shall not be used to clean melter applicator equipment.

316.3.2 Weather:

In no case shall sealant be placed during damp roadway conditions that exist such as wet roadway surfaces or damp material inside the cracks. Operations stopped by the Engineer, due to weather, shall be at no additional cost to the City.

316.3.3 Cleaning Cracks:

Immediately before applying the sealant, cracks shall be thoroughly cleaned of loose particles, grass, grass roots, weeds, dust, and other deleterious substances by means of high velocity compressed air or by other methods approved by the Engineer. Compressed air alone may not be sufficient to clean the cracks properly. Additional handwork may be required.

The compressor used shall be capable of a sustained pressure of 90 psi. The crack cleaning equipment shall be capable of cleaning cracks to a minimum depth of ½ inch. The equipment shall also be capable of dust containment by filtering particulate matter 10 micrometers or less in diameter with no dust clouds visible to the naked eye as determined by the Engineer (i.e. vacuum).

During the cleaning of cracks, the Contractor shall protect against damage to items such as, but not limited to, cars, people, driveways, walkways, landscape materials, etc. in the work area. During and after placement of the sealant, the Contractor shall protect against harm to persons or animals that may be exposed to the hot material.

316.3.4 Application:

The Contractor shall protect all utilities from damage. The Contractor shall immediately contact the appropriate utility company if damage should occur and shall be responsible for all claims for damage due to their operations.

All cracks which have an average clear opening ¼ inch or greater shall be sealed. All cracks with an average clear opening of ¼ inch or greater shall be routed using a mechanical router. All cracks which have an average clear opening of less than ¼ inch shall not be sealed or routed. Immediately prior to applying the sealant, the cracks shall be routed and thoroughly cleaned of loose particles, dust and other deleterious substances by means of high velocity compressed air or vacuum or by other methods approved by the City. All cracks to be sealed shall be cleaned to a depth from ½ to 1 inch. The maximum crack width to be sealed shall be 1-½ inches. All cracks that have an average clear opening greater than 1-½ inches shall not be sealed unless directed to do so by the Engineer.

The sealant shall be placed in a manner that will completely fill the crack and not form a lap of greater than 1 inch on each side after forcing material into the crack with a squeegee. Immediately after the application, a rubber squeegee, or other acceptable method, shall be sued to force the material into the crack, level the sealant with roadway surface, and form the lap.

The sealant shall be heated to the written manufacturer specifications, or as directed by the Engineer, before starting any crack sealant application. The sealant shall only be applied to clean dry cracks that have been approved by the Engineer.

316.3.5 Inspection:

Inspection will include, but not be limited to, the quality of workmanship, width of cracks filled, cleanliness of cracks, and lapping.

The Contractor, at no additional cost to the City, will correct unacceptable work. Unacceptable work shall include, but not be limited to, unsealed cracks, material wastage on the sides of the roadway, and such quantities of material on the roadway that driving is affected.

Correction of unacceptable workmanship shall be accomplished within five working days after notification from the Engineer of the unacceptable work. The Contractor shall not progress to a new area until the unacceptable work is corrected to the satisfaction of the Engineer.

The Contractor shall meet with the Engineer on a daily basis and supply a signed daily report indicating the amount of crack sealant material applied for the day in total pounds and total square yards. In addition, the Contractor shall supply the Engineer with the dates of completion for each segment of road.

316.4 PAYMENT:

Payment shall be made per Actual Cost Work per MAG Section 109.5 under the allowance item **Crack Sealing**. This price shall be full compensation for furnishing, preparation, and placing of this material, all labor, equipment, tools, and incidentals including taxes, necessary to complete the item. Also included as incidental items are cleaning of cracks, application of blotter material, and all costs associated with any construction water and clean up.

SECTION 321 ASPHALT CONCRETE PAVEMENT

This section is modified to add:

321.1 DESCRIPTION:

The pavement structural section is as shown on the plans. AC pavement mix shall be designed for high volume traffic loading. The AC material shall be laid down in thickness lifts as shown on the plans. Submit asphalt cement, aggregate materials testing data and mix design for approval by the Engineer. Pre-approved asphalt mix product codes can be obtained through the City of Peoria Engineering website. A tack coat shall be applied to all exposed existing pavement edges where new paving will match existing paving. All exposed existing pavement edges shall be thoroughly cleaned vertical face prior to applying tack coat and placement of new pavement.

321.2 MATERIALS AND MANUFACTURER:

Materials and manufacture shall conform to City of Phoenix standards for the asphalt mix design and Section 710 for the type of material specified. Pre-approved asphalt mix product codes can be obtained through the City of Peoria Engineering website.

321.8.4 Compaction Base and Surface Course:

The compacted thickness of asphalt concrete pavement layers placed shall be in accordance with the plans. Final paving course shall include a ¼" overlap of the adjacent lip of gutter where new pavement is being placed adjacent to concrete gutter pans unless the design is for sheet flow C & G then asphalt will be flush with lip of gutter. The contractor shall be responsible for providing positive (1% min.) cross flow drainage across new pavement once final paving course has been placed, unless directed otherwise by the Engineer.

321.12 MEASUREMENT:

Asphalt concrete pavement will be measured by the ton, computed to the nearest 0.10 ton for the mixture actually used as allowed above, which shall include the required quantities of mineral aggregates, filler material, asphalt cement and sand. Measurement shall include any tonnage used to construct intersections, roadways, streets, ¼" overlays of lip of gutter or other miscellaneous surfaces indicated on the plans or as directed by the Engineer. Weigh master's certificates in accordance with Section 109 will be provided.

321.13 PAYMENT:

The asphalt concrete measured as provided above will be paid for at the contract price per ton which price will be full compensation for the item complete as herein described and specified.

All thickened pavement edges as shown on the plans will be paid for at the unit price per Linear Foot under the bid item **Thickened Edge of Payment per MAG Detail 201 Type "A"** which price will be full compensation for the item complete as herein described and specified.

There will not be a separate payment made for tack coat and it shall be considered incidental to **AC Pavement** and **ARAC Terminal Blend Pavement** pay items in the bid schedule.

SECTION 325 ASPHALT-RUBBER CONCRETE OVERLAY, GAP GRADED (Bid Alternate A)

325.2 MATERIALS

This section is modified to add:

325.2.3 Mix Designs:

Replace the Asphalt Rubber Binder Content table with the following:

The percent of asphalt-rubber binder in the mix shall be between 8.2 and 8.6 percent.

325.4 CONSTRUCTION METHODS

325.4.2 Quality Control and Acceptance

This section is replaced by the following:

Production requirements for asphalt-rubber concrete shall be as specified in Section 321.9 Quality control and Section 321.10 Acceptance except the acceptable production range for asphalt-rubber binder shall not vary more than 0.4 percent from the mix design target value. The production tolerances and corrective actions will be enforced for asphalt-rubber concrete.

325.5 MEASUREMENT

Replace the third paragraph with the following:

Shoulder adjustment to match the new pavement surface elevation shall not be measured. The cost of grading and compaction for shoulder adjustment shall be included in the price paid for the Asphalt-Rubber Concrete or other related pay items. When the Engineer determines an insufficient amount of material is available for shoulder adjustment, the Engineer may require the Contractor to provide additional acceptable material. Engineer requested imported material for shoulder adjustment is not included in the price paid for the Asphalt-Rubber Concrete.

325.6 PAYMENT

This section is modified to add:

There will not be a separate payment made for tack coat and it shall be considered incidental to **AC Pavement** and **ARAC Terminal Blend Pavement** pay items in the bid schedule.

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

340.2 MATERIALS:

This section is modified to add:

Concrete shall be class B unless otherwise noted with the exception of concrete curbs, sidewalk and sidewalk ramps at or along each curb return which shall be class A concrete.

340.2.1 Detectable Warnings

This section is replaced by the following:

Detectable warnings shall be TekWay Dome-Tiles StrongGo, terra cotta in color. Ramp dome tiles shall be wet set into new concrete during installation in accordance with manufacturer's requirements. Thin set installation will not be allowed. Tiles shall be protected from debris and damage until final acceptance of improvements.

340.5 MEASUREMENT

This section is modified to add:

For the situation where a detectable warning mat is being installed into an existing sidewalk ramp, measurement and payment will be made at the unit price per **EACH** under the item **Detectable Warning Mat per City of Peoria Infrastructure Guidelines.** This payment will be full compensation for furnishing all labor, equipment and materials necessary including the sawcutting and removal of a portion of the existing concrete ramp and the installation of the detectable warning mat.

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

This section is modified to add:

345.1 DESCRIPTION

The Contractor shall remove and replace existing frames and covers as a part of water valve and sewer cleanout adjustments under the bid items **Adjust Water Valve to Grade per PE-270 and Adjust Sewer Cleanout to Grade per MAG 270**.

All valve and manhole adjustments per PE-270 and PE-271 shall also adhere to the requirements found in MAG Section 345.

345.2 ADJUSTING FRAMES

For the adjustment of cathodic protection test stations, the Contractor shall remove the existing concrete slab, adjust test boxes to finish grade and replace the concrete slab at the required grade. Test boxes shall be replaced if damaged during removal. The complete adjustment of all test boxes related to a cathodic protection test station will constitute a single adjustment under the bid item **Adjust Cathodic Protection Test Station**.

SECTION 350 REMOVAL OF EXISTING IMPROVEMENTS

Add the following section:

350.1.1 Removal of Concrete Pavement

Historically, there was a concrete pavement along the section line of 83rd Avenue. Records indicate that this pavement was approximately 22 feet wide and as much as 12 inches thick. In the stretch of 83rd Avenue between Las Palmaritas Drive and Hatcher Road, the City of Peoria does not know whether this pavement was removed before the current roadway was built. If any portion of this old pavement is encountered during the course of construction of this project, the pavement will need to be removed and disposed of properly. A Bid Allowance has been set up for this removal work if it is necessary**.**

Payment for removal of concrete pavement will be made per Actual Cost Work per MAG section109.5 under the Bid Allowance Remove Existing WPA PCCP which price shall be full compensation for all labor, equipment and material required for the removal, backfill and proper disposal.

SECTION 401 TRAFFIC CONTROL

This section is modified to add:

401.1 DESCRIPTION

Maintenance and protection of traffic shall conform to the applicable paragraphs of Section 401 of the MAG Specifications with revision, Section 13 of the City of Peoria General Terms and Conditions and these Special Conditions.

Local access shall be maintained to all properties on the project at all possible times. When local access cannot be maintained, the Contractor must notify the affected property owner at least 24 hours in advance and restore access as soon as possible.

Traffic Control Plans:

Construction shall not commence or proceed without a City of Peoria approved Traffic Control Plan (TCP). The Contractor shall submit traffic control plans for review along with the required application form to the City of Peoria Off-Site Inspection Department at (623-825-0325). The TCP shall show placement of all traffic control devices including all conflicting signs to be covered/removed or relocated, or other features that may conflict with the placement of temporary signage. This plan is to be professionally drawn on a 24 inch x 36 inch reproducible medium and shall be submitted to the Engineer at the pre-construction meeting. Copies of the application form and instructions for review submittals are available on the City of Peoria's website. The City of Peoria requires three (3) working days (72 hours) for review of all traffic control plans. If the TCP is denied, the City of Peoria will again require an additional three (3) working days (72 hours) for a re-review. Traffic/Pedestrian control shall comply with the latest editions to the MUTCD (Part 6), City of Phoenix Barricade Manual, MAG Section 401, City of Peoria Infrastructure Guide or any special conditions required by the City of Peoria. The contractor will be required to maintain minimum 11' wide traffic lanes during all construction activities unless otherwise directed by the Engineer. At the time of the pre-construction conference, the Contractor shall also submit for review preliminary traffic control plans for advance closure signing. The Contractor shall submit a preliminary traffic control plan at the pre-construction meeting outlining the anticipated traffic control, phasing and anticipated devices that will be used during construction. A final traffic control plan(s) shall be later submitted in accordance with this specification and shall include any review comments provided as a result of the pre-construction meeting. A copy of the accepted TCP shall be on-site at all times during construction and available for review by the City of Peoria.

If the project is constructed in multiple phases, a separate TCP shall be submitted and approved for each phase.

In order to eliminate the possibility of causing or exacerbating air quality violations resulting from construction activities, any traffic control plans which include temporary traffic detours involving adjacent streets or alternate routes must be approved by the Engineer.

Air Pollution:

In the event that the Governor declares an air pollution emergency, pursuant to ARS 49-465.B, which restricts work schedules for all employees of the state and its political subdivisions, the Engineer will direct the Contractor to suspend all work activities until further notice. The Contractor shall discontinue all current work activities as soon as possible, but not later than four hours after notification by the Engineer. The Contractor will be compensated for labor costs incurred through the end of the work shift in which the notification occurs. No payment adjustments will be made for equipment or overhead costs resulting from the suspension of work. An extension of the time allowable under the contract will be granted. In the event that any local air quality authority declares an air pollution advisory, the cooperation of the Contractor is requested in complying with the actions recommended by the local authority to the maximum extent possible.

401.2 TRAFFIC CONTROL DEVICES:

It shall be the Contractor's responsibility to provide, erect, and maintain and remove all necessary signs, barricades, temporary paved travel lanes, barriers, high level warning devices, light, delineators, flagmen and other devices necessary to properly mark and control the construction areas for the safe and efficient movement of traffic. Temporary traffic control warning signs and devices shall be installed prior to the start of any work. The Contractor shall provide other adequate devices or measures deemed necessary by the Engineer. The Contractor shall inspect the traffic control measures at the end of each work shift to ensure that all required traffic control devices are in place. The Contractor shall also remove any unnecessary traffic control devices and remove construction equipment from the roadway at the completion of each work shift to open the roadways to traffic to the maximum extent practicable.

All temporary traffic control devices shall be ballasted with sandbags or other approved ballast. Ropes, flagging, fencing and woven plastic tape may be required at open excavations and/or used between barricades and channeling devices to provide additional guidance and security.

The **"SPEED LIMIT 25"** sign is used where the existing pavement has been removed, on traffic lanes that are severely restricted or as directed by the Engineer.

The Contractor shall provide and maintain all necessary temporary traffic control devices as indicted on the City approved TCP. The City of Peoria will not allow devices that, in their judgment, fall into the "unacceptable" category. Should the City determine that the traffic control devices fall into the "unacceptable" category the contractor shall be immediately informed by the City and take necessary steps to bring the traffic control devices into compliance with the approved TCP. Failure of the contractor to take such action will result in the City issuing a Cease Work Order. The Contractor shall secure the work zone and remove all traffic control devices from the roadway immediately and the contractor could be subject to penalty per City of Peoria Code Section 23-8, Ordinance #01-181 Dangerous Construction Practices.

The Traffic control devices shall be set in place in accordance with the approved traffic control plan and maintained by a traffic control technician certified by a recognized organization such as ATTSA or IMSA or other organizations recognized by the City of Peoria .

The Contractor shall provide complete and accurate 24 hour emergency contact information to the City.

The Contractor shall designate an on-site employee during work hours who is ATSSA certified in construction traffic control to monitor and respond immediately to correct traffic control measures as necessary. This individual shall be authorized to receive and carry out requests from the Engineer. Requests and information given by the Engineer to this individual shall be considered as having been given to the Contractor.

Variable Message Boards:

The contractor shall install advance warning variable message boards along 83rd Avenue and Olive Avenue. Final locations shall be as determined by the Engineer. All message boards shall be in place a minimum of seven (7) days prior to the start of traffic control restrictions. The Contractor shall coordinate with the Engineer what message will be displayed on each board. Display message shall be limited to two pages of text.

401.3 FLAGMEN AND UNIFORMED OFFICERS:

Flagmen and uniformed officers shall consist of providing sufficient personnel and off-duty law enforcement officers as needed to expedite the safe passage of traffic.

City of Peoria uniformed off-duty law enforcement officers shall be provided when construction activities occur within 300 feet of a signalized intersection in accordance with the City of Peoria Engineering Development Guidelines. In the event that City of Peoria officers are not available, alternative arrangements shall be made by the Contractor to provide a replacement off-duty officer in accordance with these Specifications and as approved by the Engineer.

Requests for City of Peoria Police Officers must be received at least five (5) working days prior to when they will be needed. All work associated with providing and payment for Off-Duty Police Officers shall be in accordance with the City of Peoria Police Department Off-Duty Officers Guidelines. Contact Heather Cammarata at (623-773-7069) to obtain copies of these requirements (included below in “Off-Duty Officers Work Information”).

Requests for officers must be made by email **(offduty@peoriaaz.gov)**. An Off-Duty Request Form will then be provided to the Contractor. This form should be completed and submitted back to the City.

The Contractor or its insurance carrier must also submit a certificate of insurance indicating:

a) Liability Insurance
b) A statement (usually written in the “description of operations” box) as follows: Coverage is extended to the assigned officer(s) of the Peoria Police Department.

If a certificate of insurance prepared as indicated is not received prior to the event, the off duty officer(s) will be cancelled.

Officers shall be knowledgeable of city and state traffic control systems and their manual use. A key for the traffic control cabinet, along with any special instructions, shall be obtained from the City of Peoria.

Off-duty uniformed police officers are required at all major intersections when restrictions are present and may be required at additional locations and stages of the traffic control as requested by the Engineer.

All persons used as flaggers shall be properly trained and certified by a recognized source prior to their use on the project.

Allowable hours must be directed by the City. Partial payment requests must be supported by timesheets or invoices.

401.3.1 Off-Duty Officers Work Information:

Procedures:

1. Requests for an officer must be received at least five (5) working days prior to event.
2. Requests must be made by email to: offduty@peoriaaz.gov. A form will be provided to the vendor on request.
3. The vendor or its insurance carrier must submit a certificate of insurance that includes:
   a) Liability Insurance
   b) A statement (usually written in the "Description of Operations" box) that reads as follows: Coverage is extended to the assigned officer(s) of the Peoria Police Department. Without this statement, all certificates of insurance state that "no rights are conferred upon the certificate holder". Therefore this statement must be present.
4. For insurance purposes, once the officer intervenes to prevent or respond to a serious crime (felony), he/she is on the clock with the City of Peoria and is covered by the City's liability and worker's compensation coverage; vendor is only covering officers for job injuries sustained which do not meet the above specific criteria.
5. If a certificate of insurance prepared as indicated is not received prior to the event, the off-duty officer(s) will be cancelled.
6. If company is a NEW VENDOR for off-duty requests, New Vendor Documentation must be completed for tracking and billing purposes.

Payments:

1. The vendor must make suitable arrangements to pay the officer(s) directly for services rendered for single event coverage at the time of the event.
2. The current rate of pay is $30.00 per hour per officer with a three (3) hour minimum.
3. On assignments where more than three (3) officers are needed for the same time block, the fourth officer must be of supervisory rank and hired at the rate of $35.00 per hour.
4. The officers are considered contract employees therefore no taxes are withheld from the checks being issued. The City will provide appropriate IRS W-9 forms signed by each officer on request so that an IRS form 1099-R can be issued by the vendor at the end of the calendar year for all services rendered throughout the calendar year by that officer.
5. Cancellations must be received 24 hours prior to the event or the vendor must pay all assigned officers the 3 hour minimum fee.

Equipment:

1. Unless requested otherwise by the vendor and approved by the Chief of Police, the officer(s) will report to all off-duty assignments in full uniform, armed and with all equipment necessary for normal duty.
2. Specialized equipment and department vehicles are not provided when hiring off-duty officer(s).
3. Should a department vehicle be requested, it can be included at an additional fee of $10.00 per hour. The department vehicle would be invoiced by the City of Peoria.

Availability:

Generally, officers are available for assignments 24 hours a day, 7 days a week. The more notice that is provided, the more likely the assignment will be filled.

Special events, department needs, major incidents and other factors can affect the availability of officers for off-duty work. Some officers are subject to call-out and, if paged during an off-duty assignment, will need to leave that assignment and respond to the call-out. However, these situations are avoided whenever possible through the coordination of assignments and regular work load.

Documentation:

A. Samples of Certificates of Insurance
B. Off-Duty Job Request

401.5 GENERAL TRAFFIC REGULATIONS:

The Contractor shall maintain or relocate all warning signs, **STOP, YIELD** and street name signs. These signs shall be maintained erect, cleaned and in full view of the intended traffic at all times. Portable signs should be used to supplement blocked or removed signs. All unnecessary traffic signs shall be covered or removed and stored.

Access to all properties and emergency services shall be maintained at all times where possible. In no case shall the access be restricted for more than four hours without Engineer approval. The Contractor shall give 48 hours notification to the affected responsible person concerning all restrictions. If prolonged access restriction is required by construction, the Contractor and/or Engineer shall notify the property owner/resident before closing the road or driveway. The Contractor shall also notify emergency services, fire department, police department and the local school district.

Construction Schedule:

In addition to the schedule requirements contained in Subsection 108.4 “Commencement, Prosecution and Progress” of the Standard Specifications and as modified in these Special Conditions, the Contractor shall provide separate construction progress schedules for each individual construction activity and the required traffic

control for those activities. The schedule shall specify the limits of the work activities and related traffic control plan by station or milepost, by day and by time of day.

The schedule and the related traffic control shall be developed in such ways that access or alternative access is maintained at all times to all adjacent residences and businesses. The schedule should be developed in such a manner that it can be released to the public. The schedule shall be updated as necessary.

Traffic Restrictions:

The traffic-carrying capacity of the roadways and structures within the limits of the project shall not be reduced without the approval of the Engineer. Restrictions will not be permitted during recognized holidays. If special events will be occurring during construction for the City of Peoria or the Peoria Unified School District, the Contractor will be notified two weeks in advance by the Engineer to make adjustments to traffic control to accommodate event traffic.

The recognized holidays for the calendar year 2011 & 2012 are:

Labor Day	Monday, September 5, 2011
Veterans Day	Friday, November 11, 2011
Thanksgiving Day	Thursday, November 24, 2011
Day After Thanksgiving	Friday, November 25, 2011
Christmas Day	Monday, December 26, 2011
New Year's Day	Monday, January 2, 2012
Martin Luther King Jr.	Monday, January 16, 2012
President's Day	Monday, February 20, 2012
Memorial Day	Monday, May 28, 2012
Independence Day	Wednesday, July 4, 2012
Labor Day	Monday, September 3, 2012
Veterans Day	Monday, November 12, 2012
Thanksgiving Day	Thursday, November 22, 2012
Day After Thanksgiving	Friday, November 23, 2012
Christmas Day	Tuesday, December 25, 2012

Traffic restrictions within public rights of way are subject to Chapter 1, Section J-21 "Work Hours in Public Rights of Way" of the City of Peoria Infrastructure Guidelines requirements.

Access Requirements and Notification to Property Owners and Business Operators:

Access shall be maintained to adjacent businesses at all times during their hours of operation. Access may be maintained by such measures as constructing driveways in half sections, or by providing bridging over new concrete. Properties having more than one point of access shall not have more than one access restricted for more than 14 calendar days at any given time. Access to adjacent driveways shall be provided during all non-working hours. All business restrictions shall be coordinated with the affected business in writing at least one week prior to imposing restrictions.

Pedestrians:

The Contractor shall maintain safe and passable walkways on at least one side of the roadway at all times. The Contractor shall ensure that all sidewalks on this project remain open and safely usable at all times. Backfilling or ramping to existing sidewalks or providing alternate sidewalk areas adjacent to existing sidewalks may be used. In high pedestrian use areas, the Engineer may request temporary hard-surface walkways such as plywood sheets or temporary asphalt to be installed and removed at no additional cost.

The Contractor must provide and maintain clean, safe and adequate pedestrian walkways and sidewalks that are free of mud, dust, debris and equipment. They must also maintain access to all transit facilities and bus stops by providing temporary BUS STOP signs as needed (if any).

Schools:

The Contractor shall maintain adequate signing, safe pedestrian access, school traffic access and school bus access to all schools within the vicinity of the project during all hours the schools are in use. The Contractor shall coordinate all roadway and walkway restrictions with the schools in writing at least one week in advance of instituting the restriction.

Special Sign Requirements:

The Contractor shall provide, erect and maintain advance notification, informational and directional access signs (for businesses, churches, hospitals, etc.) that may be required by the Engineer.

401.6 MEASUREMENT:

Measurement for payment of the uniformed off-duty law enforcement officer will be the actual number of man-hours used. As part of the payment request for Off-Duty Police Officer, the Contractor shall provide the Engineer with copies of all request forms and invoices as backup information showing the actual cost incurred.

Measurement of all remaining traffic control work, as described herein and as required for the Project, will be measured on a lump sum basis.

401.7 PAYMENT:

Payment for traffic shall be made at the contract unit price, lump sum, under the item **Traffic Control** in the Bid Schedule. Price shall be full compensation for the work, including labor, materials, traffic control devices, and miscellaneous incidentals necessary to complete the work. This includes flagging services.

Payment for uniformed off-duty law enforcement office will be based on the contractors actual hourly rate paid and the actual number of hours used. An **Off-Duty Police Officer** allowance has been set up in the Bid Schedule to pay for this item.

Add the following section:

SECTION 403 SIGNING

403.1 DESCRIPTION OF WORK:

The work under this section shall consist of furnishing and installing all roadside signs, sign supports, support foundations and object markers as indicated on the plans and constructed in accordance with Section 607, 608 and 703 of the Arizona Department of Transportation Standard Specifications for Road and Bridge Construction 1990 revisions and stored special provisions.

All abandoned signs and jersey barriers shall be removed and delivered to the City of Peoria Municipal Operation Center (MOC) yard located at 8850 N. 79th Avenue just south of Olive Avenue.

Removal of Traffic Control Signs:

The contractor shall coordinate the removal of existing traffic control signs as designated on the construction plans with the Public Works Department. Please contact the Traffic Maintenance Supervisor at 623-773-7432 a minimum of 24 hours in advance**.**

Installation of Traffic Control Signs:

The contractor shall install traffic control signs prior to or simultaneously with the striping of the roadway or intersection. The roadway or intersection shall not be open to traffic until such time as the striping and signage is complete.

403.2 MEASUREMENT AND PAYMENT:

Measurement and payment will be made per the associated contract bid items and shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals as indicated in the plans and as specified herein.

No separate payment shall be made for delivering the abandoned signs and jersey barriers to the MOC.

SECTION 421 STEEL FENCING

421.1 DESCRIPTION:

The work under this section shall consist of fabrication, transportation, installation and finishing including all materials, labor and equipment to install and construct metal fencing as included as bid item Steel Crosswalk Fencing in the bid schedule and in accordance with the plans and specifications.

421.2 MATERIALS:

Metal fence shall be constructed of steel tubing, powder coated, with a minimum tensile strength of 45,000 psi. Steel crosswalk fence shall be equivalent in style and quality to Boundary Fence and Railing Systems, Inc., Plebian Style. Equivalents include: Ameristar – Aegis plus Genesis 3-rail style, and Jerith Products – 100 Series 101 style fence with no picket option. Fence color shall be black as approved by the Engineer. Contractor shall submit detailed shop drawings and material submittals for approval by the Engineer prior to construction.

421.3 POWDER COATING:

Powder coating for the fence shall be a thermoset electrostatic spray powder coat process with a Polyester TGIC powder as described by the Powder Coating Institute (www.powdercoating.org).

The powder coat shall be applied prior to assembly in the field. As described by the Powder Coating Institute, thermoset powder coatings are applied and then cured in an oven at a certain temperature and for a certain period of time to achieve a chemical crosslink between the coating and the part.

Powder coating film thickness shall be between 3 and 5 mils/75-100 microns in accordance with the Powder Coating Institute. The color shall be gloss black as approved by the Engineer.

421.4 PAYMENT:

Payment for steel crosswalk fence shall be per lineal foot complete and in place as described and specified herein and as shown on the project plans including materials, footings, anchors, fabrication and powder coated finish.

SECTION 450 PAVEMENT MARKING

Section 450, as included in these Special Provisions, is currently not included in the MAG Specifications and is therefore considered by the City of Peoria (City) as an added specification required solely for the purpose of constructing pavement markings within the City. The City requires all pavement markings to be constructed in accordance with the latest edition of the Arizona Department of Transportation (ADOT) standard specification and details unless otherwise noted in these special provisions. Any references to ADOT standard specifications are noted and include any required modifications and revisions as required by the City.

These sections are the City of Peoria's amendments or additions to the ADOT and MAG Standard Specifications.

450.1 DESCRIPTION OF WORK:

Installation of roadway pavement markings in the City of Peoria shall be performed in accordance with the requirements of the latest editions of the Manual on Uniform Traffic Control Devices for Streets and Highways, Arizona Supplement to MUTCD, the Arizona Department of Transportation Standard Specifications for Road and Bridge Construction, Arizona Department of Transportation Signing and Marking Standard Drawings, City of Peoria Supplement to MAG Uniform Standard Details and these project plans and specifications.

The Contractor shall furnish labor, materials, tools, transportation and supplies required to complete the work in accordance with the plans, project construction specifications and these pavement-marking specifications. The work under this section shall consist of:

A. Cleaning and preparing the final surface course and the pavement marking layout
B. Applying temporary paint, permanent paint, or thermoplastic striping in accordance with the plans & specifications
C. Installing raised pavement markers in accordance with the plans & specifications

450.2 CONTROL OF WORK:

No pavement markings shall be applied to the project by the Contractor until field inspection of the striping layout is completed and approved by the Engineer. Any pavement markings placed prior to inspection and approval of the Engineer is subject to removal and reinstallation at the Contractor's expense.

In the event conflicts exist between actual field conditions and striping plans, Contractor shall notify the Engineer immediately.

Contractor shall maintain appropriate traffic control during the work and shall comply with the City of Peoria's Code Section 23-8, Barricade Ordinance #01-181 and these special conditions.

450.3 COORDINATION AND SEQUENCE OF WORK:

450.3.1 Striping Limits:

Contractor shall verify the striping limits of the project with the Engineer before beginning work. Striping limits may exceed the construction project limits to match existing striping as determined by the Engineer.

450.3.2 Removal of Existing Markings:

Removal of existing pavement markings shall be completed prior to the layout and marking activity and shall be performed in accordance with Section 460 of these specifications. Pavement markings shall not be removed until proper traffic control has been installed as directed by the Engineer and City inspector. Any conflicting signs or striping shall be removed prior to pavement marking removal.

450.4 MATERIALS:

The paint shall not bleed, curl or discolor when being applied to the roadway surface. If bleeding, curling or discoloration occurs, the unsatisfactory areas shall be corrected by the contractor to the satisfaction of the Engineer at no additional cost to the City and given additional coat(s) of paint to correct the problem. In the event that the additional coat(s) are not sufficient, the Engineer will determine what method of correction may be used. Such corrections will be at Contractor's expense.

450.4.1 Temporary or Permanent Traffic Paint:

All pavement marking paint, temporary or permanent, shall conform to Section 708 of the latest edition of the ADOT Standard Specifications for Road and Bridge Construction and these special conditions.

All white and/or yellow temporary and permanent paint shall have a minimum 15 mils WFT (wet film thickness).

450.4.2 Thermoplastic Paint:

Thermoplastic paint shall conform to Section 704 of the latest edition of the ADOT Standard Specifications for Road and Bridge Construction.

All longitudinal lane lines for arterial roadways shall be 60 mil hot sprayed, alkyd extruded thermoplastic paint.

All longitudinal lane lines for local roadways shall be permanent paint in accordance with these specifications.

All legends, symbols, crosswalks, stop bars, railroad crossing pavement markings, cross hatching, transverse elements and chevrons shall be 90 mil hot sprayed alkyd, extruded thermoplastic paint.

450.4.3 Preformed Thermoplastic Pavement Marking Tape:

Subject to approval by the Engineer, minimum 90 mil preformed thermoplastic tape may be used for all crosswalks, stop bars, legends and symbols. Preformed thermoplastic tape may be either hot or cold applied thermoplastic preformed tape. Contractor shall submit material samples to the City of Peoria for approval prior to installation. Installation shall be in accordance with Section 450.5.5.3 of these special provisions.

450.4.4 Raised Pavement Markers:

Shall conform to Section 706, of the latest edition of the ADOT Standard Specifications for Road and Bridge Construction and City of Peoria Standard Details PE- 011.

450.5 CONSTRUCTION REQUIREMENTS:

450.5.1 Methods and Equipment:

The methods and equipment used for this work shall be according to Section 704, 705, 706, 707, and 708 of the latest edition of the ADOT Standard Specifications for Road and Bridge Construction, City of Peoria Standard Details and these special conditions.

450.5.2 Cleaning and Preparing the Pavement Surface:

Before applying any paint or thermoplastic to the roadway surface, the surface shall be free of dirt, grease, oils, acids, laitance or other foreign matter that would reduce the bond between the pavement marking and the road.

Area that cannot otherwise be satisfactorily cleaned shall be scrubbed with a biodegradable chemical called Citrus Solv Plus or approved equal.

After a thorough cleaning, the surface shall be rinsed with water and completely dried before applying any paint, thermoplastic, or raised pavement markers. The roadway surface shall be dry and the air and pavement surface temperature shall not be less than 50° F and shall be rising for placement of temporary, permanent paint and thermoplastic striping.

450.5.3 Field Layout and Marking:

The Contractor shall coordinate with the City of Peoria Traffic Engineering Division Inspector three working days (72 hrs) in advance of any pavement marking to obtain preliminary striping layout approval prior to placement of any pavement markings. This includes any temporary pavement markings required prior to placement of thermoplastic striping. Contact the City of Peoria Traffic Engineering Technician at Phone (623) 773-7536 to schedule for striping layout approval.

The preliminary striping layout shall only be completed after all pavement marking Inspectors have been contacted, coordinated with, and are on site to review and approve the preliminary striping layout. The striping contractor shall make all necessary field adjustments that will be required by each of the Inspectors.

Any pavement marking completed prior to the City's inspection shall be removed if it is not consistent with the requirements included in these special provisions and the project plans. The cost of the removal shall be paid for by the Contractor and not the City of Peoria.

The Contractor shall establish a string line or other method when laying out the striping in the field and shall properly spot mark all pavement markings.

All new longitudinal lane lines exceeding 200 feet in length shall be spot marked at 25 foot intervals all longitudinal lane lines less than 200 feet in length shall be spot marked at 10 foot intervals. Spot marking must include any angle points, interval changes and begin/end taper points.

Final striping shall not occur until preliminary striping layout approval has been completed by the Inspector. The City Traffic Engineering Inspector requires that if he/she is required to return to the site to approve the final preliminary striping layout, the Inspector will return to the site at their earliest convenience. The Contractor is responsible for paying all construction costs needed to complete the pavement marking approval process, including restriping, striping obliteration and mobilization/remobilization costs. The cost of the approval process shall be considered incidental to the pavement marking bid item.

All signing and marking work shall be completed at the same time. All new signs shall be installed prior to or concurrently with the striping work. Any conflicting new traffic sign installed prior to striping work shall be covered so they cannot be read. In addition any existing signs that will be in conflict with the new striping shall be removed or covered prior to the completion of the striping work. The Contractor shall coordinate with the City Traffic Engineering Inspector prior to removing/covering any new or existing signs.

Upon completion, the Contractor shall notify the Engineer that the project is ready for final inspection. The Inspector will inspect the project and either accept the work or identify unsatisfactory work within three (3) working days.

The completed roadway shall not be open to public travel, with exception to approved traffic control, until after all striping and signing has been completed unless the Contractor has prior approval by the City of Peoria Inspectors.

450.5.4 Tolerances:

New pavement striping shall not vary more than one-half inch (1/2") in 50 feet from the specified striping design. The longitudinal deviation of pavement marking segment and gap shall not vary more than 6 inches in a 40 foot cycle.

450.5.5.1 Pavement Markings:

All crosswalks, stop bars, turn arrows, legends, symbols, cross hatching and chevrons shall be applied with thermoplastic paint in accordance with Section 450.4.2 of these specifications. All permanent paint markings shall be a double application of water based traffic paint. Median noses shall be painted in accordance with City of Peoria Standard Detail PE-018. The Contractor shall submit paint materials specifications and manufacturer's data sheets for approval by the Engineer prior to use in accordance with Section 105 of these special provisions.

All measurements as shown on the plans for parallel lines shall be taken from center of stripe to center of stripe or center of stripe to face of curb.

450.5.5.2 Thermoplastic Paint:

Contractor shall apply temporary pavement marking paint in accordance with these contract documents prior to placing any thermoplastic striping.

The final thermoplastic striping shall be installed 30 to 60 calendar days after the application of the temporary pavement marking or as directed by the Engineer.

Thermoplastic material shall be in accordance with Section 450.4.2

450.5.5.3 Preformed Pavement Marking Tape:

Preformed Pavement Marking Tape shall be installed in accordance with manufacturer's recommendations.

450.5.5.4 Crosswalks and Stop Bars:

All crosswalks and stop bars shall be constructed in accordance with City of Peoria Detail PE-014. Measurement for crosswalk lines shall be from inside the line to inside the line, not center to center.

All railroad crossing stop bars shall be twenty four inches (24") wide, in accordance with the latest edition of the Manual on Uniform Traffic Control Devices for Streets and Highways.

450.5.5.5 Arrows and Bike Symbols:

Arrows & bike symbols shall be constructed in accordance to City of Peoria Standard Detail PE-013. With prior approval of the Engineer, 90 mil cold tape in accordance with

Section 450.4.2 may be substituted for thermoplastic paint when applying arrow and bike symbols.

450.5.5.6 Raised Pavement Markers:

Raised pavement markers shall be installed as shown on the plans in accordance with Section 706, of the latest edition of the ADOT Standard Specifications for Road and Bridge Construction and City of Peoria Standard Detail PE-011.

450.5.5.7 Median Noses:

Median island end (median noses) treatment shall be constructed in accordance with City of Peoria Standard Detail PE-018. Median noses shall be painted yellow or white in accordance with the plans with permanent paint.

450.5.6 Inspection of Work:

The City will conduct two field inspections of the signage and pavement markings. The first inspection shall be made during the preliminary layout. The second inspection shall be made after all markings have been installed.

Inspection and approval of spot markings shall not relieve the Contractor from the obligation of obtaining a final inspection.

If it is decided by the Engineer that more than two (2) coats of paint are required it will be done at the expense of the Contractor. If the paint has to be applied in more than two (2) coats, each previous coat shall be thoroughly dry before each new coat is applied.

450.6 MEASUREMENT AND PAYMENT:

Measurement and payment will be made per the associated contract bid items and shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals as indicated in the plans and as specified herein.

Add the following section:

SECTION 460 PAVEMENT MARKING REMOVAL

460.1 STANDARD SPECIFICATIONS:

Removal of roadway pavement markings shall be done according to the requirements of the latest editions Manual on Uniform Traffic Control Devices for Streets and Highways, and the Arizona Department of Transportation Standard Specification for Road and Bridge Construction, 2008 and revision thereto.

460.2 DESCRIPTION OR WORK:

The Contractor shall furnish experienced supervision and labor, and all materials, equipment, tools, and transportation and supplies required to complete the work according to the plans, standard specifications and these construction specifications. The removed raised pavement markers, delineators and object markers shall become the property of the Contractor.

The work under this section shall consist of the removal of all conflicting pavement markings and associated traffic control devices including:

(A) Removal of Traffic Paint
(B) Removal of Thermoplastic Painted Markings
(C) Removal of Preformed Pavement Marking Tape Markings
(D) Any other traffic control devices deemed necessary by the Engineer for public safety
(E) Cleaning and preparing the pavement surface according to Section 450 for installation of new pavement markings
(F) Repair of any excess damages to the existing asphalt caused by striping obliteration

460.3 CONTROL OF WORK:

Contractor shall determine the type of pavement markings currently in existence and the appropriate removal methods specified in this Section.

Existing traffic pavement markings shall not be painted over with slurry seal, asphalt emulsions, black paint or stain of any kind unless otherwise directed by the Engineer in accordance with these specifications.

Any damage caused to the surface of the road by pavement marking removal shall be repaired by the Contractor at Contractor's expense in accordance with these specifications. The method of repair shall be approved by the Engineer before the work begins.

460.4 COORDINATION AND SEQUENCE WORK:

460.4.1 Extent of Removal:

The Contractor shall be responsible for verifying the striping removal limits of the project before commencement of the work. The striping removal limits may exceed the construction project limits, or new striping limits in order to match existing striping.

Existing pavement markings shall be removed to the fullest extent possible from the pavement by one of the methods identified in this Section unless another method is approved by the Engineer.

460.4.2 Preparation of Pavement for Installation of Markings:

Removal of existing pavement markings shall be completed prior to layout and marking of new pavement markings.

460.5 METHODS OF REMOVAL:

460.5.1 Traffic Paint Markings:

All pavement marking removals shall be completed by water blasting method. As directed by the Engineer, the contractor will be required to repair any excess damages to the asphalt caused by striping obliteration. The contractor shall repair all damaged asphalt using micro seal coat (asphalt emulsion slurry seal coat) in accordance with the project plans and these special provisions.

460.6 MEASUREMENT AND PAYMENT:

Measurement and payment for the removal of pavement markings will be made on a lump sum basis under the item **Obliterate Existing Striping** in the bid schedule and shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals as indicated in the plans and as specified herein. Any excess damage to the existing pavement will be repaired by the Contractor, as directed by the Engineer, and is included in this lump sum bid item.

Add the following section:

SECTION 601 TRENCH EXCAVATION, BACKFILLING AND COMPACTION

601.8 PROVIDING MAGNETIC DETECTION FOR UNDERGROUND FACILITIES:

601.8.1 General:

Traffic Signals Interconnect Conduits & Empty Conduit Sleeves:

Tracer wire shall be installed according to City of Peoria Standard Detail PE-033.

Drainage:

All new underground utility facilities, including service connections, placed within City of Peoria Right-of-Way by the Contractor must be magnetically detectable with standard locating instruments such as a Metrotech Model 810 or approved equal. The Contractor shall place continuous detectable tracer wire with all those underground utility facilities that lack a continuous and integral metallic component capable of detection by standard locating instruments.

Tracer wire will be required where the metallic component is encased within the pipe such as reinforced concrete pipe (RGRCP).

The Contractor shall also provide access points for all the facilities that will receive tracer wire.

(A) Materials:

Tracer wire shall be a minimum 12 American Wire Gauge (AWG) solid copper. Tracer wire shall be coated with a minimum 30 mil polyethylene jacket designed specifically for buried use. Tracer wire shall conform to the specifications of the NEC, UL and other applicable industry standards. Splices as required to promote continuity shall utilize sealed water tight connections.

(B) Construction Requirements:

The Contractor shall install tracer wire along the top of the entire length of the underground facilities. The tracer wire shall be attached to the facility at minimum intervals of not more than 20 feet and shall be secured in such a manner that the wire remains firmly attached throughout the construction period.

Tracer wire shall be made accessible along the facility through appropriate manholes, catch basins, structures or other means as approved by the Engineer. For storm sewer pipe, tracer wire shall be constructed into the manhole at the pipe entry point, secured to the inside wall along the full length and be accessible from above upon removal of the manhole cover.

Tracer wire installed for each segment of underground utility shall be terminated at each access point with the catch basin, manhole and head walls as directed by the Engineer. The Contractor shall make no connections or splices of tracer wire between manholes.

601.8.2 Testing:

The Contractor shall test all installed tracer wire and all those facilities determined to be magnetically detectable without tracer wire with standard locating instruments to verify conductivity both before and after backfilling and provide the results to the Engineer. The Contractor shall install new tracer wire for those newly installed utilities that fail to be detectable at no additional cost to the City. Tracer wires that fail to test properly shall also be replaced at no additional cost to the City.

For all other underground facilities, should the magnetic characteristics be unknown, the Contractor shall perform sufficient tests with standard locating instruments to determine whether tracer wire will be necessary and provide the results to the Engineer. Such tests shall be performed prior to construction.

601.8.3 Measurement and Payment:

No measurement or direct payment will be made for furnishing and installing tracer wires and access boxes or for testing the installed wires or facilities. Such costs shall be considered as included in the cost of contract items.

SECTION 610 WATERLINE CONSTRUCTION

610.15 TESTING:

This section is modified to add:

Testing shall also be in accordance with Chapter 5 of the City of Peoria Infrastructure Guidelines.

Add the following section:

SECTION 612 WATER LINE ABANDONMENT

612.1 DESCRIPTION:

The abandonment of a water line shall include the cut and plug of the water line section to be abandoned and the filling of the abandoned line with grout. Also included shall be the removal and backfilling of any valve boxes on the abandoned line. The abandonment shall not take place until the new water lines, fire hydrants and water service are installed and

operational. The cut and plug shall be installed per City of Phoenix detail P1343. The abandoned line shall be pumped full of CLSM with the exact mix design suitable for pumping to be submitted to the Engineer for approval. Contractor will need to demonstrate to the satisfaction of the Inspector that full grouting of the pipe was accomplished.

612.2 MEASUREMENT AND PAYMENT:

Measurement and payment will be at the unit price bid per linear foot of abandoned water line under the item **Abandon in Place Existing Waterline** in the Bid Schedule. Such payment will be compensation in full for all excavation draining, cutting and installation of plugs, filling with grout, removal and backfilling of valve boxes, backfilling and pavement replacement.

SECTION 615 SEWER LINE CONSTRUCTION

615.4 MEASUREMENT AND PAYMENT:

Add the following sections:

(D) Sewer Stub Markers:

Payment will be made under the item **Sewer Stub Marker per Detail Sheet DT05** and shall be compensation in full for the installation of the frame and cover and concrete collar including all excavation, backfilling, compaction, maintenance of traffic and all work incidental thereto.

(E) Reconstruct Existing Sewer Manhole Shafts

Payment will be made under the item **Reconstruct Existing Sewer Manhole Shaft and Adjust to Grade** and shall be compensation in full for the removal of the frame and cover, manhole cone and manhole sections and the installation of new manhole sections, new manhole cone and new frame and cover. This work shall include all excavation, backfill and compaction, maintenance of traffic and all work incidental thereto.

SECTION 618 STORM DRAIN CONSTRUCTION

This section is modified to add:

618.2 MATERIALS:

Allowable pipe materials for storm drain pipe are (1) Rubber Gasket Reinforced Concrete Pipe and (2) Cast-in-Place Concrete Pipe (CIPP) for pipe sizes 24 inches in diameter and larger. HDPE pipe will not be allowed as a pipe material.

618.3 CONSTRUCTION METHODS:

For new mains constructed with cast-in-place pipe, lateral connections shall be constructed per City of Phoenix Detail P1576.

For new mains constructed with RGRCP, lateral connections shall be constructed using a prefabricated tee.

For existing main lines, lateral connections shall be constructed per City of Phoenix Detail P1577.

618.6 MEASUREMENT:

(B) Connecting Pipe: Storm drain lateral connections shall be measured as each under the item **Storm Drain Lateral Connection** in the Bid Schedule.

618.7 PAYMENT:

(B) Connecting Pipe: Storm drain lateral connections shall be paid for at the unit price bid per each under the bid item **Storm Drain Lateral Connection** and will be complete compensation in full for all labor and materials necessary to connect the lateral pipe to the main line.

D) Remove Plug: Will be paid for at the unit price bid per each under the bid item **Remove Plug and Connect to Existing Storm Drain** and will be compensation in full for the complete removal of an existing plug including any concrete collars, brick and mortar or any other plug materials and the connecting of the new storm drain to the existing storm drain pipe as shown on the Plans.

SECTION 620 CAST-IN-PLACE CONCRETE PIPE

Replace all of Section 620 of the MAG Standard Specifications with the following:

620.1 GENERAL:

This specification covers cast-in-place non-reinforced concrete pipe intended for use as storm sewers or irrigation lines. The abbreviated title is CIPP. CIPP is conduit made of Portland cement concrete cast monolithically in a properly prepared trench, using equipment specifically designed for this purpose. The type of equipment to be used by the Contractor must be approved by the Engineer and the Contractor may be required to furnish evidence of the successful use of this equipment on prior work. CIPP will be placed only:

(A) By experienced operators. The Engineer will be the sole judge as to experience level.
(B) In the presence of the Engineer.
(C) In ground capable of standing unsupported from the bottom of the trench to the top of the pipe without sloughing.
(D) In fill when it can be demonstrated to the satisfaction of the Engineer that the fill will adequately support the pipe.
(E) When designated as an allowable storm sewer pipe material in the project specifications, this designation is no warranty, expressed or implied, that conditions will be suitable for the use of CIPP. Any costs incurred and/or time required to provide suitable conditions or to substitute an alternate pipe acceptable to the Engineer, in whole or part, shall be the responsibility of the Contractor.

620.2 MATERIALS:

620.2.1 Cement shall be ASTM C-150, Type II, low alkali as per Section 725.

620.2.2 Sand aggregate used for concrete and mortar shall conform to Section 701. Maximum size of the aggregate shall not be greater than 1/3 of the minimum wall thickness up to and including a wall thickness of 4-1/2 inches (114MM). The maximum aggregate size is 1-1/2 inches (38MM).

620.2.3 Water used for concrete and for curing the pipe shall be as per Section 725.

620.2.4 Concrete shall be Class ≥ A in accordance with Section 725. Slump shall be the minimum required for satisfactory placement of the concrete by the equipment used by the Contractor. The slump shall not exceed 3 inches (75MM).

620.2.5 Bonding mortar shall consist of two (2) or more parts of cement to three (3) parts of sand by volume.

620.3 CONSTRUCTION METHODS:

620.3.1 Excavation:

The trench will be neatly excavated with vertical sides and semi-circular bottom. The trench shall be shaped to form the bottom outside of the pipe on the alignment and to the grades specified in the plans. Departure from and return to the established grade for the finished trench and the invert of the installed pipe shall not exceed 1 inch per 10 linear feet with a maximum allowable departure of 0.10 feet. Departure from and return to specified alignment for the trench and pipe shall not exceed the allowable tolerances specified for the grade. The bottom of the trench, hereinafter known as the trench form, will be shaped to provide full, form, and uniform support by undisturbed earth or compacted fill for at least the bottom 210 degrees of the pipe. Density of the fill shall be at least five percent (5%) greater than the natural in place soil, but in no case less than 85 percent (85%) when tested in accordance with AASHTO T-99, Method A and T-191 or ASTM D-2922 and D-3017.

When it is necessary to install the pipe in rocky areas, the rock will be removed and replaced with suitable fill material compacted to proper density. The rock will be over-excavated to leave a 6-inch (150MM) minimum compacted soil cushion between the rock and the pipe. For construction accuracy, areas left void by rock removal will be completely filled with compacted material then trenched for the pipe as though natural ground. If the rock below the pipe subgrade is fractured or fragmented or if it consists of large cobblestones or boulders, the replacement fill material will be carefully selected to ensure that it is of such gradation that it will not be removed downward by fluctuation of the water table. If no case will expansive soils be used for fill. A similar procedure of over-excavation, backfill, compaction, and retrenching will be used where sloughing sand or where soft or spongy soil conditions are encountered. When expansive clays are encountered, they will be thoroughly moistened by ponding to completely expand the soil and the moisture maintained until the concrete is placed. The Contractor may substitute non-reinforced or reinforced concrete pipe for CIPP in these unsuitable areas. There will be no additional payment for this substitution.

Excavated trench shall be checked for compliance with requirements for grade and alignment prior to placement of concrete. The Contractor shall submit his proposed method of grade and alignment control and checking of same for conformance with specifications to the Engineer for his approval prior to start of work. The Contractor shall supply manpower, equipment and materials as are required to provide and confirm

compliance with grade and alignment requirements. This is a non-pay item and all costs incurred shall be included in the bid item(s) for the pipe installation.

620.3.2 Placement:

At the time of concrete placement, all soil in the trench will be adequately moistened so that water is not drawn from the freshly place concrete. However, the trench form will be completely free of water, mud and debris. All forming devices including the slipforms and hopper of the placement device shall be thoroughly moistened.

Concrete shall not be placed when temperature of the concrete exceeds 90 degrees Fahrenheit (32 Celsius) or is less than 50 degrees Fahrenheit (10 Celsius). The soil adjacent to the trench shall be at a temperature above freezing.

The pipe shall be constructed in one placement, the entire cross-section being placed monolithically. Inside forms shall be sufficiently rigid to withstand consolidation of the fresh concrete. Placement shall be such as to produce a thoroughly consolidated homogeneous concrete mixture conforming to the test requirements of this specification. Effective consolidation means shall be applied to the fresh concrete over the entire circumference and from within the pipe shell. Consolidation means shall be capable of effectively placing and consolidating fresh concrete at production speeds. Methods of consolidating shall be capable of building up sufficient pressure to effectively bond the concrete to the surrounding earth and to keep loose sand, mud and water out of the pipe shell.

Under no circumstances will the Contractor be allowed to continue the pipe installation if the vibrators of the cast-in-place machine are inoperable. Portable vibrators or “stingers”, shall only be used to supplement internal vibrators on the machine and not as a sole source to consolidate and distribute the concrete mix.

The Contractor shall make provisions for removing sloughed material, debris and any foreign objects from trench before and during placement of concrete such that buildup of material does not occur ahead of the machine. In addition, small transverse trenches shall be dug across trench bottom at distances not to exceed 25 linear feet to receive soil built up and pushed ahead of the slipform.

(A) Construction Joints:

When pipe placement stops in excess of ninety (90) minutes, a construction joint shall be formed. The ends of the pipe that are to be butt contact shall be left in rough condition with a slope between 20 and 45 degrees. Number 4 reinforcing bars shall be embedded 12 inches in the previous pour and 12 inches into the next pour and shall be placed 12 inches on center for pipe 42 inches in diameter or less and shall be placed 18 inches on center for pipe diameters in excess of 42 inches. Immediately before resuming concrete placement the surface to be bonded shall be cleaned of all laitance, coatings, foreign materials and loose or defective concrete thoroughly wetted and coated with a layer of bonding mortar (Section 620.2.5) approximately ¼ inch

(6MM) thick. In lieu of the bonding mortar, neat cement past may be thoroughly scrubbed onto the wet surface of the previously placed concrete.

For a joint that may be used for connections to another pipe or structure, a joint shall be made by squaring off the end of the pipe. An excavation shall be made along the sides and bottom of the cast-in-place pipe for any diameter to permit casting of a concrete collar as described above.

(B) Pipe Dimensions and Tolerances:

(1) The internal diameter of the pipe at any point shall not be less than 95% of the nominal diameter, and the average of any four (4) measurements of the internal diameter made at 45 degree intervals shall not be less than the nominal diameter.

(2) For pipe less than 15 inches (381MM) inside diameter, the minimum wall thickness shall be 2 inches (50MM).

For the pipe with an inside diameter of 15 inches (381MM) to 24 inches (610MM) the minimum wall thickness shall be 2-1/2 inches (63MM). For pipe exceeding 24 inches (610MM) inside diameter the minimum wall thickness shall be 1/12 of the inside diameter, plus 1 inch (25MM).

(3) Offsets at form laps and horizontal edges shall not exceed ½ inch (13MM) for pipe having inside diameter not greater than 42 inches (approx. 1M); ¾ inch (19MM) for pipe having inside diameter greater than 42 inches, but not greater than 72 inches (approx. 2M); and 1 inch (25MM) for pipe having inside diameter greater than 72 inches (1.8M).

(C) Pipes Placement:

(1) It is essential that concrete placement be done in a smooth and steady manner with as few starts and stops as is possible. The Contractor shall schedule materials and operate the pipe machine at speeds and in a manner that will achieve this.

(2) The Contractor shall provide an anchoring system for pull of the machine in a manner which will provide the least probability of causing deviations in grade and/or alignment. Adjustments to or modifications in anchoring system when required in the opinion of the Engineer shall be made at no additional cost to the project.

620.3.3 Curing and Backfilling:

The Contractor shall be responsible for proper curing of the concrete and backfilling the trench to an even grade. Final backfill and compaction shall not be started until concrete has developed a compressive strength of at least 3000 psi. The pipe shall be checked for grade, alignment and thickness prior to backfilling. Curing shall be performed in such

a manner as to prevent the premature drying of the concrete. The Contract shall use the method described below.

(A) Polyethylene film complying with ASTM C-171, nominal thickness 0.0015 inches (0.038MM), shall be placed on the exposed top surface of the pipe immediately after the pipe is cast. The film shall be anchored in place with loose soil to assure continuous, adequate curing.

A humid atmosphere within the pipe, as evidenced by condensation on the interior surface, shall be maintained for at least seven (7) days following placement, except for a maximum period of 24 hours allowed for removing forms and making repairs. To prevent air drafts which may dry the pipe and to maintain a humid atmosphere inside the pipe, all openings, ends, manholes, connector pipes shall be kept closed or securely covered except when actual work is in progress on the inside of the pipe. The pipeline shall be partially filled with water during the curing period when work is not being performed on the inside of the pipe.

620.3.4 Repair:

Immediately after removal of the forms, the inside of pipeline will be inspected for required repairs and conformance with all dimensional requirements including alignment and grade. The Engineer shall be the sole judge as to the repairability of deficiencies. He shall require removal and replacement of those sections of pipeline which he judges to be non-repairable or which is not within required dimensional tolerances including alignment and grade.

When concrete placement is done by a method requiring the use of metal inner forms, the Contractor shall schedule his work force, by extended, staggered or multiple shifts, as required, to provide for removal of forms within 4 to 6 hours of placement of concrete and start of repairing, patching and finishing of pipeline to conform with specification requirements.

When concrete placement is done by methods using pneumatically inflated inner liner, the Contractor shall schedule his work force by extended, staggered or multiple shifts, as required, to provide for removal of the pneumatic inner liner within 12 hours of placement of concrete and start of repairing, patching and finishing of pipeline to conform with specification requirements.

All rock pockets, non-longitudinal cracks or indentations shall be cleaned out, moistened and filled with 1:2 cement grout or approved epoxy material. Except where, in the opinion of the Engineer, the width and/or length of the crack may indicate a structural deficiency, repairs shall be made as required for longitudinal cracks.

At the discretion of the Engineer, longitudinal cracks exceeding 0.01 inches in width and 12 inches in length may be cause for rejection and removal and replacement of that portion of the pipe. Subject to the approval of the Engineer, cracks may be repaired using a pressure applied epoxy compound capable of providing structural correction to

the area in addition to sealing the void. A longitudinal crack shall be defined as one which has the general direction of a 30 degree angle or less with the alignment of the pipe.

Irrespective of concrete placement method, all repairs, patches and finishing shall be completed within 24 hours of concrete placement.

The Contractor, prior to start of concrete placement on project shall submit a written schedule of his proposed work activities and work time schedules for the Engineer's review and approval. No time schedule requiring overtime by the Engineer's staff is authorized without specific written approval of the Engineer.

Compliance with this section is a non-pay item and any costs incurred shall be included in the bid proposal item(s) for the pipe.

620.3.5 Finishing:

Except for the form offsets, the interior surface of the pipe shall be equivalent to or better than a wood float finish. Form offsets shall be trimmed so as to provide a reasonably tapered slope from surface to surface. The bottom of the pipe below the metal forms shall be finished in a workmanlike manner and shall conform to the general circular circumference of the pipe without sags, dips and humps. All extraneous concrete shall be removed from the interior surface.

620.4 TESTS:

Random tests shall be made of the wall thickness at the top, bottom and sides approximately every 100 feet on a daily basis by probes through fresh concrete or small holes drilled through the concrete. Holes shall be properly and permanently closed and sealed flush with the inside surface of the pipe after measurements are made, in accordance with the requirements of the fifth paragraph of Subsection 620.3.4, contained herein.

Test cylinders shall be prepared and tested as per Section 725. If the cylinder tests indicate that the concrete does not meet the specified strength requirements, cores shall be taken from the same section of concrete represented by the faulty test cylinder under the supervision of the Engineer.

The concrete should be at least 14 days old before the core specimens are taken. The diameter of the core specimens for the determination of compressive strength should be at least three (3) times the maximum nominal size of the coarse aggregate used and must be at least twice the maximum nominal size of coarse aggregate.

The length of the specimen, when capped, should be twice the core diameter. A core having a maximum height of less than 95 percent of its diameter before capping or a height less than its diameter after capping shall not be tested.

If cores are taken, the Contractor shall patch all core holes in such a manner that the patch will be permanent, will not leak and will have a smooth interior finish flush with the interior surface of the pipe.

Procedures and payment for coring shall be in accordance with applicable portions of Section 725.

The Engineer will evaluate the test results and his decision as to required corrective action will be final.

620.5 MEASUREMENT:

Measurement of cast-in-place concrete pipe will be the number of linear feet of pipe measured horizontally along the pipe axis from end to end of pipe. At change in diameter, the measurement shall be to center of manhole or transition.

620.6 PAYMENT:

Payment will be made at the contract unit price bid per linear foot to the nearest foot for each size of pipe and shall be compensation in full for furnishing and installing the cast-in-place concrete pipe as specified including removal of obstructions, excavation, backfilling, compacting, testing and all incidental costs not specifically covered in other items in the proposal.

SECTION 631 WATER TAPS AND WATER SERVICE CONNECTIONS

631.8 SERVICE ON EXISTING MAINS

This section is modified to add:

631.8.1 Description

The work shall consist of the installation of a new water service and meter box, the installation of a private water service line, the cutting over and attachment of the new service line to the existing private water service line and the removal of the abandoned water service line. The location of this work is at approximately STA 32+00 on the east side of 83rd Avenue. The new 1" water service with a ¾" meter box shall be installed per Peoria Standard Detail PE-363. The exact tie-in point of the new ¾ inch copper private service line shall be determined in the field. Abandoned service line shall be removed all the way to the existing corp stop at the main. Corp stop shall be shut off.

631.8.2 Measurement and Payment

Payment will be made under the bid item "Remove and Replace Existing Water Meter and 1" Service Line per City of Peoria Detail PE-363". The lump sum bid price shall be compensation in full for the complete installation in place including all labor, materials, equipment and all incidentals necessary to complete the installation and removals.

SECTION 717 ASPHALT-RUBBER

Replace all of Section 717 of the MAG Standard Specifications with the following:

717.1 DESCRIPTION:

The work under this section shall consist of furnishing, proportioning and mixing all the ingredients necessary to produce an asphalt-rubber material.

717.2 MATERIALS:

717.2.1 Asphalt-Rubber:

Asphalt Cement: Asphalt cement shall conform to the requirements of Section 711.

Rubber: Rubber shall meet the following gradation requirements when tested in accordance with Arizona Test Method 714. Type B shall be used unless otherwise specified.

Sieve Size	Percent Passing	
	Type A	Type A
#8 (2.36 mm)	100	
#10 (2.00 mm)	95 - 100	100
#16 (1.18 mm)	0 - 10	65 - 100
#30 (600 µ m)		20 - 100
#50 (300 µ m)		0 - 45
#200 (75 µ m)		0 - 5

The rubber shall have a specific gravity of 1.15 ± 0.05 and shall be free of wire or other contaminating materials, except that Type A rubber shall contain not more than 0.1percent fabric and Type B shall contain not more than 0.5 percent fabric. Calcium carbonate, up to four percent by weight of the granulated rubber, may be added to prevent the particles from sticking together.

Certificates of Compliance conforming to Arizona State Department of Transportation Standard Specifications for Road and Bridge Construction Section 106.05 shall be submitted. In addition, the Certificates shall confirm that the rubber is a crumb rubber, derived from processing whole scrap tires or shredded tire materials; and the tires from which the crumb rubber is produced is taken from automobiles, trucks, or other equipment owned and operated in the United States. The Certificates shall also verify that the processing does not produce, as a waste product, casings or other round tire material that can hold water when stored or disposed of above the ground.

717.2.2 Asphalt-Rubber Proportions:

Ground rubber in asphalt-rubber shall be a minimum of 20 percent and a maximum of 22 percent by weight of the asphalt cement.

717.2.3 Asphalt-Rubber Properties:

Asphalt-rubber shall be Type 1 unless otherwise specified and conform to the following:

Property	**Requirement**		
	Type I	**Type 2**	**Type 3**
Grade of base asphalt cement	**PG 64-16**	**PG 58-22**	**PG 52-28**
Rotational Viscosity*; 350°F (177°C); cps (Pascal seconds)	1500-4000 (1.5-4.0)	1500-4000 (1.5-4.0)	1500-4000 (1.5-4.0)
Penetration; 39.2°F (4°C), 200g, 60 sec. (ASTM D 5); dmm (in), min	10 (0.04)	15 (0.06)	25 (0.10)
Ductility; 39.2°F (4°C), 1 cpm (ASTM D 113); cm (in), min.	5 (2)	5 (2)	5 (2)
Softening Point; (ASTM D 36); °F (°C), min.	135 (57)	129 (54)	126 (52)
Resilience; 77°F (25°C) (ASTM D 3407);%,min	25	20	15
* The Viscometer used must be a Haake Viscometer, Model VT – 04, Rotor No. 1, or viscometer correlated.			

717.2.4 Asphalt-Rubber Design:

At least two weeks prior to the use of asphalt-rubber, the Contractor shall submit an asphalt-rubber design prepared by an approved laboratory. Such design shall meet the requirements specified herein. The design shall show the values obtained from the required tests, along with the following information: percent, grade and source of the asphalt cement used; and percent, gradation and source(s) of rubber used.

717.3 CONSTRUCTION REQUIREMENTS:

717.3.1 Mixing of Asphalt-Rubber:

The temperature of the asphalt-cement shall be between 375°F (191°C) and 425°F (218°C) prior to the addition of rubber. No agglomerations of rubber particles in excess of 2" in the least dimension shall be allowed in the mixing chamber. The ground rubber and asphalt-cement shall be accurately proportioned in accordance with the design and thoroughly mixed prior to the beginning of the one-hour reaction period. Reaction time may be decreased to 45-minutes if documentation is provided that the physical properties of the mix design requirements are consistently met using a 45-minute reaction period. The Contractor shall document that the proportions are accurate and that the rubber has been uniformly incorporated into the mixture. Additionally, the Contractor shall demonstrate that the rubber particles have been thoroughly mixed such that they have been "wetted." The occurrence of rubber floating on the surface or agglomerations of rubber particles shall be evidence of insufficient mixing. The temperature of the asphalt-rubber immediately after mixing shall be between 350°F (177°C) and 400°F (204°C). Reaction time shall start after all of the material for the batch has been mixed and the minimum reaction temperature of 350°F (177°C) has been achieved.

Prior to use, the viscosity of the asphalt-rubber shall be tested by the use of a rotational viscometer, which is to be furnished by the Contractor or supplier. The Contractor shall provide a qualified person to perform the testing.

717.3.2 Handling of Asphalt-Rubber:

Once the asphalt-rubber has been mixed, it shall be kept thoroughly agitated during periods of use to prevent settling of the rubber particles. During the production of asphaltic concrete the temperature of the asphalt rubber shall be maintained between 325°F (163°C) and 375°F (191°C). However, in no case shall the asphalt-rubber be held for more than 10 hours at these temperatures. It shall be allowed to cool to a temperature of 250°F (121°C) or less and held at that temperature for not more than four days. The process of cooling and reheating shall not be allowed more than one time for a batch of asphalt rubber binder.

For each load or batch of asphalt-rubber, the Contractor shall provide the Engineer with the following documentation:

(A) The source, grade, amount and temperature of the asphalt cement prior to the addition of rubber.
(B) The source and amount of rubber and the rubber content expressed as percent by the weight of the asphalt cement.
(C) Times and dates of the rubber additions and resultant viscosity test.
(D) A record of the temperature, with time and date reference for each load or batch. The record shall begin at the time of the addition of rubber and continue until the load or batch is completely used. Readings and recordings shall be made at every temperature change in excess of 52°F (11°C), and as needed to document other events which are significant to batch use and quality.

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APPENDIX A

SRP CONSTRUCTION LICENSE

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APPENDIX B

GEOTECHNICAL EVALUATION

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SECTION II

LANDSCAPE AND IRRIGATION SPECIAL CONDITIONS

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83RD AVENUE STREET AND DRAINAGE IMPROVEMENTS PROJECT
DESIGN SERVICES
CITY OF PEORIA

LANDSCAPE SPECIFICATION SECTIONS

PROJECT NO. EN00313
SOLICITATION NO. P09-0068

September 2011

Prepared for:

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SPECIAL CONDITIONS

SECTION 342 – DECORATIVE PAVEMENT CONCRETE PAVING STONE AND BRICK

Modify this section by adding the following;

Concrete pavers to be as manufactured by Pavestone, "Holland Stone" , Two Tone Brown in color. Size to be 60 mm, 3-7/8 x 7-13/16 x 2-3/8

Geotextile (Filter Fabric): Install filter fabric as shown on plans and details. Material to be as manufactured by US Fabrics, US 115NW or equal. Material to be a nonwoven needlepunched geotextile made of 100% polypropylene staple filaments.

Weight-Typical ASTM D-5261, 4.0oz/sy
Tensile strength ASTM D-4632, 115lbs.
Elongation @ Break ASTM-D4632, 50%
Mullen Burst ASTM-D 210psi
Water Flow Rate ASTM-D 140g/min/sf
Uv Resistance @ 500 hours ASTM-D 4355, 70%

Subsection 342.3.1 The aggregate base course is to be a 4 inch depth

SECTION 430 – LANDSCAPING AND PLANTING

SUBSECTION 430.1 – DESCRIPTION

Modify this section by adding the following:

Provide complete landscaping and planting installation in accordance with the Contract Documents and conform to the MAG Uniform Standard Specifications.

Work shall include, but is not limited to landscape fine grading; material procurement; material testing; soil preparation; planting of nursery stock trees and shrubs; staking; landscape surface preparation; Hardscape including pavers and pedestrian barrier railing; landscape restoration where necessary; and maintenance, establishment and warranty of landscape work.

SUBSECTION 430.2 – GENERAL

Modify this section by adding the following:

The contractor shall protect existing surfaces beyond the limits of site grading modifications. These areas are to remain undisturbed from Contractor activities with the exception of rock mulch placement, planting and irrigation installation, and be protected during construction.

Landscape area surfaces shall be smooth graded or shaped as shown on the drawings unless otherwise indicated. Imported soil or on site soil used as fill or backfill shall meet or be amended

to conform to MAG Section 795.2 and shall not contain more than ten percent aggregate or rock by volume. Aggregate or rock shall not be nested or layered within the planting pit backfill.

Subsurface obstructions, materials, or substances which conflict with or impact the installation of plants or may be detrimental to plant health shall be excavated and removed and soil replaced and compacted to the depth of the rootball container depth and three (3) times the rootball container width unless otherwise noted in the Plans and Specifications.

Landscape plants, materials, and surfaces shall be installed, planted, established, and maintained in accordance with these Plans and Specifications, and the maintenance/establishment period shall be one hundred and twenty (120) calendar days from the completion and acceptance date of pre-maintenance inspection and landscape planting punch list items of the project as determined by the Engineer. If this period extends beyond the final acceptance date of the project, the Owner will retain ten (10) percent of the bid for project landscaping until the requirements for final acceptance are met at the end of the maintenance/establishment period.
Restoration of existing landscape areas or other existing improvements that are disturbed or impacted by work completed under this contract are to be replaced in kind and to the approval of the engineer. The limits of this work shall be as determined by the limit of disturbance or as necessary to complete the satisfactory restoration of impacted areas as indicated on the plans and in accordance with MAG Section 107.9 and other Specifications sections.

For existing landscaped areas, outside the allowable limits of work, the Contractor shall restore the plantings, pavement, structures, irrigation system, granite, rock, soil, or other existing landscape surfaces using material(s) to match the existing in type in kind, quality, and appearance to the satisfaction of the engineer The Contractor shall remove and replace such rejected work to the Engineer's satisfaction at no additional cost to the Owner. The contractor is to cap, reroute and test the property owner's existing irrigation system when impacted to the satisfaction of the property owner and the engineer. The contractor is to coordinate with all the property owners and obtain a written "letter of acceptance" from each impacted owner as to the final acceptance of the restoration work.

Existing landscape items identified during installation activities in the way of new construction or that conflict with vehicular sight visibility requirements shall be removed or relocated to an appropriate area near the present location to achieve the safety requirements and as directed by the Engineer.

SUBSECTION 430.2.1 – RELATED WORK

Add this section as follows:

The Contractor shall be responsible for the procurement, installation, and completion of work items and components of work items indicated, including: coordination, scheduling and sequencing of work between the various trades required to complete the work and in accordance with the Contract Documents.

SUBSECTION 430.2.2 – QUALITY CONTROL

Add this section as follows:

Within fourteen (14) days after the award of contract, the Contractor shall submit a list of specified landscape materials, sources, locations, phone numbers, and contact persons to the Engineer for review and approval. Prior to bringing plant materials onto the site, at his discretion, the Engineer is to visually inspect the proposed materials. The Contractor shall make necessary arrangements with the Engineer to have the plant material inspected in accordance with MAG Section 430.5.2. The Engineer may reject any material, which shall be replaced with acceptable material by the Contractor.

The Contractor shall provide certificates of inspection and testing for materials and equipment as required by law and regulation.

Note: Required laboratory testing and analysis reports shall be paid for by the Contractor.

Packaged materials shall be delivered sealed in the manufacturers original packaging and shall have the manufacturers certified analysis printed or stamped on each container.

For non-packaged materials, the Contractor shall provide analysis and testing reports from an independent certified agricultural soils testing laboratory or agency. The laboratory must be approved by the Engineer. The Contractor shall provide certification and documentation that required materials, equipment and products meet or exceed these specifications. The Contractor shall submit certification, testing reports and samples to the Engineer for acceptance. Final acceptance of materials shall be determined by the Engineer.

SUBSECTION 430.2.3 – FINISHED LANDSCAPE SURFACES

Add this section as follows:

The work includes the grading and preparation of landscape surfaces within the project area, in the locations shown. Finish grade for landscape surfaces in areas shall be as shown on the construction drawings and as follows: one (1) inch below the back of median curbs and below new or existing concrete walkway and header surfaces and flush with unpaved surfaces.

SUBSECTION 430.5.6 – SHRUB AND TREE PITS

Add the following to this section:

Plant pits shall be sized three times the root ball width and no more or no less than one times the root ball depth, unless otherwise indicated on the Plans. Plant pits shall be dug so that the root ball rests on undisturbed native soil unless otherwise indicated on the Plans.

Plant pit backfill may use on site native soil per the Native Planting Backfill Mix in Section 430.5.9.

In rocky site conditions, on-site soils to be used for backfill may be screened to meet the specifications for maximum aggregate content in topsoil. Refer to Section 430.2 for removal of sub-surface conditions impacting the installation or health of plants.

Nested or layered aggregate or other infertile materials located beyond the limits of the plant pit or within the potential root growth zone of the plants/turf shall be considered a subsurface obstruction and removed as specified.

Pits shall be excavated to the detailed dimensions with the sides of pit roughened or scarified. Prior to installing plant material, the Engineer is to visually inspect the pits for proper size and depth. The Contractor shall make necessary arrangements with the Engineer to have the pits inspected. The Engineer may reject any pits, which shall be re-excavated and prepared by the Contractor.

SUBSECTION 430.5.9 – NATIVE PLANT BACKFILL MIX

Add this section as follows:

Native Planting Backfill Mix shall consist of 'native' site soil (no caliche in backfill). Remove inorganic material greater than 1 inch in size. Soil mix shall be water settled without pooling.

SUBSECTION 430.6 – HEADER INSTALLATION

Replace this section and add the following:

Headers shall be installed at the locations and grades as shown on the plans and details prior to planting operations. Headers shall be constructed per MAG Section 340 and per the plans and details. Concrete headers shall have a medium broom finish per the details.

SUBSECTION 430.9 – PLANT ESTABLISHMENT PERIOD

Modify this section by replacing with the following:

All existing and new plants shall be kept in a healthy, growing condition by watering, pruning, spraying, weeding and other necessary operations or maintenance. Plant basins shall be kept free of weeds, and other undesirable vegetation. Plants shall be inspected at least once per week and appropriate maintenance performed prior to the Landscape Establishment Period and the Warrantee Period. Inspections during each of these subsequent periods are to occur as per the specifications.

A pre-maintenance inspection will be performed upon substantial completion of landscape work under this contract. The Contractor shall be present at the inspection and a punch list of items requiring remedial work shall be generated. Upon completion of the punch list items and approval by the Owner, the 120 day Landscape Establishment Period will begin. The contractor is responsible for the maintenance of the landscape and irrigation installation during this period.

Final Maintenance Inspection: At the end of the Establishment Period a final inspection will be performed. If, after this inspection, the Owner agrees that planting areas are weed free and plant materials are in satisfactory growing condition, written Notice of Acceptance will be given to the Contractor for landscape installation.

During the Landscape Establishment Period, maintenance inspections will occur periodically but no less than once every two weeks. The contractor is to provide a dated written summary of conditions and corrective actions taken to the engineer of each inspection during the Landscape Establishment Period. If landscape areas are improperly maintained, if appreciable plant replacement is required, or other corrective work becomes necessary, the Contractor shall continue to maintain the entire site until items are corrected and accepted at no cost to the Owner.

Corrective work disturbance, repairs, or replacements completed during the Landscape Establishment Period shall be subject to an additional maintenance/establishment period per Section 430.8.

The cost of the activities and corrective actions taken during the Landscape Establishment Period, shall be included in the Landscape Establishment Period pay item as a lump sum amount. Ten (10) percent landscape retention will be withheld and paid at the end of the successful completion of the Landscape Establishment Period.

Subsection 430.9.1 – Warranty

Required: Warranty plant materials to be in a healthy thriving condition for specific periods after the engineer's acceptance of the Landscape Establishment Period. The duration of the Warranty period is as follows:

Trees and other plant material – one year (365 days) from the date of the engineer's acceptance of the completed Landscape Establishment Period..

Replacements: Immediately replace, repair, or repeat applications as specified over rejected plant material or surfaces at no cost to the Owner. Immediately replace with like kind, in a satisfactory condition, plant materials not surviving, in poor condition, or not showing vigorous healthy new growth at the end of the pertaining warranty period, at no cost to the Owner.

Contractor's Observations: The Contractor shall check the landscaped areas at least once every two weeks during the warranty periods and notify the Engineer in writing of advised changes or concerns.

Periodic Inspection: Appointed personnel representing the Contractor and the Owner will perform bi-weekly inspections of the landscape installation. Plants requiring replacement and other required corrective measures shall be completed prior to the next bi-weekly inspection meeting.

Final Inspection: Notify the Engineer ten days prior to the end of the warranty period that final landscaping inspection is requested. The Engineer will make an inspection and give the Contractor notice of plantings or other work of this section that are not acceptable and require correction. Contractor shall immediately make such corrections.

Warranty Exceptions: The Contractor is not responsible for plant loss or damage caused by unusually extreme weather as determined by the Engineer, or lack of maintenance by the Owner.

SUBSECTION 430.10 – MEASUREMENT AND PAYMENT

Modify this section by replacing with the following:

Measurement and payment shall be in accordance with Section 109.

Payment for tree and shrub planting shall be based on the unit price bid per each and shall be full compensation for site preparation, furnishing and planting the trees and shrubs, maintenance and landscape establishment period, and warranty .

ITEM 430-2 – PLANTING 36" BOX TREES
ITEM 430-3 – PLANTING 5 GALLON CONTAINER PLANTS
ITEM 430-4 – PLANTING 15 GALLON CONTAINER PLANTS
ITEM 430-5 – PLANTING 5 GALLON ACCENT CONTAINER PLANTS
ITEM 430-6 – 8" CONCRETE HEADER
ITEM 430-8 – LANDSCAPE ESTABLISHMENT PERIOD
ITEM 430-9 - WARRANTY

SECTION 460 – AESTHETIC TREATMENT

Add this section in its entirety:

SUBSECTION 460.1 – GENERAL

This section includes work and materials necessary to furnish and install the surface select granite boulders as indicated in the plans including the respective notes, legends, and detail drawings.

SUBSECTION 460.2 – LANDSCAPE BOULDERS

Contractor shall provide surface select granite boulders. The boulders are to be natural in appearance without damage, fractures or marring from the handling and placement operations. Landscape boulders shall be of the size and placed/installed as shown on the plans. The sequence of boulder dimensions shown on the plan legend corresponds to length, width, height.

SUBSECTION 460.3 – SAMPLES

Contractor shall provide samples of each size of surface select granite boulder required to be bid for approval by the Engineer prior to purchase and installation. The approved samples shall be kept on site for comparison in a protected location at all times throughout the construction process. Samples may be used on the project following the purchase, delivery, and placement of the required boulders.

SUBSECTION 460.4 – MEASUREMENT AND PAYMENT

Payment for surface select granite boulders shall be made on the basis of the price bid per each. The price shall be full compensation for the item complete in place, including materials, equipment, labor, delivery, site preparation, placing of boulder, and other work required to install landscape boulders to complete the item as shown on the plans and details.

ITEM 460-1 – 4 FOOT X 3 FOOT X 2 FOOT BOULDER
ITEM 460-2 – 3 FOOT X 2 FOOT X 2 FOOT BOULDER
ITEM 460-3 – 2 FOOT X 1.5 FOOT X 1.5 FOOT BOULDER

SECTION 702 – BASE MATERIALS

Add the following to this section:

SUBSECTION 702.5 – 2" MINUS AND ¾" SCREENED ROCK MULCH

SUBSECTION 702.5.1 – DESCRIPTION

The work shall consist of the application of rock mulch as shown on the plans, and in these Special Provisions.

SUBSECTION 702.5.2 – MATERIALS

Rock mulch to conform to the requirements of Section 702.4.3 of these Special Provisions.

SUBSECTION 702.5.3 – SUBGRADE PREPARATION

The subgrade surfaces shall be to the neat lines and grades shown on the drawings. The subgrade shall be prepared to accept the full depth of the proposed rock mulch treatment.

The finished surface for both equipment and hand-tilled areas shall be left in a smooth racked condition as approved by the Engineer.
Rocks larger than 3 inches in diameter, trash, weeds, and other debris that will interfere with rock mulch placement shall be removed or disposed of as determined by the Engineer.

Subgrade preparation shall be discontinued when soil moisture conditions are not suitable for the preparations of a satisfactory subgrade as determined by the Engineer.

Rock mulch shall not be placed until the subgrade surfaces have been inspected and approved by the Engineer.

SUBSECTION 702.5.4 – PLACEMENT

The rock mulch shall be placed by equipment or by hand on the prepared surfaces. The mulch shall be constructed to the full course thickness in one operation and in such a manner as to avoid serious displacement of the underlying materials. The rock mulch shall be delivered and placed in a manner that will ensure that the in-place mulch layer shall be reasonably homogeneous and the fractions uniformly distributed. Hand placing of rock mulch cover shall be required to the

extent necessary to prevent damage to the permanent works. The rock shall be placed in an even application, tightly packed, to provide complete coverage of the area shown on the project plans so that soil will not be visible between rocks. The uniform depth of the rock mulch shall be 3 inches. In no case shall the thickness of the rock mulch layer be less than 3 inches.

The rock mulch will be spread and raked smooth prior to water spray settling. The application of a uniform spray of water will be made at a rate not exceeding the infiltration rate to minimize run off. The use of pressure pumps and spray bars on sprinkling equipment used for the application of water will be required. The use of gravity flow spray bars and splash plates will not be permitted.

SUBSECTION 702.5.5 – MEASUREMENT AND PAYEMENT

Rock mulch shall be measured by the square foot in place within the limits of dimensions as shown on the plans. The measurement shall be to the neat line as delineated on the plans. Payment for rock mulch shall be made on the basis of the price bid per square foot. This price shall be considered full compensation for the item complete including labor, materials, equipment, water, pre-emergent, and other items necessary and incidental to the placement of the rock mulch.

ITEM 702-1 – 2" MINUS ROCK MULCH
ITEM 702-2 – ¾" SCREENED ROCK MULCH

SECTION 795 – LANDSCAPE MATERIAL

Landscape Material shall conform to Section 795 of the MAG Uniform Standard Specifications except as modified herein.

SUBSECTION 795.8 – MISCELLANEOUS MATERIAL

Add the following:

Subsection 795.8.7 – Native Planting Backfill Mix

Native Planting Backfill Mix shall consist of 'native' site soil (no caliche in backfill). Remove all inorganic material greater than 1" in size. Soil mix shall be water settled without pooling.

83RD AVENUE STREET AND DRAINAGE IMPROVEMENTS PROJECT
DESIGN SERVICES
CITY OF PEORIA

IRRIGATION SPECIFICATION SECTIONS

PROJECT NO. EN00313
SOLICITATION NO. P09-0068

September 2011

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SECTION 440 – LANDSCAPE IRRIGATION SYSTEM INSTALLATION

SUBSECTION 440.1 – DESCRIPTION

Replace this section in its entirety with the following:

Provide complete installation of a fully automated landscape irrigation system in accordance with the Plans, these Specifications, and City of Peoria requirements.

The Owner's Representative, when referenced in this section, shall refer to the Consultant Landscape Architect unless otherwise agreed to in writing between the Contractor and the Owner within ten (10) days of the award of contract.

Landscape irrigation system installation work shall include, but is not limited to: material procurement, material and installation testing, above and below ground system installations, trenching, piping, valves, controllers, wiring cabinet/cage enclosures with pads, fittings, emitters, preparation of record drawing as-builts, and maintenance and warranty of irrigation work.

Irrigation quantities where indicated are for general reference only. It shall be the responsibility of the Contractor to determine quantities and materials necessary to complete the work in accordance with the notes and symbols shown on the plans and as herein specified.

This section includes installation specifications for items installed as part of the landscape irrigation system. Certain construction procedures or minor equipment installation procedures may have been omitted from these specifications that are necessary for the proper installation of the system. Carefully investigate the structural and finished conditions affecting of the work and plan the work accordingly, furnishing such fittings, etc., as may be required to meet such conditions. Drawings are diagrammatic and indicative of the work to be installed. The work shall be installed in such a manner as to avoid conflicts between irrigation systems, planting, pavements, utilities, and other existing or constructed site improvements or architectural features.

Materials and equipment shall be installed in a neat and workmanlike manner according to manufacturer's recommendations and specifications, local and state codes, as shown on the Plans and as specified herein. If the drawings call for or describe materials, workmanship, or construction of a better quality, higher standard, or larger size than is required by the above rules and regulations; the provisions of these specifications and drawings shall take precedence. Discrepancies or conflicting information in the Plans and Specifications shall be brought to the attention of the Owner's Representative and the Owner's Representative shall determine the course of action. Contractor assumes full responsibility for work installed without clarification.

SUBSECTION 440.1.2 – RELATED WORK

Add this section as follows:

The Contractor shall be responsible for the procurement, installation and completion of work items and components of work items indicated, including: coordination, scheduling and sequencing of work between the various trades required to complete the work and in accordance with the Plans and Specifications.

SUBSECTION 440.2 – GENERAL

Add the following to this section:

SUBSECTION 440.2.1 – QUALITY CONTROL

Add this section as follows:

Work under this contract shall comply with the provisions of these specifications, as illustrated on the accompanying drawings, or as directed by the Owner's Representative, and shall satisfy applicable local codes, ordinances, or regulations of the governing bodies and authorities having jurisdiction over this project.

Installation of equipment and material shall be done in accordance with the requirements of the National Electric Code, local and national Plumbing Codes and standard plumbing procedures. The drawings and these specifications are intended to comply with the necessary rules and regulations; however, some discrepancies may occur. Where such discrepancies occur, the Contractor shall immediately notify the Owner's Representative in writing of the discrepancies and apply for an interpretation. Should the discovery and notification occur after the execution of a contract, additional work required for compliance with the regulations shall be paid for as covered by these contract documents.

All materials shall be delivered new, protected and maintained in an undamaged condition throughout the entire installation.

The Contractor shall provide certificates of inspection and testing for materials and equipment as required by law and regulation.

Note: Required laboratory testing and analysis reports shall be paid for by the Contractor.

All equipment and packaged materials or components shall be delivered sealed in the manufacturers original packaging and shall have the manufacturer’s instructions and warranties included.

Prequalification:
The installation of the irrigation system shall be made by an individual or firm duly licensed under the State of Arizona Registrar of Contractors.

Superintendent:
A superintendent satisfactory to the Owner shall be identified by the Contractor and submitted for approval by the Owner prior to award of contract. The superintendent shall not be changed, except with the consent of the Owner. The superintendent shall be authorized to represent the Contractor.

SUBSECTION 440.2.2 – APPLICABLE STANDARDS

Add this section as follows:

APPLICABLE STANDARDS:

ASTM D2241	Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR)
ASTM D2464	Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Threaded, Schedule 80

ASTM D2466	Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Threaded and Socket, Schedule 40
ASTM D24647	Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Socket, Schedule 80
ASTM D2564	Solvent cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings
ASTM D2855	Making Solvent - Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings
ASTM F-477	Gasket Pocket Pipe

SUBSECTION 440.2.3 – SUBMITTALS

Add this section as follows:

The Contractor shall submit six (6) copies of shop drawings or manufacturer's "cut sheet" for each type of emitter, pipe, controller, valves, check valve assemblies, valve boxes, wire, conduit, fittings and other types of fixtures and equipment which he proposes to install on the job. The submittal shall include the manufacturer's name, model number, equipment capacity and manufacturer's installation recommendation, if applicable, for each proposed item. No partial submittal will be accepted and submittals shall be neatly bound into a brochure and logically organized. Shop drawings shall include dimensions, elevations, construction details, arrangements and capacity of equipment, as well as manufacturer's installation recommendations.

After the submittal has been approved, substitutions will not be allowed except by written consent of the Owner’s Representative.

Equipment or material installed or furnished without prior approval of the Owner may be rejected and the Contractor required to remove such materials from the site at the Contractor’s own expense and shall include the replacement with the approved specified item.

Approval of an item, alternate or substitute indicates only that the product or products apparently meet the requirements of the drawings and specifications on the basis of the information or samples submitted.

SUBSECTION 440.2.4 – SUBSTITUTION OF MATERIALS

Add this section as follows:

This irrigation system has been designed around the irrigation components herein stated and as shown on the plans. Changes of brand name, trade name, trademarked, patented articles, or other substitutions will be allowed only by written order signed by the Owner's Representative. The Owner is under no obligation to accept materials other than as specified. If a bidder wishes for a substitute item to receive consideration as an "approved equal," the bidder and each item must meet the following requirements without exceptions:

An item, to be considered a substitute, must meet the same specifications of materials, fabrication or construction, dimension or size, shape, finish, performance standards, warranty or guarantee, and other pertinent and salient features of quality, as indicated in manufacturer's specifications for original specified item. Equipment or material installed or furnished without prior approval of the Owner's Representative

as herein specified, may be rejected and the Contractor required to remove such materials at his own expense.

The Contractor alone shall bear complete responsibility for the installation and operation of material or equipment installed on the job (as a substitute for specified equipment or material) should such substituted material prove to be defective, inoperable or in-applicable.

SUBSECTION 440.2.5 – NOTIFICATION OF OWNER'S REPRESENTATIVE

Add this section as follows:

The Owner's Representative shall have free access to the work whenever it is in preparation or progress and proper facilities, for such access and inspection. Failure to notify the Owner's Representative may require the Contractor to redo, uncover pipe, expose for inspection, etc., work that the Owner's Representative was unable to inspect.

SUBSECTION 440.2.6 – RECORD DRAWINGS

Modify the requirements for as-built drawings to include this section as follows:

Contractor shall record dimensioned locations and depths for each of the following:

A. Irrigation pressure main line routing (provide dimensions for each 100 linear feet {maximum} along each routing, and for each change in directions).
B. Controllers, pressure regulators and other major items identified on the plans.
C. Irrigation control valves
D. Control wire routing
E. Sleeves under paving

Contractor shall locate dimensions from two permanent points (buildings, monuments, sidewalks, curbs or pavements.) Record drawings shall include changes which are made from the Contract Drawings, including changes in the pressure and non-pressure lines. Required information shall be recorded on a set of blackline prints of the Plans. Do not use these prints for another purpose. Contractor shall maintain information daily and keep drawings at the site at all times and available for review by the Owner's Representative.

SUBSECTION 440.2.7 – CONTROLLER CHARTS

Add this section as follows:

Do not prepare charts until record drawings have been approved by the Owner's Representative.
Contractor shall provide one controller chart per controller.

A. Chart may be a reproduction of the Record Drawing, if the scale permits fitting the controller door. If photo reduction prints are required, keep reduction to maximum size possible to retain full legibility. Coordinate with Owner's staff.
B. Chart shall be blackline print of the actual system, showing the area covered by that controller.

Contractor shall identify the zone of coverage of each remote control valve, using a distinctly different pastel color, drawn over the entire area of coverage. Following approval of charts by the Owner's Representative, they shall be hermetically sealed between two layers of 20 mil thick plastic sheet.
Charts must be completed and approved prior to final acceptance of the irrigation system.

SUBSECTION 440.2.8 – OPERATING AND MAINTENANCE MANUALS

Modify Section 440.2 language regarding the manufacturer's instructions and maintenance manuals with the following:

Contractor shall provide four individually bound manuals detailing operating and maintenance requirements for each component of the irrigation system. Manuals shall be delivered to the Owner's Representative no later than 10 days prior to completion of work. Provide descriptions of installed materials and systems in sufficient detail to permit maintenance personnel to understand, operate, and maintain the equipment. Provide the following in each manual:

A. Index sheet, stating Irrigation Contractor's name, address, telephone number and name of person to contact.
B. Duration of guarantee period.
C. Equipment list providing the following for each item:
    1. Manufacturer's name
    2. Make and model number
    3. Name and address of local manufacturer's representative
    4. Spare parts list
    5. Detailed operating and maintenance instructions of major equipment.

SUBSECTION 440.2.9 – CHECKLIST

Add this section as follows:

Contractor shall provide a signed and dated checklist and deliver to the Owner's Representative prior to final acceptance of the work. Use the following format:

A. Plumbing permits: if none required, so note
B. Material approvals: approved by and date
C. Pressure line tests: by whom and date
D. Record drawings: received by and date
E. Controller charts: received by and date
F. Operation and maintenance manuals: received by and date
G. Manufacturer's warranties if required: received by and date
H. Written guarantee: received by and date

SUBSECTION 440.2.10 – EQUIPMENT TO BE FURNISHED

Add this section as follows:

Supply as part of this contract the following tools:

A. Two sets of special tools required for removing, disassembling and adjusting each type of valve supplied on this project
B. Three valve box keys or wrenches
C. Twelve of each emitter type
D. One (1) five-foot gate valve key

The above-mentioned equipment shall be delivered to the Owner at the conclusion of the project. Before final inspection can occur, evidence that the Owner has received material must be shown to Owner's Representative.

SUBSECTION 440.4 – LANDSCAPE IRRIGATION SYSTEM RESTORATION

Remove the option to salvage and reuse material and add the following to this section:

Materials and installation shall conform to MAG Sections 440.3 and Section 757 of these Specifications.

This work shall be considered incidental to the contract and no separate payment shall be made to comply with these provisions.

SUBSECTION 440.5 – TRENCH EXCAVATION AND BACKFILL

Modify this section by deleting sub items A, B, C, and D regarding trenching depths.

SUBSECTION 440.5.1 – TRENCHING

Add this section as follows:

Contractor shall dig trenches straight and support pipe continuously on bottom of trench. Lay pipe to an even grade. Trenching excavation shall approximately follow the schematic layout indicated on drawings and as noted. If the bottom of a pipe trench excavation is found to consist of rock, caliche, or other material that, by reason of its hardness, cannot be excavated to give a uniform bearing surface, said rock or other material shall be removed for at least 3" below the specified trench depth, and be refilled to specified trench depth with sand or similar material thoroughly tamped into place.

Trenching and installation of mainline and lateral lines shall occur after excavation of existing surface material and soil, but before the placement of imported soil.

Burial of Pipe: Burial of pipe shall be as follows:

Main Line - 6" and less PVC	18" minimum coverage
Sleeves	24" minimum coverage under vehicular paving
All Other Sleeves	18" minimum coverage
Drip Laterals	12" minimum coverage
Irrigation Control Wire	at or below Main Line

SUBSECTION 440.5.2 – BACKFILLING

Add this section as follows:

The trenches shall not be backfilled until required tests are performed. Trenches shall be carefully backfilled in 6" lifts with the excavated materials approved for backfilling, consisting of earth, loam, sandy clay, sand, or other approved materials, free from clods of earth or stones larger than 1" in diameter. Backfill shall be mechanically compacted in landscaped areas to a dry density equal to adjacent undisturbed soil in planting areas. Backfill will conform to adjacent grades without dips, sunken areas, humps or other surface irregularities. Backfilling shall not be performed while trenches or backfill material is in a wet or muddy condition.

A fine granular material backfill will be initially placed on lines to a depth of 2". No foreign matter larger than 1/2" in size will be permitted in the initial backfill. If settlement occurs and subsequent adjustments in pipe, valves, sprinkler heads, lawn or planting, or other construction are necessary, the Contractor shall make required adjustments without cost to the Owner.

SUBSECTION 440.5.3 – TRENCHING AND BACKFILLING UNDER PAVING

Add this section as follows:

Trenches located under areas where paving, asphaltic concrete or concrete will be installed shall be backfilled with sand (a layer 6" below the pipe and 3" above the pipe) and compacted in layers to 90% compaction, using manual or mechanical tamping devices. Backfill with ½ sack CLSM slurry from top of sand to subgrade unless native backfill is allowed by engineer, then compaction shall be 95% under pavement. Trenching for piping shall be compacted to equal the compaction of the existing adjacent undisturbed soil and shall be left in a firm, unyielding condition. Trenches shall be left flush with the adjoining grade. The irrigation Contractor shall set in place, cap, and pressure test piping under paving prior to the paving work.

Provide for a minimum cover of 24" between the top of the pipe and the bottom of the aggregate base for pressure and non-pressure piping installed under asphaltic concrete paving.

Where the plans or site conditions require the existing paving to be cut, the saw cut method shall be used. The removed paving shall be replaced in kind.

SUBSECTION 440.5.4 – TRENCHING ADJACENT TO EXISTING TREES

Add this section as follows:

Where it is necessary to excavate adjacent to existing trees, the Contractor shall use care to avoid injury to trees and tree roots. Excavation in areas where 2" and larger roots occur shall be done by hand. Roots 6" and larger in diameter, except directly in the path of pipe or conduit, shall be tunneled under and shall be heavily wrapped with burlap to prevent scarring or excessive drying. Where a ditching machine is run close to trees having roots smaller than 51 mm in diameter, the wall of the trench adjacent to the tree shall be hand trimmed, making clean cuts. Roots 1" and larger in diameter shall be painted with two coats of Tree Seal or equal. Trenches adjacent to trees should be closed within 24 hours, and where this is not possible the side of the trench adjacent to the tree shall be kept shaded with burlap or canvas.

SUBSECTION 440.6 – PIPE INSTALLATION

Add the following to this section:

The Contractor shall be responsible for providing piping necessary to provide a complete and fully operational irrigation system, including sub-lateral piping, risers and fittings to each plant emitter as specified and detailed whether or not piping is shown on the plans.

Type, class or schedule of PVC or metallic pipe shall be as shown on the drawing, except that Schedule 80 must be used for pipes and fittings with threaded joints.

PVC sleeves that must be installed under paved surfaces and structures are included and shall be the responsibility of the Contractor to coordinate the installations prior to completion of the pavements or structures. Where sleeving is to be placed beneath existing pavements or structures the Contractor will be responsible for required boring necessary to complete the installation.

All pipe installed beneath paving or structures shall be sleeved and sleeved separately from wire, in PVC pipe sleeves. Size and type as shown on the drawings.

SUBSECTION 440.6.3 – SLEEVES

Add this section as follows:

Sleeves shall be provided where shown on the drawings, where required and/ or specified herein. Not all required sleeves may be shown on the drawings.

Main lines, lateral line piping, emitter headers and lateral piping and control wire shall be installed in a sleeve under paving walls and concrete surfaces.

Sleeving shall be Schedule 40 PVC solvent weld pipe. Joints shall be solvent welded. Welds to be primed and glued as per pipe size. Sleeves shall be capped and kept clean of dirt and debris.

Excavation and backfill shall be as specified in Sections 440.5.1, 440.5.2, and 440.5.3 and shall extend a minimum of 2 feet into the planting area.

Location of sleeves shall be shown on the record drawings. Each sleeve shall be taped along its entire length with metallic locator tape manufactured for that purpose.

Sleeves shall have a minimum horizontal clearance of 12" from each other and other piping. Sleeves shall not be installed parallel and directly over another line. Sleeves shall have a minimum of 6 inches vertical clearance where they cross other lines. Sleeves shall be a minimum size of 2". Each pipe shall have its own sleeve unless approved by the Owner's Representative.

SUBSECTION 440.7 – VALVES, VALVE BOXES, AND SPECIALTY EQUIPMENT INSTALLATION

Delete all references to quick-coupler valves and backflow preventers.

SUBSECTION 440.8 – DRIP IRRIGATION SYSTEM INSTALLATION AND ADJUSTMENT

Replace Section 440.8 Sprinkler Head Installation and Adjustment in its entirety with the following:

In accordance with the requirements of Subsection 440.6 mains and laterals shall be flush and pressure tested before installing drip irrigation components. A complete test of the drip system shall be performed after emitters are installed.

SUBSECTION 440.8.2 – CONTRACTOR RESPONSIBILITY

Add this section as follows:

The Contractor shall not willfully install the irrigation system as shown on the drawings when it is obvious in the field that obstructions, grade differences or discrepancies in equipment usage, area dimensions or static water pressure exist that might not have been considered in the engineering. Such obstructions or differences shall be brought to the attention of the Owner's Representative. In the event this notification is not performed, the Contractor shall assume full responsibility for necessary revisions.

All material and equipment shall be delivered to the job site in unbroken and unopened reels, cartons or other packaging to demonstrate that such material is new and of a quality and grade in keeping with the intent of these specifications.

SUBSECTION 440.8.2.1 – SITE CONDITIONS

Scaled dimensions are approximate. The Contractor shall check and verify size dimensions and receive Owner's Representative approval prior to proceeding with work under this Section.

Coordinate installation of irrigation materials, including pipe, so there shall be no interference with utilities or other construction or difficulty in planting trees, shrubs, and ground covers. Contractor shall coordinate with other Contractors to insure timely placing of necessary sleeves, wires and pipes under walks, curbs and paving.

Design Pressure: This irrigation system has been designed to operate with a minimum static inlet water pressure as shown on the drawings. The Contractor shall take a pressure reading prior to beginning construction. If the pressure reading is less than indicated, the Contractor shall notify the Owner's Representative.

SUBSECTION 440.8.3 – PREPARATION

Prior to installation, the Contractor shall stake out pressure supply lines, location of remote control valves, specialty valves, and controllers. Layout shall be approved by Owner's Representative prior to installation. Prior approval shall be obtained for valves, controllers, and main line routing. Strict adherence shall be made to provide clearances between potable and irrigation lines as required by MAG and COP Standards.

Contractor shall comply with requirements for piping specified in MAG Section 610 for water supply from exterior water service piping and water meters. Drawings indicate general arrangement of piping, fittings, and specialties.

SUBSECTION 440.8.4 – ASSEMBLIES

Install lines and various assemblies to conform to the details shown on drawings and in accordance with the manufacturer's recommendations. Install no multiple assemblies on plastic lines. Provide each assembly with its own outlet.

Install assemblies specified herein in accordance with respective detail. In absence of detail drawings or specifications pertaining to specific items required to complete work, perform such work in accordance with best standard practice with prior approval of Owner's Representative.

PVC pipe and fittings shall be thoroughly cleaned of dirt, dust and moisture before installation. Installation and solvent-welding methods shall be recommended by the pipe and fitting manufacturer. Primer shall be used on solvent weld joints. No solvent weld joint shall be submitted to water pressure until curing for 24 hours minimum.

On PVC to metal connections, the Contractor shall work the metal connections first. Teflon tape or shall be used on threaded PVC to PVC joints, and on threaded PVC to metal joints. Light wrench pressure is all that is required. Where threaded PVC connections are required, use threaded PVC adapters into which the pipe may be welded.

SUBSECTION 440.8.5 – PVC PIPE INSTALLATION

Piping shall be snaked in the trench to allow for thermal expansion and contraction. All lines shall have a minimum clearance of 6" from each other, and from lines of other trades. Parallel lines shall not be installed directly over one another.

After curing of solvent weld joint and after having received the approval of the Owner's Representative, the mainline shall be filled. Extreme care will be taken to slowly fill the piping while releasing entrapped air at the ends of the main line. Manufacturer’s installation recommendations shall be strictly adhered to.

SUBSECTION 440.8.6 – REMOTE CONTROL VALVE INSTALLATION

Install remote control valves where shown on drawings and details. Drawings are schematic and valves shall be located adjacent and perpendicular to walks or curbs and in decomposed granite areas where possible. When grouped together, allow at least 1" between valve boxes. Install each remote control valve in a separate valve box. Electric control valves shall be tagged with permanent tags and markings indicating valve number, controller, controller station and type and location of heads and emitters on the valve. Each remote control valve box shall be branded with the controller and station number in an approved manner. Piping connecting the main line with the valve shall be the same size as the largest lateral pipe size for that zone. Reducing fitting shall occur at the unions and ball valve on either side of the valve. Each remote control valve shall have a separate tee from the main line. Boxes shall be aligned in a manner acceptable to the Owner's Representative.

SUBSECTION 440.8.8 – CONTROL WIRE INSTALLATION, SEE 440.9

All control wire less than 2500 feet in length shall be continuous without splices or joints from the controller to the valves. Connections to the electric valves shall be made within 18" of the valve using waterproof connectors.

All control wires shall be installed at least 18" deep. Contractor shall obtain the Owner's Representative's approval for wire routing when installed in separate trench. Control wires may be installed in a common trench with piping; however, wires must be installed a minimum of 4" below or to one side of piping.

Wire passing under existing or future paving, sidewalk, construction, etc., shall be encased in PVC Schedule 40 conduit extending at least 24" beyond edges of paving, sidewalks or construction. Sleeving shall be shown on the record drawings.

SUBSECTION 440.9 – AUTOMATIC CONTROL SYSTEM INSTALLATION

Replace with the following:

A new DIG Leit X Controller shall be installed in each location where indicated on the project plans. The Contractor shall provide station area coverage maps, sealed in plastic, for the controller. The controller(s) shall have the minimum number of stations as indicated on the Drawings. Controllers shall include required solenoid adapters required to operate the specified valves.

Control wiring shall be U.L. approved for direct underground burial, controller shall have its own common wire to respective valves. Connections between the automatic controllers and the electric control valves shall be made with direct burial copper wire AWG-UF 600 volt. Circuit wires shall be red with white common wires. Install in accordance with valve manufacturer's specifications. Remote Control Valve circuit wire shall be #14 and common wire shall be #12. Wiring shall occupy the same trench and shall be installed along the same route as pressure supply or lateral lines whenever possible.

Where more than one wire is placed in a trench, the wiring shall be taped together at intervals of 10 feet. An expansion curl shall be provided within 3 feet of each wire connection. Expansion curl shall be of sufficient length at each splice connection at each electric control, so that in case of repair the valve bonnet may be brought to the surface without disconnection of the control wires. Control wires shall be laid loosely in trench without stress or stretching of control wire conductors. Field splices between the automatic controller and electrical control valves will not be allowed without prior approval of the Owner's Representative.

Control wiring installed under paving shall be installed in UL listed Schedule 40 electrical conduit. Conduit shall terminate at least 2 feet inside of a planting area. Conduit joints and fittings shall be solvent weld. Size shall be 2" minimum and larger as required and/or shown on the plans. All control wire under paving or structures shall be separately sleeved from water piping in schedule 40 PVC pipe sleeves. Size as shown on the drawings.

Two #12 "spare" wires shall be run from the controller in each direction as noted on plans. Wires shall be white with color stripes or otherwise marked in an approved manner. Spare wires shall be indicated on the Record Drawings. A #14 green tracer wire shall be installed along the path of main lines. Loop tracer wire in valve boxes.

Wire connectors shall have a two-piece PVC housing which, when filled with resin epoxy and pressed together, forms a permanent, one-piece, moisture-proof wire splice. Connectors shall be UL listed, rated 600 volt, for PVC insulated wire. No wire splices shall be buried. Wire connectors shall be 3M models DBR, DBY or approved equal. Connector joints shall be absolutely waterproof so that there is no chance for leakage of water and corrosion buildup on the joint.

SUBSECTION 440.10 – FLUSHING AND TESTING

Replace this section with the following:

The Contractor shall be responsible to make temporary system alterations and have necessary equipment available to perform the required testing in accordance with the Plans and these Special Provisions. Terminal fittings shall be installed only after flushing of the system has been accomplished to the complete satisfaction of the Owner's Representative. All parts of the irrigation system and associated equipment shall be adjusted to function properly and shall be turned over to the Owner in operating condition.

SUBSECTION 440.10.1 –TESTING OF IRRIGATION SYSTEM

Add this section as follows:

The Contractor shall request the presence of the Owner's Representative at least 48 hours in advance of testing. Hydrostatic tests shall be made only in the presence of Owner's Representative. No pipe shall be backfilled until it has been inspected, tested and approved in writing.

Furnish necessary force pump and other test equipment. Test pressure lines under hydrostatic pressure of 150 psi and prove water tight. Piping under paved areas shall be tested under hydrostatic pressure of 150 psi and proved water tight. PVC lateral line pipe shall be tested at working line pressures with couplings exposed and other outlets capped.

Sustain pressure in lines for not less than two hours. Pipe sections shall be center loaded and couplings shall be exposed. Before testing, the line shall have been filled with water for at least four hours and provisions made for thoroughly bleeding the line of air.

Upon completion of each phase of work, entire system shall be tested and adjusted to meet site requirements.

SUBSECTION 440.10.2 – MAINTENANCE AND OBSERVATION PERIOD

Add this section as follows:

The entire irrigation system shall be under full automatic operation for a period of seven days prior to planting. The Owner's Representative reserves the right to waive or shorten the operation period.

Contractor shall provide job maintenance of the entire irrigation system and shall continue until job acceptance by the Owner. Maintain system components and assure proper watering of plants. Repair leaks and replace defective components. After landscape and irrigation operations are complete and in conformance with the contract documents, the Owner shall grant provisional acceptance.

Following provisional acceptance, the Contractor shall provide job maintenance consisting of items covered under maintenance alone. Following the maintenance period, the Owner shall grant final job acceptance after verifying work and system components are in conformance with the contact documents.

SUBSECTION 440.10.3 – FINAL OBSERVATION PRIOR TO ACCEPTANCE

Add this section as follows:

The Contractor shall operate each system in its entirety for the Owner's Representative at the time of final observation. Items deemed not acceptable shall be reworked to the complete satisfaction of the Owner's Representative. The Contractor shall show evidence to the Owner's Representative that the Owner has received accessories, charts, record drawings, and equipment as required before final observation can occur.

SUBSECTION 440.10.4 – OBSERVATION SCHEDULE

Add this section as follows:

Contractor shall be responsible for notifying the Owner's Representative in advance for the following observations according to the time indicated:

1. Pre-job conference - 7 days
2. Main line layout, remote control valve locations - 72 hours
3. Pressure supply line installation and testing - 72 hours
4. Automatic controller hook up - 72 hours
5. Control wire installation - 72 hours
6. Lateral line and emitter installation - 72 hours
7. Final observation - 7 days

The Contractor shall be present at each inspection and a punch list of items requiring remedial work shall be generated. When the inspections have been conducted by other than the Owner's Representative, show evidence of when and by whom these inspections were made.

Upon completion of punch list items and approval by the Owner, the one hundred and twenty (120) day maintenance/establishment period will begin.

Final Maintenance Inspection: At the end of the one hundred and twenty (120) day maintenance/establishment period a final inspection will be performed. If, after this inspection, the Owner agrees that irrigation system and components are in satisfactory operating condition, written Notice of Acceptance will be given to the Contractor for irrigation installation and commencement of the required warranties will start.

Maintenance shall include, but not necessarily be limited to the following:

1. Backfilling of trenches.
2. Adjustment of head emitter placement and spacing as necessary.
3. Unstopping emitters plugged by foreign material.
4. Adjustment of controller as necessary to ensure proper sequence and watering time.
5. All maintenance necessary to keep the system in good operating order.

The Owner's staff and Contractor's representative will perform a bi-weekly inspection. Items requiring replacement shall be replaced and corrective work shall be completed prior to the next bi-weekly inspection meeting.

SUBSECTION 440.10.5 – WARRANTY

Add this section as follows:

In addition to manufacturer's guarantees or warranties, work shall be warranted for one (1) year from the date of final acceptance against defects in material, equipment and workmanship by the Contractor. Warranty shall also cover repairs to the work and damage to the premises resulting from leaks or other defects in materials.

The Contractor is required to guarantee the sprinkler irrigation system in accordance with the form below. A copy of the guarantee form shall be included in the Operations and Maintenance Manual. The guarantee form shall be on the Contractor's letterhead and contain the following information:

GUARANTEE FOR IRRIGATION SYSTEM

> We hereby guarantee that the irrigation system we provided is free from defects in materials and workmanship, and the work has been completed in accordance with the drawings and specifications, ordinary wear and tear, and unusual abuse or neglect excepted. We agree to repair or replace defects in material or workmanship including repair of backfill settlement which may develop during the period of one year from date of Substantial Completion and to repair or replace damage related to such defects at no additional cost to the Owner. We shall make such repairs or replacements within a reasonable time, as determined by Owner, after receipt of written notice from the Owner, we authorize the Owner to proceed to have said repairs or replacements made at our expense and we will pay the costs and charges therefore upon demand.
>
> PROJECT:
> LOCATION:

SIGNED:_____

Contractor

ADDRESS:
PHONE:
DATE OF ACCEPTANCE:

Guarantee and maintenance after final acceptance does not include alterations as necessitated by re-landscaping, re-grading, addition of trees or the addition and/or changes in sidewalks, walls, driveways, etc.

SUBSECTION 440.11 – MEASUREMENT AND PAYMENT

Replace this section with the following:

Payment for the landscape irrigation system shall be made in conformity with the terms of the contract and will be based on the lump sum price bid. The lump sum price bid shall be full compensation for all labor, equipment, and materials needed for site preparation, purchase, delivery, installation and testing necessary to complete the work as shown on the plans including water meter acquisition from the City of Peoria, water meter taps, and cutting and patching of pavements in the public rights-of-way.

(END SECTION 440)

SECTION 757 – IRRIGATION SYSTEM

Irrigation System shall conform to Section 757 of the MAG Uniform Standards Specifications except as modified herein.

SUBSECTION 757.2 – PIPE AND FITTINGS

Replace the following subsections:

SUBSECTION 757.2.2 – PLASTIC PIPE

Plastic pipe shall be rigid, unplasticized polyvinyl chloride, PVC 1120 or 1220, with an SDR of 26 or less, complying with ASTM D-1785. Schedule 40 pipe shall be used for the continuously pressurized run on the supply side and on the discharge side of control valves.

All PVC pipe shall be PURPLE PIPE to designate the use of reclaimed water and bear the following markings:

1. Manufacturer's name
2. Nominal pipe size
3. Schedule or class
4. Pressure rating in psi
5. National Sanitation Foundation (NSF) approval.
6. Date of extrusion

Pressure mainline piping sizes shall be Sch.40 PVC Type I, solvent weld. Pipe shall be made from NSF approved type I, Grade I PVC compound conforming to ASTM specification D 2241.

Non-pressure buried lateral line piping shall be Schedule 40 PVC with solvent-weld joints. Pipe shall be made from NSF approved, Type I, Grade II PVC compound conforming to ASTM resin specifications D1784. Pipe shall meet requirements set forth in Federal Specification PS-22-70, with an appropriate standard dimension ratio.

SUBSECTION 757.2.3 – PIPE FITTINGS AND COUPLINGS

Fittings shall bear the manufacturer's name or trademark, material designation, size, applicable IPS schedule and NSF seal of approval.

A. Steel Pipe Fitting and Couplings – Steel pipe fittings and couplings shall be galvanized, malleable iron, screwed fittings or couplings, conforming to Section 753.

B. Brass Pipe Fitting and Couplings - Where indicated on the drawings, use red brass screwed pipe conforming to Federal Specification #WW-P-351. Fittings shall be red brass conforming to Federal Specification #WW-P-460.

C. Plastic Pipe Fittings and Couplings – PVC solvent-weld fittings shall be Schedule 40, Type I NSF approved conforming to ASTM test procedure D2466 as manufactured by Spears, Lasco or Dura. Except as noted above, requirements for non-pressure lateral-line pipe and fittings shall be the same as for solvent-weld pressure mainline pipe and fittings. Plastic pipe fittings and couplings shall be either threaded type or slip fitting tapered socket solvent weld type. Schedule 80 pipe only will be used for threaded joints. Tapered solvent weld fittings may be either Schedule 80 or Schedule 40, but

in any case, will be equal to or greater than the Schedule and Pressure Rating of the plastic pipe being joined. Tapered fittings shall be sized so that a dry, unsoftened taper cannot be inserted more than halfway into the socket. Plastic saddles and flange fittings are not permitted.

Fittings for pressure mainline piping up to and including 2-1/2 inches shall be PVC solvent-weld fittings Schedule 80, Type I NSF approved conforming to ASTM test procedure D 2466 and shall be as manufactured by Spears, Lasco or Dura.

D. Copper Pipe Fittings and Couplings – Where indicated on the drawings, use Type K rigid conforming to ASTM Standard B88. Fittings shall be wrought copper or bronze. Use a 95% tin and 5% antimony solder.

SUBSECTION 757.2.4 – SOLVENT CEMENT

The solvent cement shall be a solution of Type 1, Grade 1, unplasticized, polyvinyl chloride molding or extrusion compound as specified in ASTM D-1784, or an equivalent PVC resin. The cement shall be free flowing and shall not contain lumps, microscopic undissolved particles or any foreign matter that will adversely affect the ultimate joint strength. It shall show no stratification or separation that cannot be removed by stirring. Container labeling shall be in accordance with ASTM D-2564.

Solvent cement for PVC solvent-weld pipe and fittings shall be "heavy-duty grey cement" as manufactured by "Oatey" or equal. Solvent primer for PVC solvent weld pipes and fittings shall be "all purpose" primer (purple) for PVC and CPVC pipe fittings. Installation methods of solvent cement and primer for PVC solvent-weld pipe and fittings shall be as prescribed by the manufacturer. All threaded connections between metal to metal, PVC to metal and PVC-to-PVC shall be made using Teflon tape thread sealing compound. Thread sealing compound shall not be used on threaded connections between emitter and riser.

SUBSECTION 757.3 – VALVES AND VALVE BOXES

SUBSECTION 757.3.1 – GENERAL

Add the following to this section:

Valves shall be of the size, type, and capacity designated on the plans or in the special provisions and shall comply with the requirements specified herein.

All valves shall be capable of satisfactory performance at a working pressure of 200 psi. Valves shall be designed to permit disassembly to replace sealing components without removal of the valve body from the pipeline.

SUBSECTION 757.3.2 – GATE VALVES

Gate valves in size two (2) inches and smaller shall be all bronze double disc wedge type with integral taper seats and non-rising stem. Section 753 applies.

SUBSECTION 757.3.3 – MANUAL CONTROL VALVES

Manual control valves shall be brass or bronze, and shall be straight or angle pattern glove valves, full opening, key operated with replaceable compression disc and ground joint union on the discharge end.

SUBSECTION 757.3.4 – ELECTRICAL REMOTE CONTROL VALVES

Replace this section with the following:

SUBSECTION 757.3.4.1 – MASTER VALVE

The electric valve shall be normally closed 24 VAC 50/60 Hz (cycles per second) solenoid actuated, globe pattern design capable of a flow rate of 0.25 to 50 GPM. The valve pressure rating shall not be less than 150 psi (10,4 bar). The valve body and bonnet shall be constructed of heavy-duty, glass-filled UV resistant nylon and have stainless steel studs and flange nuts. The valve shall have a purple flow control handle to indicate the use of non-potable water. The valve shall be as such to provide for all internal parts to be removable from the top of the valve without disturbing the valve installation.

The valve shall have a diaphragm constructed of durable nylon reinforced EPDM rubber. The valve shall have one fully encapsulated solenoid with captured plunger. The valve shall have a self-cleaning stainless steel screen designed for dirty water applications.

The valve shall be actuated by a low power 0.30 A (7.2 VA) in-rush current and 0.23 A (5.5VA) holding current. The valve shall have both internal and external manual open/close control to manually open and close the valve without electrically energizing the solenoid.

SUBSECTION 757.3.4.2 – ZONE CONTROL VALVES

The electric valve shall be normally closed 24 VAC 50/60 Hz (cycles per second) solenoid actuated, balanced pressure type capable of a flow rate of 40.0 gpm. The valve pressure rating shall not be less than 150 psi (10,4 bar). The valve body and bonnet shall be constructed of high impact weather resistant plastic, stainless steel and other chemical/UV resistant materials.

The valve shall have a one unit diaphragm constructed of durable Buna-N rubber material with a clog resistant metering orifice, and a double knife seal. The valve shall have a 1⁄2" diameter seat. The valve shall have one fully encapsulated solenoid with captured plunger. The valve shall have one 90-mesh (200 micron) filter attached to the solenoid base. .

The valve shall be actuated by a low power 0.30 A (7.2 VA) in-rush current and 0.23 A (5.5VA) holding current. The valve shall be capable of on/off control by turning the solenoid 1⁄4 turn.
The valve shall provide a flush mode that is manually activated by 1⁄2 turn of the bleed screw where external porting is permissible. The valve shall be as such to provide for all internal parts to be removable from the top of the valve without disturbing the valve installation.

SUBSECTION 757.3.6 – QUICK-COUPLING VALVES AND ASSEMBLIES

Replace this section with the following:

Quick-coupling valves are not allowed on this system due to the fact that the water supply is from an reclaimed source.

SUBSECTION 757.3.7 – VALVE BOXES

Replace this section with the following:

Use plastic rectangular box for electrical control valves as required. Provide stainless steel bolts. Provide extensions as required to ensure box rests on continuous soil base. Seal all openings including the bottom with geotextile fabric. Valve boxes shall be as follows:

Junction Box, Pull Box	Carson Model 1419 with T Style Cover

Remote Control Valve	Carson Model 1220 with T Style Cover
Master Valve	Carson Model 1324 with T Style Cover

Valve boxes with locking bolt down covers shall be molded, non-corrosive plastic. Applicable ASTM references: D-638. Valve boxes and lids shall be colored PURPLE to designate the use of reclaimed water.

SUBSECTION 757.4 – BACKFLOW PREVENTER ASSEMBLY

Replace this section with the following:

A backflow preventer is not required for this design provided the water supply is from an approved reclaimed source. CONTRACTOR is to notify the Owner's Representative immediately if the use of reclaimed water is in any way prohibited by site conditions or a change in reclaimed water availability for this project.

NO IRRIGATION EQUIPMENT SHALL BE INSTALLED PRIOR TO CONFIRMATION OF RECLAIMED WATER AVAILABILITY.

SUBSECTION 757.5 – SPRINKLER EQUIPMENT

Remove requirements for sprinkler heads and spray nozzles and add the following to this section:

SUBSECTION 757.5.1 DRIP SYSTEM COMPONENTS

Regulator shall be Rain Bird PSI-L30X-075 for flows less than 2.0 GPM or Rain Bird PSI-M30X-075 for flows from 2.0 to 10.0 GPM. Filter shall be Rain Bird RBY-3/4" with 200 stainless steel mesh screen. Emitters shall be Bowsmith ML200 series multi-port (trees) and SL200 series single port (shrubs). Distribution box for the emitters shall be a standard 6" econo-box with purple lid. The maximum length for the distribution tubing shall be 7' for trees and 6' for shrubs.

SUBSECTION 756.3.1 – CONTROLLER UNIT

Replace this section with the following:

Irrigation controllers shall be LEIT X10 and be installed in a LEIT MCDLXS (304) stainless steel vandal resistant enclosure with strip perforations on top, allowing light to enter the controller, plus a lockable-hinged door (lock included) for added protection. The controller and enclosure shall be mounted on a galvanized mounting column with a length of 35" with curved sweep at the bottom to permit ease of wire pull.

SUBSECTION 757.7 – MANUAL FLUSH END CAP ASSEMBLY

Add this section as follows:

The drip system manual flush end cap assembly shall be as detailed on the drawings. The flush device shall be used for flushing of emitter pipes or tubing downstream of the valve, and shall be placed downstream of the last emitter on every dead end run.

SUBSECTION 757.8 – OTHER MISCELLANEOUS MATERIALS, EQUIPMENT, OR SPECIAL INSTALLATIONS

Add this section as follows:

Other miscellaneous system components, equipment, or special installation required to provide and install a complete and fully automated irrigation system, but is not addressed herein shall be considered incidental to the work and shall be provided and installed.

(END SECTION 757)

SECTION III

TRAFFIC SIGNAL AND INTELLIGENT TRANSPORTATION SYSTEM SPECIAL CONDITIONS

BASE BID

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TRAFFIC SIGNAL CONSTRUCTION SPECIFICATIONS:

The work embraced herein for the construction of traffic signals shall be performed in accordance with the requirements of the following separate documents:

Arizona Department of Transportation, Highways Division, Standard Specifications for Road and Bridge Construction.

Arizona Department of Transportation, Highways Division, Traffic Signals & Lighting, Standard Drawings.

Arizona Department of Transportation, Signing and Marking, Standard Drawings.

Arizona Department of Transportation, Traffic Control Supplement to Part VI of the Manual on Uniform Traffic Control Devices.

Manual on Uniform Traffic Control Devices for Streets and Highways.

City of Phoenix Traffic Barricade Manual.

International Municipal Signal Association, Wire and Cable Specifications, Latest Edition.

City of Peoria Infrastructure Development Guidelines and details.

City of Peoria pavement marking and signing requirements.

TRAFFIC SIGNAL GENERAL NOTES:

1. During construction if existing irrigation and landscaping is disturbed, it is the Contractors responsibility for replacing, in kind, disturbed irrigation and landscaping. The cost associated with this item shall be considered as incidental work to the contract and shall not be paid for separately. The contractor should factor this in the unit rate bid.

2. Prior to construction of the traffic signal, the Contractor shall contact the City of Peoria Community Services Department (ROW Contract Supervisor at (623) 773-5245) to notify and coordinate construction activities.

3. Material Submittals shall be submitted to the City Engineering Department for review and approval prior to ordering or manufacturing of any equipment. The Contractor shall anticipate and schedule for a two week review period by the City of Peoria and/or its designer during which time will either approve, disapprove, or request modifications. The latter two will require re-submittal of the material and a subsequent additional review period. This process shall be repeated until all submitted materials have been approved.

4. No used or old equipment is to be used on this project without prior written approval by the City of Peoria.

5. The contractor shall schedule a Pre-Signal Turn-on Meeting with representatives from the City of Peoria Engineering and Public works Departments one (1) day prior to signal turn-on to inspect the items listed below. This meeting shall be requested three (3) working days in advance of the meeting date. Signal turn-on will not be done on Fridays due to monitoring of the signal operation the first 24 hours. The following are some of the items that need to be checked, other items may be added:

    - Phase indications checked manually by applying voltage (ringing out) to each phase field output termination (including pedestrian phases) to verify that all indications are wired correctly and working.
    - Pull Boxes checked for proper labeling, connections, grounds and overall installation.
    - Cabinet Inspected/inventoried for all equipment, connections, Timing card, cleanliness and labeling. Electrical service verified for correct voltage for signal, street lighting and illuminated street signs.
    - Pedestrian push buttons checked for proper functionality/continuity.
    - Striping and signage verified per plans.
    - Signal Poles checked for cleanliness, grouting around pole base.
    - Verify all redlines and locations on plans for as-built finals.
    - Verify all signal equipment has been cleaned of all oil, dirt and debris. Ensure all touch ups have been performed.
    - Verify LED Manufacturer type.
    - Signal head alignment and mountings will be checked during un-bagging of heads during signal turn on.
    - Actual functionality and operation for entire system and related components will be done during signal turn on.

TRAFFIC SIGNAL AND ITS SUBMITTALS:

The materials on the submittal shall be identified by the contract project number, bid item numbers, catalog part numbers, catalog cut sheets, shop drawing for signal and lighting equipment, trade names, schedules or other pertinent information. The materials from any catalog cut sheets shall be clearly noted on the materials list. If requested by the Engineer, the Contractor shall submit manufacturer shop drawing for a review and approval and shall furnish Certificates of Compliance conforming to the requirements of Subsection 106.05. The Contractor shall submit the pole schedule shown on the plans to the pole manufacturer, who shall perform and submit to the Engineer structural calculations verifying the poles' and mast arms' structural integrity under loading shown on the plans. These manufacturer's calculations shall include detailed drawings of installation layouts for each pole.

PULL BOX (No. 7 ADOT TS 1-4)
PULL BOX (NO. 7) (WITH EXTENSION)

Description:
The Contractor shall furnish and install No. 7 Pull Boxes and No. 7 Pull Boxes with Extension as shown in the Project Plans.

Materials:
A certificate of compliance, in accordance with Section 106.05 of the ADOT Standard Specifications shall be supplied for structural capabilities and materials used in manufacture.

Covers shall be marked as follows:
"TRAFFIC SIGNALS" with one inch letters for all traffic signal pull boxes.

The boxes shall have a locking mechanism approved by the Engineer.

The pull boxes shall be fabricated of a composite material. Metal junction boxes and covers shall not be used.

Construction Requirements:
The compaction around the box shall not cause the sides to deflect or any part of the box or lid to crack. The Contractor shall replace any cracked, broken, chipped or damaged pull boxes or lids at no additional cost to the City.

Each new pull box location shall be field approved by the Engineer.

Each new pull box shall be installed to the finished grade.

The Contractor shall be responsible for restoring the surrounding surface conditions back to their original state, including concreted areas.

Method of Measurement:
New No. 7 Pull Boxes and No. 7 Pull Boxes with Extension will be measured as a unit for each pull box.

Basis of Payment:
The accepted quantities of each No. 7 Pull Box and No. 7 Pull Box with Extension, measured as provided above, will be paid for at the contract unit price each, which price shall be full compensation for the work, complete in place, including any excavating, backfilling, and area restoration necessary to complete the work.

PULL BOX (COMMUNICATION VAULT)

Description:
The Contractor shall furnish and install Communication Vaults as shown in the Project Plans. The Contractor shall furnish and install racks and hooks in all new vaults.

Materials:
The vaults shall meet all the requirements as noted in City of Peoria Standard Detail PE-036. A certificate of compliance, in accordance with Section 106.05 of the ADOT Standard Specifications shall be supplied for structural capabilities and materials used in manufacture.

Construction Requirements:
The construction shall be in accordance with PE-036. Each new vault location shall be field confirmed by the Engineer.

Each new pull box shall be installed to the finished grade.

The Contractor shall be responsible for restoring the surrounding surface conditions back to their original state, including concreted areas.

Method of Measurement
New Communication Vaults will be measured as a unit for each vault.

Basis of Payment
The accepted quantities of each vault, measured as provided above, will be paid for at the contract unit price each, which price shall be full compensation for the work, complete in place, including racks, hooks, and any excavating, backfilling, and area restoration necessary to complete the work.

PULL BOX (COMMUNICATION PULL BOX)

Description:
The Contractor shall furnish and install Communication Pull Boxes as shown in the Project Plans.

Materials:
The pull box shall meet all the requirements as noted in City of Peoria Standard Detail PE-034. A certificate of compliance, in accordance with Section 106.05 of the ADOT Standard Specifications shall be supplied for structural capabilities and materials used in manufacture.

Construction Requirements:
The construction shall be in accordance with PE-034. Each new pull box location shall be field confirmed by the Engineer.

Each new pull box shall be installed to the finished grade.

The Contractor shall be responsible for restoring the surrounding surface conditions back to their original state, including concreted areas.

Method of Measurement:
New Communication Pull Boxes will be measured as a unit for each pull box.

Basis of Payment:
The accepted quantities of each Communication Pull Box, measured as provided above, will be paid for at the contract unit price each, which price shall be full compensation for

the work, complete in place, including racks, hooks, and any excavating, backfilling, and area restoration necessary to complete the work.

SCH. 40 PVC ELECTRICAL CONDUIT (2")
SCH. 40 PVC ELECTRICAL CONDUIT (2") (DRILLED)
SCH. 40 PVC ELECTRICAL CONDUIT (3")
SCH. 40 PVC ELECTRICAL CONDUIT (2-3") (DRILLED)

Description:
The Contractor shall furnish and install PVC conduit for traffic signals and interconnect where indicated in the plans.

Materials:
All conduit material, including but not limited to fittings, couplers, primer, elbows, and adhesive shall conform to the contract design documents, shall be UL listed, and shall meet the requirements of Section 732 of the Arizona Department of Transportation (ADOT) Standard Specifications for Road and Bridge Construction.

Construction Requirements:
Conduits shall be installed under existing pavement by drilling. Open trench excavation shall be in accordance with Section 203-5.03 of the ADOT Standard Specifications.

Method of Measurement:
Schedule 40 PVC conduit will be measured on a linear foot basis for each size.

Basis of Payment:
Schedule 40 PVC conduit will be paid at the unit price established in the Bid Schedule for all labor, materials, tools and equipment to complete the work.

ELECTRICAL CONDUIT (4 – 1 ¼") (PVC OR HDPE)
ELECTRICAL CONDUIT (4 – 1 ¼") (HORIZONTAL DRILL) (HDPE)

Description:
The work under these items shall consist of furnishing and installing electrical conduit as shown on the Project Plans. The work shall include excavation, installation of conduit, removal of spoil, backfilling, compaction of horizontal drilling pits, installation of warning tape, connectors and fittings, locating existing conduit when new is to be intercepted with existing, and restoration of the surface to existing condition, including decomposed granite and other landscaping items.

The Contractor may open cut or horizontal drill conduit not under existing pavement with prior approval of the Engineer. All conduit under existing pavement shall be horizontal drilled.

Materials:
Conduit material shall be either Schedule 40 PVC or High Density Polyethylene (HDPE) SDR-11. PVC Conduit and materials shall be in accordance with Section 732-2.02 of the ADOT Standard Specifications. Conduit shall be HDPE when horizontal drilling is required (under streets or other facilities) as directed by the Engineer.

The Contractor shall provide original data sheets from the conduit manufacturer to the Engineer indicating that the conduit meets the requirement of these Special Provisions and obtain written approval for use from the Engineer prior to procuring and installing the conduit.

HDPE conduit shall be compliant with ASTM F2160-01. The Contractor shall allow field inspection of the HDPE conduit by the Engineer, prior to installation, to ensure that the DR rating, outside diameter, wall thickness, and circularity meet these Special Provisions.

The HDPE formulations used by the manufacturer must be specifically for conduit applications in accordance with ASTM F 2160 *Standard Specification for Solid Wall HDPE Conduit Based on Controlled Outside Diameter (OD)*. It shall have a cell classification of 334430C (for black conduit) or 334430E (for colored conduit) per ASTM 3350 *Standard Specification for Polyethylene Pipe and Fittings Materials*.

The polyethylene base resin shall meet the density and melt index properties described herein. The density shall not be less than 0.940 g/cc and shall not exceed 0.950 g/cc for the best combination of strength and durability using the test procedure contained in ASTM D 1505 *Standard Test Method for Density of Plastics by the Density-Gradient Technique*. The acceptable range for the melt index shall be from 0.1 g to 0.5 g per 10 minutes at a load of 2,160 g and 190°C, which are the standard conditions for melt index measurement of polyethylene, to prevent creeping and buckling of the conduit due to continuous earth loads. The melt index shall be obtained using the test procedure contained in ASTM D 1238 *Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer*.

Additives to the polyethylene base resin shall be included to provide heat stabilization, oxidation prevention, and ultraviolet (UV) protection. The polyethylene base resin shall have a minimum thermal stability of 20 minutes at 200°C to minimize conduit brittleness and cracking using the test procedure contained in ASTM D 1693 *Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics*. It shall also utilize carbon black in the range of 2% to 3% for long-term protection against UV degradation. The minimum protection period shall be one (1) year from date of manufacture in unprotected, outdoor storage using the test procedure contained in ASTM D 1603 *Standard Test Method for Carbon Black in Olefin Plastics*.

Upon a request by the Engineer, the Contractor must provide the conduit manufacturer's physical property data sheet prior to acceptance of the HDPE conduit.

Conduit components shall include compatible adapters, bell and spigot ends, factory bends/sweeps, deflection joints, end caps, and expansion joints. Each section of conduit shall be sealed on both ends with end caps, prior to shipment to the Contractor, to prevent the entry of dirt, dust, moisture, and other foreign materials into the conduit system. Factory bends or sweeps shall be available in 11¼°, 22½°, 45°, and 90° angles with a minimum radius of 3 ft. to a maximum of 6 ft., as appropriate for the specific application. In no case shall conduit bend radius exceed the maximum specified for the fiber optic cable planned to be installed within it in the future.

Factory bends and sweeps for conduits, both rigid and flexible, shall be manufactured with a bell and spigot for the integrated PVC communication conduit.

PVC conduit and materials shall be in accordance with Section 732-2.02 of the ADOT Standard Specifications.

Conduit shall be colored gray, white, orange, and blue for conduits 1 through 4, respectively. Contractor may substitute conduit colors with prior approval of the Engineer. The conduit colors shall be the same throughout the entire project limits.

Construction Requirements:
The construction requirements shall be in accordance with Section 732-3 of the ADOT Standard Specifications, the COP Standard Detail PE-033, and as specified herein.

Conduit depths shall be a minimum of 30 inches, or as shown on the Project Plans.

All horizontally drilled conduit shall be HDPE. Horizontal drilling shall be used to install all HDPE conduits along a prescribed bore path from the surface with minimal impact to the surrounding area. Horizontal drilling must be performed in accordance with the following:

- ASTM F 1962 *Standard Guide for Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit Under Obstacles, Including River Crossings*,
- *Mini Horizontal Directional Drilling Manual* published by the North American Society of Trenchless Technology (NASTT), and
- *Polyethylene Pipe for Horizontal Directional Drilling* published by the Plastics Pipe Institute (PPI).

The contractor shall furnish one copy of each of these references, current edition, to the Engineer at the kick-off meeting. No measurement or payment will be made for the references.

The installation instructions shall carry a warning that the installer shall not use any unauthorized solvents on the conduit.

When joining separate segments of HDPE conduit, the Contractor shall utilize non-corrosive, airtight, and watertight couplings. Heat fusion, electrofusion fittings, and mechanical connections shall be permitted as long as the HDPE conduit and joining device manufacturers' recommendations are observed and the internal diameter of the HDPE conduit is not reduced. Joining of HDPE conduit using extrusion welding and hot gas welding shall not be allowed.

Conduits damaged during horizontal drilling operations shall be repaired in place to the satisfaction of the Engineer. Conduit damaged beyond repair will be removed and replaced. Repair or removal and replacement of damaged conduit will be done at the Contractor's expense.

Upon completion of final installation and assembly, the HDPE conduit shall be blown clean with compressed air. Then, in the presence of the Engineer, a cleaning mandrel of 80% of the inside diameter of the HDPE conduit being tested shall be pulled through to insure that the HDPE conduit has not been deformed during the installation process. If the mandrel pulls through the HDPE conduit without any problems, the Contractor shall

install a locator wire in the HDPE conduit and insert the duct plugs into each end of the tested HDPE conduit. If the mandrel encounters a deformity in the HDPE conduit, the Contractor shall replace the entire segment of HDPE conduit with new HDPE conduit at no additional cost to the Department.

Within 2 days of installation, all new PVC conduit runs shall be cleared/cleaned by pulling through a metal-disc mandrel that is 90% of the inside diameter of the conduit, or brushed, or swabbed, as the situation requires. The conduits will be sealed with a duct plug upon the completion of the mandrilling. Duct tape shall not be used to seal the ends of any conduits.

Prior to any conduit installation, the Contractor shall verify, with utility as-builts, the existence of any cathodic protection in all existing utilities and take all possible precautions to maintain existing cathodic protection.

All conduits shall be constructed as shown on the Plans and in accordance with ADOT Standard Specifications. The bend radius on conduit sweeps shall be a minimum of 36".

Conduits shall be installed under existing pavement by drilling.

All spoilage shall be removed from the project within 48 hours.

Method of Measurement:
Conduit will be measured by the linear foot by each diameter size combination from center to center of pull boxes, or center of pull box to center of foundation, in both joint use and ITS trenches. Vertical conduit, conduit in boxes, and conduit in foundations shall be considered incidental and shall not be measured or paid.

The use of concrete slurry shall be considered incidental to the conduit installation and shall not be measured or paid.

Basis of Payment:
The accepted quantities of each diameter size combination and trenching, measured as provided above, will be paid for at the contract unit price per linear foot, which price shall be full compensation for the work, complete in place, including any labor, materials, restoration of landscaping items, excavating, hand digging, backfilling, removal of spoilage, and incidentals required to complete the work.

No measurement or payment will be made for locating existing conduit, couplings, duct plugs, expansion fittings, clearing the conduit prior to cable installation, removal of spoilage, and all other materials, the cost being considered as included in the price of the conduit.

TYPE R POLE FOUNDATION
TYPE R-MODIFIED POLE FOUNDATION

Description:
The Contractor shall furnish all materials and shall construct new foundations for the traffic signal poles.

Materials:
New Type R pole foundations shall conform to the requirements of the ADOT Standard Specifications and ADOT Standard Drawings, with the exception that a foundation dish will be provided similar to the Modified R pole foundation dish shown on Peoria Standard Detail PE-037-2.

New Type R-Modified pole foundations shall conform to the requirements of Peoria Standard Detail PE-037-1 & 2.

Foundations noted in the plans are shown schematically; the Engineer shall review and approve all equipment placement prior to construction.

Construction Requirements:
All signal pole foundations shall be constructed in accordance with general requirements of ADOT Specifications Section 731, the ADOT Standard Drawings, the project plans, and PE-037-1 &2 for the Type R-Modified poles.

Concrete samples shall be obtained each day of pouring for signal foundations. Poles shall not be installed until concrete compressive strength test results are received and approved by the City.

The Contractor shall pot hole all foundations for potential conflicts. The cost associated with this item shall be considered incidental to complete the work associated with this item. Repair of any damaged utility lines shall be at the expense of the Contractor.

The Contractor shall schedule a meeting with the City of Peoria and the design consultant prior to approval by the City of equipment submittals for poles and mast arms. The purpose of the meeting is to determine underground and overhead utility conflicts with proposed signal pole foundations and evaluate whether pole foundations are required to be relocated.

Prior to excavation of the foundations, the site must first be inspected and approved by the Engineer.

The foundations shall be set flush with the existing or new curb and sidewalk or flush with the finished grade where there is no curb or sidewalk, except in sloped areas. The Engineer may direct that changes be made in locations due to obstructions or other existing conditions.

If the soil is not stable and a hole cannot be augured, the Contractor may auger/excavate, fill with bentonite slurry, and re-drill the foundation through the slurry at the Contractor's expense. They final hole shall be of the proper size and dimensions and shall be rigid. The forms and the bottoms of the holes shall be thoroughly moistened prior to placing the concrete.

Anchor bolts and conduit stubs will be provided by the Contractor, and shall be placed and held in proper alignment, position, and height during the placing and vibrating of concrete.

High strength bolts, nuts, and washers will be provided by the Contractor, and shall be assembled and bolts torqued as required by the ADOT or Peoria Standards and the project plans.

New R and Modified R pole foundations shall have the grouted dish per Peoria Standard Detail PE- 037-2; other information in the detail does not apply to the ADOT standard poles.

Method of Measurement:
Pole foundations will be measured as a unit for EACH unit furnished and installed, that includes but is not limited to, auguring, anchor bolts, reinforcing steel, ground rods, grounding wire, excavation, conduit, backfill, and incidentals necessary to complete the work.

Basis of Payment:
Pole foundations will be paid as measured. Contract unit price in the Bid Schedule shall be full compensation for work described in these Special Provisions, as shown on the plans, and as indicated in the Bid Schedule, complete and in place.

TYPE R SIGNAL POLE
TYPE R-MODIFIED SIGNAL POLE

Description:
The Contractor shall furnish and install ADOT standard Type R poles, and City of Peoria Standard Modified Type R signal poles.

Materials:
The Type R standard ADOT poles shall be fabricated in accordance with ADOT Standard Specifications and Drawings.

The Modified Type R shall be fabricated in accordance with the requirements of City of Peoria Standard PE-038-1 & 2.

Construction Requirements:
The ADOT standard poles shall be installed in accordance with the ADOT standard specifications, standard drawings, and the plans.

The Modified Type R pole shall be installed in accordance with the requirements of City of Peoria Standard PE-038-1 & 2.

All steel poles shall be plumbed to the vertical with all traffic signal equipment installed.

Holes shall be drilled and nippled at each site per the plans and ADOT or Peoria standards. Touch-up shall be by hot stick method.

Method of Measurement:
The poles will be measured as a unit for EACH type unit installed, which includes but is not limited to equipment, labor, and incidentals necessary to complete the work.

Basis of Payment:
The poles will be paid as measured. Contract unit prices in the Bid Schedule shall be full compensation for work described in these Special Provisions and as shown on the plans, complete in place, and functional.

MAST ARM (20') (TAPERED)
MAST ARM (45') (TAPERED)
MAST ARM (50') (TAPERED)

Description:
The Contractor shall furnish and install ADOT standard mast arms (20' through 50' in length).

Materials:
The 20' through 50' mast arms shall be fabricated in accordance with ADOT Standard Specifications and Drawings.

Construction Requirements:
The mast arms shall be installed in accordance with the ADOT standard specifications, standard drawings, and the plans.

Method of Measurement:
The mast arms will be measured as a unit for EACH unit installed, which includes but is not limited to equipment, labor, and incidentals necessary to complete the work.

Basis of Payment:
The mast arms will be paid as measured. Contract unit prices in the Bid Schedule shall be full compensation for work described in these Special Provisions and as shown on the plans, complete in place, and functional.

MAST ARM (25') (TAPERED)
MAST ARM (65') (TAPERED)

Description:
The Contractor shall furnish and install City of Peoria standard mast arms (25' for Modified Type R pole luminaire arms and 65' mast arms for the Modified Type R poles).

Materials:
The mast arms shall be fabricated in accordance with City of Peoria Standard Detail PE-038-1 & 2.

Construction Requirements:
The mast arms shall be installed in accordance with the City of Peoria Standard Detail (PE-038-1 & 2), and the plans.

Method of Measurement:
The mast arms will be measured as a unit for EACH unit installed, which includes but is not limited to equipment, labor, and incidentals necessary to complete the work.

Basis of Payment:
The mast arms will be paid as measured. Contract unit prices in the Bid Schedule shall be full compensation for work described in these Special Provisions and as shown on the plans, complete in place, and functional.

PEDESTRIAN PUSH BUTTON W/SIGN

Description:
The Contractor shall furnish and install new pedestrian push button assemblies where indicated on the project plans.

Materials:
Pedestrian push buttons shall conform to ADOT Std. Dwg. T.S. 11-1 except that button shall be a minimum of 2" in diameter. The pedestrian push button sign shall be a 9"x12" R10-3e in accordance with the MUTCD.

Button must be highly vandal resistant and pressure activated with essentially no moving parts.

Manufacturer must provide a 5-year warranty on the button.

The System shall meet NEMA TS 2 Temperature & Humidity requirements.

The System shall meet NEMA TS 2 Transient Voltage Protection requirements.

The System shall meet NEMA TS 2 Mechanical Shock and Vibration requirements.

The Push Button Station (PBS) Enclosure shall meet NEMA 250 – Type 1 requirements.

Button housing must be cast aluminum powder coated and certified by an outside lab to meet applicable NEMA 250-6P requirements for Ingress of Water, Salt Spray, Corrosion, and Ingress of Foreign Objects.

The System shall meet NEMA TS 4 – Electrical Reliability requirements.

Typical Push Button "Off" or Stand-By current is 15 micro-amperes.

Operating Temperature Range -34C to +74C (-29F to +165F).
Operating Voltage Range 12-36 VDC, 9-25 VAC RMS (18VDC Typical).

Button cap must be made of solid 316 stainless steel.

Switch must be solid state electronic Piezo switch rated for 300 million cycles with no moving electrical contacts.

Button must activate with 2 lbs force or less.

Button must have an LED to give indication of button being pushed.

Button LED must be able to function in a momentary mode without any additional control units, or latching mode by adding a single control unit into the cabinet.

Both Momentary and Latching modes shall require only the typical two wires from the cabinet to the push button. No additional wires from the cabinet, or pedestrian head, shall be required.

Button must give a two toned beep indication of button being pushed (one tone for push, one tone for release).

In Momentary mode the button must be able to hold the call for a minimum of 5 seconds.

Button must have raised ridges to protect the button from side impacts**.**

Construction Requirements:
The pedestrian push button assembly shall be installed in accordance with ADOT Standard Drawing T.S. 11-1. Mounting height shall be a maximum of 42".

Method of Measurement:
Pedestrian Push Button with Sign will be measured on an each basis.

Basis of Payment:
Pedestrian Push Button with Sign will be paid at the price established in the Bid Schedule for all labor, materials, tools, the R10-3e sign, and equipment to complete the work.

REMOVE AND SALVAGE TRAFFIC SIGNAL EQUIPMENT

Description:
The Contractor shall remove and salvage the existing traffic signal equipment, as noted in the plans, to a City of Peoria Yard, as designated by the Engineer. All salvaged hardware shall be disassembled prior to delivery.

Materials:
The Contractor shall furnish all equipment, labor, and material to remove and salvage all equipment as noted in these specifications and the project plans. The Contractor shall notify the Engineer 2 weeks prior to salvaging equipment.

Method of Measurement and Payment:
This item will be measured on a lump sum basis and paid at the price established in the Bid Schedule for all labor, materials, tools and equipment to complete the work.

OPTICOM PRE-EMPTION EQUIPMENT

Description:
The Contractor shall furnish, install, and test emergency vehicle pre-emption equipment where indicated on the project plans.

Materials:
(A) Optical Detector Modules

The detectors shall be mounted as shown in the plans and shall be of the models indicated. The detector shall be a "711" detector.

(B) Phase Selector and System Chassis

A phase selector shall be installed and wired to provide a complete priority system as shown in the plans. A system chassis shall be used to install the "764" phase selector interface card**.**

(C) Detector Cable

Provide new Model 138 detector cable for the preemption equipment.

Construction Requirements:
The emergency vehicle pre-emption equipment shall be field adjusted at the approximate mounting location in order to provide an unobstructed line-of-site view along the route of the approaching priority vehicle. The Model 138 cable shall run un-spliced from the detector on the mast arm to the phase selector in the cabinet. Construction shall be accordance with manufacturer's requirements.

Method of Measurement:
Each relocated emergency vehicle preemption system will be measured as a unit for installing each component and pulling a new Model 138 cable from the controller cabinet to the preemption unit.

Basis of Payment:
The accepted quantity of emergency vehicle preemption systems, measured as provided, will be paid for at the contract unit price, as designated on the schedule of bid items, complete in place.

RELOCATE VIDEO DETECTION SYSTEM (ECONOLITE TERRA)

Description:
The Contractor shall relocate the video detection systems as shown in the Project Plans. The cabling shall be new, furnished and installed by the Contractor.

Materials:
The new cabling shall be as recommended by the vendor of the Econolite Terra system.

Construction Requirements:
The video cameras shall be mounted on the luminaire arm, with the construction being in accordance with the manufacture's requirements.

The Contractor shall place the detection zones by means of a PC with a Windows XP or Vista operating system, a keyboard, and a mouse. The PC monitor shall be able to show the detection zones superimposed on images of traffic scenes.

The detection zones shall be created by using a mouse to draw detection zones on the PC monitor.

Method of Measurement:
Video detection system will be measured as a unit for each system reinstalled.

Basis of Payment:
The accepted quantities of each video detection system, measured as provided above, will be paid for at the contract unit price each, which price shall be full compensation for the work, complete in place, including testing and calibration, necessary to complete the work.

RELOCATE CCTV CAMERA

Description:
The work under this item shall consist of relocating an existing Closed Circuit Television (CCTV) camera mounted on the existing traffic signal pole in the southeast quadrant.

Materials:
The Contractor shall furnish new composite cabling for the relocated CCTV camera.

Construction Requirements:
After relocation of the CCTV camera, installation of the new cable, and reconnection to the existing encoder in the controller cabinet, the Contractor shall perform a Stand-Alone test.

Stand-Alone Test
The Contractor shall verify the operation of the pan, tilt, and zoom (PTZ) functions of the camera at the cabinet.

Method of Measurement:
CCTV camera relocation will be measured as a unit for relocating the CCTV camera in the southeast corner of Olive Avenue at 83rd Avenue, successfully tested, complete and in place.

Basis of Payment:
The accepted quantity of Relocate CCTV Camera, measured as provided, will be paid for at the contract unit price as designated on the Schedule of Bid Items, complete and in place. This shall be full compensation for the work described herein and on the Plans.

TRAFFIC SIGNAL FACE (PEDESTRIAN MAN/HAND W/COUNTDOWN)
TRAFFIC SIGNAL FACE (TYPE F)
TRAFFIC SIGNAL FACE (TYPE Q)
TRAFFIC SIGNAL MOUNTING ASSEMBLY (TYPE XI)
TRAFFIC SIGNAL MOUNTING ASSEMBLY (TYPE II)

Description:
This work shall consist of installing all traffic signal faces and mounts as shown in the plans.

Materials:
All traffic signal indications shall be “DIALIGHT” Light Emitting Diode (LED) modules. This will include red, yellow, and green ball indications and red, yellow, and green arrow indications.

All pedestrian signal indications shall be In-line filled-in Man/Hand “DIALIGHT” Light Emitting Diode (LED) Count Down, 430-6479-001X, pedestrian indications.

Traffic signal mounting hardware shall conform to the ADOT Standard Drawings.

Construction Requirements:
All traffic signal construction shall be accomplished by a certified IMSA Level II Signal Technician. A uniformed off-duty Peoria police officer shall be provided by the Contractor to control traffic during the change-over when the traffic signal is not in operation.

If a City signal technician is needed after hours, the Contractor shall be responsible for the technician's overtime pay.

Equipment noted in the plans is shown schematically; the Engineer shall review and approve all equipment placement prior to construction.

Method of Measurement:
Traffic signal faces and mounts will be measured as a unit for EACH type of unit furnished and installed, that includes but is not limited to, tools, labor, and incidentals necessary to complete the work.

Basis of Payment:
The items of work described herein and indicated on the plans shall be paid as indicated on the Bid Schedule.

LUMINAIRES

Description:
The Contractor shall furnish and install new Light Emitting Diode (LED) luminaries, where indicated in the plans.

Materials:
The new luminaries shall be GE Evolve ERMC-0-A360A LED Roadway lights.

Construction Requirements:
The luminaire shall be installed on the luminaire arm in accordance with the requirements of the ADOT Traffic Signal Standard Drawings and the manufacturer.

Method of Measurement:
Work described herein and shown on the plans shall be measured as a unit EACH, in the amount indicated on the Bid Schedule.

Basis of Payment:
Work described herein and shown on the plans shall be paid as a unit EACH, in the amount indicated on the Bid Schedule. This amount shall be considered full compensation for the work complete and in place per the requirements of the City.

RELOCATE INTERNALLY ILLUMINATED STREET NAME SIGN

Description:
The Contractor shall relocate two (2) existing illuminated street name sign (ISNS) units where indicated on the project plans.

Materials and Construction Requirements:
The Contractor shall relocate the existing ISNS as noted in the project plans.

Method of Measurement:
Each relocated ISNS system will be measured as Each unit furnished and installed, that includes but is not limited to, tools, labor, and incidentals necessary to complete the work.

Basis of Payment:
The accepted quantity of relocate ISNS, measured as provided, will be paid for at the contract unit price, as designated on the schedule of bid items, complete in place.

RELOCATE AND RETROFIT ILLUMINATED STREET NAME SIGN

Description:
The Contractor shall relocate two (2) existing illuminated street name sign (ISNS) units where indicated on the project plans and retrofit them for LED illumination.

Materials:
The Contractor shall coordinate with the City of Peoria on the design of the illuminated street name signs during the electrical submittal process. The Contractor shall obtain approval from the City on the design of the sign retrofit prior to ordering or fabrication.

The ISNS cabinet and face plates shall be re-used.

Illumination: GE Tubular LED's with Manufacturer recommended drivers. The Contractor shall supply all materials and equipment necessary to convert the ISNS to LED illumination.

Construction Requirements:
The edge lit LED Illuminated street name signs shall be installed as a pennant mount on the traffic signal poles above the mast arm connections by the Contractor per the manufacturer's recommendations and the plans.

Method of Measurement:
Relocate and retrofit ISNS will be measured as a unit Each, furnished and installed; that includes but is not limited to, tools, labor, and incidentals necessary to complete the work.

Basis of Payment:
The accepted quantity of relocate and retrofit ISNS, measured as provided, will be paid for at the contract unit price, as designated on the schedule of bid items, complete in place.

ELECTRICAL CONDUCTORS (FOR SIGNALS AND LIGHTING)

Description:
The Contractor shall furnish and install traffic signal conductors, as indicated in the plans. Emergency Vehicle Pre-emption, Video Detection, and CCTV cables shall be included in those respective items.

Materials:

Traffic Signal Conductors
New traffic signal cables shall be IMSA Specification 19-1, 14 AWG, 7x22 stranded, copper with 4, 7, or 20 conductors.

Individual conductors shall meet the requirements of the ADOT Standard Specifications and the plans.

Construction Requirements:
Conductors shall be installed per the manufacturer's instruction, and in accordance with the City of Peoria Requirements.

During pulling, the cable shall be lubricated at each pull box, in accordance with the manufacturer's requirements. The Contractor shall use a pre-lubrication or continuous lubrication method.

Method of Measurement:
Conductors shall be measured on a lump sum basis.

Basis of Payment:
Conductors (for signals and lighting), measured as provided above, will be paid for at the contract lump sum price, which price shall be full compensation for the work related to wiring as specified in the plans and for ancillary cabinet items, such as additional load switches, flashers, etc., complete in place, to provide a complete, functioning cabinet assembly for control of the traffic signals as shown on the plans.

48 STRAND FIBER OPTIC CABLE (SINGLE MODE)

Description:
The Contractor shall furnish, install, and test single mode fiber optic cable with 48 strands in accordance with the Maricopa County 2011 Supplement to the MAG specifications, and as indicated in the plans.

Materials and Construction Requirements:
The fiber optic cable shall be manufactured, installed, and tested in accordance with the requirements of Section 482 of the Maricopa County 2011 Supplement to the MAG specifications.

Method of Measurement:
Single mode fiber optic cable will be measured by the linear foot from center to center of pull boxes. Fiber optic cable slack in pull boxes shall not be measured or paid.

Basis of Payment:
All fiber optic cable, measured as provided above, will be paid for at the contract unit price per the bid schedule, complete in place, in accordance with the Plans and these Special Provisions.

SECTION IV

TRAFFIC SIGNAL AND INTELLIGENT TRANSPORTATION SYSTEM SPECIAL CONDITIONS

BID ALTERNATE B

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SCH. 40 PVC ELECTRICAL CONDUIT (2")
SCH. 40 PVC CONDUIT (2.5")
SCH. 40 PVC ELECTRICAL CONDUIT (3")
SCH. 40 PVC ELECTRICAL CONDUIT (2-3")

Description:
The Contractor shall furnish and install PVC conduit for traffic signals and interconnect where indicated in the plans.

Materials:
All conduit material, including but not limited to fittings, couplers, primer, elbows, and adhesive shall conform to the contract design documents, shall be UL listed, and shall meet the requirements of Section 732 of the Arizona Department of Transportation (ADOT) Standard Specifications for Road and Bridge Construction.

Construction Requirements:
Conduits shall be installed under existing pavement by drilling. Open trench excavation shall be in accordance with Section 203-5.03 of the ADOT Standard Specifications.

Method of Measurement:
Schedule 40 PVC conduit will be measured on a linear foot basis for each size.

Basis of Payment:
Schedule 40 PVC conduit will be paid at the unit price established in the Bid Schedule for all labor, materials, tools and equipment to complete the work.

TYPE K POLE FOUNDATION
TYPE Q POLE FOUNDATION
TYPE R POLE FOUNDATION

Description:
The Contractor shall furnish all materials and shall construct new foundations for the traffic signal poles.

Materials:
New Type K, Q, and R pole foundations shall conform to the requirements of the ADOT Standard Specifications and ADOT Standard Drawings, with the exception that a foundation dish will be provided similar to the Modified R pole foundation dish shown on Peoria Standard Detail PE-037-2.

Foundations noted in the plans are shown schematically; the Engineer shall review and approve all equipment placement prior to construction.

Construction Requirements:
All signal pole foundations shall be constructed in accordance with general requirements of ADOT Specifications Section 731, the ADOT Standard Drawings, and the project plans.

Concrete samples shall be obtained each day of pouring for signal foundations. Poles shall not be installed until concrete compressive strength test results are received and approved by the City.

The Contractor shall pot hole all foundations for potential conflicts. The cost associated with this item shall be considered incidental to complete the work associated with this item. Repair of any damaged utility lines shall be at the expense of the Contractor.

The Contractor shall schedule a meeting with the City of Peoria and the design consultant prior to approval by the City of equipment submittals for poles and mast arms. The purpose of the meeting is to determine underground and overhead utility conflicts with proposed signal pole foundations and evaluate whether pole foundations are required to be relocated.

Prior to excavation of the foundations, the site must first be inspected and approved by the Engineer.

The foundations shall be set flush with the existing or new curb and sidewalk or flush with the finished grade where there is no curb or sidewalk, except in sloped areas. The Engineer may direct that changes be made in locations due to obstructions or other existing conditions.

If the soil is not stable and a hole cannot be augured, the Contractor may auger/excavate, fill with bentonite slurry, and re-drill the foundation through the slurry at the Contractor's expense. They final hole shall be of the proper size and dimensions and shall be rigid. The forms and the bottoms of the holes shall be thoroughly moistened prior to placing the concrete.

Anchor bolts and conduit stubs will be provided by the Contractor, and shall be placed and held in proper alignment, position, and height during the placing and vibrating of concrete.

High strength bolts, nuts, and washers will be provided by the Contractor, and shall be assembled and bolts torqued as required by the ADOT or Peoria Standards and the project plans.

New K, Q, and R pole foundations shall have the grouted dish per Peoria Standard Detail PE- 037-2; other information in the detail does not apply to the ADOT standard poles.

Method of Measurement:
Pole foundations will be measured as a unit for EACH unit furnished and installed, that includes but is not limited to, auguring, anchor bolts, reinforcing steel, ground rods, grounding wire, excavation, conduit, backfill, and incidentals necessary to complete the work.

Basis of Payment:
Pole foundations will be paid as measured. Contract unit price in the Bid Schedule shall be full compensation for work described in these Special Provisions, as shown on the plans, and as indicated in the Bid Schedule, complete and in place.

TYPE K-MODIFIED SIGNAL POLE
TYPE Q SIGNAL POLE
TYPE R SIGNAL POLE

Description:
The Contractor shall furnish and install ADOT standard Type K-Modified, Q and R poles.

Materials:
The Type K-Modified, Q, and R standard ADOT poles shall be fabricated in accordance with ADOT Standard Specifications and Drawings.

Construction Requirements:
The ADOT standard poles shall be installed in accordance with the ADOT standard specifications, standard drawings, and the plans.

All steel poles shall be plumbed to the vertical with all traffic signal equipment installed.

Holes shall be drilled and nippled at each site per the plans and ADOT standards. Touch-up shall be by hot stick method.

Method of Measurement:
The poles will be measured as a unit for EACH type unit installed, which includes but is not limited to equipment, labor, and incidentals necessary to complete the work.

Basis of Payment:
The poles will be paid as measured. Contract unit prices in the Bid Schedule shall be full compensation for work described in these Special Provisions and as shown on the plans, complete in place, and functional.

MAST ARM (20') (TAPERED)
MAST ARM (35') (TAPERED)
MAST ARM (40') (TAPERED)
MAST ARM (45') (TAPERED)
MAST ARM (55') (TAPERED)

Description:
The Contractor shall furnish and install ADOT standard mast arms (20' through 50' in length).

Materials:
The 20' through 50' mast arms shall be fabricated in accordance with ADOT Standard Specifications and Drawings.

Construction Requirements:
The mast arms shall be installed in accordance with the ADOT standard specifications, standard drawings, and the plans.

Method of Measurement:
The mast arms will be measured as a unit for EACH unit installed, which includes but is not limited to equipment, labor, and incidentals necessary to complete the work.

Basis of Payment:
The mast arms will be paid as measured. Contract unit prices in the Bid Schedule shall be full compensation for work described in these Special Provisions and as shown on the plans, complete in place, and functional.

PEDESTRIAN PUSH BUTTON W/SIGN

Description:
The Contractor shall furnish and install new pedestrian push button assemblies where indicated on the project plans.

Materials:
Pedestrian push buttons shall conform to ADOT Std. Dwg. T.S. 11-1 except that button shall be a minimum of 2" in diameter. The pedestrian push button sign shall be a 9"x12" R10-3e in accordance with the MUTCD.

Button must be highly vandal resistant and pressure activated with essentially no moving parts.

Manufacturer must provide a 5-year warranty on the button.

The System shall meet NEMA TS 2 Temperature & Humidity requirements.

The System shall meet NEMA TS 2 Transient Voltage Protection requirements.

The System shall meet NEMA TS 2 Mechanical Shock and Vibration requirements.

The Push Button Station (PBS) Enclosure shall meet NEMA 250 – Type 1 requirements.

Button housing must be cast aluminum powder coated and certified by an outside lab to meet applicable NEMA 250-6P requirements for Ingress of Water, Salt Spray, Corrosion, and Ingress of Foreign Objects.

The System shall meet NEMA TS 4 – Electrical Reliability requirements.

Typical Push Button "Off" or Stand-By current is 15 micro-amperes.

Operating Temperature Range -34C to +74C (-29F to +165F).
Operating Voltage Range 12-36 VDC, 9-25 VAC RMS (18VDC Typical).

Button cap must be made of solid 316 stainless steel.

Switch must be solid state electronic Piezo switch rated for 300 million cycles with no moving electrical contacts.

Button must activate with 2 lbs force or less.

Button must have an LED to give indication of button being pushed.

Button LED must be able to function in a momentary mode without any additional control units, or latching mode by adding a single control unit into the cabinet.

Both Momentary and Latching modes shall require only the typical two wires from the cabinet to the push button. No additional wires from the cabinet, or pedestrian head, shall be required.

Button must give a two toned beep indication of button being pushed (one tone for push, one tone for release).

In Momentary mode the button must be able to hold the call for a minimum of 5 seconds.

Button must have raised ridges to protect the button from side impacts**.**

Construction Requirements:
The pedestrian push button assembly shall be installed in accordance with ADOT Standard Drawing T.S. 11-1. Mounting height shall be a maximum of 42".

Method of Measurement:
Pedestrian Push Button with Sign will be measured on an each basis.

Basis of Payment:
Pedestrian Push Button with Sign will be paid at the price established in the Bid Schedule for all labor, materials, tools, the R10-3e sign, and equipment to complete the work.

OPTICOM PRE-EMPTION EQUIPMENT

Description:
The Contractor shall furnish, install, and test emergency vehicle pre-emption equipment where indicated on the project plans.

Materials:
(A) Optical Detector Modules

The detectors shall be mounted as shown in the plans and shall be of the models indicated. The detector shall be a "711" detector.

(B) Phase Selector and System Chassis

A phase selector shall be installed and wired to provide a complete priority system as shown in the plans. A system chassis shall be used to install the "764" phase selector interface card**.**

(C) Detector Cable

Provide new Model 138 detector cable for the preemption equipment.

Construction Requirements:
The emergency vehicle pre-emption equipment shall be field adjusted at the approximate mounting location in order to provide an unobstructed line-of-site view along the route of the approaching priority vehicle. The Model 138 cable shall run un-spliced from the detector on the mast arm to the phase selector in the cabinet. Construction shall be accordance with manufacturer's requirements.

Method of Measurement:
Each relocated emergency vehicle preemption system will be measured as a unit for installing each component and pulling a new Model 138 cable from the controller cabinet to the preemption unit.

Basis of Payment:
The accepted quantity of emergency vehicle preemption systems, measured as provided, will be paid for at the contract unit price, as designated on the schedule of bid items, complete in place.

VIDEO DETECTION SYSTEM (ECONOLITE TERRA)

Description:
The Contractor shall furnish, install, and test the video detection systems as shown in the Project Plans.

The detection of vehicles passing through the field of view on an image sensor shall be made available to a large variety of end user applications as simple contact closure outputs that reflect the current real time detector or alarm states (on/off) or as summary traffic statistics that are reported locally or remotely. The contact closure outputs shall be provided to the traffic signal controller and comply with the NEMA (National Electrical Manufacturers Association) type C or D detector rack.

The system architecture shall fully support networking of system components through a variety of industry standard and commercially available infrastructure that are used in the traffic industry. The serial data communications shall support direct connect, [modem] and multi-drop interconnects. Simple twisted pair wiring shall be supported to minimize overall system cost, improve reliability, utilize existing infrastructure and make system installation and maintenance easier. Both video communications and serial data communications shall optionally be interconnected over long distances through repeat and daisy chain configurations. A single serial data communications multi-drop link on twisted pair shall extend up to 2 miles and include up to 24 units on a drop before the signal(s) must be repeated.

On the system application side of the network, the system shall be integrated through a client-server relationship. A communications server application shall provide at the data communications interface between as few as one to as many as hundreds of machine vision processor (MVP) sensors and a number of client applications. The client applications shall either be hosted on the same PC as the communications server or may be distributed over a local area network of PC's using the industry standard TCP/IP network protocol. Multiple client applications shall execute simultaneously on the same host or multiple hosts, depending on the network configuration.

Materials:
The Video Detection System shall be Econolite Autoscope Solo Terra.

System Hardware
The machine vision system hardware, to be provided and installed by Contractor, shall consist of three major components:

- A color zoom, Solo Terra Sensor (MVP Sensor)
- A modular cabinet interface unit (TIP)
- A communication interface panel (TAP)

System Software
The MVP sensor embedded software shall incorporate multiple applications that perform a variety of diagnostic, installation, fault tolerant operations, data communications, digital video streaming, and vehicle detection processing. The detection shall be reliable, consistent, and perform under all weather, lighting, and traffic congestion levels. An embedded web server shall permit standard internet browsers to connect and perform basic configuration, maintenance, and video streaming services.

There shall be a suite of client applications that reside on the host client / server PC. The applications shall execute under Microsoft Windows XP or Vista. Available client applications shall include:

- Master network browser: Learn a network of connected modular cabinet interface units and MVP sensors, display basic information, and launch applications software to perform operations within that system of sensors.
- Configuration setup: Create and modify detector configurations to be executed on the MVP sensor and the modular cabinet interface unit.
- Operation log: Retrieve, display, and save field hardware run-time operation logs of special events that have occurred.
- Software install: Reconfigure one or more MVP sensors with a newer release of embedded system software.
- Streaming video player: Play and record streaming video with flashing detector overlay.
- Data retrieval: Fetch once or poll for traffic data and alarms and store on PC storage media.
- Communications server: Provide fault-tolerant, real-time TCP/IP communications to / from all devices and client applications with full logging capability for systems integration.

MVP Image Sensor
The MVP sensor shall be an integrated imaging color CCD array with zoom lens optics, high-speed, Dual core image processing hardware bundled into a sealed enclosure. The CCD array shall be directly controlled by the dual-core processor, thus providing high-quality video for detection that has virtually no noise to degrade detection performance. It shall be possible to zoom the lens as required for setup and operation. It shall provide JPEG video compression as well as standard MPEG-4 digital streaming video with flashing detector overlay. The MVP shall provide direct real-time iris and shutter speed control. The MVP image sensor shall be equipped with an integrated 22x zoom lens that can be changed using either configuration computer software. The digital streaming

video output and all data communications shall be transmitted over the three-wire power cable.

Power
The MVP sensor shall operate on 110/220 VAC, 50/60Hz at a maximum of 25 watts. The camera and processor electronics shall consume a maximum of 10 watts and the remaining 15 watts shall support an enclosure heater.

Detection Zone Programming
Placement of detection zones shall be by means of a PC with a Windows XP or Vista operating system, a keyboard, and a mouse. The PC monitor shall be able to show the detection zones superimposed on images of traffic scenes.

The detection zones shall be created by the Contractor using a mouse to draw detection zones on the PC monitor. Using the mouse and keyboard it shall be possible to place, size, and orient detection zones to provide optimal road coverage for vehicle detection. It shall be possible to download detector configurations from the PC to the MVP sensor and cabinet interface module, to retrieve the detector configuration that is currently running in the MVP sensor, and to back up detector configurations by saving them to the PC fixed disks or other removable storage media.

Modular Cabinet Interface
The modular cabinet interface unit shall provide the hardware and software means for up to eight (8) MVP sensors to communicate real-time detection states and alarms to a local traffic signal controller. It shall comply with the electrical and protocol specifications of the detector rack standards. The card shall have 1500 Vrms isolation between rack logic ground and street wiring.

The modular cabinet interface unit shall be a simple interface card that plugs directly into a 170 input file rack or a NEMA type C or D detector rack. The modular cabinet interface unit shall occupy only 2 slots of the detector rack. The modular cabinet interface unit shall accept up to sixteen (16) phase inputs and shall provide up to twenty-four (24) detector outputs.

Communications Interface Panel
The communications interface panel shall support up to eight MVPs. The communications interface panel shall accept 110/220 VAC, 50/60 Hz power and provide predefined wire termination blocks for MVP power connections, a Broadband-over-Power-Line (BPL) transceiver to support up to 10MB/s interdevice communications, electrical surge protectors to isolate the modular cabinet interface unit and MVP sensors, and an interface connector to cable directly to the modular cabinet interface unit. The interface panel shall provide power for up to eight (8) MVP sensors, taking local line voltage 110/220 VAC, 50/60 Hz and producing 110/220 VAC, 50/60 Hz, at about 30 watts to each MVP sensor. Two ½-amp SLO-BLO fuses shall protect the communications interface panel.

Cabling
The Contractor shall provide and install the manufacturer approved cable, to power and transfer data from the video detection sensor to the control cabinet.

System Installation & Training
The supplier of the video detection system shall supervise the installation and testing of the video detection system and computer equipment. A factory certified representative from the supplier shall be on-site during installation. A four-hour session of training shall be provided to personnel of the City of Peoria in the operation, setup and maintenance of the video detection system, instruction and materials shall be provided for a maximum of 10 persons and shall be conducted at a location selected by the City of Peoria. Proper instruction from certified instructors is required to ensure that the end-user has complete competency in system operation. The User's Guide is not an adequate substitute for practical classroom training and formal certification by an approved agency.

Warranty, Service and Support
For a minimum of two (2) years, the supplier shall warrant the video detection system. The warranty period shall commence upon the date of final project acceptance. A copy of the written warranty shall be submitted for Department review and approval with the equipment submittals at the start of the project. An option for additional year(s) warranty for up to 5 years shall be available. Ongoing software support by the supplier shall include software updates of the MVP sensor, modular cabinet interface unit, and supervisor computer applications. These updates shall be provided free of charge during the warranty period. The supplier shall maintain a program for technical support and software updates following expiration of the warranty period. This program shall be available to the contracting agency in the form of a separate agreement for continuing support. During the warranty period, technical support shall be available from the supplier, at no cost to the agency, via telephone within 4 hours of the time a call is made by the agency, from factory-certified personnel or factory-certified installers.

Prior to activation of the signal, the video detection system shall be fully functional and operating in accordance with the specifications identified above.

Construction Requirements:
The Contractor shall provide the video detection system, including system hardware, software, cabling, and integration. The Contractor shall install the video detection system, provide the cable from the pull boxes to the controller with no splices in the wire, and all equipment necessary for installing the video detection system as identified in the following specification:

The video detection system shall optimally detect vehicle passage and presence when the MVP sensor is mounted 30 feet or higher above the roadway, when the image sensor is adjacent to the desired coverage area, and when the distance to the farthest detection zone locations are not greater than ten (10) times the mounting height of the MVP. The recommended deployment geometry for optimal detection also requires that there be an unobstructed view of each traveled lane where detection is required. The MVP sensor orientation shall be installed to view approaching traffic. The MVP sensor placed at a mounting height that minimizes vehicle image occlusion shall be able to simultaneously monitor a maximum of six (6) traffic lanes when mounted at the road-side or up to eight (8) traffic lanes when mounted in the center with four lanes on each side. The Type K-Modified pole in the southwest corner of 83rd Avenue at Butler Drive shall have an extension riser to achieve the necessary mounting height.

The video cameras shall be mounted on the luminaire arm, with the construction being in accordance with the manufacture's requirements.

The Contractor shall place the detection zones by means of a PC with a Windows XP or Vista operating system, a keyboard, and a mouse. The PC monitor shall be able to show the detection zones superimposed on images of traffic scenes.

The detection zones shall be created by the Contractor using a mouse to draw detection zones on the PC monitor.

Prior to activation of the signal, the video detection system shall be fully functional and operating in accordance with the specifications identified above.

Method of Measurement:
Video detection system will be measured as a unit for each system reinstalled.

Basis of Payment:
The accepted quantities of each video detection system, measured as provided above, will be paid for at the contract unit price each, which price shall be full compensation for the work, complete in place, including testing and calibration, necessary to complete the work.

TRAFFIC SIGNAL FACE (PEDESTRIAN MAN/HAND W/COUNTDOWN)
TRAFFIC SIGNAL FACE (TYPE F)
TRAFFIC SIGNAL FACE (TYPE Q)
TRAFFIC SIGNAL MOUNTING ASSEMBLY (TYPE XI)
TRAFFIC SIGNAL MOUNTING ASSEMBLY (TYPE II)

Description:
This work shall consist of installing all traffic signal faces and mounts as shown in the plans.

Materials:
All traffic signal indications shall be “DIALIGHT” Light Emitting Diode (LED) modules. This will include red, yellow, and green ball indications and red, yellow, and green arrow indications.

All pedestrian signal indications shall be In-line filled-in Man/Hand “DIALIGHT” Light Emitting Diode (LED) Count Down, 430-6479-001X, pedestrian indications.

Traffic signal mounting hardware shall conform to the ADOT Standard Drawings.

Construction Requirements:
All traffic signal construction shall be accomplished by a certified IMSA Level II Signal Technician. A uniformed off-duty Peoria police officer shall be provided by the Contractor to control traffic during the change-over when the traffic signal is not in operation.

If a City signal technician is needed after hours, the Contractor shall be responsible for the technician’s overtime pay.

Equipment noted in the plans is shown schematically; the Engineer shall review and approve all equipment placement prior to construction.

Method of Measurement:
Traffic signal faces and mounts will be measured as a unit for EACH type of unit furnished and installed, that includes but is not limited to, tools, labor, and incidentals necessary to complete the work.

Basis of Payment:
The items of work described herein and indicated on the plans shall be paid as indicated on the Bid Schedule.

LUMINAIRES

Description:
The Contractor shall furnish and install new Light Emitting Diode (LED) luminaries, where indicated in the plans.

Materials:
The new luminaries shall be GE Evolve ERMC-0-A360A LED Roadway lights.

Construction Requirements:
The luminaire shall be installed on the luminaire arm in accordance with the requirements of the ADOT Traffic Signal Standard Drawings and the manufacturer.

Method of Measurement:
Work described herein and shown on the plans shall be measured as a unit EACH, in the amount indicated on the Bid Schedule.

Basis of Payment:
Work described herein and shown on the plans shall be paid as a unit EACH, in the amount indicated on the Bid Schedule. This amount shall be considered full compensation for the work complete and in place per the requirements of the City.

LED ILLUMINATED STREET NAME SIGN

Description:
The Contractor shall install new double faced LED Illuminated Street Name Signs (ISNS) and associated equipment where indicated on the project plans.

Materials:
The Contractor shall coordinate with the City of Peoria on the design and layout of the illuminated street name signs during the electrical submittal process. The Contractor shall obtain approval from the City on the design and layout of the sign prior to ordering or fabrication.

The ISNS shall be polycarbonate with first surface vinyl.

The background shall be 3M #1176 Worboys Green (Reverse Out White Graphics), and the City logo shall be 3M #1175 Blue (Reverse Out White Graphics).

The font shall be Clearview 3-W.

The ISNS cabinet shall be 30” high x 8’-0-3/4” wide x 12” deep , and shall be fabricated from extruded MMG12 Aluminum with a Mill Finish.

Retainers: Hinged Face With Prop Rod. Mill Finish.

Illumination: GE Tubular LED’s with Manufacturer recommended drivers.

The edge lit LED Illuminated street name signs shall be installed on the traffic signal poles above the mast arm connections by the Contractor per the plans. The signs shall be manufactured by Fluoresco Lighting-Sign Maintenance Corp., Phoenix. Signs shall be controlled with a photoelectric cell mounted on the controller cabinet. The contact person at Fluoresco Corp. is Gary Gryder, (602) 276-0600.

Construction Requirements:
The Contractor shall install the new 2.5 foot x 8 foot ISNS as a pennant mount to the pole, above the mast arm, in accordance with the manufacturer’s recommendations.

Method of Measurement:
Each new ISNS system will be measured as a unit Each, furnished and installed; that includes but is not limited to, tools, labor, and incidentals necessary to complete the work.

Basis of Payment:
The accepted quantity of ISNS, measured as provided, will be paid for at the contract unit price, as designated on the schedule of bid items, complete in place.

ELECTRICAL CONDUCTORS (FOR SIGNALS AND LIGHTING)

Description:
The Contractor shall furnish and install traffic signal conductors, as indicated in the plans. Emergency Vehicle Pre-emption, Video Detection, and CCTV cables shall be included in those respective items.

Materials:

Traffic Signal Conductors
New traffic signal cables shall be IMSA Specification 19-1, 14 AWG, 7x22 stranded, copper with 4, 7, or 20 conductors.

Individual conductors shall meet the requirements of the ADOT Standard Specifications and the plans.

Construction Requirements:
Conductors shall be installed per the manufacturer’s instruction, and in accordance with the City of Peoria Requirements.

During pulling, the cable shall be lubricated at each pull box, in accordance with the manufacturer’s requirements. The Contractor shall use a pre-lubrication or continuous lubrication method.

Method of Measurement:
Conductors shall be measured on a lump sum basis.

Basis of Payment:
Conductors (for signals and lighting), measured as provided above, will be paid for at the contract lump sum price, which price shall be full compensation for the work related to wiring as specified in the plans and for ancillary cabinet items, such as additional load switches, flashers, etc., complete in place, to provide a complete, functioning cabinet assembly for control of the traffic signals as shown on the plans.

CONTROL CABINET

Description:
The Contractor shall furnish, install, and test a new traffic signal controller, cabinet, and foundation in the northwest corner of Butler Drive and 83rd Avenue, in accordance with ADOT Standard Drawings and Specifications, the plans, and these special provisions.

Materials:
The traffic signal controller shall be ECONOLITE ASC/3-1000.

The traffic signal controller cabinet shall be NEMA TS-2, Econolite Type I, size 6 for 8-phase operation.

The Contractor shall install a separate on/off switch for the internally illuminated street name signs. This switch shall be separate and shall operate independently from the circuit controlling the on/off operation of the luminairies. The contractor shall install the switch on the inside technician switch panel of the traffic signal cabinet door.

The cabinet foundation shall be constructed in accordance with ADOT Standard Drawing T.S. 2-4.

Construction Requirements:
The testing of the controller shall be accomplished by the Contractor, including a representative from the traffic signal controller manufacturing company, and in the presence of the City of Peoria Traffic Signal Technician Staff at the construction site. Contractor shall be required to provide control of traffic at the intersection with a uniformed police officer during testing of controller and during turn-on of traffic signal when all work is completed.

The controller manufacturer shall provide controller operation, trouble shooting and maintenance training for the City of Peoria employees by a certified TS-2 controller technician. The traffic signal controller manufacturer shall be present at the job site during turn-on of the traffic signal**.**

Prior to construction of the cabinet foundation. The Contractor shall coordinate the cabinet orientation with City traffic signal staff.

The Contractor shall install a concrete courtesy pad for the cabinet base foundation with a walkway that connects the courtesy pad to the sidewalk. The Contractor shall also install a cabinet screen wall per City of Peoria detail PE-039.

Method of Measurement:
Each new Control Cabinet system will be measured as a unit Each, furnished and installed; that includes but is not limited to, foundation, cabinet, tools, labor, and incidentals necessary to complete the work.

Basis of Payment:
The accepted quantity of Control Cabinet, measured as provided, will be paid for at the contract unit price, as designated on the schedule of bid items, complete in place.

METER PEDESTAL

Description:
The Contractor shall furnish, install, and test a new Meter Pedestal with an internal battery backup system, and foundation in the northwest corner of Butler Drive and 83rd Avenue, in accordance with ADOT Standard Drawings and Specifications, the plans, and these special provisions.

Materials:
The Contractor is responsible for providing and installing a MYERS MEUG16-TS meter pedestals.

The Meter Pedestal shall be provided with a Tesco BBU-22-000 battery backup system.

The cabinet foundation shall be constructed in accordance with ADOT Standard Drawing T.S. 2-6.

Construction Requirements:
The construction shall be in accordance with ADOT and City of Peoria requirements. The Contractor shall coordinate with SRP for the traffic signal power connection and meter installation.

Method of Measurement:
Each new Meter Pedestal will be measured as a unit Each, furnished and installed; that includes but is not limited to, foundation, cabinet, tools, labor, and incidentals necessary to complete the work.

Basis of Payment:
The accepted quantity of Meter Pedestal, measured as provided, will be paid for at the contract unit price, as designated on the schedule of bid items, complete in place.

12 STRAND FIBER OPTIC CABLE (SINGLE MODE)

Description:
The Contractor shall furnish, install, and test single mode fiber optic cable with 12 strands in accordance with the Maricopa County 2011 Supplement to the MAG specifications, and as indicated in the plans. The associated fiber pigtails shall be in accordance with this Special Provision.

Materials and Construction Requirements:
The fiber optic cable shall be manufactured, installed, and tested in accordance with the requirements of Section 482 of the Maricopa County 2011 Supplement to the MAG specifications.

SC Style Pigtails
All pigtail assemblies shall use Fujikura SR-15e fiber.

All pigtail assemblies shall be 900um tight buffered, and be color coded blue, orange, green, brown, slate, white, red, black, yellow, violet, rose, aqua respectively.

All pigtail assemblies shall be OFNG-LS rated.

SC connectors shall be ultra polished.

SC connectors shall be compliant to the requirements of ANSI/TIA/EAI 604-3-A-2000 (FOCIS 3).

Polymeric materials used in connectors shall have a flammability rating of V-1 or better as determined by UL 94 and an oxygen index of 28% or greater as determined by ASTM D-2863-87.

Polymeric materials used in connectors shall not support fungus growth per ASTM G21-70 (rating of 0 is required).

SC connectors shall be blue.

All material shall be RoHS compliant.

SC Adapters
SC adapters shall be duplex style.

SC adapters shall be comprised of GE Valox, PBT and flame retardant UL 94 V-0 material.

SC adapters shall be blue.

Method of Measurement:
Single mode fiber optic cable will be measured by the linear foot from center to center of pull boxes. Fiber optic cable slack in pull boxes shall not be measured or paid.

Basis of Payment:
All fiber optic cable, measured as provided above, will be paid for at the contract unit price per the bid schedule, complete in place, in accordance with the Plans and these Special Provisions.

FIELD HARDENED ETHERNET SWITCH

Description:
The Contractor shall furnish, install, and test a field hardened Ethernet switch in the traffic signal cabinet on the northwest corner of Butler Drive and 83rd Avenue.

Materials and Construction Requirements:
The field hardened Ethernet switch to be furnished by the Contractor shall be a RuggedCom RS 900G, with:

Fiber Optical Gigabit Ethernet Ports (1000BaseX)

8 - Fast Ethernet Ports (10/100BaseTX)

Multiple fiber connector types (LC, SC, SFP Pluggable Optics)

Bi-directional single strand fiber support

Long haul optics allowing Gigabit distances up to 70km

Reliability in Harsh Environments

Immunity to EMI and heavy electrical surges

Meets IEEE 1613 (electric utility substations)

Exceeds IEC 61850-3 (electric utility substations)

Exceeds IEC 61800-3 (variable speed drive systems)

Exceeds IEC 61000-6-2 (generic industrial)

Exceeds NEMA TS-2 (traffic control equipment)

Hazardous Location Certification: Class 1 Division 2

-40 to +85°C operating temperature (no fans)

Conformal coated printed circuit boards

Testing
The Contractor shall perform testing in accordance with Section 486 of the Maricopa County 2011 Supplement to the MAG specifications.

Method of Measurement:
Field Hardened Ethernet Switch will be measured as a unit Each, furnished and installed; that includes but is not limited to, tools, labor, and incidentals necessary to complete the work.

Basis of Payment:
Field Hardened Ethernet Switch, measured as provided above, will be paid for at the contract unit price per the bid schedule, complete in place, in accordance with the Plans and these Special Provisions.

FIBER OPTIC SPLICE ENCLOSURE

Description:
The Contractor shall furnish, install, and test a fiber optic splice enclosure in the No. 9 pull box in the northeast corner of the Butler Drive and 83rd Avenue intersection.

Materials and Construction Requirements:
The fiber optic splice enclosure materials, installation, and testing shall be in accordance with Section 482 of the Maricopa County 2011 Supplement to the MAG specifications.

Method of Measurement:
Fiber Optic Splice Enclosure will be measured as a unit Each, furnished and installed; that includes but is not limited to, tools, labor, and incidentals necessary to complete the work.

Basis of Payment:
Fiber Optic Splice Enclosure, measured as provided above, will be paid for at the contract unit price per the bid schedule, complete in place, in accordance with the Plans and these Special Provisions.

MODIFY FIBER OPTIC SPLICE ENCLOSURE

Description:
The Contractor shall modify the existing splice enclosure in the No. 9 pull box in the northwest quadrant of the Olive Avenue and 83rd Avenue intersection.

Materials and Construction Requirements:
The fiber optic splice enclosure new materials, installation, and testing shall be in accordance with Section 482 of the Maricopa County 2011 Supplement to the MAG specifications.

The Contractor shall notify the Engineer three (3) days prior to the splicing so a City of Peoria Traffic Engineering representative can be present at the activity. The existing splice enclosure shall not be removed from the No. 9 pull box without the City representative present.

Method of Measurement:
Fiber Optic Splice Enclosure will be measured as a unit Each, furnished and installed; that includes but is not limited to, tools, labor, and incidentals necessary to complete the work.

Basis of Payment:
Fiber Optic Splice Enclosure, measured as provided above, will be paid for at the contract unit price per the bid schedule, complete in place, in accordance with the Plans and these Special Provisions.

FIBER OPTIC DISTRIBUTION CENTER

Description:
The Contractor shall furnish, install, and test a Fiber Optic Distribution Center (FODC) in the controller cabinet in the northwest corner of the Butler Drive and 83rd Avenue intersection.

The FODC shall facilitate the interconnection of 12 single-mode optical fiber pairs within a modular platform. Each module must function independently of any other device adjacently mounted.

Materials and Construction Requirements:
The splice and termination modules shall be installable into an industry standard 4RU patching shelf.

The solution shall be a fixed solution, to be defined as containing no moving parts. No sliding or telescoping appendages are acceptable.

The FODC shall provide protection to the extent of no 250um or 900um fiber being exposed within the shelf.

The FODC must be provisioned to encapsulate all fiber either beneath a cable sheath or within a splice and termination module.

The splice and termination module shall be supplied with all components necessary to complete installation inclusive of all module hardware, adapters, pigtails, fusion sleeve organizers, heat shrink fusion splice sleeves, cable strain relief, and instructional literature.

The FODC shall be comprised of three primary components.

Module housing

Constructed of 0.062” aluminum per ASTM B209, 5052 H32

Adapter faceplate

Shall be constructed of 16 gauge CRS

Removable cover

Shall be constructed of 30 mil Lexan sheet

The FODC will secure and organize twelve SC style optical adapters, twelve single-mode optical fibers terminated with SC style optical connectors, and twelve heat shrink splice protection sleeves.

The FODC shall provision for no less than 24” of pigtail length to be stored for each fiber to be terminated.

The FODC shall provision for no less than 36” of raw 900um fiber to be stored for each fiber to be spliced in the module.

The FODC shall house no less than three 8-position splice organizer chips that will mount without adhesive.

The FODC module shall be provisioned with two permanently affixed posts that will facilitate proper location and retention of the splice organizer chips.

The FODC housing shall nominally be 6 inches x 4 inches x 1.1 inches.

Module housing shall feature a black Envirocron PTC90190 or equivalent powder coat finish of the following characteristics:

Specific Gravity: 1.59 +/- 0.05

Theoretical Coverage: 121ft^2 /lb/ml

Gloss @ 60°: 8-12

Pencil Hardness: 2H

Dir/Rev Impact, Gardner: 60/40 in/lbs

Salt Spray: 1000 hrs

Film Thickness: 4-5 mils (.004”-.005”)

Module housing shall feature an open end with pressed nuts provisioning for installation of an adapter plate equally provisioned.

Module housing shall be provisioned to provide a four point mount to a removable cover.

Adapter Faceplate

Adapter faceplate shall be LGX compatible.

Adapter faceplate shall house six duplex SC style adapters.

Adapter faceplate shall be provisioned to mount to the open end of the module housing with two Phillips screws.

Removable cover

Removable cover shall allow for an unobstructed view of the internal workings of the module.

Removable cover shall attach to the module base at four points.

Removable cover shall be removable without the use of any tools.

Method of Measurement:
FODC will be measured by the will be measured as a unit Each, furnished and installed; that includes but is not limited to, tools, labor, and incidentals necessary to complete the work.

Basis of Payment:
FODC, measured as provided above, will be paid for at the contract unit price per the bid schedule, complete in place, in accordance with the Plans and these Special Provisions.