

TECHNICAL SPECIFICATIONS

FOR

SKYLINE REGIONAL PARK PHASE I

WATSON ROAD

(MCDOWELL ROAD TO PARK ENTRANCE)

CITY OF BUCKEYE

CONTRACT NO. 2011-120

BUCKEYE, AZ

February 2015

Table of Contents

PART 100 – GENERAL CONDITIONS.....	4
PART 200 – EARTHWORK.....	29
PART 300 – STREETS AND RELATED WORK.....	33
PART 400 – RIGHT-OF-WAY AND TRAFFIC CONTROL.....	38
PART 500 – STRUCTURES.....	92
PART 600 – WATER, SEWER, STORM DRAIN AND IRRIGATION.....	106

APPENDICES

APPENIX A	GEOTECHNICAL REPORT
APPENIX B	BRIDGE FOUNDATION REQUIREMENTS
APPENIX C	FLOODPLAIN USE PERMIT
APPENDIX D	NATIONWIDE PERMIT NUMBER 14
APPENDIX E	WESTERN BURROWING OWL AWARENESS FLYER
APPENDIX F	SONORAN DESERT TORTOISES GUIDELINES

For the purpose of the Technical Specifications, both MAG standards and ADOT standards noted and revised shall be used for the City’s Skyline Park project; however where a direct conflict exists between the Technical Specifications and the City’s General Conditions, the more stringent will prevail.

PROFESSIONAL ENGINEER SEALS

This book of specifications and related contract documents represents the efforts of the following firms:

(1) Kimley-Horn and Associates, Inc. (KHA)

A representative of various disciplines have affixed his/her professional seal below, which attests that those portions of these specifications, which relate to their respective discipline area, were prepared under his/her direction.



Expires 09/30/15



Expires 12/31/2015



Expires 06/30/15



Exp. Date 12/31/16

PART 100 – GENERAL CONDITIONS

The City of Buckeye Engineering and Design Standards can be accessed at <http://www.buckeyeaz.gov/developers/engineering/> are part of these contract documents.

The "Uniform Standard Specifications for Public Works Construction" which are sponsored and distributed by the Maricopa Association of Governments (MAG), and which are hereinafter referred to as the "MAG Standard Specifications," are hereby adopted as part of these contract documents. Copies of these documents, with revisions, may be obtained at the Maricopa Association of Governments, 302 North 1st Avenue, Phoenix AZ 85003.

The Arizona Department of Transportation (ADOT) standard specifications are also adopted as part of these contract documents. Copies of these documents may be accessed at <http://azdot.gov/business/ContractsandSpecifications/Specifications>.

The Maricopa County Department of Transportation Supplement to the MAG Standard Specifications is also adopted as part of these contract documents. Copies of these documents may be accessed at: http://www.mcdot.maricopa.gov/technical/eng-manuals/2015_Suppl.pdf.

SECTION 101 ABBREVIATIONS AND DEFINITIONS

101.2 Definitions and Terms

The following additions are made to definitions in Section 101.2 of the MAG Standard Specifications:

Contracting Agency:	City of Buckeye, Arizona
Owner:	City of Buckeye, Arizona
Design Engineer:	Kimley-Horn
Architect:	Perlman
Geotechnical Engineer:	Speedie and Associates
Engineer:	To be appointed
Project Manager:	To be appointed
Owner's Representative:	To be appointed
Inspector:	To be appointed

The Engineer, Project Manager and/or an Owner's Representative may all be a same person and will be appointed by City to represent the City of Buckeye.

SECTION 104 SCOPE OF WORK

104.1 Work to be Done

Section 104.1 of the MAG Standard Specifications is modified to add:

The Skyline Regional Park project is located in the City of Buckeye in Maricopa County. The project includes roadway construction, park features including entry gate house, entry gate monument and gates, ramadas, rest rooms and a pedestrian/equestrian bridge across the Skyline Wash. The work consists of subgrade preparation, pipe and reinforced concrete box culverts, asphalt paving, new entry gate house and restrooms, curb, gutter and sidewalks, parking areas, decomposed granite roads and parking, landscaping, riprap, erosion control, park monument wall and sign, signing and striping, and other related incidental work.

The above items of work along with the construction requirements are adequately described and defined in the Uniform Standard Specifications and Details for Public Works Construction sponsored and distributed by the Maricopa Association of Governments (MAG) together with the City of Buckeye and MCDOT supplements thereto, latest revisions, ADOT Standard Specifications for Road and Bridge Construction, latest revision, or within these technical specifications.

The information written into these project technical specifications will:

Describe any special or unusual conditions
Explain details of the work not covered in the MAG Specifications and Details
Relate certain work to specific bid items or payment quantities
Contain the specifications and/or drawings and specifications of this project.

104.1.5 Pre-construction video

Contractor shall provide a copy of a pre-construction video to the City of Buckeye prior to commencing work and retain a copy for their records; at a minimum, this video shall show the existing condition of the roads adjacent to the project, condition of landscaping and fences in close proximity of the work, and the like. There will be no measurement or payment for this video.

104.2.6 Value Engineering Proposals by the Contractor

Proposals may be submitted to the Engineer for modifying the plans, specifications, or other requirements of the contract for the sole purpose of reducing the total costs of construction without impairing in any manner the essential functions or characteristics of

the project, including service life, economy of operations, ease of maintenance, benefits to traveling public, desired appearance or design and safety standards.

After execution of the contract, an initiative may be recommended by the Contractor. The initiative must be identified as a Value Engineering Proposal (VEP), and may include modifications to the plans or specifications, construction phasing procedures, or other contract requirements.

Any cost savings generated to the contract as a result of the VEP offered by the Contractor and approved by the City will be shared equally between the Contractor and the City.

Bid prices are not to be based on the anticipated approval of a VEP. If a VEP is rejected, the contract shall be completed in accordance with the original terms of the contract or as otherwise modified.

Any decision whether to approve or accept a VEP shall be within the sole discretion of the City. The City will bear no liability for any delay in considering a VEP, the refusal to accept or approve such a proposal, or any other matter connected with a VEP.

GENERAL INFORMATION

The following items, though not a comprehensive list, are non-payment items being considered incidental to the project, the costs of which are to be included in project overhead or within other specific bid items:

- Clearing and Grubbing
- Dust Palliative Material and Application
- Temporary construction fencing
- Sawcutting of asphalt or concrete
- Roadway Excavation; Fill construction; Importing Borrow
- Shoring and bracing if required
- Rock blasting if required
- MAG thickened edge per MAG Detail 201 (Asphaltic Concrete paid separately)
- Locating (or potholing) of new or existing utilities
- SWPPP Preparation and Document Maintenance
- Contractor's site office or yard
- Roadway sweeping
- Any and all permits - preparation costs and permit fees
- Protective fencing or plating for open trenches
- As-builts (Included with Construction Survey and Staking)

ARCHITECTURAL/BUILDING ITEMS

The following architectural items and associated mechanical, electrical, plumbing, and structural components are shown as to be paid for as Lump Sum Items, each its own item. All work shown in Architectural Plans shall be constructed as per details shown in plans and architectural specifications.

- Picnic Ramadas
- Picnic Ramada Solar Lighting, bracing, and collection device
- Equestrian Area Ramada
- Equestrian Area Solar Lighting, bracing, and collection device
- Restroom Building and associated furnishings
- Restroom Building Solar collection panels, mounting, and electrical components
- Restroom Building water tank, embedment, piping, fittings and bracings
- Gate House
- Gate House Solar collection panels, mounting, and electrical components

CONTRACT STANDARD SPECIFICATIONS AND DRAWINGS

The following Standard Specifications and Standard Drawings referenced in the project contract documents are required for construction of this project:

- City of Buckeye Engineering Design Standard Specifications and Details, latest adopted edition
- Maricopa Association of Governments (MAG) Uniform Standard Specifications for Public Works Construction, latest edition
- Maricopa County Department of Transportation (MCDOT) Supplement to MAG Uniform Standard Specifications, latest edition
- Maricopa Association of Governments Uniform Standard Details for Public Works Construction, latest edition.
- AASHTO Manual of Uniform Traffic Control Devices, latest edition.
- Arizona Department of Transportation (ADOT) Manual of Approved Signs, latest edition.
- ADOT Signing and Marking Standards, latest edition.
- ADOT Traffic Signal & Lighting Standard Drawings, latest edition.
- ADOT Standard Specifications for Road and Bridge Construction, latest edition.
- Maricopa County, Arizona, Drainage Design Manual for Maricopa County, Volume III, Erosion Control. August 15, 2013

CONSTRUCTION RESTRICTIONS

General: The Contractor shall perform construction activities between normal work hours; 7 a.m. to 5 p.m., Monday through Friday excluding national holidays and holiday weekends, except as approved by the City.

Night work may be established by the Contractor as regular procedure with written permission of the City of Buckeye, and will be subject to the City's Noise Ordinance. Such permission may be revoked at any time by the City of Buckeye.

Work outside these hours may be permissible provided a construction schedule has been prepared, submitted to and found acceptable to the City of Buckeye. The schedule shall identify the details of the work to be performed, including the location and duration of planned activities. Submittals shall be made a minimum of seven days prior to the planned work to allow sufficient time for the City to review the request and schedule any necessary inspections and testing services that occur outside the normal and excepted working hours indicated above.

TRAFFIC CONTROL

Traffic control shall be provided and maintained in accordance with the latest edition of the Manual of Uniform Traffic Control Devices and the City of Phoenix Barricading Manual, Maricopa County Department of Transportation, MAG Uniform Standard Detail 401, and City requirements. The Contractor is required to submit a Traffic Control Plan and Barricade Plan to the City for approval where the construction of the new improvements are adjacent to or connecting to any existing roadway or pedestrian facilities. The Traffic Control Plan and Barricade Plan shall be approved before a permit for the work will be issued. The Contractor shall install approved barricading and traffic control, as approved by the City, before work can take place. All overnight barricades shall be lit and functioning.

All required traffic control work for the project is being paid for under bid item 401.01000.

SAFETY FENCING FOR TRENCHES AND EXCAVATIONS

The Contractor shall provide safety construction fencing around all open trenches and excavations during all non-working hours.

The Contractor shall provide for the safety and welfare of the general public by adequately fencing all excavations and trenches that are permitted by the Engineer to remain open when construction is not in progress.

Fencing shall be securely anchored to approved steel posts located six (6) feet on center, having a minimum height of six (6) feet, and shall consist of wire mesh fabric of sufficient weight and rigidity to adequately span a maximum supporting post separation of six (6) feet.

The fencing, when installed about the periphery of excavations and trenches, shall form an effective barrier against intrusion by the general public into areas of construction. The Contractor, at all times when construction is not in progress, shall be responsible for maintaining the fencing in good repair, and upon notification by the Engineer, shall take immediate action to rectify any deficiency. Prior to the start of any excavation or trenching required for the execution of the proposed work, the contractor shall submit to the Engineer for approval, detailed plans showing types of materials and methods of fabrication for the protective fencing.

There will be no separate measurement or payment for furnishing, installing, or maintaining protective fencing. The cost shall be considered included in other bid items for which the fence is necessary.

SOILS INFORMATION

The material boring logs shown in the Geotechnical Report is available upon request. It is not intended to imply that the character of materials shown in the logs is representative throughout the project. The soil borings are indicative of the soil characteristics only at the locations and to the depths of each of the borings.

GENERAL REQUIREMENTS

ENVIRONMENTAL MITIGATION MEASURES:

The Bureau of Land Management (BLM) prepared an Environmental Assessment (EA) for the Buckeye White Tanks Regional Park (The Buckeye White Tanks Regional Park R&PP, Environmental Assessment, DOI-BLM-AZ-P010-2010-016-EA, Finding of No Significant Impact issued by BLM on June 14, 2010). Phase I of the Skyline Park is included in this project. The EA included the following mitigation measures and additional mitigation measures have been included as necessary.

The following project-specific mitigation measures are required to address key environmental issues and other concerns that were identified as part of the plan development process. These mitigation measures are not subject to change without prior written approval from the BLM and City of Buckeye.

Contractor Responsibilities

The Contractor shall arrange for a qualified biologist to give a worker awareness presentation to all on-site workers prior to the start of construction. The worker awareness presentation shall include, at a minimum, information regarding the biology and status of the western burrowing owl and Sonoran Desert tortoise and a summary of the measures that are being implemented to prevent impacts to individual western burrowing owl and Sonoran Desert tortoise that may be encountered during construction.

Prior to construction, all personnel who shall be on-site, including, but not limited to, contractors, Contractor employees, supervisors, inspectors, and subcontractors shall review the attached "Western Burrowing Owl Awareness" flyer.

If any burrowing owls are located during construction, the contractor shall stop work at that location and notify the City of Buckeye immediately. The Contractor shall contact the City of Buckeye (623-349-6621) to determine whether the owls can be avoided or must be relocated. If owls must be relocated, the Contractor shall employ Wild at Heart Inc. and Bob Fox (480-595-5047) to relocate burrowing owls from the project area, as appropriate.

If any burrowing owls or active burrows are identified during construction, no construction activities shall take place within 100 feet of any active burrow until the owls have been relocated.

If tree or shrub removal shall occur from February 15 through August 31, at least 14 days prior to tree pruning or removal activities the Contractor shall arrange for a biologist experienced in bird surveys to conduct a bird nest search of all trees that shall be removed. The bird nest search shall be conducted within 10 days prior to tree or shrub removal and shall include a search for visible nests, observation of the trees to determine the potential presence of cavity nests, and potential relocation of nests. No tree pruning or removal is allowed unless only inactive nests are present or all active nests have been successfully relocated by a qualified biologist with the appropriate USFWS permit. Between September 1 and February 15, tree/limb removal is not subject to this restriction.

To prevent the introduction of invasive species seeds, the Contractor shall inspect all earthmoving and hauling equipment at the equipment storage facility and the equipment shall be washed prior to entering the construction site.

To prevent invasive species seeds from leaving the site, the Contractor shall inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site.

All disturbed soils not paved that shall not be landscaped or otherwise permanently stabilized by construction shall be seeded using species native to the project vicinity.

Protected native plants within the project limits shall be impacted by this project; therefore, the Contractor shall determine if Arizona Department of Agriculture notification is needed. If notification is needed, the Contractor shall send the notification at least 60 calendar days prior to the start of construction.

If previously unrecorded cultural resources are encountered during project construction activities, work shall stop immediately at that location, and steps shall be taken to secure the preservation of the resources. The BLM Phoenix District Office –

Archeologist shall be contacted immediately at 623-580-5676 to make arrangements for the proper treatment of the resources. If human remains are encountered during any phase of the project, all work must stop and the ASM Repatriation Coordinator (520-621-4795) or the ASM Assistant Permits Administrator (520-621-2096) must be notified immediately pursuant to state law.

Measurement and Payment for Various Work Items

Sawcutting

No measurement or direct payment will be made for sawcutting existing AC or Portland Cement Concrete Pavements (PCCP); the cost being considered as included in the price of contract items.

Grade Unpaved Roadway to Match

No measurement or direct payment will be made for grading to match unpaved roadways as shown in the plans; the cost being considered as included in the price of contract items.

MAG Thickened Edge

No measurement or direct payment will be made for constructing MAG thickened edge per MAG Detail 201, MAG Section 321 and as shown in plans. The cost is being considered as included in the price of contract items. The cost of material shall be paid with respective AC bid items.

Clearing and Grubbing

No separate bid item has been established for clearing and grubbing, inclusive of temporary construction fencing. The cost shall be considered as included in the price of contract items. The work shall be performed in accordance to MAG Section 201.

Earthwork

There is no separate pay item for earthwork. All earthwork quantities are being paid under ITEM 301.01000 – SUBGRADE PREPARATION. No additional measurement or payment shall be made for earthwork including roadway and drainage excavation, fill construction, hauling waste and importing borrow.

Low Water Crossing – Bituminous Ford

No additional measurement or direct payment will be made for constructing low water crossing bituminous ford as shown in plans as per the Modified ADOT Standard Detail C-19.10 Type I. The cost is being considered as included in the price of contract items.

The cost of asphaltic concrete material shall be paid with respective AC bid items.

The AC wedges (slopes) for the ford shall be constructed as shown in plans. Subgrade for ford wedges (slopes) shall be compacted to 95% of the maximum density. The AC for the ford wedges (slopes) shall be compacted as per the applicable MAG Section 321. Manual compaction or other methods may be required to achieve required compaction. No additional measurement and payment will be made for construction of ford using alternative equipment and compaction methods.

Speed Hump

No measurement or direct payment will be made for constructing Speed Hump as per MAG Detail 210. The cost is being considered as included in the price of contract items. The cost of AC material and striping shall be paid with their respective bid items.

Temporary Drainage

The contractor shall be responsible for maintaining the temporary drainage facilities for the different phases of construction. No measurement or direct payment will be made for maintaining temporary drainage and other measures as required to prevent ponding and embankment scour, the cost being considered as included in the price of contract items.

Shoring

Temporary shoring may be required for pipe culvert and box culvert installations to contain the embankment; no additional measurement or payment will be made, the cost being considered as included in the price of contract items.

Utilities

The contractor shall be responsible for determining exact location of utilities if present.

Additional Requirements

All other materials removed and not designated to be salvaged or incorporated into the work shall become the property of the contractor.

No substitutions will be allowed for the pipe materials shown in the project plans.

The contractor shall not remove or damage any existing private improvements outside the right of way. Private improvements cannot be removed by the contractor unless otherwise shown on the project plans. The contractor shall repair any damaged improvements at his own expense.

All new construction shall be completed within the public right of way areas shown on the project plans.

When working in the vicinity of mailboxes, the contractor shall maintain access to the mailboxes for mail delivery and pickup.

SECTION 105 CONTROL OF WORK

105.2 Plans and Shop Drawings

Section 105.2 of the MAG Standard Specifications is modified to add:

All materials and equipment not provided by City of Buckeye shall be approved by the Engineer prior to purchasing and installation. Any work in which materials or equipment not previously approved by the Engineer are used shall be performed at the Contractor's risk and may be considered as unauthorized and unacceptable and are not subject to the payment provisions of the contract. Such materials or equipment may be subject to removal at the discretion of the Engineer.

Before ordering or installing any material or equipment, the Contractor shall submit four (4) copies of each proposed material and/or equipment list, including shop drawings to the City for approval by the Engineer. To be acceptable, the list shall be complete and contain all items supplied on the project by the Contractor, including pre-approved items. The City of Buckeye reserves the right to reject an incomplete or unclear material submittal. All items on the list shall be identified by manufacturer's part number, model, specification or other pertinent catalogue information. The materials from any catalog cuts shall be clearly indicated by the Contractor. One (1) copy will be returned to the Contractor for further action.

All equipment or material specified or shown on plans, or other drawings, by brand name, part number, or model number is intended to be descriptive of the type and quality of material or equipment desired. Another equal brand name, part number, or model number may be substituted so long as it is in accordance with these specifications and is equal in form, fit, function, performance, reliability, and is approved by the Engineer.

Materials

The Contractor shall furnish to the City of Buckeye's Engineer product data, material certificates of compliance, mix designs and shop drawings in sufficient detail to show complete compliance with all specified requirements, including but not necessarily limited to the following:

- Prefabricated Steel Truss Bridge and related components

- Pipes (drainage and water) and appurtenances
- All plumbing components
- All electrical components
- Concrete and asphalt mix designs
- Reinforcing steel
- Masonry block
- Permanent and temporary traffic control items

Product data shall include information such as the manufacturer's printed recommendations, compliance with recognized trade association standards, application of testing agency labels and seals, product dimensioning, and notation of coordination requirements.

The Certificates shall be prepared by the Manufacturer or testing agency thereof and should include technical specifications and compliance with industry trade association and testing agency standards.

The mix designs shall directly compare the proposed mix components and properties with those of the referenced standard mix or as modified within the special provisions.

Distribution and Review

The Contractor shall anticipate and schedule for a two week review period by the City of Buckeye and/or its designee during which time the City will 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.

Shop drawings shall be on sheets in standard size increments between 8 ½" X 11" and 24" x 36". All drawings shall indicate the name of the job, the City's job number, date, names of the Contractor, Subcontractor and Preparer, and the date of approval by the Contractor. All other data, certificates or mix design reports shall be presented on 8 ½" x 11" formats, or as provided by the Supplier/Manufacturer.

105.6 Cooperation with Utilities

Section 105.6 of the MAG Standard Specifications is modified to add:

The Contractor shall notify the affected utility companies and Blue Stake (263-1100) prior to the start of construction and shall ascertain the approximate locations of the various underground utilities either shown on the plans and/or as may be brought to his attention by the utility companies. The exact locations of underground utilities shall be determined by "potholing" by the Contractor prior to any trenching or excavation operations.

No utility conflicts are anticipated, however, It shall be the Contractor's responsibility to notify Blue Stake at 602-263-1100 (1-800-STAKE-IT), field verify existing utility locations and to coordinate in a timely manner with the pertinent utility companies so that any obstructing utility installation may be adjusted without delay to the Contractor's project schedule.

The Contractor shall be responsible for potholing all utility conflicts in a timely manner; the cost for potholing new or existing utilities shall be included in the cost for other items of work.

105.7 Cooperation between Contractors

Section 105.7 of the MAG Standard Specifications is modified to add:

The Contractor is hereby notified of the following proposed projects that may be ongoing during the project improvements. There will be no separate measurement or payment for the needed coordination, providing needed access, and sequencing of construction that may be needed for these projects.

Watson Road (Van Buren to McDowell Road) Improvements:

This potential ADOT project to pave Watson Road from Van Buren to McDowell Road construction may be ongoing. The project is currently under design development and no construction schedule is available as of writing of these requirements.

The Contractor is hereby notified of this project and shall coordinate work with this project (including traffic control) and shall make no claim for any delays that may be associated with the ADOT's Watson Road project improvements.

Section 105.8 of the MAG Standard Specifications is replaced with the following:

105.8 Construction Stakes, Lines and Grades

MAG Section 105.8, Construction Stakes, Lines and Grades are deleted.

The Contractor shall furnish all materials, personnel, and equipment necessary to perform all surveying, staking, laying out of control lines and verifications of the accuracy of all existing control points which are delineated in the Contract Documents. The work shall be done under the direction of a Registered Land Surveyor licensed to practice in the State of Arizona.

Staking Outline: Prior to beginning any survey operations, the Contractor shall furnish to the City of Buckeye Project Manager, for approval, a written outline detailing the

method of staking, interval of stakes, marking of stakes, grade control for various courses of materials, referencing, structure control, and any other procedures and controls necessary for survey completion. A part of this outline shall also be a schedule which will show the sequencing of the survey and layout work, throughout the course of the contract, listing a percentage of completion for each month.

Field Books: The Contractor shall furnish field books to be used for recording survey data and field notes. These books shall be available for inspection by the City at any time and shall become the property of the City upon completion of the work.

Survey Control Verification: The Contractor shall be responsible to stake construction elevations tied to the prime bench mark.

Coordinate and elevation information for other monuments and benchmarks has been provided in the project plans. If a discrepancy is discovered with respect to project elevations, the project prime benchmark will override all other monuments and/or benchmarks.

- a. Control Points (horizontal and vertical) – The existence and location of all survey monuments, bench marks and control points shall be verified prior to demolition or construction activity. Immediately notify the City of Buckeye Project Manager when location discrepancies greater than two-hundredths (0.02) foot horizontal or one-hundredth (0.01) foot vertical are found.
- b. Control Lines – Construction control lines with grade breaks, transition points, horizontal and vertical curves, etc., shall be established and referenced prior to construction.
- c. Temporary Bench Marks – Temporary bench marks shall be established and referenced at this time.

Pre-Construction Location Survey: All existing features which are located prior to construction shall be referenced to survey monuments along control lines by stationing in accordance with the construction documents and by offset distance from the control lines. All features shall be relocatable after construction. Distances measured shall be within one-hundredth (0.01) foot.

- a. Survey monuments - All survey monuments that lie within the construction area that may be disturbed shall be referenced to a specific point on at least four (4) stable objects by distance measurement. Reference objects shall be located no greater than three-hundred (300) feet from the survey monument being referenced.
- b. Water and Sewer line appurtenances - Water and sewer line surface appurtenances such as manholes, valves and cleanouts that lie within the construction area shall be located and noted on the Contractor's approved construction documents prior to any demolition or excavation.

- c. Match Points and Removals - Verify the location (horizontal and vertical) of existing facilities to which the project connects. Immediately notify the City of Buckeye Project manager when location discrepancies of connecting facilities greater than one-tenth (0.10) foot horizontal or two-hundredths (0.02) foot vertical are found.

Construction Stakes: The Contractor shall set construction stakes and marks establishing lines and grades for road work, curbs, gutters, path, structures, buildings, centerlines for utilities and necessary appurtenances and other work as indicated in the Contract Documents and shall be responsible for their conformance with the plans and specifications.

The stakes shall be established in accordance with the following guidelines which represent the minimum standard and the Contractor shall provide additional stakes and controls necessary to perform the work. The Contractor shall be held responsible for the preservation of all stakes and marks and will replace, at no additional cost to the City, any construction stakes or marks which have been carelessly or willfully destroyed by any party.

a. Curbs, Curb and Gutter, Sidewalks:

1. Curb and gutter shall be staked and installed prior to construction.
2. Cut/fill stakes for rough grade shall be set at one-hundred (100) feet intervals with cuts to the top of curb.
3. Finish grade stakes shall be set to curb grade at twenty-five (25) feet intervals, at grade breaks, angle points, transitions, returns, driveways, alley entrances, sidewalk ramps and other curb control points. The stakes shall be tacked for line on a two (2) foot offset to the back of curb.
4. Face of curb forms shall be checked for grade at flow line prior to placing concrete where longitudinal grades are one-tenth (0.10) percent or less.

- b. **Landscaping:** The Contractor shall delineate the procedures and controls to be utilized in the Staking Outline.

105.8.3.2 Resetting Monuments:

(A) General:

The Contractor shall be responsible to maintain all existing monumentation, including section line, right-of-way and roadway monumentation. Monumentation disturbed during construction shall be re-established by the Contractor and recorded at the appropriate county recorder's office, at no additional cost to the City.

(B) Monumentation Standards:

Section corner, quarter corner and property corner monuments shall be re-established following the procedures in the Manual of Surveying Instructions 1973, published by the

U.S. Department of the Interior, Bureau of Land Management and all applicable statutes and requirements specified in the current Arizona State Board of Technical Registration's "Arizona Boundary Survey Minimum Standards."

(C) Procedures:

Section line, right-of-way and roadway monumentation re-established by the Contractor shall bear the registration number of the Land Surveyor in responsible charge of the location.

Monuments used to define section lines shall be stamped in accordance with Manual of Surveying Instructions 1973, published by the Department of Interior, Bureau of Land Management. Roadway monumentation shall be stamped in accordance with the requirements of the appropriate municipal jurisdiction.

Monuments that are re-established shall be recorded at the appropriate county recorder's office and a copy of the Corner Recordation documentation shall be submitted to the Construction Manager within five working days of recordation.

Any discrepancies in grade, alignment, earthwork quantities, locations or dimensions detected by the Contractor shall immediately be brought to the attention of the Construction Manager. No changes in the project plans will be allowed without the approval of the Construction Manager.

Inspection and Acceptance of Work: The City reserves the right to make inspections and random checks of any portion of the staking and layout work. If, in the City's opinion, the work is not being performed in a manner that will assure proper control and accuracy of the work, the City will order any or all of the staking and layout work redone at no additional cost.

As-Builts

The as-built work shall conform to the City of Phoenix Survey Section Standard Requirements For: Staking, As-Builts, Quantity Calculations; dated January 1, 1980.

A full size set of project drawings shall be kept on-site and updated on a weekly basis with a red pencil or red ink to reflect any field adjustments, changes, omissions, additions, etc. as they occur on the project. The Engineer will check site as-builts on a weekly basis to insure all modified project elements have been properly recorded on the field plan set.

Information shall be shown on the project plans in red opaque ink, depicting the constructed dimensions, elevations, grades and materials including locations of existing underground utilities found during construction.

The Contractor shall exercise extreme care in handling the originals and will return them to the City in like condition. In the event the originals are damaged or determined by the City to be unacceptable, the Contractor shall replace the originals by contacting the design Engineer of record and have new drawings produced. All costs incurred as the result of replacing the originals shall be borne by the Contractor. The City will be the sole judge in determining whether the as-builts are acceptable.

All work included in the contract documents as well as changes to the contract shall be noted as correct or modified by either checking off the information if it is correct, or by drawing a neat line through the original data and writing in the correct information in red opaque ink if the information is incorrect. Unless noted otherwise below in the minimum as-built requirement section, station/offset measurements will be from construction centerline/monument line both parallel and transverse to roadway; added items or location changes shall be physically drawn at revised or new locations on the as-builts; and all measurements and stations should be to the nearest tenth of a foot.

The minimum requirements for as-built acceptance is as follows:

1. Project Drawing Quantity Notations: Any project drawing or quantity summary sheet that shows a quantity on it that is incorrect shall be corrected by drawing a neat line through the original quantity and writing in the correct information. When space on the drawing does not allow room to indicate the corrections, a separate table may be drawn on a separate sheet with reference on both plan sheets to the plan sheet that the table refers to or to the sheet where the table is located.
2. Existing/New Utilities: All underground infrastructure utilities, whether depicted on the project plans or not, shall be verified, corrected or added to the as-builts noting the beginning and ending station/offset location and elevation of utility relative to finished roadway grade or other identifiable ground or permanent roadway/project feature. Any electrical installation work for street lighting or power connection shall be located relative to construction centerline/monument line or relative to back of curb and gutter (whichever is closer) including the depth of the facility.
3. Removals: Dimensions and/or other volumetric descriptions and station/offset location of all removed items.
4. Curb/Gutter: Beginning and ending station/offset location of straight curb/gutter runs relative to construction centerline/monument line; flow line elevation; and station/offset location of PC's and PT's.
5. Driveway/Alley Entrances: Beginning and ending station/offset including driveway wings.
6. Path: Beginning and ending station/offset and any other modification necessary to incorporate or avoid existing facility conflicts.
7. Sidewalk Ramp: Curvilinear distance deviations measured along gutter flow line from curb and gutter PC/PT or other shifts/adjustments to properly align with pedestrian crosswalks or other modifications necessary to incorporate/avoid existing facility conflicts.

8. Median Island: Beginning and ending station/offset of median and straight run median widths measured from back of curbs; beginning and ending station/offset of decorative median paving; bullnose radiuses; and measured widths of median in transition sections from back of curbs in 25 foot minimum increments or to bullnose radius PT/PC (whichever is less).
9. Roadway Pavement: Beginning/ending station and measured completed roadway width from edge of pavement to edge of pavement in straight roadway sections; measured completed roadway width perpendicular to construction centerline/monument line from both edges of pavement to construction centerline/monument line in curved roadway sections; and actual sawcut removal/tie-in to existing pavement locations.
10. Pipelines: When pipeline parallels the construction centerline/monument line, verify or correct the perpendicular distance between the two. When pipeline angles relative to the construction centerline/monument line or is in a curved roadway section, as-built measured straight pipe run distances, angle points, changes in size, fitting/tee locations tied-in with practical known construction centerline/monument line location or other easily verifiable permanent point. Distances between fittings are from fitting centerline. Fire hydrant and catch basin branch lines are to be shown in profile including pipeline bends and collars. All project drawing pipeline cross sections and profiles are to be corrected to reflect modified pipeline locations/alignments. Station and offset locations for sewer line laterals are from main line to ROW line with beginning/ending line location tied to a monument or to a property corner. Locations where waterlines cross curb and gutter are to be noted by station. Where waterlines run parallel to curb and gutter, note locations relative to back of curb or construction centerline/monument line (whichever is closer) including angle points and elevation.
11. Manhole/Catch Basin/Valve/Cleanout/Tee: Beginning/ending station and offset. Stationing is to commence at the downstream manhole (or as depicted on drawings) with location of tap/wye/tee/lateral locations clearly noted.
12. Landscaping and Irrigation: Note beginning and ending station/offset/elevation including size of PVC; sleeve/pull-box/electrical-valve/water-service/tap/meter/bubbler/dripline locations.
13. Roadway Striping/Signage: Any relocated sign shall be located by station and offset from construction centerline/monument line. Any change in roadway marking is to be noted on as-builts.
14. Bridges, Box Culverts and Other Structures: Station/offset distances/centerline-bearing line/finished elevations of all bridge or structure elements. Bridge deck and girder elevations must reflect before and after concrete placement elevations.
15. Linear Items: Fences, walls, ditches, etc. should be located by station/offset and tied in with a permanent point.

The as-built drawings shall be certified by an Arizona Registered Land Surveyor. As-built drawings shall be delivered to the City of Buckeye Project Manager within thirty

(30) calendar days from the date of final inspection and acceptance by the City of the work completed under this contract. Work under this bid item includes transfer of all information noted by the Contractor on the on-site as-built drawing set described above under Bid Item number 105.80000. Final payment will be made only after submitted signed and sealed as-builts are accepted by the City (see “Measurement and Payment” below).

The Engineer 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 Engineer. The cost of all material, labor, tools and equipment to provide a complete set of as-built drawings to the Engineer shall be considered included in the contract Bid Item number 105.80000.

Measurement and Payment:

Construction survey and staking will be measured by the lump sum.

<i>ITEM</i>	<i>CONSTRUCTION SURVEYING & STAKING</i>	<i>LUMP SUM</i>
105.80000		

105.10 Inspection of Work

Section 105.10, add the following:

The Contractor shall hire an independent third party Material Testing firm to perform Quality Control testing for the project. The City reserves the right to do Quality Assurance testing.

All material testing for the project shall be paid under bid item 112.01000 Contractor Quality Control.

SECTION 107 LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC

107.1 Laws to be Observed

Section 107.1 of the MAG Standard Specifications is modified to add the following:

The City of Buckeye will endeavor to ensure in every way possible that small, minority and woman-owned business enterprises shall have every opportunity to participate in providing professional services, purchased goods and contractual services to the City of Buckeye without fear of discrimination based on race, religion, sex, age, disability or

national origin. A Small Business, Minority and Woman-Owned Business Enterprise goal has NOT been established for this contract, however participation is encouraged.

107.2 Permits

Section 107.2 has been revised to read:

It is Contractor's responsibility to obtain all permits and licenses, pay all fees, charges, and taxes and prepare all required notices for the lawful execution of the work. Permits for earth moving may be obtained from Air Pollution Control, Maricopa County Department of Environmental Management, 2406 South 24th Street, Suite E-214, Phoenix, Arizona 85034, Telephone Number (602) 506-6700. A copy of the earthmoving permit and dust control plan shall be submitted to the Engineer prior to commencement of any earthmoving activities.

107.2.1 AZPDES (NPDES) Construction General Permit Requirements:

Unless otherwise directed by the City, the Contractor shall be responsible for compliance with the Arizona Pollutant Discharge Elimination System (AZPDES) requirements administered by the Arizona Department of Environmental Quality (ADEQ).

107.2.1.1 Regulation Compliance:

The Contractor shall take all necessary measures to assure compliance of employees and subcontractors with the AZPDES Construction General Permit for Arizona as well as all other applicable federal, state and local laws, ordinances, statutes, rules and regulations pertaining to stormwater discharge and air, ground water and surface water quality. As the permittee, the Contractor is responsible for preparing, in a manner acceptable to the ADEQ and the EPA, all documents required by regulation, which shall include but not necessarily be limited to the following:

107.2.1.1.1 Notice of Intent (NOI).

107.2.1.1.2 Stormwater Pollution Prevention Plan (SWPPP).

107.2.1.1.3 Notice of Termination (NOT).

107.2.1.2 NOI Submittal:

Preliminary copies of the NOI and the SWPPP shall be submitted to the County during the pre-construction conference and shall be subject to review by the County prior to implementation.

The Contractor shall ensure the completed and duly signed NOI form(s) are submitted in a timely manner to prevent a delay to project construction.

The AZPDES form shall be submitted to ADEQ's Phoenix office by certified mail or hand delivered to the address below:

Stormwater Program-Water Permits Section/NOI
Arizona Department of Environmental Quality
1110 West Washington, 5415B-3
Phoenix, AZ 85007

The form may also be faxed to ADEQ at 602-771-4674 or submitted via "smart NOI" accessible from the ADEQ's website:
<http://www.ev.state.az.us/enviro/water/permits/stormwater.html>.

If the construction is near an impaired or unique water, the SWPPP shall be submitted with the NOI. Permit activation may require 32 business days or more for construction sites near impaired or unique waters, as well as for construction sites with special concerns, therefore documentation is to be submitted to ADEQ as early as possible (preferably at least 32 business days prior to the desired start of construction).

All local municipalities within the construction project limits shall be notified, as applicable. A copy of all submitted NOI forms shall be posted at the construction site. An additional copy shall be submitted to the Engineer.

107.2.1.3 Time Extension:

Failure by the Contractor or subcontractor of any tier to submit a NOI within the mandated time frame shall result in delay of the construction start date and no claims for extension of time will be granted for such a delay.

107.2.1.4 SWPPP:

The Contractor shall develop, implement, update and revise the SWPPP, as necessary, to assure compliance with permit requirements. The SWPPP shall be retained on the project site at all times during construction. Copies of forms and guidance for preparing the SWPPP are available in the "Drainage Design Manual for Maricopa County, Volume III Erosion Control." The manual is available at the Flood Control District, 2801 West

Durango Street, Phoenix, Arizona 85009. In addition, a “Construction SWPPP Checklist” can be obtained from ADEQ for assisting in the preparation of the SWPPP.

107.2.1.5 Inspections:

Contractor shall perform inspections of all stormwater pollution control devices on the project once every fourteen (14) days and within twenty-four (24) hours of each 0.5-inch or greater storm event, as required under the provisions of the AZPDES Construction General Permit for Arizona. Contractor shall prepare reports on such inspections and shall retain the reports for a period of at least three (3) years following the completion of the project. Inspection reports shall be submitted monthly to the City along with progress payment requests. Additionally, Contractor shall maintain all stormwater pollution control devices on the project in proper working order, which shall include cleaning and/or repair during the duration of the project.

107.2.1.6 NOT Submittal:

Upon project completion, acceptance and demobilization, Contractor shall submit to the permitting agency a completed, duly executed Notice of Termination form for each NOI issued, with a copy to appropriate municipalities, thereby terminating all AZPDES permit coverage for the project. Contractor shall then provide to the City copies of the SWPPP, inspection information and all other documents prepared and maintained by the Contractor in compliance with the AZPDES Construction General Permit. Contractor shall retain the originals of such documents for a period of at least three (3) years following the completion of the project and make such documents available for inspection by representatives of the Environmental Protection Agency, the Arizona Department of Environmental Quality, the County, and any municipality having jurisdiction, upon request.

107.2.1.7 Fines and Penalties:

Fines and penalties imposed by the ADEQ or the EPA for Contractor’s failure to comply with any or all of the permit requirements shall be borne by the Contractor.

107.2.1.8 Payment:

The lump sum price for AZPDES shall include all material, labor, and costs relating to the NOI, NOT, and the SWPPP. This includes but is not limited to the preparation, installation, maintenance, and removal of temporary SWPPP elements, assuring proper operation of the pollution control devices installed, and all maintenance, cleaning, and disposal costs associated with clean-up and repair following storm events, runoff or releases on the project. The lump sum price for AZPDES shall be inclusive of all related costs, and no additional claims shall be made by the Contractor under any other

specification provision, including changed conditions. Contractor shall be compensated for this bid item at a rate of 25% of the total bid price with the first progress payment, with the remaining 75% prorated over the entire length of the project.

ITEM	COMPLIANCE WITH MARICOPA COUNTY	LUMP SUM
107.02010	MS4 STORMWATER REGULATION	

107.7 Barricades and Warning Signs

Section 107.7 of the MAG Standard Specifications is modified to add the following:

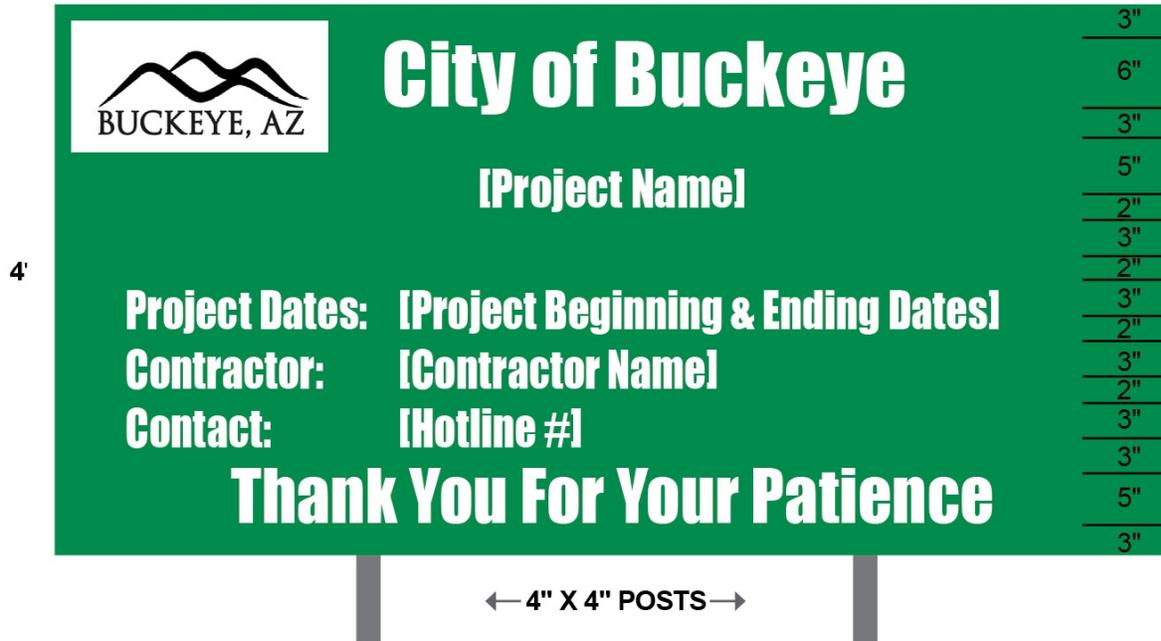
Construction Signs:

It shall be the responsibility of the Contractor to furnish and erect construction project signs in accordance with this Specification. The project signs shall be professionally prepared and subject to approval by the City, shall be maintained by the Contractor for the duration of the project and shall be removed by the Contractor during the final project clean up. Sign locations shall be determined by the City. The cost for the project sign(s) shall be considered included as part of other contract items. No separate payment will be made for the construction project sign(s).

The number of signs required, the size, shape, installation requirements and information to be included for construction signs are established in the paragraphs and detail provided below:

CONSTRUCTION SIGN DETAIL

8'



The Contractor shall provide a 4-foot by 8-foot green signboard, as detailed herein. Typical project identification sign for general projects shall be non-reflectORIZED green background and non-reflectORIZED white letters and numerals. Letter height and spacing shall be as shown on the attached detail. Lettering shall be manufactured according to the Federal Manual on Uniform Traffic Control Devices (MUTCD) using Type “C” letters. Sign shall list the following information:

1. Project Name
2. Project Dates (Scheduled beginning and ending dates.)
3. Construction Contractor Name
4. Contractor hotline number for project **and** City email address

The hotline number for the project will be supplied by the Contractor. The hotline is intended to be an answering service that actually answers the phone 24/7. The Contractor shall have a contact that is familiar with the project and will be reachable 24/7 to respond to any emergency that may arise in off work hours.

The hotline cannot be a 24 hour “answering machine.”

The Contractor shall submit a layout drawing to City Construction Manager for approval showing the location, size and color of lettering and logos. Sign supports shall be 4-inch by 4-inch pressure treated posts, set a minimum of 2-feet in the ground. The bottom of the sign shall be a minimum of 4-feet above the ground. All required construction signs shall be installed by the Contractor within seven days of issue of the Notice to Proceed. The sign shall be maintained in good condition until the completion of the Contract, at which time the sign shall become the property of the Contractor. One sign shall be erected for buildings and other limited area single sites. For multiple sites, one sign shall be erected at each site. For linear projects one half mile or longer, place one sign at each end of the project.

SECTION 109 MEASUREMENTS AND PAYMENTS

Add the following subsections to the MAG Standard Specifications:

109.10 Mobilization

Mobilization:

The City of Buckeye will compensate Contractor for one-time, round trip mobilization/demobilization of Contractor's personnel, equipment, supplies and incidentals, establishment of offices, buildings and other facilities required for the performance of the work on the project, as well as preparatory work and operations prior to the commencement of the work on the project site.

Measurement:

Measurement of all work completed under the contract will be measured by the Engineer according to United States standard measures. The methods of measurement and computation to be used in determination of quantities of materials furnished and of work performed under the contract will be those methods generally recognized as conforming to good engineering practice. Mobilization/demobilization will be measured for payment by the lump sum as a single complete unit of work.

Payment:

Payment for pay items in the proposal will be as indicated in the applicable standard specification or in the special provisions.

Payment for mobilization/demobilization, measured as provided above, will be made at the contract lump sum price. Payment shall be made in equal one-third portions. The first payment will be paid with Contractor's initial billing. The second payment will be made when the total payments to Contractor for the bid items, exclusive of payments for mobilization/demobilization, equals one-half of the total bid by Contractor, exclusive of mobilization/demobilization. The remaining one-third will be paid as part of the second to last progress payment. Final payment due Contractor will be for retention.

When other contract items are adjusted as provided in Section 109, and if the costs applicable to such items of work include mobilization costs, such mobilization costs will be considered as recovered by Contractor in the lump sum price paid for mobilization, and will be excluded from consideration in determining compensation under Section 109.

If the Contractor performs a second mobilization/demobilization of personnel, material and/or equipment at the Engineer's express written request, the City will compensate the Contractor for such expenses at the Contractor's actual costs. The Contractor shall provide all documentation for these costs at the request of the Engineer.

ITEM	MOBILIZATION/DEMobilIZATION	LUMP SUM
109.09000		

Add the following new MAG Section:

SECTION 112 CONTRACTOR QUALITY CONTROL

112.2 TESTING FREQUENCY:

Compaction testing procedures for the pipe bedding, trench backfill and aggregate base course will be in accordance with MAG Section 601.4.4 except aggregate base shall be compacted to 100 percent. The sampling and testing point will be in-place at the following minimum frequencies:

- Aggregate Base 1 per 600 CY
- Pipe Bedding 1 per 200 CY, minimum 1 per lift
- Trench Backfill 1 per 200 CY, minimum 1 per lift

The Contractor will be required to conduct compaction tests at a minimum of 500 feet intervals at one (1) foot vertical lifts or at the above stated frequencies, whichever is the strictest. The maximum backfill lift for water consolidation shall not exceed four (4) feet, if mechanical compaction is used the lift shall not exceed a one (1) foot lift. Single sections of trenches less than 500 feet shall be tested at least once.

The asphalt concrete which will be utilized for the asphalt replacement will require an approved mix design. The Contractor's Quality Control testing and acceptance will follow MAG 321.9 and 321.10.

The concrete which will be utilized for the roadway improvements will require an approved mix design. The tests and acceptance will follow MAG 725.8 and 725.9 at the

minimum stated frequencies. The sampling and testing under this section will be paid under, CONTRACTOR QUALITY CONTROL, bid item 112.01000.

112.3 MATERIAL CERTIFICATIONS:

Prior to application, the Contractor shall submit certification of compliance to the Engineer at least 14 days prior to application for all materials to be used in the work.

No payment will be made on any materials, either installed or stored within project limits, until the Contractor has provided proper certifications following the requirements in the current MAG and/or ADOT standards.

<i>ITEM</i>	<i>CONTRACTOR QUALITY CONTROL</i>	<i>LUMP SUM</i>
<i>112.01000</i>		

PART 200 – EARTHWORK

SECTION 201 CLEARING AND GRUBBING

201.1 Description

Section 201.1 of the MAG Standard Specifications is modified to add the following:

Trees that are to be removed shall be completely unearthed, included the root structure. The void shall be filled and compacted.

201.3 Construction Methods

Any vegetation identified on the plans as to be preserved in place will be fenced with temporary protective fencing as shown on the plans, or as needed by proximity to high traffic construction areas. Vegetation that is willfully removed or that dies as a result of neglect, careless construction, or trampling of roots will be replaced in kind to the City of Buckeye in a location selected by the Owner, within the boundaries of the City of Buckeye.

201.5 Payment, Clearing and Grubbing

Section 201.5 of the MAG Standard Specifications is modified to add the following:

No payment will be made for clearing and grubbing as such; the cost thereof shall be included in the bid price for the construction or installation of the items to which said clearing and grubbing are incidental or appurtenant.

No measurement or direct payment will be made for temporary construction fence used in the preservation of existing plants, the cost being considered included in the price of the items.

201.6 Measurement, Removal and Disposal of Trees

If the proposal includes separate estimates of quantities for the removal of trees, the tree will be classified by size as follows:

- a. Trees 12 inches or less in diameter at 1-foot above the original ground surface will be included in the bid price for clearing and grubbing or excavation and no additional compensation will be allowed therefore.
- b. Trees more than 12 inches in diameter at 1-foot above the original ground will be included as separate bid item and payment will be made at the unit bid price quoted in the proposal.

201.7 Payment, Removal, and Disposal of Trees

Payment for removal of trees will be on a unit price for each tree measured and removed, in accordance with the above classifications, at the unit price stipulated in the proposal.

ITEM	REMOVE TREE, DIAMETER >12"	EACH
201.01012		

SECTION 205 ROADWAY EXCAVATION

205.7 Measurement: *Of the MAG Uniform Standard Specifications is modified to read:*

No direct measurement shall be made for Roadway Excavation.

No direct measurement shall be made for Tent Pad clearing, grading, or excavation.

205.8 Payment: *Of the MAG Uniform Standard Specifications is modified to read:*

Roadway Excavation shall not be paid, the costs considered as being included in bid Item 301.01000, Subgrade Preparation. No direct payment will be made for the removal and disposal of unsuitable material, the costs being considered included in other items of work.

Tent Pad construction shall be considered included in Item 301.01000.

MAG SECTION 210 BORROW EXCAVATION

210.2 Imported Borrow: *Of the MAG Uniform Standard Specifications is modified to include:*

There is no City furnished source of materials for this project. It is the Contractor's responsibility to make arrangements for obtaining all required imported borrow and pay all costs involved.

If imported common fill for use in site grading is required, it should be examined by a Soils Engineer to ensure that it is of low swell potential and free of organic or otherwise deleterious material. In general, the fill should have 100 percent passing the 3-inch sieve and a combination of percent passing the 200 sieve and plasticity index that would result in a correlated R-value (per ADOT method) of equal to, or better than 70 in order to stay within the parameters used for the design of the roadways. It should exhibit less than 1.5 percent swell potential when compacted to 95 percent of maximum dry density (ASTM D-698) at a moisture content of 2 percent below optimum, confined under a 100 psf surcharge, and inundated.

Imported borrow shall consist of clean, granular material with a very low or low expansion potential. Import material shall also have low corrosion potential (minimum resistivity greater than 2,000 ohm-cm, chloride content less than 25 parts per million [ppm], and soluble sulfate content of less than 0.1 percent).

210.4 Measurement: *Of the MAG Uniform Standard Specifications is modified to read:*

Borrow Excavation shall not be measured.

210.5 Payment: *Of the MAG Uniform Standard Specifications is modified to read:*

Borrow Excavation shall not be paid, the costs considered as being included in bid Item 301.01000, Subgrade Preparation.

MAG SECTION 211 FILL CONSTRUCTION

211.2 **Placing:** *Of the MAG Uniform Standard Specifications is modified to include:*

Roadway shoulder and drainage basin slopes shall not exceed 4:1 horizontal to vertical.

211.5 **Measurement:** *Of the MAG Uniform Standard Specifications is modified to read:*

Fill Construction shall not be measured.

211.6 **Payment:** *Of the MAG Uniform Standard Specifications is modified to read:*

Fill Construction shall not be paid, the costs considered as being included in bid Item 301.01000, Subgrade Preparation.

SECTION 220 RIPRAP CONSTRUCTION

Riprap/rock Mulch shall be constructed as per the requirements of MAG Section 220 and as shown in the plans. The rock for all rock mulch, riprap and bank protection shall be native materials obtained from within the construction limits of the project, to the amount practical and to meet the requirements of MAG Section 703, these Special Provisions and the project plans. The material shall be angular in shape, and the color shall match the surrounding soil material. If an outside source is used, it shall be as approved by the Engineer prior to use.

220.8 **PAYMENT:** *is revised to read:*

Payment for furnishing and placing riprap shall be on the basis of the price bid per cubic yard for rock of the size indicated and to the thickness and dimensions shown on the plans and details, and shall include full compensation for furnishing all labor, materials, tools, and equipment, and doing all the work involved in furnishing and placing the riprap complete in place as shown on the plans and specified herein. This includes, but is not limited to, hauling and stockpiling; sorting or screening; excavation, watering, grading and compaction of ground surfaces; placing the stone on the prepared surfaces; leveling, trimming, and final grading of the finished surface; installing erosion control geosynthetic fabric, bedding material, riprap stone, grouting the stone (where shown on the plans), leveling, trimming, and cleaning off excess grout from the finished surface and curing the completed grout and backfilling.

No separate measurement and payment will be made for erosion control geosynthetic fabric, bedding material, or grout.

220.10075	Riprap, D50=3" w/ Filter Fabric	CY
220.10300	Riprap, D50=12" w/ Filter Fabric	CY
220.20000	Grouted Riprap D50=9" No Filter Fabric	CY

SECTION 230 DUST PALLIATIVE APPLICATION

230.11 Measurement: *is revised to read:*

No separate measurement will be made for dust palliative surface course application and dust palliative materials. The cost being considered included with contract items.

230.12 Payment: *Of the MAG Uniform Standard Specifications is modified to read:*

No payment will be made for dust palliative surface course application and dust palliative materials. The cost being considered included with contract items.

PART 300 – STREETS AND RELATED WORK

SECTION 301 SUBGRADE PREPARATION

301.1 DESCRIPTION: *is modified to add:*

The work shall also include proof rolling of the area to be paved.

301.2 PREPARATION OF SUBGRADE: *is modified to add:*

Project excavation shall include all required excavation detailed or implied by the plans and specifications, including roadway, structure, ditches, drainage, trench excavation and any other excavation separately designed.

The earthwork for this project is not balanced. It is anticipated that Borrow material will need to be imported.

Relative compaction requirements for subgrade preparation are defined by MAG Specification Section 301.3. Compaction requirements for structure excavation are defined by MAG Specification Section 206.

Required Inspections:

Sub-grade shall be inspected and tested prior to placing aggregate base course.

Base Material:

Base material used below pavement shall conform to the requirements of MAG Specifications for aggregate base (Section 702) as modified by the City of Buckeye.

The subgrade surface to receive aggregate base course material shall be proof rolled after the top 12 inches of the subgrade meets the compaction requirements, and after the subgrade has been brought to approximate shape within 0.1 to 0.2 feet of the lines and grades required by the project plans. Proof rolling shall be performed immediately following subgrade compaction operations.

Equipment:

Proof rolling shall be performed by a tractor drawn or self-propelled pneumatic-tired proof roller. The roller shall have a loading platform or a body suitable for ballast loading, supported by four pneumatic-tired wheels mounted on a rigid steel frame. The wheels shall be evenly spaced in one line across the width of the roller, and shall be arranged in such a manner that all wheels will carry approximately equal loads when operated over an uneven surface. The maximum spacing between adjacent wheels shall not exceed the tire width. The roller tires shall be maintained at an operating pressure of 120 psi. The proof roller shall weigh at least 25 tons. Charts or tabulations verifying the proof roller's specifications shall be available at all times. These charts shall at a minimum include the roller's dimensions, mass, contact areas and contact pressures over the full range of tire inflation pressures and over the full range of loading. Ballast shall be provided that consist either of 1) ingots of known unit weight, 2) sand bags with a unit weight of 100 pounds, 3) bags of other material of known unit weight, or 4) Other suitable material such that the total ballast weight is readily determinable at all times.

The proof roller shall be operated at a speed between 2 miles per hour and 5 miles per hour and the speed shall be adjusted per the Construction Manager to allow the Construction Manager to measure the deflections, ruts, or elasticity in the subgrade.

No proof rolling shall be performed during a period of rain, snow, or any other precipitation.

Each traffic lane shall be completely covered by the tire treads of the proof roller. The proof roller shall be operated in a pattern to readily allow recording of the number of coverages. The longitudinal trips of the proof roller shall have sufficient overlap ensure complete coverage.

Any permanent rutting in excess of one inch is considered failure. Any elastic movement or rutting in excess of one inch with substantial cracking is also considered failure. Any subgrade distress or failures shall be digitally photographed using a camera with a resolution of at least 3 megapixels. If soft or failed subgrade is found, compaction tests shall be completed in the upper six inches of subgrade to determine if the specified

degree of compaction has been achieved. The Contractor shall correct all deficiencies found in these locations as directed by the Construction Manager. No additional measurement or payment will be made for documentation of failed subgrade. Compensation for correcting failed subgrade shall be made under the allowance established for this work.

301.7 MEASUREMENT: *Is modified to include:*

The areas to be measured will be the total accepted area of new asphalt concrete pavement including paved shoulders, tapers, and turnouts. Subgrade Preparation area measured will also include the accepted surface areas of Campsite Road, equestrian parking and other parking areas that are surfaced with aggregate base and stabilized decomposed granite (DG) designated for vehicular traffic.

The area under portland cement concrete surfaces such as concrete curb and sidewalk; other unpaved surfaces including stargazing path and DG paths which are not designated for vehicular traffic shall not be included in the Subgrade Preparation measurement.

No direct measurement will be made for proof rolling; the cost is considered included in the other contract items.

There are no separate bid items for Roadway Excavation, Borrow Excavation including importing Borrow, and Fill Construction and shall not be separately measured. The payment for all earthwork items shall be included in the unit price for Subgrade Preparation.

ITEM	SUBGRADE PREPARATION	SQUARE
301.01000		YARDS (SY)

SECTION 310 PLACEMENT AND CONSTRUCTION OF AGGREGATE BASE COURSE

310.1 DESCRIPTION: *Is modified to add:*

Aggregate base course shall comply with MAG Section 702. The materials shall meet the gradation and other quality requirements for Aggregate Base Course as defined in Table 702-1.

ITEM	AGGREGATE BASE COURSE	CUBIC YARDS
310.03300		(CY)

**SECTION 321 PLACEMENT AND CONSTRUCTION OF ASPHALT
CONCRETE PAVEMENT**

321.1 DESCRIPTION: *Is modified to add:*

This section covers the placement of ½ inch Marshall Mix asphalt concrete for high traffic conditions on a previously prepared base in accordance with Section 321 of the MAG Standard Specifications.

321.2 MATERIALS AND MANUFACTURE: *Is modified to add:*

The asphalt binder shall be Performance Grade Asphalt conforming to the requirements of MAG Section 711 for PG 70-10, unless otherwise approved by the Engineer or specified differently in the plans or special provisions.

Inspection and Acceptance:

The City of Buckeye will perform inspection and will require twenty-four (24) hour notice. The Contractor shall have an independent testing company on-site at the on-set of construction to establish a rolling pattern and monitor compaction. A minimum of one density test for every 1,000 square yards is required.

Certificates of mix design for each product is required prior to paving.

ITEM	Asphalt Concrete Pavement (Marshall 1/2" Mix, High Traffic)	TON
321.00200		

**SECTION 329 TACK COAT (ALTERNATE BID – PAVEMENT
STRUCTURAL SECTION NO. 1)**

329.1 DESCRIPTION: *Is modified to add:*

Tack coat should follow MAG Section 329 using a SS-1h diluted 50/50 with water.

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

340.1 DESCRIPTION: *Is modified to add:*

Sidewalk exit/ entrance points shall have a detectable warning surface. In addition to sidewalk ramps, there are specific areas of sidewalk designated to receive the detectable warning surface.

Concrete sidewalk and Flush Concrete Curb, will have an integral colorant. Colorant will be applied as an integral color additive added to the concrete mix before it is poured. Color will be per plans.

340.2.1 Detectable Warnings: *is revised to read:*

Detectable warning surfaces shall be in accordance with the details and requirements by City of Buckeye

340.3 CONSTRUCTION METHODS: *Is modified to add:*

The Contractor shall provide a two-foot by two-foot sample of the detectable warning surface for sidewalk ramps to the City for approval prior to installation of the surface.

The proposed color for the warning mat shall be as noted on plans, and selected from samples submitted to the Construction Manager for approval prior to installation of the surface.

The Contractor shall provide three six foot by six-foot sample panels of the colored concrete for review by owner. Each sample panel will have a differing density of color. Owner will review sample panels and will select color based on the built examples. Samples shall stay in place as approved for the life of the project construction.

340.3.1 Detectable Warnings: *is revised to read:*

Detectable warning surfaces shall be in installed accordance with the details and requirements by City of Buckeye.

340.5 MEASUREMENT: *is modified to add:*

No direct measurement or payment for curb transitions will be by the linear foot, the cost being considered included in the unit price for concrete curb and curb and gutter.

No direct measurement shall be made for Detectable warnings. Detectable warnings are considered integral to the walking surface that they form a part of and the cost is included in the related pay item.

No direct measurement shall be made for Integral Colorant. Integral Colorant is considered a full component of the sidewalk and flush curb construction, and the cost is included in the related pay item.

ITEM 340.10000 Concrete Parking Lane Marker Each

PART 400 – RIGHT-OF-WAY AND TRAFFIC CONTROL

SECTION 401 TRAFFIC CONTROL: *is modified:*

Traffic Control for the project shall comply with Section 401 of the current MCDOT Supplement to MAG Uniform Standard Specifications.

Remove Section 401.2.5 Removal of Permanent Traffic Control Devices - from this section of the MCDOT Supplement.

401.6 Measurement

Section 401.6 is replaced with the following:

Measurement for Traffic Control shall be made on a Lump Sum basis. This item shall include all materials, equipment and labor necessary to facilitate traffic control if required for the project. Items of Traffic Control include but are not limited to the obliteration of existing and temporary pavement markings, flagmen, barricades, sign panels, sign stands, warning lights, and temporary pavements.

401.7 Payment

Section 401.7 is replaced with the following:

Payment for Traffic Control shall be made on a Lump Sum basis.

ITEM 401.01000

Traffic Control

Lump Sum

SECTION 415 FLEXIBLE METAL GUARDRAIL

415.1 DESCRIPTION: *is modified to add:*

The work under this section shall consist of furnishing all materials, constructing new weathering steel guardrail, and delineating guardrail sections at the locations shown on the plans.

Before placement of the guardrail, the designated locations shall be completely free of all trash, debris, grass, weeds, and other unwanted vegetative growth. The locations will be approved by the Engineer before installation of the guardrail.

Contractor shall place guardrail as shown on the project plans and as directed by the

Engineer. Guardrail final placement and installation shall be approved by the Engineer.

415.2 MATERIALS: *the first paragraph is modified to add:*

Materials for guardrail, guardrail transitions, end anchors, and reflector tabs shall conform to the requirements of MAG Section 415 and the project plans, except that all W-Beam guard rail elements shall be Weathering Steel conforming to the requirements of AASHTO Specifications M180, Class A, Type 4 and all guardrail hardware shall be galvanized. All guardrail terminals shall be painted a color that matches the weathered steel W-beam sections. Bolt heads shall be painted in kind after installation when so directed by the Engineer.

Contractor shall submit to the Engineer the railing shop drawings for approval. Contractor shall supply photos to the Engineer for review and approval prior to placement on the project site.

Paint shall be Semi-gloss, poly urethane that is highly resistant to abrasion, wet conditions, corrosive fumes, chemical contact and exterior weathering. Color and paint manufacturer shall be approved by Engineer prior to application.

415.3 CONSTRUCTION REQUIREMENTS:

415.3.1 General: *is modified to add:*

Prior to painting, all steel that is galvanized shall be etched.

415.4 MEASUREMENT: *is modified to add:*

Fifty (50) feet of guard rail will be considered included with each Guardrail Terminal (ET Plus, 50').

415.5 PAYMENT: *is modified to add:*

No additional measurement and payment will be made for installing weathering steel guardrail and appurtenances required. The cost is being considered included in guard rail and guard rail terminal contract items.

Fifty (50) feet of guard rail will be considered paid with each Guardrail Terminal (ET Plus, 50').

ITEM 415.01200	<i>Guardrail (Wood), MCDOT Detail 3001 - 3002</i>	<i>Linear Foot</i>
EM 416.02150	<i>Guardrail Terminal (ET Plus, 50'), MCDOT Detail 3006</i>	<i>Each</i>

ITEM 426.00001 DESERT PAVEMENT

DESCRIPTION:

This work shall consist of salvaging, stockpiling, furnishing, and hauling salvaged DESERT PAVEMENT from site to an approved stockpile location, and placing the DESERT PAVEMENT back on site to locations identified on the plans.

MATERIALS:

Material shall be excavated from site within the boundaries of cut and fill. Material shall be the top 2" of site material, inclusive of all inert rock, dead and remnant plant material, sand, gravel, and topsoil.

CONSTRUCTION METHODS

Site boundaries shall be staked prior to the excavation of existing DESERT PAVEMENT,

Prior to the excavation of DESERT PAVEMENT, all weeds and other objectionable material shall be removed from the surface of the area. Note that native, dead plant material is not objectionable.

Excavation shall include the collection of the top 2" of existing ground, inclusive of all inert rock, dead plant material, topsoil, and remnant plant material. Excavation shall include site boulders up to 24" x 24" as are found at the surface of the site.

Material shall be stockpiled in one or multiple stockpiles throughout the site. Stockpile locations shall be within the project boundaries, outside of any Jurisdictional washes, and out of the clear zone of any preserved in place trees or cactus.

Installation of DESERT PAVEMENT shall occur as the final step in the landscape construction process. Installation shall be implemented in a manner that will blend with the undisturbed native areas. The methods and sequencing proposed in this specification may require adjustment to match existing conditions in each specific area.

Upon completion of landscape installation, Contractor shall ensure that final grade has been established.

Randomly scatter the cobble on top of previously installed seed mix and mulch. Install the DESERT PAVEMENT cobble throughout all disturbed areas as shown on plans, in

patterns and densities to match existing conditions. Randomly shovel or scatter the site soil over the disturbed areas in varying depths between 1" and 2".

Cobbles four (4) inches and larger should be embedded into the ground by 1/3rd their size. Cobbles less than four (4) inches can be left on the surface. No special placement of these cobbles is intended

Contractor shall provide a 50' by 50' test area for landscape architect and Owner review prior to proceeding with the remainder of the site.

DESERT PAVEMENT shall be installed after but within 48 hours (or less) of seed mix installation. The DESERT PAVEMENT will be installed directly on top of seed mix.

Any existing weeds or Bermuda grass growing in designated landscape areas shall be treated with a post-emergent spray, such as Round-Up or approved equal. Any existing or salvaged vegetation shall be protected from the spray drift. Bermuda grass or weeds must be completely eradicated from all areas of the landscape and where designated by the Owner's Representative.

All dead grass and weeds shall be removed and properly disposed of. There will be no separate payment for the weed spraying. Bermuda grass or weeds must be completely eradicated where designated by the Owner's Representative from landscape or decomposed granite areas.

MEASUREMENT

Unless otherwise specified, DESERT PAVEMENT shall be measured by the square yard in place and loose after settling.

PAYMENT:

The quantities measured as provided above will be paid for at the contract price per square yard for furnishing and placing DESERT PAVEMENT, which prices shall be full compensation for the item complete, as described and specified.

MAG SECTION 430 LANDSCAPING AND PLANTING

430.1 DESCRIPTION: *is modified to add:*

The work under this section shall consist of furnishing all labor, materials, and equipment to install stabilized decomposed granite and landscape boulders as designated for installation.

430.2 GENERAL: *is modified to add:*

The Contractor shall furnish all labor, materials, equipment, and incidental and appurtenant items of work needed to install the landscape, to the extents and details shown in the plans.

The Contractor shall perform all work in accordance with all applicable laws, codes, and regulations required by authorities having jurisdiction over such work and provide for all inspections and permits required by Federal, State, and local authorities in furnishing, transporting, and installing materials shown or for completing the work identified herein.

All planting areas shall be left free of construction debris including but not limited to concrete, grout, rebar, wood, nails, debris, and/or toxic material and graded to a level to permit landscape construction. Compact trenches, foundation backfill or other fill areas for planting shall be at 85 percent maximum. No soil preparation or planting shall begin before the site has been cleared and cleaned of debris. The Owner's Representative shall approve the condition of all planting areas prior to commencement of soil preparation for planting. Commencement of work indicates acceptance of job site conditions by the Contractor.

The Contractor shall cooperate and coordinate with other contractors and trades working in and adjacent to landscape areas.

The Contractor shall maintain stakes set by others until all parties concerned mutually agree upon their removal.

Before delivery, submit Certificates of Compliance, certifying that materials meet the specified requirements. Submit certified copies of the compliance reports for the following materials:

- Herbicides
- Decomposed Granite Stabilizer
- Decomposed Granite

Certification shall indicate suppliers name, address, telephone number, date of purchase, model number and technical description of item purchased, and quantity of each item purchased.

The Owner's Representative reserves the right to take and analyze samples of materials for conformity to the specifications at any time. The Contractor shall furnish the samples upon request. Immediately remove rejected materials from the site at the Contractor's expense. The Contractor shall pay for the cost of removing any materials not meeting specifications.

All herbicide/pesticide applicators shall possess a valid A-20 or A-21 license with Pesticide Endorsement from the State Registrar of Contractors and Structural Pest Control Commission for application of non-restricted use chemicals. All Landscape Contractors, which shall list the names of those employees approved as applicators by the Registrar of Contractors. Application of non-restricted use pesticides shall not take place until the Owner's Representative receives a copy of the application.

As directed by the Owner's Representative, treat all non-paved areas with a post-emergent chemical contact herbicide, such as Round Up or approved equal, to kill the existing weeds. Clear, grub, and remove the weeds after weed kill has been established, to the satisfaction of the Owner's Representative.

Finished grades for landscape areas shall be smooth, uniform surface, free of abrupt grade changes or depressions. Finished soil grades adjacent to paving, curbs or headers shall be as shown in the drawings and may be adjusted by the Owner's Representative for surface materials.

Provide proper surface drainage within all planted areas. Any grading conditions found in the plans or specifications, in obstructions on the site, or in prior work done by another party that the Contractor feels precludes establishing proper drainage, shall be brought to the attention of the Owner's Representative in writing for resolution.

During the installation of landscape, keep pavements clean and work areas in a neat and orderly condition on a daily basis. Remove all debris, trash and excess materials generated by the landscape installation. Sweep, scrub or hose affected areas as directed by the Owner's Representative to maintain a clean and neat work area.

Contractor shall not begin planting operations until landscape grading is complete.

Product Data and Samples

Submit product data and samples for the following items:

- Stabilized Decomposed Granite – Sample for review and selection by Owner's Representative
- Soil Amendments and Conditioner – Sample for review by Owner's Representative

430.4 DECOMPOSED GRANITE AREA: is revised to read:

Add the following new Subsections:

430.4.2 Stabilized Decomposed Granite:

Subgrade Preparation shall be per MAG Section 301.

Aggregate Base Course per MAG Standard 310.

Decomposed granite used in stabilized dg shall be native, local, desert, decomposed granite at the size and color selected from samples provided by the contractor. The

decomposed granite shall be from a single source, free from coating, clay, caliche or organic matter. The Contractor shall provide the Owner's Representative with three samples of different colored material for approval before installation.

The Contractor shall apply two (2) applications of pre-emergent. One application of pre-emergent herbicide as per manufacturer's directions prior to installing granite and one application after granite has been installed and compacted. The pre-emergent herbicide shall be applied in the manner recommended by the manufacturer to prevent germination of noxious weeds, and shall be equivalent to Gallery, Sulfan, or an approved equal, and shall be applied at a rate per manufacturers recommendations. The Owner's Representative is to be notified prior to all pre-emergent applications. Water to activate the pre-emergent herbicide shall be applied to the areas of the herbicide application as recommended by the manufacturer's label. The amount of water specified by the manufacturer may be adjusted due to rainfall, if approved by the Owner's Representative.

All weed control products and herbicides shall be approved for use by the Owner's Representative prior to any applications. The Contractor shall submit copies of all manufacturer specifications and application rates for review and approval prior to application. Herbicides and weed control shall only be performed by a licensed applicator; Contractor shall supply information on applicator to the Owner's Representative for approval.

Equipment operations for spreading, grading, raking, compaction, chemical application, water settling, and any other operations shall be done in a manner that uniformly maximizes the vehicle(s) wheel compaction over the surface area.

The use or application of granite by any method (conveyor belt etc.) shall not relieve the Contractor of providing granite compaction to a level approved by the Owner's Representative.

Unless otherwise specified in the drawings, granite finish grade shall be one-half inch (1/2") below top of curb or adjacent sidewalk surfaces.

Gradation requirements for the stabilized decomposed granite 1/4" minus are as follows:

Decomposed Granite 1/4 Inch Minus

Sieve Size	Percent Passing
1/4 Inch	100
No. 40	50-60

Stabilizer shall be Stabilizer Solutions. or approved equal as directed by the Owner's Representative.

Contractor shall install stabilizer at a rate of at least 1 gallon per 80 square feet, or in conformance with the requirements of the manufacturer's specifications, and shall install stabilizer in the field in the presence of the owner's representative.

The contractor shall stake out or paint the boundary of all areas to receive stabilized path and stabilized DG treatment. The Owner's Representative shall approve the boundary prior to the placement of the stabilizer.

430.5 TREE, SHRUB, AND GROUND COVER PLANTING: is modified to add:

Planting backfill mix shall be water settled to a grade sufficient; that in the setting of the plant, the finish grade is level, after settlement, will be the same as that at which the plants were grown (see details in landscape plans).

430.8 PLANT GUARANTEE AND MAINTENANCE: is modified to add:

The Contractor shall begin maintenance immediately after planting and continue until the start of the Plant Establishment Period.

The Contractor shall maintain landscape work until final acceptance, but in no case less than 90 days after the Owner's Representative accepts the work.

The Contractor shall instruct the Owner's Maintenance personnel in the proper maintenance and operation of landscape work.

The Contractor shall furnish all labor, materials, equipment, tools, services, skill, etc., required to maintain the landscape in an attractive condition throughout the contract period. Maintenance shall include, but not be limited to, replacement of displaced materials, pest control, and landscaped areas trash and debris clean up, per specifications. Maintenance shall be performed a minimum of once a month throughout the maintenance period.

The Contractor's supervisor shall be responsible for the training and supervision of the maintenance personnel's performance of their duties during the maintenance period.

All materials as noted (but not limited to this list) shall conform to the bid specifications:

- Pre-emergent
- Fertilizer
- Decomposed granite

Weed Control:

In groundcover area, keep areas between plants free of weeds. Use recommended, legally approved, herbicides whenever possible. Avoid frequent soil cultivation.

Ground Cover Care:

Foster attractiveness at all times by following these practices:

Desert Pavement Areas:

Inspect Desert Pavement areas weekly. Remove man-made debris, weeds, and grass controlled with chemicals. Any erosion that has occurred in any granite areas the Contractor shall be remedy, repair and replace granite at the Contractor's expense.

Weed Control:

Keep all landscape areas free of broadleaf or grassy weeds and Bermuda grass, with pre-emergent and/or selective herbicides. Cultivating or hoeing weeds is not an allowed practice. The Contractor shall eradicate all noxious weeds or the City will not accept the project.

Unless otherwise authorized, the Contractor shall maintain all landscape areas, as they are completed during the course of work, on a continuous basis and until Owner's Representative's final project acceptance. The Contractor shall provide adequate and experienced personnel to accomplish the maintenance. Maintenance shall include keeping the landscape areas free of debris on a weekly basis, chemical control and hand removal of weeds, fertilization as needed, cultivating the planting areas, and repairing tree stakes. An Arizona pesticide licensed contractor shall perform all chemical control.

Installation shall be 100 percent guaranteed by the Contractor for a period of 365 Calendar Days beginning at the start of the Plant Establishment Period.

The Contractor shall notify the Owner's Representative 48 hours prior to the application of any chemical treatments. Qualified personnel shall do chemical mixing and use the application equipment in the presence of the Owner's Representative. An Arizona pesticide licensed contractor shall perform all chemical control. The Owner's Representative shall approve the personnel, materials and methods of application of chemicals prior to beginning the operation.

430.10 MEASUREMENT AND PAYMENT: *is revised to read:*

Measurement and Payment for Stabilized Decomposed Granite (1/4" Minus) will be at the contract unit price bid per Square Yard for the inert materials as shown on the project plans, details, and special provisions and shall include all costs, materials, equipment, labor, and operations necessary for the installation and associated weed control and pre-emergent applications.

ITEM 430.00001: LANDSCAPE BOULDERS

Description: The work under this item includes salvaging from site or procuring from an offsite source and installing landscape boulders at designated areas as shown on the project plans or as directed by the Owner's Representative. All work under this item shall be completed in accordance with the details shown on the project plans and the requirements specified herein.

Before placement of the landscape boulders, the designated locations shall be completely free of all trash, debris, grass, weeds, and other unwanted vegetative growth. The locations will be approved by the Owner's Representative before installation of the decorative boulders.

Contractor shall place boulders as shown on the project plans and as directed by the Owner's Representative. Prior to placement, boulder surfaces shall be dry and clean of dirt and debris. Boulders shall be placed with a minimum 1/3 to 1/2 below ground level. Final placement and installation shall be approved by the Owner's Representative.

Materials: Landscape boulders shall be 3 feet by 3 feet in diameter or larger, and of a sufficient size to act as a vehicle control barrier at the entrance gatehouse. Boulders shall be free of scars and blemishes. Contractor shall submit to the Owner's Representative photos of selected source material for review and approval prior to use in construction.

Measurement and Payment:

Landscape boulders will be measured by the unit per each. The estimated quantities shown on the plans and in the bid schedule, plus or minus authorized changes directed by the Owner's Representative, will be the quantity used for payment.

The accepted quantities, measured as provided above, will be paid for at the contract unit price per unit of measurement for the pay items listed below that are shown in the proposal. Payment will be full compensation for the work prescribed in this Section.

ITEM 430.00002: PLANT SALVAGE

Description:

The work under this section shall include the salvaging, holding, nursing, transporting and replanting of all designated salvage plant material, as shown on plans under the terms and conditions of the Standard Specifications, these Special Provisions, and/or the approved Salvage Operations Plan. The work shall also include the machinery, equipment, labor and materials required to provide and supply irrigation water, maintain the nursery(ies); distributing water to the salvaged plant material at the final planting location, including excavating and backfilling; the documentation, measurement, and inspection of salvaged plant material as identified herein; the preparation, modifications and reproduction of a Salvage Operations Plan; mixing and applying chemical solutions, fertilizers and amendments; the propagation of the salvaged plant material; hauling the salvaged plant material to their final location and replanting the salvaged plant material, including furnishing all labor, material, equipment, and safety control devices to dig, box, lift, transport salvaged plant material to their final location from the nursery site; replant the salvaged plant material; water the salvaged plant material; warranty of workmanship; the storage and protection of all planted and unplanted salvaged plant material and other materials; bracing; guying; staking; and wrapping; the cleanup of the area, disposal of unwanted and deleterious materials, and the care and maintenance all in accordance with the details shown on the project plans and the requirements of the Standard Specifications and these Special Provisions.

All landscape items shall be completed within the number of days identified for the project.

The backfill (prepared soil) for planting plant materials shall conform to the requirements of Section 425 and these Special Provisions.

Materials:

Amendments shall be as follows:

Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws if applicable.

Bulk Materials: Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.

Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.

Accompany each delivery of bulk materials with appropriate certificates.

Fertilizers: Nutrient Composition: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.

Soil Conditioner: Well-composted, stable, and weed-free organic matter, pH of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through a 1-inch sieve; soluble-salt content of 2 to 5 dS/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings.

Soil Sulfur: Soil sulfur shall be 85-95 percent pure soil sulfur.

Granular, biodegradable, and containing a minimum of 90 percent elemental sulfur, with a minimum of 99 percent passing through a No. 6 sieve and a maximum of 10 percent passing through a No. 40 sieve.

Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through a No. 50 sieve.

Sand: Clean, washed, natural or manufactured, free of toxic materials, and according to ASTM C 33

Superphosphate: Commercial phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.

Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight. Mix fertilizer with prepared soil no more than seven days before planting.

Amendments shall be inspected separately before adding to soil conditioner to ensure quality control. PRE-PACKAGING OF AMENDMENTS IS PROHIBITED.

Water used during landscape construction to properly plant, maintain and care for the plant material, shall be furnished by the City of Buckeye at the designated water meter sources, at no cost to the contractor.

All bare root cacti shall be dusted with 85-95% pure soil sulfur.

Prepared Soil:

It is the intent of this Special Provision to utilize existing soil removed from the plant pit. The Prepared Soil shall consist of the following amendments blended with the on-site soil:

- 1) Ratio of Soil Conditioner to Soil: 1 part conditioner: 3 parts excavated soil by volume.

- 2) Weight of Soil Sulfur: ½ Pound per cubic yard of prepared soil material.
- 3) Weight of Agricultural Gypsum: 20 Pounds per cubic yard of prepared soil material.
- 4) Weight of Superphosphate 1 Pound per cubic yard of prepared soil material.
- 5) Weight of Slow-Release Fertilizer: 3 Pounds 20-10-5 per cubic yard of prepared soil material.

Large rocks, that have a dimension greater than four (4) inches in any direction shall not be buried in the plant pit, but may be wasted on the site by the contractor as approved by the Engineer. Large soil clumps shall not be used to support the plants or be permitted in the planting pit. If the contractor chooses, backfill soil may be manufactured in bulk from the existing site soils within the limits of the project, but only after the Desert Pavement has been successfully collected and stockpiled and clearing and grubbing operations have been completed. The soil for bulk backfill mix shall be collected to a depth no greater than 18 inches from the original grades. If this bulk method is pursued, the contractor shall provide a plan for review and approval by the Engineer. The contractor shall accept complete responsibility for the planning and management of the bulk backfill soil stockpile and the accuracy of the quantities necessary to provide and install all prepared backfill soil for the planting efforts and work shown on the project plans under the terms and conditions of these Special Provisions. The mixing or collection of the material in bulk shall not commence until the Desert Pavement collection and stockpiling and the clearing and grubbing operations are completed as determined by the Engineer. Any efforts required to collect bulk backfill soil with the intent to manufacture prepared backfill in bulk shall not be measured or paid for separately by the City.

The Owner's Representative may waive minor variations in the prepared soil requirements if such action is of benefit to the Department.

Water:

Water used during landscape construction and for landscape establishment as described herein to properly plant, maintain and care for the plant material throughout the term of the contract shall be furnished by the City of Buckeye. Water shall be delivered to the installed plants as described in these Special Provisions.

Hardware:

All hardware materials shall be as approved in the Salvage Operations Plan.

Hardware materials shall include but not limited to the nursery fence, gates, security devices, fasteners and posts; bracing and guying materials; shade screens, liners and fabrics; and calibrated measuring materials and devices.

Shade screens in physical contact with cactus shall be made of burlap, hemp or other breathable fiber material as approved by the Engineer.

Insecticide:

Insecticide shall be a commercially-prepared product suitable for the intended purpose and as approved by the Owner's Representative.

Construction Requirements

General:

All applicators of pesticides and herbicides shall have a current and valid applicator's card from the State of Arizona Structural Pest Control Commission.

The contractor shall submit a Salvage Operations Plan for the review and approval of the Owner's Representative prior to the beginning of any ground breaking work by the contractor. The Salvage Operations Plan shall contain but not be limited to the following items and shall conform to the details shown on the project plans and these Special Provisions:

- The Salvage Operations Plan shall clearly demonstrate to the City how the contractor's salvage operations methods and approach will be accomplished.
- Methods for coordinating the replanting of all salvaged plant material with anticipated phasing and sequencing of construction per stationing limits.
- Final location of each salvaged plant material (if different than shown on the plans);
- Identification numbers of each salvaged plant material (if different than shown on the plans);
- List of mechanical and hand equipment to be used to accomplish all salvaging and planting work;
- Shop drawing(s) of all bracing, transport bracing and cradle details;
- A description (in detail) of the hardware and materials, salvaging and replanting procedures and transporting methods plus all other methods to accomplish all salvaging work as per the project plans and the requirements of these Special Provisions;
- A section that identifies all proposed nursery(ies) location(s). This section shall include a photo inventory of the existing conditions of these nursery(ies) location(s) and the contractors proposed re-establishment of the areas disturbed as part of the nursery development.
- A section within the plan that identifies the "Watering Plan." The Watering Plan shall include applicable drawings, details and documentation to demonstrate how the plant material (nursery(ies)) will be watered from the initiation of the salvaging activities through the plant establishment period. The Plan shall identify the source of water; its capability to deliver water in sufficient quantity to meet the project needs; the proposed layout of piping or water delivery method from the source to the stored and replanted plants; and protection of the watering method from damage by animals, insects and/or other detrimental conditions;
- A description of the maintenance activities and anticipated total quantity of water

to be supplied during the holding and landscape establishment period. Additional documentation requirements for landscape establishment activities are contained in these Special Provisions;

The Owner's Representative will be the sole judge of the acceptability of the recommendations within the Salvage Operations Plan and will notify the contractor within 21 days of the acceptability of the plan.

The Site Plan identifies by symbol the location and type of salvaged plants to be replanted on the project. Saguaro cacti are identified by symbol and specific key number.

The inventory plan identifies which plants are to be salvaged for Skyline Park usage, and those that will be disturbed as a result of construction. Those that will be disturbed by construction can be made available for salvage with appropriate permits, and for use as additional plants to be used for replacement of dead plants.

The contractor working through the Engineer will be allowed to make use of a different plant that meets or exceeds the specie, size and quality of the plant designated to fill that area. This is being allowed to facilitate a flexible approach relative to nursery establishment and access to plants. This flexibility does not dismiss the fact that the contractor is required to plant the required specie, size and quality of plant material specified and shown on the plans and to manage the salvage inventory so that all plantings shown on the landscape plans meet or exceed these specified requirements.

The City reserves the right to reject the contractor based on the review of the qualifications statement and/or performance of the work specified herein.

With the Salvage Operations Plan, the contractor shall submit a list of all materials and equipment proposed for incorporation into the work. The contractor shall have materials and equipment correctly marked on the list. The list shall show the catalogue numbers, manufacturer's names, model numbers, sizes, capacity, complete specifications, instructions, design data and/or drawings to determine whether or not each piece of material or equipment is acceptable.

No vehicles, equipment and machinery required to perform the salvage work shall trespass outside the boundaries of the clearing limits, planned access routes or established nursery site approved by the Owner's Representative. The contractor shall adhere to the Standard Specifications with respect to parking of all vehicles. The contractor is advised that rugged terrain may be encountered during the salvaging and replanting of plant material.

Transporting of salvaged plant material for the project shall be in compliance with all State and local requirements. The contractor shall be responsible to obtain all necessary permits and tags for transporting salvaged plant material on public roadways;

no separate payment will be made to the contractor for the permits. Permits and tags shall be made available to the Engineer upon request.

The contractor shall provide adequate water to each plant to maintain optimum health from the initiation of the salvaging operations to the completion of the landscape establishment period, or until such a time as determined by the City.

Substitutions:

If any of the specified salvage plant material is not obtainable, submit proof of non-availability in writing, together with a proposal for use of equivalent materials, similar in appearance, ultimate height, shape, habit of growth and general soil requirements. Send the availability letter to the Owner's Representative within 30 calendar days of Notice to Proceed. The definition of non-availability is the Contractor contacting a minimum of five (5) different sources. The Contractor may make substitutions of a larger size of the same species and variety with the approval by the Owner's Representative and at no additional cost to the City.

Nursery (Salvaged Plants):

The nursery(ies) shall be located at sites approved by the Owner's Representative. The contractor has the option to locate the nursery on or off the project site with approval of the Owner's Representative. The contractor shall have completed the protection of the plants to remain and construction of the nursery per the Salvage Operations Plan as approved by the Owner's Representative prior to the excavation of any plant material. The nursery(ies) shall be separately gated and fenced with temporary chain link fence or approved materials; graded to prevent ponding and promote positive drainage away from the salvaged plant material, and to control off-site run-off to prevent damage to the salvaged vegetation, boxes, and/or transplanting operations. At the end of the salvage and replanting efforts and activities, the nursery equipment shall be removed as approved by the Owner's Representative. The contractor has the option of maintaining the nursery(ies) past the salvage and replanting operations for use during the Landscape Establishment project. The continuation of maintaining the nursery(ies) as part of the Landscape Establishment project is at the discretion of the contractor as approved by the Owner's Representative. The continuation of the nursery maintenance and operations past the completion of the project shall be considered incidental to the portion of work included in the Landscape Establishment project.

Occasional watering shall be provided to meet the requirements of all salvaged plant material occupying the nursery. The contractor shall document and record all watering occasions, dates and frequencies and submit this information to the Owner's Representative.

The nurseries may also be watered by hand from water that has been transported to the nursery.

The nursery shall be kept weed free by the contractor by the use of hand equipment and labor. The use of chemicals or herbicides to combat weeds will not be allowed within a 6 foot radius of all salvaged plant material. The contractor shall grade the nursery sites and access roads as required to accomplish the salvage work in accordance with the requirements of these Special Provisions. The contractor shall locate the nursery site as approved in the Salvage Operations Plan. The nursery site work shall include wasting the excavated soil not used in the nursery construction on-site or within the project limits as approved by the Engineer. Clearing and grubbing debris that is generated during creation of the nursery area shall be removed from the nursery site and properly disposed of by the contractor. The contractor shall be responsible for all labor, material and equipment needed to prepare the nursery area to make it usable for nursery storage.

At the completion of the nursery use period, the contractor shall remove all fences or other equipment used during the nursery operation. This equipment shall become property of the contractor. Seeding of the nursery sites and access roads shall be as described in these specifications.

The contractor may choose to locate the required nursery(ies) in areas that are not associated within the established project limits. If the contractor chooses any area outside of the project limits the contractor shall be responsible to obtain all necessary and required clearances and permits and all cost associated with this effort shall be considered a non-cost item to the Owner.

Excavation:

Prior to plant layout, all grasses and weeds shall be removed from the planting areas.

The contractor shall flag for the approval of the Owner's Representative all plant locations prior to the excavation of plant pits and installation of soil conditioner. Flag colors shall be consistent with the requirements of the Arizona Corporation Commission rules for landscape flagging.

Location and positioning of all plant materials need prior approval from the Owner's Representative before planting commences. A minimum of 1-week notice is required for inspection of flagging, prior to planting. The flagging shall remain in the center of the planting pit until the plant is planted.

All extra work that is required to achieve proper drainage in planting pits after the drainage test, will be designated as part of the price of furnishing the plant material.

After the planting pits are refilled with amended soil, the planting pits shall be pre-watered by hand to fill the plant pit. Planting shall be accomplished during a 3-day period starting 2 days following the pre-wetting as specified. Areas not planted during the 3-day period shall be re-watered and allowed to dry as heretofore specified.

Final cuts to salvaged roots during transplanting shall be accomplished to provide the minimum acceptable root lengths by the use of lopping shears, pruning saw and/or by the method approved in the Salvage Operations Plan. After the final cut, the remaining root attached to the salvage shall be structurally intact with no signs of splintering or shredding.

Removal and Transportation:

The boxed plants shall be removed and transported to the nursery without damaging the box or the plant. The contractor is responsible for safety considerations of the public, other contractors and his/her crew members during the relocation operations. Equipment for this process is to be identified in the Salvage Operations Plan and approved by Engineer prior to commencement of work. Care shall be taken so that branches are not broken or otherwise damaged by the equipment or the operation involved in transporting the plant materials.

Planting:

All salvaged materials shall be replanted at their original growing depth.

If the existing material removed from the plant pit results in a deficient soil quantity to fulfill the backfill quantities as required, the contractor shall collect and prepare additional existing surface soil to fulfill the quantities necessary to complete the work under the terms and conditions of the Standard Specifications and these Special Provisions, at no additional cost to the City. The additional soil shall be collected from within the clearing limits of the project site as approved by the Owner's Representative.

Soil from sites with noxious and invasive weeds shall not be used.

The cactus planting pits shall be backfilled with dry site soil only. Clods or stones exceeding 2 inches in diameter and foreign matter deemed objectionable by the Owner's Representative will not be allowed. All excess soil excavated from the plant pits that has stones objectionable to the Owner's Representative shall be disposed of off the project site, in a manner acceptable to the Owner's Representative

Do not water for 3 weeks after planting. Thereafter, water by hand as needed to aid cactus establishment and keep the plant alive.

The contractor shall adequately water plants to maintain a healthy and vigorous growing condition during the planting period, as determined by the Owner's Representative.

Barrel cactus and Saguaro cactus shall be maintained in a straight vertical position during the project. The contractor shall be responsible for the care of the cactus and damage caused by improper support of the cactus. Staking and bracing of cactus shall be completed as detailed on the project plans and in accordance with the approved "Staking and/or Guying, and Pruning Plan" submitted at the Preconstruction Conference for this project.

Pruning and Staking:

All final cuts to local and/or salvage plant material made above the root collar. All cuts shall be accomplished by the use of lopping shears, pruning saw and/or by the method in the Salvage Operations Plan as approved by the Engineer. All wounds and/or cuts made to the stock shall be treated with powdered sulfur or bactericide on the same day that the cut and/or wound was made.

Trimming shall be gathered into common piles within the roadway footprint for disposal on site. The excavation pits that remain following any plant salvage or removal operations shall be backfilled after the plant removal has occurred, unless directed otherwise by the Engineer.

Bracing materials shall not cause conditions that may be detrimental to the plants over the life of the project (i.e., bruising or scarring the cambium layer or skin, providing opportunities for fungus and bacteria at the contact areas, etc.).

Wrapping and herbivore control are not required at the time of installation. However, the Engineer reserves the right to direct the contractor to install these items for each cactus replanted under this contract on a plant-by-plant basis. If directed, the contractor shall provide and install the items to the satisfaction of the Engineer.

It is the intent of this specification that the bracing, wrapping, herbivore protection and supporting materials remain in place through the landscape establishment period. However, at the completion of the first 12 months of the landscape establishment period, the Engineer will evaluate the condition of the planted stock for stability and root growth and provide a status report within ten (10) working days to the contractor on the results of that evaluation. Removal of all bracing and/or supporting materials at any time during the project shall be at the contractor's discretion. These materials shall become the property of the contractor and be removed and disposed of off the project site. Removal of bracing will not relieve the contractor's responsibility for maintaining the plant material in a vertical and upright position during the entire landscape establishment period.

Care and Protection of Plants:

The Engineer will perform visual inspections relative to the care and protection of plants in the nursery each month in the presence of the contractor, unless the Engineer and the contractor agree to other arrangements in writing. Saguaro measurements identified in this specification will be conducted as part of these monthly visual inspections, as applicable.

Nursery-stored plants will be reviewed for overall condition including pruning and boxing compliance with accepted standards. During the reviews, the contractor must present copies of his log including species identification number, box size, and dates side boxed, bottomed and delivered to nursery. Notations will be made as to any unacceptable plants, plants in shock or other pertinent information. After 30 days

stabilization in the nursery, or unless the decision is deferred for a longer period by the Engineer, plants may be accepted, rejected or put on hold to see if their condition improves at the sole discretion of the Engineer.

The contractor shall remove from the nursery salvaged plant materials determined by the Engineer as unacceptable during its period in the nursery within 15 working days from notification.

Plants shall be staked and/or guyed as detailed on the project plans by the specified and approved "Staking and/or Guying and Pruning Plan." The contractor shall pay special attention to the infestation of weeds and grasses. Either of these items found in the planting pits shall be grounds for immediate removal and disposal. The planting pit shall be excavated and inspected to assure complete eradication of any roots or rhizomes that may have grown into the area. This work and all materials associated shall be the responsibility of the contractor, and shall be completed by the contractor at no additional cost to the City.

All planting areas shall be graded as specified and required to facilitate proper watering of the plant materials and the planting areas shall be graded so as to leave a generally smooth appearance after the completion of planting, as approved by the Owner's Representative.

The Contractor shall replace plants within seven days of notification from the Owner's Representative. Remove and replace dead, damaged or vandalized plants within seven days of notification. Install replacement plants of the same kind and size as originally specified and as described in the contract documents.

Contractor may salvage more plants than those shown from within boundaries of cut and fill limits for use as replacement material, provided correct permits are purchased. Re-staking shall be required as needed to remove any plant growth conflicting with vehicular or pedestrian movement.

Method of Measurement:

Measurement for all cacti shall be on a per each basis relative to species and size.

Measurement for the nursery(ies) shall be on a lump sum basis.

There shall be no separate measurement and payment for the Plant Guarantee and Maintenance Period. This cost shall be included in landscape bid items for: plant materials and inert groundcover. The City of Buckeye will hold ten percent of each landscape bid item amount in addition to retention for distribution until after the maintenance and establishment period.

Basis of Payment:

Payment for all salvaged cactus will be made at the contract unit price each size and

species shown, which price shall be full compensation for the work complete, as described and specified herein and on the project plans, including pruning, gathering of the trimmings and debris, boxing the plants, excavating, if approved supplying salvage plant material, transplanting salvage plant material to the nursery and to their final location, replanting the plants, watering the plants, herbivore protection, tagging or retagging, and wrapping the plants as described in these Special Provisions.

Additional plants approved in the adjusted inventory list shall be paid for under respective plant salvage items for each size and species shown on the bid schedule. The contractor shall obtain the Engineer's approval prior to providing and installing any plant replacements as described herein.

Payment for the nursery shall be included in Item 430.01070 Nursery (Salvaged Plant Material).

No measurement or direct payment will be made for any water use associated with the salvage and nursery(ies) operations, the cost is considered incidental to these efforts.

No measurement or direct payment will be made for saguaro or other cactus bracing, the full costs of which are considered incidental to the salvaging and replanting operation.

No separate measurement or direct payment will be made for providing water for the nursery(ies), the cost of which shall be included in Item 430.01070 Nursery (Salvaged Plant Material).

No measurement or direct payment will be made for the preparation and necessary modifications to the Salvage Operations Plan as described herein. The work is considered incidental to the contracted items.

No measurement or direct payment will be made for the prepared backfill soil, the soil amendments, the acquisition of, storage of, or placement of the prepared backfill soil in the planting pits, the costs associated with this effort are considered to be incidental to the salvage and replanting items.

No measurement or direct payment will be made for pioneering of access roads, or the use of specialized equipment required to gain access to, perform salvage or replanting operations, or for the transportation of the plant materials from their point of salvage to the nursery or to the final planting site, or any special permits for the plant or transportation thereof, the cost of which shall be considered incidental to the salvage and replanting items.

No measurement or direct payment will be made for transporting the plant materials from their original location to the nursery and from the nursery to their designated location. All transportation cost associated with this effort are considered incidental to the salvaging and replanting operation.

No measurement or direct payment for any reason will be made for plant materials salvaged by the contractor beyond the material identified on the plans for his/her own use and benefit.

No measurement or direct payment will be made for work involving excavation and salvaging of substitutions not approved in writing by the Engineer or for materials not identified in the Salvage Operations Plan.

No measurement or direct payment will be made for the preparation of the area identified for the nursery(ies), the cost of which shall be included in the direct price bid for Item 430.01070 – Nursery (Salvaged Plant Material).

No measurement or direct payment will be made for any plant protection required from herbivore damage installed as part of the project, the cost of which is considered incidental to the unit price paid for these items.

No measurement or direct payment will be made to the contractor for the removal and disposal of any salvaged plant materials determined as unacceptable by the Engineer.

No measurement and payment for plant materials as specified above will be made when the unacceptable salvage plant material quantities are replaced with either additional salvage plant material or approved salvage plant material as specified in these Special Provisions to meet the acceptable mortality quantities, the cost considered incidental to the contracted items.

No measurement or direct payment will be made for eradication of unwanted plant growth, and maintenance of plants during construction phase, the cost being considered included in the price of the items.

No measurement or direct payment will be made for temporary construction fence used in the preservation of existing plants, the cost being considered included in the price of the items.

ITEM 430.00003 LANDSCAPING ESTABLISHMENT

Description:

The work under landscaping establishment shall consist of the care of all salvaged and installed plant materials as part of the project in accordance with accepted horticultural practices; supplying and applying all irrigation water; repairing, adjusting or replacing bracing; repairing public or weather damage to all landscape areas; furnishing and applying sprays, dust and/or cages to combat vandalism, disease, insects and other pests; noxious weed control, pruning as required by the Engineer as specified herein.

Landscape Establishment consists exclusively of the work to be done under the Item 430.01001 Landscape Establishment. Until final written acceptance of landscape establishment activities, the requirements of this specification shall apply.

The landscape establishment activities shall also include providing sufficient water to keep the installed plants in a healthy condition as approved by the Engineer to meet the landscape establishment needs of the project.

The contractor shall be responsible to keep a log of all landscape establishment activities. The log shall contain a record of the time and date of field inspections, watering application amounts and dates, fertilizer applications, repairs, replantings, and other operations conducted by the contractor. The contractor shall provide for approval the format for recording these activities prior to undertaking the work.

The contractor has the option of maintaining the nursery(ies) past the salvage and replanting operations completed as part of the Construction Phase for use during the Landscape Establishment project. The continuation of maintaining these nursery(ies) as part of the Landscape Establishment project is at the discretion of the contractor, as approved by the Engineer, and all cost associated with this effort is considered incidental to the work included in Landscape Establishment Phase Item.

Materials:

The water used during Landscaping Establishment to properly maintain the plant material will be furnished by the City of Buckeye at designated sources, at no charge to the contractor. The contractor shall be responsible for all equipment, materials and labor necessary to load, transport and unload water for watering purposes. The Landscape Establishment phase for this project is 365 calendar days from the date of substantial completion.

The plant material replacement shall be considered as included in the work for Landscape Establishment, and shall be made at no charge to the City.

General:

The landscape contractor shall be the only contractor that performs the work under the Landscaping Establishment Phase. Subcontracting of the Landscaping Establishment Phase work shall not be permitted except for weed eradication with herbicides, because of the special licensing required as covered under the Standard Specifications.

All landscape plants shall be provided protection which shall include, but not be limited to, eradication or control of insects, mites, fungi, and non-fungus diseases. The application of appropriate insecticide, miticide and fungicide may only be used with the prior approval of the Engineer. No insecticides, fungicides and miticides employed during the term of the contract shall cause the extermination of any landscape plant material, or cause damage to the growth characteristics such that plants will not be able to recover in a normal manner.

No chemical shall stain or cause damage to any portion of the plant materials. If staining or damage occurs, repairs or replacements shall be made at the contractor's expense to the satisfaction of the Engineer.

Application of chemicals shall be in such a manner so as to not cause injury to the personal health of anyone working on the project, observing, or passing by. Care shall be taken such that no puddles or pools of water which may contain toxic amounts of chemicals shall remain after completion of operations. Chemicals shall not be allowed to fall on or migrate to areas other than the work site. All laws and local codes shall be followed regarding application methods and personnel.

The contractor shall provide adequate water to each installed plant to maintain optimum health through the completion of its applicable plant establishment period.

The Owner's Representative will perform visual inspections in the presence of the contractor during the landscaping establishment period, unless the Owner's Representative and the contractor agree to other arrangements in writing. The contractor shall modify the maintenance practices and water delivery to the plants to maintain optimum growing conditions as directed by the Engineer.

During the landscape establishment period the contractor shall provide the necessary care to keep all plant material equal in health and vigor under the use of standard horticultural practice to combat detriments known as; rodents, mammals, pest, disease, bacteria, mites, fungi, nutrient deficiency, harmful exposure to sunlight, and drought conditions. In addition to inspecting salvage plant material for damage to its appearance in health and/or vigor resulting from any of the previously mentioned detriments, the Engineer will also inspect the salvage plant material and new plant material for symptoms that indicate poor health. Poor health symptoms will include items such as; wrinkled, loose or damaged cambium layers; evidence of transplant 'shock', i.e. leaf drop and discolored foliage; no observable improvement to the condition of the salvage or new plant material after it has received adequate irrigation or rain; change in color not consistent with color changes to identical species existing in the given area; and failure to leaf out when identical specie of the existing area are consistently found in leaf. The previously mentioned criteria shall be used by the Engineer to determine if both the salvage and new plant material is in close conformity in health and/or vigor and acceptable for payment or determined unacceptable for no payment by the Department.

The contractor is required to replace the unacceptable plant materials that with the same species, size, appearance and quality as originally planted, as determined by the Engineer. No further payment will be made to the contractor for maintenance of any plant materials determined as unacceptable by the Engineer.

Transporting of any plant materials for the landscape establishment activities shall be in compliance with all State and local requirements. The contractor shall be responsible to obtain all necessary permits and tags for transporting plant materials on public roadways; no separate payment will be made to the contractor for the permits. Permits and tags shall be made available to the Engineer upon request.

The contractor shall maintain all non-planted areas within the project limits, including the

drainage basins, shoulder areas, and all other areas as depicted on the project plans.

The Landscape Establishment period shall be 365 calendar days.

Planted Stock and Seeding Establishment:

The Contractor shall request an inspection by the Owner's Representative when the Contractor believes the landscape work is substantially complete and the planting and related work is complete. After this initial inspection, and subject to his approval of the work, the Owner's Representative will issue written notification to the Contractor setting the effective, beginning date for the Plant Establishment Period. The Plant Establishment Period shall be for a period of 365 Calendar Days, but is subject to extension by the Owner's Representative if the Contractor improperly maintains the landscape planting, appreciable plant replacement is required, or other corrective work becomes necessary. This work is incidental to other bid items within this section and there is no separate payment for the Plant Establishment Period.

The ties and stakes shall be removed at the end of the Landscaping Establishment period per the approved "Staking and/or Guying, Pruning and Irrigation Plan" and as directed by the Owner's Representative.

All cactus shall stand erect on their own without stakes when brought to this site. If the cactus cannot stand on its own when nursery stakes are removed, it shall be removed and replaced.

The contractor shall apply approved pre-emergent herbicide according to manufacturer recommendations on all areas of stabilized decomposed granite, and rock mulch as depicted on the project plans, and as directed by the Owner's Representative.

The application shall first be completed midway through the Landscaping Establishment period and the second application shall be completed 30 days prior to completion of the Landscaping Establishment Phase of the project. Watering shall be completed in accordance with the manufacturer's recommendations, as included and as related to each application.

The pre-emergent herbicide shall be applied in accordance with the requirements of these Special Provisions and the recommendations of the pre-emergent herbicide manufacturer, as approved by the Owner's Representative.

The control of weeds shall be accomplished by the use of herbicides or manual removal. Manual removal of weeds shall be required in the seeded areas, and in the stabilized decomposed granite areas after herbicides have taken affect.

The contractor shall maintain the existing seeded areas on the project, including any erosion repair, reseeding and/or restoration, as directed by the Owner's Representative. The work associated with this seeding restoration will be considered included in the price of Landscape Establishment item.

All dead or unhealthy plant stock shall be removed and replaced as directed, at no additional cost to the Department, within 21 days from the date of the inspection and the contractor shall notify the Engineer in writing when the replacement work has been completed.

Basis of Payment:

Landscape Establishment measured as provided above, will be paid for at the contract lump sum price, which price shall be full compensation for the work, complete in place, including application of pre-emergent herbicide, plant material replacement if required, control of weeds, and traffic control required during Landscape Establishment phase and as described and specified herein.

No separate measurement or direct payment will be made for white marking flags, it will be considered included in the price of Landscape Establishment.

At final project acceptance or at the end of the plant establishment period, the Owner's Representative will make a final acceptance inspection of the planted areas.

ITEM 430.00004: REVEGETATION SEED MIX

The work under this item shall consist of furnishing all materials, preparing the soil, applying revegetation seed, and establishing the seeded areas.

Areas to be seeded are those disturbed or unvegetated areas listed herein, shown on the plans, called for in the contractor's erosion control plan, or designated by the Engineer. Seeding is required to stabilize the unpaved disturbed dry area within the Waters of the U.S. Seeding area below the Ordinary High Water Mark (OHWM) shall exclude any definable low flow channels.

Seeding may be included as part of a landscape project, or used for erosion control as part of a Storm Water Pollution Prevention Plan (SWPPP), or both.

In either case, seeding shall be accomplished in two stages. The first stage shall consist of tillage; furnishing and applying compost, chemical fertilizer, and sulfur; furnishing and planting the contract-specified seed mix; and furnishing, applying and affixing final mulch cover and Desert Pavement. The second stage, beginning after the first stage has been accepted by the Engineer, shall be a 45 calendar-day period during which time the contractor shall be responsible for maintaining and stabilizing the seeded and mulched areas, and restoring damaged or eroded areas.

Seeding used as part of a SWPPP shall be completed, including the 45 calendar-day maintenance period, before the end of the contract time, or sooner as required in the SWPPP. Seeding used as part of a landscape project shall be completed, including the 45 calendar-day maintenance period, before the end of the Construction Phase. When

seeding is part of a landscape project, the maintenance activities described herein shall be in addition to the work specified in Item 430.01001 for landscape establishment. No time extension will be granted for seeding not completed as specified herein, including the 45 calendar-day maintenance period, before the end of the contract time or Construction Phase as applicable.

Materials:

Appropriate documentation, as specified below, shall be submitted to the Engineer a minimum of 30 calendar days before the start of a scheduled seeding activity. No materials shall be delivered to the site until the documentation has been approved by the Engineer.

Unless otherwise specified, Certificates of Compliance conforming to the requirements of the specifications shall be provided for all materials.

The contractor shall also provide test from accredited laboratories for all materials, as specified herein. Should the contractor perform its own testing, such test results shall also be provided to the Engineer.

Seed:

(A) General Requirements:

The species, variety, and strain of seed (designated elsewhere herein as contract-specified seed) shall be as shown on the plans or as specified herein. The contract-specified seed shall be obtained from seed suppliers through harvesting of wildland collections, or field-grown seeds grown prior to or during the contract period.

A Certificate of Analysis for each seed species shall be furnished to the Engineer at least four weeks prior to seeding construction. No seed shall be furnished to, or delivered to the project until approved by the Engineer. The Certificates of Analysis shall contain the following information for each seed sample: the test results of the Fifty States Noxious Weed list, all seeds including weed seeds listed, purity and germination, tetrazolium test results, when used and any pathology found to be present. The sample testing, when available for the native plant species, shall use the rules for testing seeds published by the "Association of Official Seed Analysts" or the "Society of Commercial Seed Technologists".

If the samples indicate species listed as noxious, restricted or invasive, the lot will be rejected or evaluated for use on the project.

Legume seed shall be inoculated with appropriate bacteria cultures approved by the Engineer, in accordance with the culture manufacturer's instructions.

Tetrazolium staining shall be acceptable to test for germination and hard seed. Cut or fill testing will not be allowed. As directed by the Engineer, seeds with an expiration date past the acceptable test date or not meeting the specified conditions for storage shall be retested by the contractor. The Engineer may perform random sampling of seeds throughout the project. Mixing of the specified seed at the project site shall be under the supervision of the Engineer.

Within 30 calendar days after the award of contract, the contractor shall submit the name of the seeding subcontractor to be used, along with written confirmation from seed suppliers and collectors, on their letterhead, that the source(s) for the contract-specified seed has been secured. If any of the contract-specified seed is expected to be unavailable prior to the time specified for seeding the contractor shall notify the Engineer at this same time.

The seed shall be delivered to the project site unmixed in standard, sealed, undamaged containers for each seed species. Each container shall be labeled in accordance with the appropriate provisions of the Arizona Revised Statutes and the U.S. Department of Agriculture rules and regulations under the Federal Seed Act. Labels shall indicate the variety or strain of seed, the percentage of germination, purity and weed content, the date of analysis which shall not be more than twelve months prior to the delivery date, and testing information. A Certificate of Analysis from an accredited seed-testing laboratory shall accompany each container of seed.

Unless otherwise approved by the Engineer, weed content of the contract-specified seed mix shall not exceed 0.5 percent.

The contractor shall provide all seed tag labels to the Engineer. No payment will be made for seed until tag labels and Certificates of Analysis from all seed to be used on the project have been submitted as specified.

The contractor shall store seed under dry conditions, at temperatures of between 35 °F and 120 °F, and out of direct sunlight. Prior to using the seed, the contractor shall provide a certification letter to the Engineer that the seed was stored as specified herein.

Application rates of seed as specified are for Pure Live Seed (PLS). PLS is determined by multiplying the sum of the percent germination of seeds, including hard or dormant seeds, by the percent purity.

Seed mix species and the Pure Live Seed (PLS) rates are shown below:

SEED MIX - for All Unpaved Disturbed Areas/ Unvegetated Areas			
Botanical Name	Common Name	PLS Rate (Pounds Per Acre)	Per Pound Value for Substitution (see text)
<i>Abronia villosa</i>	Sand Verbena	0.5	\$100
<i>Baileya multiradiata</i>	Desert Marigold	1.5	\$75
<i>Bouteloua aristidoides</i>	Needle Grama	1	\$20
<i>Distichlis stricta</i>	Desert Saltgrass	3	\$65
<i>Encelia farinosa</i>	Incienso Brittlebush	1.5	\$17
<i>Encelia frutescens</i>	Button Brittlebush	1	\$19
<i>Eschscholtzia mexicana</i>	Mexican Poppy	1	\$40
<i>Hilaria berlanderii</i>	Curly Mesquitegrass	0.5	\$80
<i>Lesquerella gordonii</i>	Gordon's Bladderpod	1.5	\$40
<i>Lupinus succulentus</i>	Arroyo Lupine	2	\$13
<i>Plantago ovata</i>	Desert Indian Wheat	2	\$5
<i>Salvia columbariae</i>	Desert Chia	1	\$55
<i>Sphaeralcea ambigua</i>	Desert Globemallow	1	\$55
<i>Sporobolus airoides</i>	Alkali Sacaton	2	\$25
<i>Sporobolus cryptandrus</i>	Sand Dropseed	1	\$10
Per Acre Subtotal Value			\$855.50

Seed Substitution:

No substitution of the contract-specified seed will be allowed unless evidence is submitted documenting that the contractor has made a diligent effort to obtain the contract-specified seed from either seed suppliers or collectors, and that the contract-

specified seed will not become available prior to the time specified for seeding in the contractor's approved construction schedule.

The contractor may also request a substitution if the lowest price available for the contract-specified seed is greater than 2.0 times the value shown in Table 1. The contractor shall provide documentation from a minimum of three seed suppliers or collectors supporting such request. Documentation shall include copies of the invoices from each supplier or collector. Only those invoices obtained within three weeks of the time specified for seeding in the contractor's approved construction schedule will be acceptable.

Should a substitution of the contract-specified seed be requested for one of the two reasons specified above, and the contractor's documentation is approved by the Engineer, the Contractor will recommend an alternate seed within five working days of the Engineer's approval of the contractor's documentation. The alternate seed will only be allowed when there is an insufficient quantity of the contract-specified seed, as determined in the previous two paragraphs, for the areas to be seeded as called for herein or as required for erosion control. The contractor shall obtain and apply the alternate seed, as required, to all such remaining areas. Unless otherwise approved by the Engineer, the approved alternate seed will only be allowed until such time that contract-specified seed meeting the availability and price requirements specified herein can be provided.

For each pound of contract-specified seed not provided by the contractor, the value indicated in the table will be deducted from the contract amount. The price per pound for the alternate seed selected by the Owner from submitted recommendations, will be determined in accordance with the specifications. No additional adjustments will be made for substituting the alternate seed, the costs being considered as included in the contract item for seeding.

No payment will be made for areas seeded with unapproved seed.

Tacking Agent:

Tacking agent shall be a naturally occurring organic compound, and shall be non-toxic. The tacking agent shall be a product typically used for binding soil and mulch in seeding or erosion control operations. Approved types shall consist of mucilage or gum by dry weight as active ingredient obtained from guar or plantago. The tacking agent shall be labeled indicating the type and mucilage purity.

Thermally-Refined Wood Fiber:

Wood cellulose fiber mulch shall be from thermo-mechanically processed wood, processed to contain no growth germination inhibiting factors. The mulch shall be from virgin wood manufactured and processed so the fibers will remain in uniform suspension in water under agitation to form homogenous slurry. Paper products will not

be considered as virgin wood. The thermally-refined wood fiber mulch shall have the properties shown in table below:

Virgin Wood Cellulose Fiber	90% min.
Recycled Cellulose Fiber	10% max.
Ash Content	0.8% +/-0.3%
pH	4.5 +/-1.0
Water Holding Capacity	10:1 (water:fiber) Min.

Straw Mulch:

General:

Straw mulch shall be from the current season's crop. A letter of certification from the supplier shall be required stating that the straw was baled less than 12 months from the delivery date.

All straw, including hydraulically applied straw, shall be free from noxious weeds in compliance with the standards and procedures of the North American Weed Management Association (NAWMA) or the Arizona Crop Improvement Association (ACIA). The contractor shall provide documentation, including a transit certificate, and appropriate labels and/or marking twine, from the ACIA or NAWMA that straw materials to be used for mulch are free of noxious weeds. The straw shall be accompanied by the certification, labels and/or marking twine at the time of delivery to the project site. Straw delivered to the project without such information will be rejected, and promptly removed from the project.

Rye straw and oat straw will not be acceptable.

Straw Mulch for Hydraulic Application:

Hydraulically applied straw mulch shall be wheat or rice straw processed to various particle sizes, mixed with water and tacking material, and applied as a non-clogging slurry using a hydroseeder. A minimum of 70 percent of the wheat or rice straw in the mix shall be not less than 1/2 inch ± 1/4 inch in length. Straw particles may be longer provided that the particles can be used with the selected hydroseeder without clogging. Hydraulically applied straw mulch, as furnished by the manufacturer, may contain up to 10 percent paper or cotton materials in dry weight, as well as 5 to 20 percent of wood fiber in dry weight. The combined dry weight percentage of paper, cotton, and wood

fiber materials together shall be not less than 15 percent nor more than 30 percent of the hydraulically applied straw mulch.

Hydraulically applied straw mulch material from the following sources shall be acceptable:

Hydra Matrick
North American Green
5401 St Wendel-Cynthia Road
Poseyville, IN 47633
Phone: 1-800-772-4297

Hydro Straw
Hydrostraw LLC
3676 W 9000 N Road
Manteno, IL 60950
Phone: 1-800-545-1755

Shot Straw
Rio Ranches LLC
PO Box 156
Palo Verde, AZ 85343
Phone: 602-680-8320

DuraBlend 361
PrimeOne Products LLC
PO Box 30816
Spokane, WA 99223
Phone: 509-981-8555

Slow-release Chemical Fertilizer and Sulfur:

Chemical fertilizer shall be composed of a mixture of one part sulfur-coated urea 25-4-8, one part monammonium phosphate 11-52-0, and one part methylene urea 38-0-0. The sulfur-coated urea, a blended fertilizer 25-4-8, shall have approximately 80 percent of the nitrogen defined as slow release, and contain 5 percent Iron, 10 percent sulfur and trace amounts of zinc and manganese. The result shall be a 24-18-2 chemical blended fertilizer, as specified herein.

In addition to the fertilizer mixture, agricultural sulfur compounds, comprised of between 80 percent and 96 percent sulfur, shall be applied at the rate specified in "Tillage". Chemical fertilizer and sulfur shall not be applied for the seeding area below the OHWM.

Water:

Water shall be free of oil, acid, salts or other substances which are harmful to plants. The source shall be as approved by the Engineer prior to use.

Compost:

Compost in bulk or furnished in containers or bags, shall consist of composted organic vegetative materials and may contain worm castings. No animal manures or city biosolids shall be used in the composting or added to the compost. Prior to being furnished on the project, compost samples shall be tested for the specified microbiological and nutrient conditions, including maturity and stability, by a testing

laboratory approved for testing of organic materials. During pre-activity seeding construction meeting, compost test written results submitted to the Engineer for approval shall be within nine months from the date of the official lab test.

Compost material shall be dark brown in color with the parent material composted and no longer visible. The structure shall be a mixture of fine and medium size particles and humus crumbs. The maximum particle size shall be within the capacity of the contractor's equipment for application to the constructed slopes. The odor shall be that of rich humus with no ammonia or anaerobic odors.

Bulk Compost shall also meet the following requirements:

Cation Exchange Capacity (CEC)	Greater than 45 meq/100 g
Carbon : Nitrogen Ratio (C : N)	Less than 20 :1
PH (of extract)	6.5 – 8.5
Organic Matter Content	Greater than 30%
Total Nitrogen (not added)	Greater than 1%
Maturity Index	Greater than 50% on Maturity Index at a 10 :1 ratio
Stability Indicator, CO ₂ Evolution: Biologically Available C (BAC)	Less than 4mg CO ₂ -C/g OM/day is desirable.
	From 4 through 8mg CO ₂ -C/g OM/day is acceptable.
	Greater than 8mg CO ₂ -C/g OM/day is <u>not</u> acceptable.
The CEC lab testing method shall refer to EPA9081 at the web link: http://epa.gov/osw/hazard/testmethods/sw846/pdfs/9081.pdf	

Bulk compost shall be applied to areas to be seeded at the specified rate of **15 cubic yards per acre** prior to final tillage for incorporation into the soil seedbed. Unless otherwise approved by the Engineer, bulk compost shall be applied to all areas where equipment can be operated for final tillage in order to incorporate into the soil seedbed.

Areas where bulk compost cannot be applied by broadcast methods, compost shall be applied hydraulically. Hydraulically applied compost shall be applied at the rate of 1,500 Pounds per acre to cut slopes or on other areas prior to final tillage for incorporation into the soil seedbed. Hydraulically applied compost may be combined with soil amendments, and fertilizer in the same slurry. Seed shall be applied separately.

Hydraulically applied compost shall meet the following requirements:

Cation Exchange Capacity (CEC)	Greater than 55 meq/100 g
Carbon : Nitrogen Ratio (C : N)	Less than 20 :1
PH (of extract)	6.5 – 8.5
Organic Matter Content	Greater than 35%
Total Nitrogen (not added)	Greater than 1%
Micronutrients (added)	S, Ca, Mg, Na, Fe, Al, Mn, Cu, Zn, B
Stability Indicator, CO ₂ Evolution: Biologically Available C (BAC)	Less than 4mg CO ₂ -C/g OM/day is desirable. From 4 through 8mg CO ₂ -C/g OM/day is acceptable. Greater than 8mg CO ₂ -C/g OM/day is <u>not</u> acceptable.
The CEC lab testing method shall refer to EPA9081 at the web link: http://epa.gov/osw/hazard/testmethods/sw846/pdfs/9081.pdf	

Compost shall not be applied for the seeding area below the OHWM.

Construction Requirements:

General:

Seeding Operations:

At least two weeks prior to beginning seeding, the contractor shall complete and submit a batch mix and seed application form to the Engineer for approval. The batch mix form will be supplied by the Engineer.

After acceptance of the form, the Engineer and contractor shall determine a one tenth of an acre sample area to be seeded and mulched prior to applying seed to the remainder of the project. Both regular straw mulch and hydraulically applied straw mulch shall be applied to the sample area. Both straw mulches shall be representative of the materials proposed for use on the project. If the seeding and mulching procedures are acceptable, the contractor shall begin seeding operations as specified herein.

The contractor shall notify the Engineer at least two days prior to commencing any phase of seeding operations for the remainder of the project.

The equipment and methods used to distribute seeding materials shall provide an even and uniform application of seed, mulch, and other materials at the specified rates.

Unless specified otherwise in the Special Provisions, seeding operations shall not be performed on undisturbed soil more than five feet outside the clearing and grubbing limits of the project or on steep rock cuts.

The contractor shall coordinate the seeding operations with the grading operations to determine mobilization frequency throughout the duration of the project. Seeding shall be done during suitable weather and soil conditions for tillage and placement of materials. Seeding operations shall not be performed when wind exceeds 10 miles per hour or, if in the opinion of the Engineer, conditions would prevent uniform application of materials or would carry seeding materials into areas not designated for seeding. Seeding shall be accomplished within 14 days after slopes and disturbed areas have been completed.

Frequent mobilizations may be required to accomplish seeding as specified herein. The cost of such multiple mobilizations is to be included in the price bid for the seeding. No adjustments will be made to the contract for the number of seeding mobilization activities. Should the contractor fail to provide seeding for a sub-area as specified herein, the Engineer will immediately notify the contractor of such non-compliance. Should the contractor fail to immediately remedy the unstabilized area, the Engineer may suspend work until such seeding stabilization has been completed, or proceed to provide the necessary seeding stabilization. The entire cost of such work will be

deducted from the monies due or to become due to the contractor. In addition, no adjustment to the contract time will be made for suspensions resulting from the contractor's failure to provide seeding for a sub-area within the time periods specified herein.

Tillage:

Where equipment can operate, the area to be seeded shall be prepared with a ripper bar, chisel plow, or with other devices to provide thorough soil cultivation to the depth specified below.

Where equipment is not suitable for operation, hand tillage and/or other manual methods shall be utilized as approved by the Engineer. Tillage depth shall follow the requirements specified herein to maximum extent practicable (MEP).

For areas too steep to be prepared for seeding after the slope has been completed, as determined by the Engineer, tillage shall be accomplished with appropriate equipment as the slope is being constructed. On slope areas, all tillage shall be horizontal and parallel to the contours of the areas involved. All areas which are eroded shall be restored to the specified condition, grade, and slope as directed prior to seeding.

Cut slopes shall be prepared with ridges and deep tillage, or shall be mini-benched. On fill slopes, the operations shall be conducted in such a manner as to form minor ridges thereon to assist in retarding erosion and favor germination of the seed.

Cut slopes flatter than 3:1 (horizontal to vertical) shall be tilled a minimum of 12 inches in depth, and fill slopes flatter than 3:1 shall be tilled to a six-inch minimum depth. All slopes steeper than 3:1, and areas which could potentially be affected by underground utilities, shall be tilled to a minimum 6 inches in depth, and left in a roughened condition as they are constructed.

Tillage shall be a minimum of two inches in depth for the first ten feet from the toe of AC wedge including shoulder build-up areas (edge of pavement build-up areas) or from the outside edge of curb and gutter.

Care shall be taken during the seeding operations to prevent damage to existing trees and shrubs in the seeding area.

Tillage may require passing the equipment over the area several times to provide thorough soil cultivation. Furrows from tillage shall be no more than 12 inches apart. No work shall be done when the moisture content of the soil is unfavorable to tillage.

All competitive vegetation shall be uprooted prior to seeding and the soil shall be left in a friable roughened condition free of clods or large stones over four inches in any dimension, and other foreign material that would interfere with the seeding operation.

Exposed stones larger than four inches shall be removed, stockpiled, and replaced on site with the Desert Pavement.

Regardless of the method of seeding application, all areas prepared with tilling shall have chemical fertilizer and soil amendments (sulfur and compost) uniformly applied and incorporated into the soil prior to final tillage and seeding.

Chemical fertilizer and sulfur shall be applied at the rate of 200 pounds each per acre. Compost shall be applied at the rate of **15 cubic yards per acre**.

Unless otherwise approved by the Engineer, bulk compost shall be applied, using broadcast methods, to all areas where equipment can be operated. For areas where bulk compost cannot be applied by broadcast methods, as determined by the Engineer, compost shall be applied hydraulically at the rate of 1,500 pounds per acre. Compost may be combined with seed in the same slurry. Sulfur and fertilizer shall be applied separately.

Slopes 3:1 and flatter shall have fertilizer, sulfur, and compost tilled into a minimum of the top four inches of the surface. Slopes steeper than 3:1 shall have fertilizer, sulfur, and compost uniformly broadcast for incorporation into the soil as directed by the Engineer. Fertilizer and sulfur shall not be applied hydraulically to any seeded areas.

For mini-benched slopes, fertilizer, compost, and sulfur shall be applied at the specified rates with no tillage or incorporation.

Seeding:

General:

Drill seeding with straw mulch shall be considered as the preferred method of seed application when practicable. Unless otherwise approved by the Engineer, drill seeding shall be used for all areas with slopes of 3:1 or less.

Hydroseeding shall be the alternative method for seed distribution for slopes in excess of 3:1, and where drill seeding is not practicable or suitable for soil conditions and seed types, as determined by the Engineer.

Seeds not suitable for drill seeding and hydroseeding methods shall be broadcast manually. Areas to be seeded manually shall be completed after the final soil tillage and prior to any drill or hydroseeding.

Straw mulch or hydraulically applied straw mulch shall be applied on all seeded areas within 24 hours of seed application. Seeding application shall be accomplished prior to application of straw mulch or hydraulically applied straw mulch. Combining the seed application process with the mulching process will not be acceptable.

Revegetation seeded areas shall not be watered after planting.

Drill Method:

After the tillage and incorporation of fertilizer, sulfur, and compost is completed and accepted by the Engineer, seed shall be planted with a drill seeder capable of accurately metering the specific seed mix. Use of a drill seeder shall not damage the prepared seedbed, and shall provide a soil cover over the planted seed.

Seed shall be planted approximately 1/4 inch deep, with a maximum depth of 1/2 inch. The distance between the furrows produced using the drill process shall not be more than eight inches. If the furrow openers on the drill exceed eight inches, the area shall be drilled twice. Seeding shall be done with grass seeding equipment with double disc openers, depth bands, packer wheels or drag chains, rate control attachments, seed boxes with agitators and separate boxes for small seed. Seed of different sizes shall be sowed from at least two separate boxes adjusted or set to provide the planting rate as specified.

Hydroseed Method:

Areas and seed types not suitable for drill-seeding, as determined by the Engineer, shall be hydroseeded. The contract-specified seed shall be applied in a slurry containing 200 pounds of thermally-refined wood fiber and a minimum of 40 pounds tacking agent per acre. Seed shall not be in the slurry for more than 30 minutes. Hydroseeded areas shall also be mulched, as specified above, within 24 hours of application of the seed.

Manual Application:

Manually applied seeds shall be broadcast evenly to produce uniform distribution over the seeded areas.

Applying Straw Mulch:

General:

Within 24 hours after each area is planted, straw mulch shall be uniformly applied at the minimum rate of 2 1/2 tons per acre for areas to be crimped and tacked, and minimum two tons per acre for tacked-only areas. Except for edge of pavement build-up areas, and unless otherwise specified by the Engineer, straw mulch shall be applied to all seeded areas. Areas to receive hydraulically applied straw mulch, if directed by the Engineer, shall be mulched in accordance with above.

During seeding and mulching operations, care shall be exercised to prevent drift and displacement of materials. Mulch material which is placed upon trees and shrubs,

roadways, structures, and upon any areas where mulching is not specified, or which is placed in excessive depths on mulching areas, shall be removed as directed. Mulch materials which are deposited in a matted condition shall be loosened and uniformly spread to the specified depth over the mulching areas. Any unevenness in materials shall be immediately corrected by the contractor. In addition, the contractor shall minimize production of dust or other airborne particulate matter during application of straw mulch, either by moistening the straw, modifying equipment with misters, or through other means approved by the Engineer.

Except as specified in the next paragraph, straw mulch applied to seeded areas shall be immediately affixed by crimping and tacking after application. No mulch shall be applied to seeding areas which cannot be crimped and/or tacked by the end of each day. Any drifting or displacement of mulch before crimping and/or tacking shall be corrected by the contractor at no additional cost to the Department.

Crimping shall not be required for areas that are steeper than 3:1. Crimping may also be waived, when specifically directed by the Engineer, for drill seeded or hydroseeded areas with rocky conditions or other areas deemed unsuitable by the Engineer for crimping. Straw mulch applied to such areas shall only be tacked, as specified below.

Prior to the application of a tacking agent, protective covering shall be placed on all structures and objects where stains would be objectionable. All necessary precautions shall be taken to protect the traveling public and vehicles from damage due to drifting spray.

Anchorage by Crimping:

Except as specified above, crimping shall be required for all straw mulched areas. Straw mulch shall be anchored into the soil with a heavy disc. Discs shall be flat and serrated, with at least 1/4 inch thickness having dull edges, and spaced no more than nine inches apart. Straw mulch shall be anchored to a depth of at least two inches and shall not be covered with an excessive amount of soil. Anchoring operations shall be across the slopes where practical, with no more than two passes of the anchoring equipment. Immediately following the crimping operation, the crimped area shall be tacked as specified below.

Anchorage by Tacking:

Straw mulch shall be anchored by tacking, using a slurry consisting of a minimum of 150 pounds of tacking agent, 500 pounds of thermally refined wood fiber mulch, and 300 gallons of water per acre. The contractor may increase the quantities of components to ensure the stability of the straw mulch to provide erosion control during the 45 calendar-day maintenance period at no additional cost to the Department.

Hydraulically Applied Straw Mulch with Tacking Agent:

Areas seeded but not practical for straw mulch, as determined by the Engineer, shall have hydraulically applied straw mulch with tacking agent applied at the variable rates shown in the Table below.

Slope (H:V)	Hydraulically Applied Straw Mulch (Pounds per acre)	Tacking agent (Pounds pure mucilage per acre)
Flat to 6:1	2,000	150
From greater than 6:1 to 3:1	2,500	150
Greater than 3:1	3,000	200
Erosive Soil Slopes or Highly Erosive Areas*	3,500	250
*As determined by Engineer		

The contractor shall submit a batch (tank) mix quantity schedule for mulch application to the Engineer for approval prior to mixing hydraulically applied straw mulch and tacking agent in a slurry. Batch mixing and coverage will be monitored throughout the seeding operations. The contractor shall coordinate the mixing and application operations with the Engineer in advance of all mixing. Fertilizer or seed shall not be mixed into any slurry for temporary erosion control mulch application.

Seeding Acceptance:

After application the Engineer will inspect seeded areas or sub-areas for conformance to the contract requirements. The contractor shall correct, to the satisfaction of the Engineer, any areas not conforming to the specifications. The 45-day maintenance period will begin upon acceptance of the area by the Engineer.

The contractor shall maintain and stabilize each area or sub-area for a minimum period of 45 calendar days after application of the seeding and mulching materials, and acceptance by the Engineer. Any areas damaged from erosion, or that have less than 90 percent of applied mulch remaining, shall be re-seeded, re-mulched, and re-tacked at no additional cost to the Owner.

Seeding shall be completed, including the 45 calendar-day maintenance period, before the end of the contract time, or sooner if required in the SWPPP or elsewhere in the contract documents. Seeding used as part of a landscape project shall be completed, including the 45 calendar-day maintenance period, before the end of the Construction Phase.

Method of Measurement:

Seeding will be measured by the acre, to the nearest one acre of ground surface seeded. Measurements will be along the ground surface for the areas seeded and mulched, as approved by the Engineer.

Basis of Payment:

The accepted quantities for Seeding, measured as provided above, will be paid in two phases corresponding to the application stage and the 45 calendar-day maintenance stage.

Upon completion of the application stage and acceptance by the Engineer, the contractor will be paid 70 percent of the contract bid price per acre for the completed work. Such price will be considered full compensation for furnishing and applying the contract-specified seed mix, fertilizers, soil amendments, tillage, mulch materials, and tacking agent, all required testing, and all equipment and labor required to complete the work as specified herein.

Upon completion of the 45 calendar-day maintenance stage, and acceptance by the Engineer, the contractor will be paid 30 percent of the contract bid price per acre for the completed work. Such price will be considered full compensation for seeding maintenance, including all equipment, labor, and materials required to correct deficiencies in seeded, mulched areas, as specified herein.

No measurement or payment will be made for the mobilizations required to apply and stabilize the seeding for each area or sub-area, as specified herein, the cost being considered as included in the contract price for Seeding.

An adjustment to the contract will be made if a contractor-requested seed substitution is approved as specified above.

ITEM 430.00005: SITE FURNISHINGS

1. SUMMARY

- A. This Section includes the following:
 - 1. Picnic Table
 - 2. Cooking Grill
 - 3. Fire Ring
 - 4. Campsite Marker

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated. Include Material Safety Data Sheets for wood preservative.
- B. Samples for Initial Selection: For units with factory applied color finishes.
- C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
 - 1. Size: Not less than 6-inch long linear components and 4-inch square sheet components.
- D. Product Schedule: For site furnishings. Use same designations indicated on Drawings.
- E. Maintenance Data: For all site furnishings provided by manufacturer's or material from suppliers, for inclusion in project maintenance manual.

1.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of site furnishings and components through one source or from a single manufacturer.

1.4 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents after acceptance of work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. PICNIC TABLE

1. TF 3200, Precast Concrete
2. manufactured by Wausau Tile
3. 85" x 62" x 33"
4. 2040 lbs
5. Color: Charcoal
6. Product delivered pre-assembled, surface anchor.

B. COOKING GRILL

1. Model: CHARWOOD FC-1193-BHC
2. Manufactured by: Belson
3. Finish: Flat Black Enamel
4. Size: 18" x 24"
5. Options: Utility Shelf, Model US-100

C. FIRE RING

1. 12" high
2. 30" Diameter
3. 3/16" thick steel
4. Finish: Heat Resistant Flat Black Enamel.

D. CAMPSITE MARKER

1. 36" tall
2. 4" x 4" treated wooden timber
3. Embedded into 12" x 12" concrete foundation, top of foundation at Finish Grade.
4. Provide camp site indicator sign per City of Buckeye direction.

2.2 FABRICATION

- A. Metal Components: Form to required shapes and sizes with true, consistent curves, lines, and angles. Separate metals from dissimilar materials to prevent electrolytic action.
- B. Exposed Surfaces: Polished, sanded, or otherwise finished; all surfaces smooth, free of burrs, barbs, splinters, and sharpness; all edges and ends rolled, rounded, or capped, unless otherwise indicated.
- C. Factory Assembly for Receptacles: Assemble components in the factory to greatest extent possible to minimize field assembly. Clearly mark units for assembly in the field.

2.3 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.
- B. Unless otherwise indicated, install site furnishings after planting, and paving have been completed.
- C. Excavating: Perform all excavations as required for installation of work included under this Section. Coordinate excavation with utility plans and Blue Stake service prior to proceeding with work. Restore all surfaces, existing underground installations, etc., damaged or cut as a result of the excavations to their original condition.
- D. Should utilities not shown on the plans be found during excavations, promptly notify Owner for instructions. Failure to do so will make Contractor liable for any and all damage arising from his operations subsequent to discovery. Indicate utility crossings on the Record Drawings promptly.
- E. Site furnishings which do not conform to requirements, details and plans due to unauthorized changes or poor installation practices shall be immediately corrected at no additional cost to the owner.

3.3 CLEANING

- A. After completing site furnishing installation, inspect components. Remove spots, dirt, and debris. Repair damaged finishes to match original finish and color or replace component.
- B. Maintain continuous cleaning operation throughout duration of work. Dispose of, off-site at no additional cost to Owner, all trash or debris generated by installation of site furnishings.
- C. Clean up, remove from project area and lawfully and properly dispose of all debris from the entire work area prior to Final Acceptance to satisfaction of Owner

ITEM 450.00100: DECORATIVE SIGNAGE

Description:

General: The work under this item includes furnishing and installing decorative signage at designated areas as shown on the project plans or as directed by the Owner's Representative. This work also consists of applying an environmentally safe non-pigment based galvanized surface stain, with a minimum life expectancy of 50 years, to achieve a rustic brown color with a matte finish to Galvanized surfaces as indicated by the plans. All work under this item shall be completed in accordance with the details shown on the project plans and the requirements specified herein.

Submittals: Submit the following items:

1. A copy of the manufacturer's product Material Safety Data Sheet together with instructions for application of stain 5 days before application.
2. Proposed methods to control overspray, spillage and protection of adjacent surfaces for approval by the Owner's Representative. No staining will be allowed prior to approval.
3. Independent lab tests showing that the stain material is environmentally safe.

Quality Control and Assurance: Apply stain to a minimum 12 inch sample section of galvanized metal. Notify the Owner's Representative not less than 7 days before staining the sample section. Prepare and stain the sample section with the same materials, tools, equipment and methods to be used in staining final surfaces. The applied stain must be allowed to cure for a minimum of 14 days before the Owner's Representative's inspection. In the event more than one sample section is required by

the Owner's Representative, each additional sample section will be paid for as change order work. Use the Owner's Representative approved sample as the standard of comparison in determining acceptability of staining.

Materials:

Galvanized Steel: Per sections 515 and 771 of the Standard Specifications.

Concrete: Per section 505 of the Standard Specifications.

Reinforcing Steel: Per section 727 of the Standard Specifications and ASTM Specification A615.

Stainless Steel Bolts: Per section 770 of the Standard Specifications and ASTM F593.

Vinyl Lettering: White diamond-grade reflective sheeting per ASTM D4956.

Galvanized Surface Stain: The stain must consist of a clear soluble solution of natural elements and soft buffered organic acids. No pigment based colorants should be added to achieve the desired color. The stain must react with the target surface over a period of 7 - 21 days to produce a rustic brown color with a matte finish. The stain must be resistant to fading in the sun.

Approved Products:

Products	Manufacturers Address
Natina Steel	Natina Products, LLC PO Box 4563 Palm Desert, CA 92261 (877) 762-8462 www.natinaproducts.com
Or Approved Equal	

Construction Method:

Preparation: Target surfaces to be stained must be free of excessive oils, dirt, and other contaminants. All surfaces must be dry before application of stain.

Stain Application: After areas to be stained have been prepared and the sample approved, apply stain to all existing galvanized surfaces and appurtenances required to be stained. Apply stain according to the manufacturer's instructions to achieve a color consistent with the approved sample. Minimize overspray. Spray application should

not be performed under windy or rainy conditions. Stain must be applied uniformly. Irregularities must be corrected according to the stain manufacturer's recommendations. Stained surfaces must be kept dry for a period of 5 days following the application of stain. Final approval of product samples shall be made by the Owner and/or Construction Manager. No work shall proceed until written approval is received.

Storage: Stained surfaces must be stored properly at the construction yard after delivery and before, and up to, time of installation. If components stack, spacers should be placed between rows to allow for necessary airflow. Items should be stacked perpendicular to the ground slope to allow for proper drainage. Items should be elevated so they do not come into direct contact with soil or plant matter. Any and all other standard storage procedures should be met. It is the responsibility of the prime contractor to ensure that all components are stored properly on site.

Measurement and Payment:

Decorative signage will be measured by the unit per each, inclusive of all foundation, mounting posts and connectors, signage panels, and construction. The quantity shown on the plans and in the bid schedule will be the quantity used for payment.

Natina stain is measured and paid for in item 531.00001

The accepted quantity, measured as provided above, will be paid for at the contract unit price per unit of measurement. Payment will be full compensation for the work prescribed in this Section.

ITEM 450.00200: SEATWALL, 18"

Description:

General: The work under this item includes furnishing and installing poured in place concrete seatwall at designated areas as shown on the project plans or as directed by the Owner's Representative. All work under this item shall be completed in accordance with the details shown on the project plans and the requirements specified herein.

Submittals: Submit the following items:

1. Formwork materials
2. Concrete release form agents

3. Concrete source, mix design
4. Concrete transportation plan

Quality Control and Assurance: Provide an 8' long sample mock of the seatwall for review by Owner. Prepare the sample section with the same materials, tools, equipment and methods to be used in final construction. In the event more than one sample section is required by the Owner's Representative, each additional sample section will be paid for as part of the bid.

Materials:

Per section 505 of the Standard Specifications.

Construction Method:

Per section 505 of the Standard Specifications.

Measurement and Payment:

Seatwall, 18" will be measured by the unit per linear foot, inclusive of all excavation, foundation, formwork, jointing, transportation of raw material, mixing, placing and finishing concrete, removal of formwork and other associated forming and constructing materials and tools, and all other materials and actions required by this construction. The quantity shown on the plans and in the bid schedule will be the quantity used for payment.

The accepted quantity, measured as provided above, will be paid for at the contract unit price per unit of measurement. Payment will be full compensation for the work prescribed in this Section.

ITEM 440.10013	MAINLINE – SCHEDULE 40 2” PVC (EQUEUSTRAIN TROUGH WATER LINE)
ITEM 450.00601	EQUESTRIAN HITCHING RAIL
ITEM 450.00602	EQUESTRIAN WATER TROUGH, VALVES, AND APPURTENANCES
ITEM 450.00603	EQUESTRIAN TIMBER CROSSING

Description:

General: The work under this item includes furnishing and installing the equestrian site furnishing items, inclusive of the hitching rail, timber trail crossing, water trough, and associated elements required for the construction of these elements.

Submittals: Submit the following items:

1. hitching rail shop drawing
2. water trough water valve
3. water trough shop drawing

Materials:

Concrete Per section 505 of the Standard Specifications.

Lumber per section 778 of the Standard Specifications.

Steel per section 515 of the Standard Specifications.

Water line per section 795 of the Standard Specifications.

Construction Requirements:

Timed Water Valve will operate for a duration of approximately 1 minute for each activation. Water valve will be in areas accessible by anyone. Valve will be activated by touching a button, turning a knob, or otherwise manipulating a device that is inherently temporary.

Water valve will deliver water through a spout into the water trough, with the intent to fill a dry water trough with enough water for a horse to drink from.

Water Trough Drain Valve will be manually manipulated, and will be normally open. Valve will be closable and will be closed to impound water within the trough. When complete the valve is meant to be opened and left open to evacuate all water held within the trough.

Measurement and Payment:

Equestrian Elements, Various will be measured and paid as follows:

Item 440.10013	Mainline – Schedule 40 2” PVC (Equestrian Trough Water Line)	LF
Item 450.00601	Equestrian Hitching Rail	Each
Item 450.00602	Equestrian Water Trough, valves, and appurtenances	Each
Item 450.00603	Equestrian Timber Crossing	Each

inclusive of all excavation, foundation, formwork, jointing, transportation of raw material, mixing, placing and finishing concrete, removal of formwork and other associated forming and constructing materials and tools, plumbing line, valves, drains, sleeving, unions, and all other materials and actions required by this construction. The quantity shown on the plans and in the bid schedule will be the quantity used for payment.

The accepted quantity, measured as provided above, will be paid for at the contract unit price per unit of measurement. Payment will be full compensation for the work prescribed in this Section.

Item 440.10013 includes all components necessary to extend the water line from the Restroom Mechanical system to the equestrian drinking trough, inclusive of everything outside of the water line feed provided for on the Plumbing Plans.

ITEM 450.00605 WASTE BIN

Description:

General: The work under this item includes furnishing and installing the custom waste bins, inclusive of the concrete, steel, attachments, steel fabrication, excavation, forming, and constructing

Submittals: Submit the following items:

1. steel fabrication shop drawing

Materials:

Concrete Per section 505 of the Standard Specifications.

Steel per section 515 of the Standard Specifications.

Construction Requirements:

Coordinate with construction of Picnic Ramadas for timing, materials acquisition, and construction timing.

Measurement and Payment:

Item 450.00605	Waste Bin	Each
-----------------------	------------------	-------------

inclusive of all excavation, foundation, formwork, jointing, transportation of raw material, mixing, placing and finishing concrete, removal of formwork and other associated forming and constructing materials and tools, drains, unions, and all other materials and actions required by this construction. The quantity shown on the plans and in the bid schedule will be the quantity used for payment.

The accepted quantity, measured as provided above, will be paid for at the contract unit price per unit of measurement. Payment will be full compensation for the work prescribed in this Section.

ITEM 450 EROSION CONTROL

450.1 STABILIZED CONSTRUCTION ENTRANCE/EXIT:

Description:

The placement of Erosion Control (Stabilized Construction Entrance/Exit) is being provided to assist in controlling and minimizing the transportation of debris from the site onto the adjacent roadways and surfaces. The stone and associated filter fabric will be required to be completely removed at the completion of the project. The contractor, in conjunction with the resident engineer shall determine the locations for the construction entrance. Multiple construction entrances may be utilized, with the approval of the Engineer, or the construction entrance may be relocated, with the approval of the Engineer, as the project progresses.

Construction Requirements:

The bed for the riprap shall be shaped and trimmed to provide even surfaces and at a depth to accommodate the stone size and depth of rock specified on the plans.

Stone shall be sound and durable, free from seams and coatings, and of such characteristics that it will not disintegrate when subjected to the action of water. Stone

for the erosion protection at the drives shall conform to ADOT requirements for Graduation C rock mulch. The Bulk Specific gravity (SSD) shall be determined in accordance with the requirements of AASHTO T 85 and shall be a minimum of 2.4. Rock shall be well graded, angular rocks varying from one and one-half inches minimum to three inches maximum in size. Rock shall have the following gradation: DMax Shall be 3": DMin Shall be 1 1/2". Control for the gradation will be by visual inspection of the Engineer.

The source from which the rock will be obtained shall be selected well in advance of the time when it will be required in the work. Rock shall be well graded, varying in size from one and one half to three inches. The acceptability of the rock will be determined by the Engineer. If testing is required, suitable samples of rock shall be taken in the presence of the Engineer at least 25 days in advance of the time when its use is expected to begin. The approval of some rock fragments from a particular quarry site shall not be construed as constituting the approval of all rock fragments taken from that quarry.

The finished surface of stone may be placed by dumping and spread in layers by bulldozers or other suitable equipment. Placement depth minimum shall be 6 inches. Fabric used below the rock drive shall comply with ADOT Standard Specifications Section 1014-4.03 for Non-Woven High Survivability Fabric.

The contractor shall remove and legally dispose from the site all stone and fabric associated with this element of work at a time approved by the Engineer.

The contractor may propose alternative methods of Construction Entrance Erosion Control. Shop drawings shall be submitted to the Engineer for approval.

Method of Measurement:

Erosion Control (Stabilized Construction Entrance/Exit) will be measured by the Square Yard installed. Measurement will not include any separate measurement of the filter fabric or removal and disposal of material those being considered an incidental cost to this item of work.

Basis of Payment:

The accepted quantities of Erosion Control (Stabilized Construction Entrance/Exit), measured as provided above, will be paid for at the contract price per Square Yard, which price shall be full compensation for the work, complete in place, including grading area to accept rock, excavating, furnishing and placing material, removing and disposing of all materials and backfilling, and re-compacting.

450.2 SEDIMENT LOGS AND WATTLES

Sediment logs and sediment wattles, shall be manufactured or constructed rolls of fiber matrix, secured with netting, and used for the purpose of controlling erosion by slowing high flow water velocity and trapping silt sediments. Netting for sediment wattles shall have a minimum durability of one year after installation, and shall be tightly secured at each end of the individual rolls. All wheat straw used in sediment logs, sediment wattles, and fiber rolls shall be free of noxious weeds.

The unit weight for wattles shall be 0.144 pounds per inch of diameter per linear foot. Sediment log unit weight shall be 0.167 pounds per inch of diameter per linear foot. The minimum weight per linear foot for sediment logs and wattles shall be determined by multiplying the specified diameter of the device by the appropriate unit weight, in pounds per inch of diameter per linear foot per, as specified above.

Netting at each end of sediment logs and wattles shall be secured with metal clips or knotted ends to assure fiber containment.

Sediment Logs:

Sediment logs shall be installed in channel bottoms, around catch basins, as check dams, or on slopes, as directed by the Owner's Representative in accordance with the manufacturer's instructions. Sediment logs shall be secured with one inch by one inch by 46 inch hardwood stakes placed with a maximum spacing of two feet on center, or as directed by the Landscape Architect. Each stake shall be intertwined with the netting on the downstream side of the log and driven approximately two feet below finished grade. Unless otherwise specified, soil shall be tamped against the upstream side of the log to assure that storm water is forced to flow through the log rather than under it.

Sediment logs installed in drainage channel bottoms shall be perpendicular to the flow of the water, and shall continue up the channel side slope two feet above the high water flow line. Spacing of the logs shall be as specified by the project plans.

When sediment logs are used to construct check dams, the logs placed on the ground shall be buried four to six inches deep, or as directed by the Owner's Representative. Logs placed on slopes shall be installed in a two-inch deep by five-inch wide anchor trench. The ends of adjacent logs shall be abutted tightly together so that water cannot undermine the logs.

Sediment Wattles:

Sediment wattles shall be installed on slopes as directed by the project plans, and in accordance with the manufacturer's instructions. Sediment wattles shall be secured with wooden stakes as shown on the plans. The ends of adjacent wattles shall be abutted tightly together.

Basis of Payment:

No additional measurement or payment will be made for the maintenance of any erosion control item necessary to keep it in good working order during the entire project period, the cost being considered included in the price of erosion control items.

No additional measurement or payment will be made for cleanup and disposal of the erosion control devices at the end of the project period, the cost being considered included in the price of erosion control items.

Add new Subsection:

461 PAINT MEDIAN ISLANDS: is added:

Painting median islands shall comply with Section 461 of the current MCDOT Supplement to MAG Uniform Standard Specifications.

Add new Subsection:

462 THERMOPLASTIC PAVEMENT MARKINGS: is added:

Thermoplastic Pavement Markings shall comply with Section 462 of the current MCDOT Supplement to MAG Uniform Standard Specifications.

Add new Subsection:

463 RAISED PAVEMENT MARKERS: is added:

Raised Pavement Markers shall comply with Section 463 of the current MCDOT Supplement to MAG Uniform Standard Specifications.

Add new Subsection:

464 PERFORATED SIGN POSTS: is added:

Perforated Sign Posts shall comply with Section 464 of the current MCDOT Supplement to MAG Uniform Standard Specifications.

Add new Subsection:

465 SIGN PANELS: is added:

Flat Sheet Aluminum Panels and Object Markers shall comply with Section 465 of the current MCDOT Supplement to MAG Uniform Standard Specifications.

PART 500 – STRUCTURES

ITEM 505.07000: REINFORCED CONCRETE BRIDGE DECK

General

The work included under this item shall consist of constructing the reinforced concrete bridge deck at the locations and in conformance with the details shown on the plans and in the bridge shop drawings, and as specified in these Technical Specifications and as directed by the Engineer.

Attention is directed to Item 515.50000 “Prefabricated Steel Truss Bridge” of these Technical Specifications for additional requirements.

Materials

The materials for the reinforced concrete bridge deck shall be in accordance with the requirements of Section 505, “Concrete Structures,” Section 725, “Portland Cement Concrete,” and Section 727, “Steel Reinforcement,” of the Uniform Standard Specifications and these Technical Specifications.

Structural concrete for the reinforced concrete bridge deck shall be Class “AA” Concrete in conformance with the requirements of Section 725, “Portland Cement Concrete,” of the Uniform Standard Specifications and these Technical Specifications.

Construction Requirements

The design of the reinforced concrete bridge deck shall be performed by the Bridge Manufacturer and be included in the design of the prefabricated steel truss bridge. Details for the reinforcing to be used in the reinforced concrete bridge deck shall be provided along with the shop drawings of the prefabricated steel truss bridge to the Engineer for review and approval. The clearance between the surface of permanent forms and any bar reinforcement shall be not less than one inch.

The surface of the reinforced concrete bridge deck shall be finished with a transverse roughened broom finish with a texture of plus or minus one-sixteenth ($\pm 1/16$) inch.

Control joint requirements shall be indicated on the shop drawings as determined by the Bridge Manufacturer.

Measurement and Payment

The reinforced concrete bridge deck shall be measured as a square foot according to the dimensions shown on the plans.

The contract unit price paid per SQUARE FOOT for REINFORCED CONCRETE BRIDGE DECK shall include furnishing and placing reinforcing and furnishing and pouring a cast in place concrete deck on top of the stay-in-place galvanized steel deck forms as required in these Technical Specifications. No additional measurement or payment shall be made for the design, detailing, shop drawings of the reinforced concrete bridge deck.

ITEM 510.00003: CONCRETE BLOCK MASONRY: DUMPSTER ENCLOSURE WITH GATE

ITEM 510.00007: ENTRY MONUMENT: CMU MONUMENT WITH PARK SIGNAGE ATTACHED

ITEM 510.00008: ENTRY MONUMENT: DECORATIVE STEEL GATE

General

The work included under this item shall consist of constructing the concrete masonry unit (cmu) entry monument walls, signage, and gates, inclusive of all elements necessary to construct monument walls, gates, and signage as shown on sheet L13 and L14, exclusive of the Gate House.

The work also consists of constructing the Dumpster Enclosure and Gate, inclusive of concrete, bollards, gates, hinges, and framework.

Materials

The materials for the Enclosure, Monument, and Gates shall be in accordance with the requirements of Section 505, "Concrete Structures," Section 510 "Concrete Block Masonry, and Section 515, "Steel Structures" of the Uniform Standard Specifications and these Technical Specifications.

Construction Requirements

Submit shop drawings for proposed construction methods of rolling gate to include:

- Rolling and wheels
- Latching connection
- Stabilization of gates
- Rolling Brackets
- Steel Connections
- Weathering Steel Finish
- Star Icon detail in main gate panel

Submit a constructed mockup of 4 linear foot of entry monument for review by Owner.

Measurement and Payment

Item 510.00007 and Item 510.00008 are measured on a Linear Foot Basis, inclusive of foundations, connections, mechanical components such as wheels and track, latches, connections, block, mortar, and signage and signage attachment methods, as well as excavation, forming, transport of materials, and construction of these elements.

The contract unit price paid per Linear Foot shall include furnishing and placing reinforcing and furnishing and constructing entry monuments and gates, as required in these Technical Specifications.

Item 510.00003 is measured on a per item basis, inclusive of all foundations, connections, hardware, mechanical components such as wheels and gate stays, latches, connections, block, mortar, excavation, forming, transport of materials, and construction of elements.

No additional measurement or payment shall be made for the design, detailing, shop drawings of the monument wall, signage, or gates.

ITEM 515.50000: PREFABRICATED STEEL TRUSS BRIDGE

General

Scope: The work included under this item shall consist of furnishing, fully engineering, fabricating, transporting, and erecting prefabricated steel truss bridge superstructure including bridge joints, anchor bolts and bearings, at the locations and in conformance with the details shown on the plans, and as specified in these Technical Specifications and as directed by the Engineer.

Attention is directed to Section 515, "Steel Structures," of the Uniform Standard Specifications.

Qualified Bridge Manufacturers: Each bidder is required to identify their intended Bridge Manufacturer as part of the bid submittal. Qualified Bridge Manufacturers shall have at least five (5) years experience fabricating these type structures. The Bridge Manufacturer shall be currently certified by the American Institute of Steel Construction to have the personnel, organization, experience, capability, and commitment to produce fabricated structural steel for Major Steel Bridges as set forth in the AISC Certification Program.

Pre-approved Bridge Manufacturers:

CONTECH Bridge Solutions Inc.
8301 State Highway 29 North
Alexandria, Minnesota 56308
1-800-328-2047

Excel Bridge Manufacturing Company
12001 Shoemaker Avenue
Santa Fe Springs, CA 90670
1-562-944-0701

Big R Manufacturing
19060 WCR 66
Greeley, CO 80631
1-800-234-0734

Wheeler Lumber, LLC
9330 James Avenue South
Bloomington MN 55431
1-800-328-3986

Written request by the Contractor for acceptance of any proposed Bridge Manufacturer who is not pre-approved shall be presented to the Engineer at least 14 days prior to the bid. To insure the proposed substitution shall comply with these specifications, the following documentation shall be included:

- Product Literature
- All documentation to insure the proposed substitution shall be in compliance with these specifications. This shall include:
 - Representative design calculations
 - Representative drawings
 - Splicing and erection procedures
 - Warranty information
 - Inspection and Maintenance procedures
 - AISC Shop Certification
 - Welder Qualifications
- Proposed Bridge Manufacturers shall have at least five (5) years experience designing and fabricating these type structures and a minimum of five (5) successful bridge projects, of similar construction, each of which has been in service at least three (3) years. List the location, bridge size, owner, and a

contact for reference for each project.

The Engineer shall evaluate and verify the accuracy of the submittal. If the Engineer determines that the qualifying criteria have not been met, the Contractor's proposed Bridge Manufacturer shall be rejected. Bridge Manufacturers other than those listed above may only be used if the Engineer provides written approval of the proposed Bridge Manufacturer 5 days prior to the bid. The Engineer's ruling shall be final. All Bidders shall be notified of the Engineer's ruling by mail.

Fabricator's Engineer: The Bridge Manufacturer shall employ an engineer who is experienced in bridge design to perform all engineering related task and design. The engineer shall have a minimum of 10 years experience in bridge design and be a currently licensed civil or structural engineer in the State of Arizona.

Applicable Codes and Standards

Governing Codes and Standards: Bridges shall be designed in compliance with the AASHTO "LRFD Guide Specifications for Design of Pedestrian Bridges," December 2009 and the AASHTO LRFD Bridge Design Specifications, 2012. Calculations shall be in accordance with these documents, and formulas shall reference the appropriate sections.

Other Reference Codes and Standards:

- (1) AISC, Steel Construction Manual, Thirteenth Edition.
- (2) AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals, 6th Edition (AASHTO Signs).
- (3) American Welding Society, Structural Welding Code, D1.1, Latest Edition.

General Features of Design

Spans: Bridge Length = 130'-0". Bridge length is measured from centerline of abutment to centerline of abutment as shown on the plans. Final out-to-out bridge length shall be determined by the Bridge Manufacturer based on the bridge layout and abutment details shown on the plans.

Width: The bridge width shall be 14'-0" measured from inside to inside of main truss members.

Bridge System Type: Bridge shall be an "H-Section Truss", one-diagonal per bay, with the floor beams welded to vertical members on the side trusses.

- (1) The top of deck to low steel measurement shall not exceed 3'-0" as shown on the plans. If the Bridge Manufacturer determines there is a discrepancy they shall notify the Engineer.
- (2) The top of deck to top face of top chord shall be a minimum of 4'-6".

Superstructure Loading:

- (1) The bridge shall be designed for a uniformly distributed Pedestrian Loading of 90 pounds per square foot (psf) in accordance with the requirements of Section 3.1 of the AASHTO "LRFD Guide Specifications for Design of Pedestrian Bridges," December 2009.
- (2) The bridge shall be designed for an H10 Vehicle Load in accordance with the requirements of Section 3.2 of the AASHTO "LRFD Guide Specifications for Design of Pedestrian Bridges," December 2009.
- (3) The bridge shall be designed for Wind Load in accordance with the requirements of Section 3.4 of the AASHTO "LRFD Guide Specifications for Design of Pedestrian Bridges," December 2009.
- (4) The bridge shall be designed for Fatigue Load in accordance with the requirements of Section 3.5 of the AASHTO "LRFD Guide Specifications for Design of Pedestrian Bridges," December 2009.

Geometry:

- (1) The bridge shall be cambered for the dead load of the individual span plus 1% of the bridge length.
- (2) Elevations shall be as detailed on the plans. All bridge layout and geometry shall be verified by the Contractor prior to Bridge Manufacturer commencing design.

Materials of Construction

Structural Steel:

- (1) All members of the truss and deck support system shall be fabricated from square or rectangular hollow structural shapes (HSS), with the exception that floor beams may be wide flange shapes. All open ends of end posts and floor support beams shall be capped. Drain holes shall be provided for all sections at the low point of the member that may become filled with water. Finish shall be weathered steel.
- (2) The bridge shall be fabricated using A847 tube or A588 structural shapes.
- (3) Minimum nominal thickness of primary hollow structural shapes shall be 1/4 inch. Rolled shapes shall have a minimum thickness of 1/4 inch.
- (4) All surfaces of steel shall be blast cleaned in accordance with the Steel Structures Painting Council (SSPC), Surface Preparation Specification No. 7, latest edition, (SSPC-SP7), Brush-off Blast.
- (5) Attention is directed to Section 8.2, "Steel HSS Members," of the AASHTO "LRFD Guide Specifications for Design of Pedestrian Bridges," December 2009, for additional material and design requirements for HSS members and their connections.

Reinforced Concrete Deck:

- (1) Structural concrete for the reinforced concrete deck shall be Class "AA"

Concrete in conformance with the requirements of Section 725, "Portland Cement Concrete," of the Uniform Standard Specifications and these Technical Specifications.

- (2) The surface of the reinforced concrete deck shall be finished per the requirements of these special provisions.
- (3) Stay-in-place galvanized metal form deck shall be used and shall be a minimum of 22 gauge metal. Form deck shall not be considered as acting as composite reinforcing. Metal form deck shall be secured to the support members with fasteners or welds in accordance with the Manufacturer's recommendation. Metal form deck panels shall be of a length to span a minimum of two bays of the truss supports. Metal form deck shall be designed for a construction live load of either 20 psf or a 200 pound moving point load. Dead load deflection due to normal weight wet concrete shall be limited to $L/180$ or $3/4"$. The top of deck to bottom of form deck shall be a minimum of 4-inches.
- (4) Reinforcing shall be Grade 60 bars in conformance with the requirements of Section 727, "Steel Reinforcement," of the Uniform Standard Specifications and these Technical Specifications. All bar bends and anchorage shall be in accordance with AASHTO Specifications. Top reinforcing shall have a minimum clearance of 2.0" to the top of deck.

Details of Design

The Bridge Manufacturer's structural design of the bridge shall be by or under the direct supervision of an experienced civil or structural engineer who is licensed in the State of Arizona. Design shall be in conformance with the governing specifications contained herein. Design calculations and shop drawings shall be stamped, signed and dated by the engineer.

The engineer shall use a three dimensional frame analysis for the truss design considering all loads and load combinations specified by AASHTO. All joints capable of transferring moments shall be modeled as fixed or continuous members.

Trusses shall be designed as fully welded. Design shall consider the truss top chord stability criteria as defined in AASHTO where applicable. Truss vertical and floor members shall make a rigid frame to resist all lateral loads and stability loads specified by AASHTO.

Deflection of the bridge:

- (1) Vertical deflection of the main truss due to un-factored service pedestrian load shall not exceed $L/360$ of the span.
- (2) Horizontal deflection of the main truss due to un-factored lateral wind load shall not exceed $L/360$ of the span.
- (3) Deflection due to occasional vehicle loads shall not be considered.

Vibration: Vibration of the Bridge shall be investigated in accordance with the requirements of Section 6, "Vibrations," of the AASHTO "LRFD Guide Specifications for Design of Pedestrian Bridges," December 2009.

Bearing and Anchorage Devices:

- (1) Expansion Bearing shall be a steel on steel Slide Plate. Size shall be per loads and anticipated movements determined by the Bridge Manufacturer.
- (2) Anchor Bolt(s) shall be designed at the fixed and expansion end of the bridge for the forces present at that point. Anchor bolts conforming to ASTM F1554 Grade 36, 55 or 105 shall be used. J shaped or hooked bolts shall not be used if uplift is present under 0.9DL plus any uplift forces. The design shall consider longitudinal, transverse and uplift forces present under the standard AASHTO load cases. The embedment design and details of the anchor bolts shall be developed by the Bridge Manufacturer's design engineer based on the substructure details shown on the plans.
- (3) Bridge Expansion Joint details, for the expansion joint between the truss reinforced concrete bridge deck and abutment backwall, shall be as shown on the plans. Bridge Manufacturer can propose alternate expansion joint details for review and approval by the Engineer. Alternate expansion joint details shall meet ADA guidelines and provide a smooth walking surface for pedestrians.

Attachments

Horizontal safety rails shall be placed on the structure to a minimum height of 4'-6" above the deck surface. The rails shall be so spaced as to prevent a 4" sphere from passing through the rail. Rails may consist of round, square or rectangular hollow steel sections, angles, or other steel section as required. Rails shall be welded directly to the truss or to spacers which are welded to the truss.

Steel toe plates shall consist of ¼"x6" material or 6" channel when bay spaces exceed 5' – 6" to be determined by the Bridge Manufacturer and shall be welded to the inside face of the verticals, with the bottom of the toe plate placed 2" above the finished height of the reinforced concrete deck.

Welding

Welding procedures and weld qualification test procedures shall conform to the provisions of AWS D1.1, "Structural Welding Code," latest edition and these Technical Specifications. Filler metal shall be in accordance with the applicable AWS Filler Metal Specification, and shall match the corrosion properties of the base metal.

Welders shall be qualified for each process and position used while fabricating the bridge. Qualification tests shall be in accordance with AWS D1.1. All weld qualifications

and records shall be kept in accordance with the Fabricator's Quality Assurance Manual which has been approved by AISC.

Nondestructive weld testing is required. Testing shall be performed by a qualified ASNT Level II Technician or greater and paid for by the Bridge Manufacturer. All welds are to be 100% visually inspected. Ten percent (10%) of all fillet and partial penetration welds shall be magnetic particle tested. Full penetration shop welds shall be Ultrasonic tested in accordance with AWS D1.1; Section 6. Base material certifications are to be supplied by the material suppliers. Inspection test results shall be available on request.

Welded splices in main truss members shall be magnetic particle tested in accordance with QC Manual procedures.

Welding details for cyclically loaded tubular members specified by AASHTO/AWS D1.1 shall be used.

All welds require qualification using AWS D1.1 Article 4.8.

Submittals

Three copies of shop drawings shall be prepared and submitted to the Engineer for review and approval. Shop drawings shall be unique drawings, prepared to illustrate the specific portion of the bridge being fabricated. All relative design information such as member size, ASTM material specification, dimensions necessary to fabricate and required welding shall be clearly shown on the drawings. Drawings shall have cross referenced details and sheet numbers. All drawings shall be stamped, signed and dated by the Bridge Manufacturer's design engineer who is licensed in accordance with the requirements of these Technical Specifications.

Two copies of the structural calculations for the design of the bridge superstructure shall be prepared and submitted to the Engineer for review and approval. Calculations shall include complete bridge deck design, analysis and code check of the three dimensional truss with appropriate member connectivity and support conditions, truss stability checks, deflection checks, bearing and anchor bolt designs and all splices. All drawings shall be stamped, signed and dated by the Bridge Manufacturer's design engineer who is licensed in accordance with the requirements of these Technical Specifications.

One copy of welder certifications and one copy of welding procedures used.

Delivery and Erection

Delivery shall be made via truck to a location nearest the site which is accessible to normal over-the-road equipment. All trucks delivering bridge materials will need to be unloaded at the time of arrival. If the erection Contractor needs special delivery or delivery is restricted he shall notify the Bridge Manufacturer prior to bid date.

The Bridge Manufacturer shall provide a written procedure for lifting and splicing the bridge. All methods, equipment and sequence of erection are the responsibility of the Contractor and Bridge Manufacturer.

Bridge Manufacturer shall have a technical representative present at the pre-bid meeting, and during Bridge installation for on-site consultation. Design Engineer representative shall be present at the pre-bid meeting.

The Bridge Manufacturer shall provide written inspection and maintenance procedures to be followed by the City.

Measurement and Payment

The contract LUMP SUM price paid for PREFABRICATED STEEL TRUSS BRIDGE shall include design, preparation of shop drawings, furnishing, transporting and installing the prefabricated steel truss bridge, metal decking, bearing assemblies, anchor bolts, expansion joints, steel rail / handrails, joints and other miscellaneous metals associated with the steel truss bridge complete in-place and accepted.

No separate measurement or payment shall be made for the verification of the geometric layout and other geometric requirements, engineering design, shop drawings and other submittals that are considered to be included in the lump sum of the prefabricated steel truss bridge.

ITEM 520.02000: METAL RAILING (HEIGHT = 3'-6")

General

The work included under this item shall consist of constructing the metal railing (height = 3'-6") at the locations and in conformance with the details shown on the plans, and as specified in these Technical Specifications and as directed by the Engineer.

Materials and Construction

Materials and construction for the metal railing (height = 3'-6") shall conform to the provisions in these Technical Specifications and the details shown on the plans.

Welding shall conform to the requirements in AWS D1.1. Welds on exposed surfaces shall be ground flush with the adjacent surfaces.

Metal railing (height = 3'-6") shall consist of tubular metal rails supported by metal posts, together with anchor bolts, hardware and fittings, as shown on the plans.

Materials for tubular rails, posts, rods, bolts and nuts shall conform to the following

requirements:

Material	ASTM Designation
Tubular steel posts, rails, and pickets	A847
Shapes, plates and bars	A588 or A242 or A606
High strength bolts	A325 (Type 3) or A449 (Type 3)
High strength threaded rods	A449 (Type 3)
Nuts and washers for high strength bolts and rods	A563 (Grade C3), F436-3

Metal railing (height = 3'-6") shall conform closely to the horizontal and vertical lines shown on the plans or ordered by the Engineer. The railing shall present a smooth, uniform appearance in its final position. Metal railing (height = 3'-6") finish shall be weathered steel.

Shims shall be installed at posts and railings, where necessary, to provide uniform bearing and conformance with the horizontal lines and vertical grade lines. Shims at steel posts shall be commercial quality galvanized sheet steel.

The difference between out-to-out rail sleeve dimensions and the clear inside dimensions of the tubular steel rails shall not exceed 3/16 inch.

The Contractor shall submit 2 sets of anchor bolt layouts to the Engineer at the jobsite, prior to placing wing wall or other structural support reinforcement.

Materials shall be carefully handled so that no parts will be bent, broken, abraded or otherwise damaged. Fabrication, handling or installation methods which will injure or distort the members shall not be used.

Bearing surfaces and surfaces to be in permanent contact shall be cleaned before the railing parts are assembled. The bases of posts shall be true and flat to provide uniform bearing on the concrete portions of the railing.

Measurement and Payment

Metal railing (height = 3'-6") will be measured by the linear foot from end to end along the face of the railing, including end and intermediate posts. The measurement shall be made along the face of the rail elements without allowance for overlap at rail splices.

The contract unit price paid per LINEAR FOOT for METAL RAILING (HEIGHT = 3'-6") shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the railings, complete in place, as specified in these Technical Specifications and in conformance with the details shown on the plans, and as directed by the Engineer. Full compensation for connecting the metal railing (height = 3'-6") to the wing walls shall be considered as included in the price paid for METAL RAILING (HEIGHT = 3'-6") work and no additional compensation will be allowed therefor.

- ITEM 523.90001: HEADWALL, SPECIAL DETAIL (H1)
- ITEM 523.90002: HEADWALL, SPECIAL DETAIL (H2)
- ITEM 523.90003: HEADWALL, SPECIAL DETAIL (H3)
- ITEM 523.90004: MODIFIED MAG STD. DET 501-3 HEADWALL, SPECIAL DETAIL (H4)
- ITEM 523.90005: HEADWALL, SPECIAL DETAIL (H5)
- ITEM 523.90006: HEADWALL, SPECIAL DETAIL (H6)
- ITEM 523.90007: MODIFIED MAG STD. DET. 501-3 HEADWALL, SPECIAL DETAIL (H7)
- ITEM 523.90008: MODIFIED MAG STD. DET. 501-3 HEADWALL, SPECIAL DETAIL (H8)
- ITEM 523.90009: MODIFIED MAG STD. DET. 501-3 HEADWALL, SPECIAL DETAIL (H9)

General

The work included under this item shall consist of constructing the concrete headwalls and trash racks at the locations and in conformance with the details shown on the plans and as specified in these Technical Specifications and as directed by the Engineer.

Materials

The materials for the concrete headwalls shall be in accordance with the requirements of Section 505, "Concrete Structures," Section 725, "Portland Cement Concrete," and Section 727, "Steel Reinforcement," of the Uniform Standard Specifications and these Technical Specifications.

Structural concrete for the concrete headwalls shall be Class "A" Concrete in conformance with the requirements of Section 725, "Portland Cement Concrete," of the Uniform Standard Specifications and these Technical Specifications.

Construction Requirements

Construction of the concrete headwalls shall be in accordance with the requirements of Section 505, "Concrete Structures" of the Uniform Standard Specifications and these

Technical Specifications.

Measurement and Payment

The contract unit price paid per EACH for HEADWALL, SPECIAL DETAIL or MODIFIED MAG STD. DET. 501-3 HEADWALL, SPECIAL DETAIL of type indicated on the plans shall include structure excavation and backfill, furnishing and placing reinforcing and cast in place concrete and furnishing and placing trash racks as required in these Technical Specifications and shown on the plans.

ITEM 531.00001 STAIN (NATINA)

GENERAL

The work included under this item shall consist of applying Natina stain to galvanized metals, concrete items and grouted rip-rap, in conformance with the details shown on the plans and as specified in these Technical Specifications, and as directed by the Engineer.

MATERIALS

For use on galvanized steel surfaces, use "Natina Steel".

For use on exposes rock faces, use "Natina Concentrate 500".

For use on seatwalls and parking curb stops use "Natina Concrete"

CONSTRUCTION REQUIREMENTS

Apply stain to the following areas/ materials:

- Galvanized steel posts and panels (both sides) of Wayfinding Signage
- Seatwalls at Discovery Point and Campsites
- Parking Curb Stops
- Grouted Rip Rap at Culverts

Apply stain in the densities necessary to impart the density of color necessary. Contractor shall provide three different sample densities/ colors for review by Owner. Approved density will be the model for future applications of this product.

Weather Conditions shall follow MAG 530.3.

Application shall be per MAG 530.4, *revised to add:*

Use only spray or dip application techniques.

Protection of Work shall be per MAG 530.6.

Safety Precautions per MAG 530.7

Surface Preparations shall be per MAG 530.8 unless directly contradicted by manufacturer requirements, in which case the manufacturer's requirements apply.

MEASUREMENT AND PAYMENT

Stain (Natina) will be measured by the square foot from end to end along the face of the area, including curb and wall ends. The measurement shall be made along the face of the rail elements without allowance for overlap.

The contract unit price paid per SQUARE FOOT for STAIN (Natina) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in staining the grouted rip rap, parking curb stop, seatwalls, and Wayfinding Signs, complete in place, as specified in these Technical Specifications and in conformance with the details shown on the plans, and as directed by the Engineer. Full compensation for application of Stain (Natina) shall be considered as included in the price paid for Stain (Natina) and no additional compensation will be allowed therefor.

PART 600 – WATER, SEWER, STORM DRAIN AND IRRIGATION

SECTION 601 TRENCH EXCAVATION, BACKFILLING AND COMPACTION

601.2.3 Trench Grade for Pipe Placement: *is modified to add:*

Grade stakes will not be provided for pipe installation, the Contractor shall perform all staking for pipe installation.

601.4.3 Backfill: *is modified to add:*

Backfill material for pipes, pipe-arches, or arches made of metal shall have a value of resistivity not less than 2000 ohm-cm or of the value shown on the project Plans. When resistivity is not shown on the Plans, the backfill material shall have a value of resistivity not less than that of the existing in-place material or 2000 ohm-cm, whichever is less. Backfill material for all metal pipe installations shall have a pH value between 6.0 and 9.0 inclusive. Backfill material for all concrete or plastic pipe installations shall have a pH value between 6.0 and 12.0. Tests for pH and resistivity shall be in accordance with the requirements of Arizona Test Method 236.

“T-Top” backfill, pavement and surface replacement, as shown on MAG Standard Detail 200, shall be used for all mainline pipe installations across major, collector, or other signalized intersections. At a minimum, the extent of the “T-Top” backfill shall be from curb-return-to-curb-return through the intersection, unless noted otherwise on the plans or in the special provisions. “T-Top” backfill, pavement and surface replacement shall also be used for all lateral pipe connections in ALL streets. Type “A” backfill, as shown on MAG Standard Detail 200, may be used at all other locations, unless noted otherwise on the plans or in the Technical Specifications.

601.4.4 Compaction Densities: *is modified to add:*

In-place density shall be determined by ASTM D-1556 (sand cone) or ASTM D-2922. The procedure specified in ASTM D-1556 shall be used for rock correction.

601.4.5 Compaction Methods: *is modified to add:*

Water consolidation by flooding or by jetting shall not be allowed. Compaction methods that may be used include tampers, rollers or other equipment approved by the Construction Manager.

SECTION 615 SEWER LINE CONSTRUCTION

615.1 Description: *is modified to add*

Work shall include all materials, equipment, and labor in order to construct an operational on-site disposal system. Work includes, but is not limited to, all materials, equipment, and labor for, new pipe including all fittings, trenching and backfilling, distribution boxes, cleanouts, filter fabric, septic tank, and adherence to the bed disposal method installation requirements listed in Section R18-9-E302.4.02 of the Arizona Revised State Statute and other requirements and work as shown on the project plans.

Work also includes all work, coordination, and paying all prevailing fees associated with permitting including completion of the Maricopa County Phase I Application and all other required applications.

The Contractor shall thoroughly satisfy himself to the permit requirements and the associated work which includes, but is not limited to, coordination with Maricopa County Environmental Services Department (MCESD), submission of information and documents and applications, and final testing/inspections as required by MCESD and the MAG Standard Specifications.

615.14 Measurement and Payment: *is modified to add*

(D) Septic System and Leach Field:

Measurement and Payment for septic system and leach field will be made by the lump sum and shall include all materials, equipment, and labor to construct and permit a functioning on-site disposal system as indicated in these Specifications, shown on the project plans, and per local City, County, and State requirements. No payment for work will be made until work is complete, all permits completed and in place, and final inspection performed, and the system is found to be functioning properly.

ITEM 615.00001	SEPTIC SYSTEM & LEACH FIELD	LUMP SUM
-----------------------	--	-----------------

SECTION 618 STORM DRAIN CONSTRUCTION

618.7 Payment: *is modified to add:*

(D) Staff Gauge: No direct measurement and payment shall be made for installing a staff gauge as per detail shown in the plans. Payment is incidental to the cost of installing culvert 8.

SECTION 795 LANDSCAPE MATERIALS

- 795.2** **TOPSOIL:** *is removed, refer to ITEM 426.00001 DESERT PAVEMENT*
- 795.6** **SEEDS:** *is removed, refer to ITEM 430.00004 REVEGETATION SEED*
MIX
- 795.8.4** **Decomposed Granite:** *is removed, refer to ITEM 426.00001 DESERT*
PAVEMENT