SCOTTSDALE AIRPORT

Project Specifications
for
PERIMETER ROAD REHABILITATION PROJECT

ADOT No. E2S4Y01C
City Project No. AI03A City
Bid No. IFB-032023-071

Prepared for:

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DATE SIGNED 10.11.2022
ARIZONA U.S.A.

October 2022

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CIVIL SPECIFICATIONS

PROJECT-SPECIFIC MAG SPECIFICATION ADJUSTMENTS

MAG Standard Section 101, Abbreviations and Definitions

- Adjust per City of Scottsdale Supplement to MAG.

MAG Standard Section 102, Bidding Requirements and Conditions

- Adjust per City of Scottsdale Supplement to MAG.
- "Engineer" shall refer to the Project Engineer, not a City of Scottsdale representative.
- "Inspector" shall refer to the "Resident Project Representative".

MAG Standard Section 103, Award and Execution of Contract

- Adjust per City of Scottsdale Supplement to MAG.

MAG Standard Section 105, Control of Work

- Adjust per City of Scottsdale Supplement to MAG.

MAG Standard Section 106, Control of Materials

- Adjust per City of Scottsdale Supplement to MAG.

MAG Standard Section 107, Legal Regulations and Responsibility to Public

- Adjust per City of Scottsdale Supplement to MAG.

MAG Standard Section 108, Commencement, Prosecution, and Progress

- Adjust per City of Scottsdale Supplement to MAG.

MAG Standard Section 321, Placement and Construction of Asphalt Concrete Pavement

- Adjust per City of Scottsdale Supplement to MAG.
- MAG Detail 201 is not required for this Project.

MAG Standard Section 321, Placement and Construction of Asphalt Concrete Pavement, Item 321.2 "Materials and Manufacture"

- Remove all reference to Warm Mix Asphalt (WMA) technologies. For clarity, WMA is NOT allowed.

MAG Standard Section 321, Placement and Construction of Asphalt Concrete Pavement, Item 321.4 "Application of Tack Coat"

- The grade of emulsified asphalt shall be SS-1h. Remove "or CSS-1h".

MAG Standard Section 321, Placement and Construction of Asphalt Concrete Pavement, Item 321.5 "Materials and Manufacture"

- Remove all reference to Warm Mix Asphalt (WMA) technologies. For clarity, Warm Mix Asphalt may NOT be used.

MAG Standard Section 321, Placement and Construction of Asphalt Concrete Pavement, Item 321.6 "Mix Production"

- In the sixth paragraph, the completed asphalt concrete may be held in storage for up to 8 hours. For clarity, 12 hours of storage will not be permitted.

MAG Standard Section 321, Placement and Construction of Asphalt Concrete Pavement, Item 321.10.5.2 "Pavement Greater than 1-1/2 Inches"

- In the third paragraph, replace the first sentence with the following: "The Engineer will designate 2 random test locations for each sublot and the quality control laboratory will collect the cores from the sublot for additional acceptance testing."

MAG Standard Section 337, Asphalt Pavement Crack Sealing and Filling

- Material for all crack seal shall meet section 337.2.1 for Category 1 Cracks.

MAG Standard Section 702, Base Materials, Item 702.2.1

- Base material shall be in accordance with the "aggregate base course" gradation specified in Table 702-1.

MAG Standard Section 710, Asphalt Concrete

- Adjust per City of Scottsdale Supplement to MAG.
- Asphalt mix design shall be a Marshall mix design, type "R".

MAG Standard Section 710, Asphalt Concrete, 710.1, 710.3.2.1, and 710.3.2.2

- 1/2-inch Mix shall be used for asphalt concrete.

MAG Standard Section 710, Asphalt Concrete, 710.2.3

- Remove all reference to Reclaimed Asphalt Pavement (RAP). For clarity, RAP is NOT allowed.

MAG Standard Section 711, Paving Asphalt, 711.2

- Performance grading system shall be in accordance with PG 70-10, as specified in Table 711-1.

MAG Standard Section 713, Emulsified Asphalt Materials, 713.3

- The grade of emulsified asphalt shall be in accordance with SS-1h, as specified in Table 713-1.

MAG Standard Section 796, Geosynthetics, 796.2.4

- Specification section 796.2.1, 796.2.2, and 796.2.3 are not relevant to this project.
- The geogrid shall be in accordance with Type 2, as specified in Table 796-4.

END OF ITEM

PART 1

STANDARD SPECIFICATIONS

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SECTION 101

ABBREVIATIONS AND DEFINITIONS

101.1 ABBREVIATIONS:

Wherever the following abbreviations are used in these specifications, standard details or on the plans, they are to be constructed the same as the respective expressions represented.

AASHTO	American Association of State Highway and Transportation Officials
AAN	American Association of Nurserymen
AB	Aggregate base
Aban	Abandon
ABC	Aggregate base course
AC	Asphalt cement or concrete
ACB	Asphalt concrete base
ACI	American Concrete Institute
ACP	Asbestos cement pipe
ACPA	American Concrete Pipe Association
ACWS	Asphalt concrete wearing surface
AFRB	Arizona Fire Rating Bureau
AGC	Associated General Contractors of America, Inc.
Agg	Aggregate
ADOT	Arizona Department of Transportation
ADA	Americans With Disabilities Act of 1990
ADEQ	Arizona Department of Environmental Quality
Ahd	Ahead
AIA	American Institute of Architects
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
APA	American Plywood Association
Approx	Approximate
APWA	American Public Works Association
AR	Aged residue
ARAC	Asphalt-Rubber Asphalt Concrete
ARIZ	Arizona Department of Transportation Test Method
	Arizona Revised Statutes
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing Materials
Ave	Avenue
AWPA	American Wood Preservers Association
AWSC	American Welding Society Code
AWWA	American Water Works Association
Bbl	Barrel
BC	Beginning of curve
BCR	Beginning of curb return
Beg	Beginning
Bk	Book or Back
Blvd	Boulevard
BM	Bench Mark or Board Measure
Brg	Bearing
BST	Bituminous Surface Treatment
BTB	Bituminous Treated Base
BTU	British Thermal Units
BVC	Beginning of vertical curve
C	Centigrade or Curb
CB	Catch Basin
CBF&C	Catch basin frame & cover
CC or C/C	Center to Center
CE	City or County Engineer
Cem	Cement
CF	Curb face
cfs	Cubic Feet per Second
CIP	Cast Iron Pipe
CIPP	Cast-in-place concrete pipe
CL or C	Centerline
CLR	Clear
Cm	Centimeter
CMP	Corrugated metal pipe
CO	Clean out
Col	Column
Conc	Concrete
Const	Construct
CP	Concrete pipe (non-reinforced)
CTB	Cement Treated Base
Cu	Cubic
Deg	Degree
DF	Douglas Fir
DG	Decomposed granite
Dia	Diameter
Dim	Dimension
DIP	Ductile Iron Pipe
Div	Division
Dr	Drive
Drwg	Drawing
Dwy	Driveway
Ea	Each
Ease	Easement
E	East
EC	End of curve
ECR	End of curb return
El or Elv	Elevation
Equa or Eq	Equation
EVC	End of vertical curve
Ex or Exist	Existing
F	Fahrenheit
FB	Field book
F & C	Frame & cover
FH	Fire hydrant
FL or F	Floor line or flow line

Fl El	Floor Elevation
Fnd	Found
fps	Feet per second
FS	Finished surface
FSS	Federal Specifications and Standards
Ft	Foot or feet
G	Gutter
Ga	Gage
Galv	Galvanized
GL	Ground line
Gpm	Gallons per minute
Gr	Grade
H	High or height
HC	House connection
HH	Hand Hole
Hdwl	Headwall
Horiz	Horizontal
Hwy	Highway
ICA	Industrial Commission of Arizona
ID	Improvement District or inside diameter
IE	Invert Elevation
IEEE	Institute of Electrical and Electronic Engineers
In	Inch
Inv	Invert
IP	Iron Pipe
IPS	Iron Pipe Size
Irrig	Irrigation
Jt	Joint
JC	Junction Chamber
Jct	Junction
JS	Junction Structure
L	Length
Lb	Pound
L&T	Lead and Tack
LD	Local Depression
LF	Linear Feet
LH	Lamp Hole
Lin	Linear
Long	Longitudinal
Lt	Left
M	Map or Maps
MAG	Maricopa Association of Governments
Max	Maximum
MCR	Maricopa County Records
Meas	Measured
MH	Manhole
MHF&C	Manhole Frame and Cover
Min	Minutes or Minimum
Misc	Miscellaneous
ML or M	Monument Line
mm	Millimeter
Mon	Monolithic or monument
MTD	Multiple Tile Duct
N	North
NBS	National Bureau of Standards
NCPI	National Clay Pipe Institute
NE	Northeast
NEC	National Electric Code
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
NP	Non-Plastic
NPI	Non pay item
NSC	National Safety Council
NSF	National Sanitation Foundation
NTS	Not to Scale
NW	Northwest
No	Number
OC	On Center
OD	Outside Diameter
Oz	Ounces
PC	Point of Curvature
PCC	Point of Compound Curve or Portland Cement Concrete
PI	Point of Intersection or Plastic Index
PL	Property Line
POC	Point of Curve
POS	Point of Spiral
PP	Power Pole
ppm	Parts per million
PRC	Point of Reverse Curve
Prod	Produced
Prop	Proposed or Property
psi	Pounds per square inch
psf	Pounds per square foot
PT or POT	Point of Tangent
P&TP	Power and Telephone Pole
Pvmt	Pavement
Q	Rate of flow
R	Radius
RC	Reinforced Concrete
RCP	Reinforced Concrete Pipe
Rd	Road
Rdwy	Roadway
Reinf	Reinforced, Reinforcing
Ret Wall	Retaining Wall
RGRCP	Rubber Gasket Reinforced Concrete Pipe
rpm	Revolutions Per Minute
Rt	Right
R/W	Right-of-way
S	South or Slope
SAE	Society of Automotive Engineers
San	Sanitary
SC	Spiral to Curve
SCCP	Steel Cylinder Concrete Pipe
SD	Storm Drain or Sewer District
Sdl	Saddle

Sec	Seconds
Sect	Section
SE	Southeast
Sht	Sheet
Spec	Specifications
SPR	Simplified Practice Recommendation
Sp MH	Special Manhole
Sq Ft Yd	Square Foot, Yard
SS	Sanitary Sewer
St	Street
Sta	Station
Std	Standard
Str gr	Structural grade
Struct	Structure or structural
SW	Southwest
SWPPP	Stormwater Pollution Prevention Plan
T	Tangent Distance
Tel	Telephone
Temp	Temporary
TH	Test Hole
TP	Telephone pole
Tr	Tract
Trans	Transition
TS	Traffic signal or Tangent to spiral
TSC	Traffic signal conduit
Typ	Typical
UL	Underwriters' Laboratories Inc.
USC & GS	United States Coast and Geodetic Survey
USGS	United States Geological Survey
V	Velocity of flow
VC	Vertical curve
VCP	Vitrified clay pipe
Vert	Vertical
W	West or width
WI	Wrought iron
WS	Wearing surface
Wt	Weight
Yd	Yard
'	feet or minutes
"	inches or seconds
°	degrees
%	percent
#	number or pound
@	at
/	per
=	equals

101.2 DEFINITIONS AND TERMS:

Whenever in these specifications or in other contract documents the following terms or pronouns in place of them are used, the intent and meaning shall be interpreted as follows:

Addendum: A supplement to any of the Contract Documents issued, in writing, after advertisement of but prior to the opening of bids for a contract.

Advertisement: The public announcement, as required by law, inviting bids for work to be performed or materials to be furnished.

Agency: The governmental agency for which the construction is being done, either by permit or by contract.

Architect: The individual or firm who has accomplished the architectural services for the project, including his representatives.

Arizona Test Method: Arizona Department of Transportation Materials Testing Manual test method.

Award: The formal action of the governing body is accepting a proposal.

Backfill: Material placed in an excavated space to fill such space. For trenches, see definitions for Initial Backfill and Final Backfill.

Base Course: The upper course of the granular base of a pavement or the lower course of an asphalt concrete pavement structure.

Bedding: A material layer placed on top of the trench foundation to the bottom of the pipe, typically 4-6 inches in height. The bedding establishes the line and grade for a conduit and provides support that is firm, but not hard.

Bidder: Any qualified individual, firm, partnership, corporation or combination thereof, acting directly or through a duly authorized representative who legally submits a proposal for the advertised work.

Board of Supervisors: The Maricopa County Board of Supervisors acting under the authority of the laws of the State of Arizona.

Bond Issue Project: A project financed from bonds issued by the City or County pledging credit or a revenue resource.

Bridge: A structure, including supports, erected over a depression or an obstruction, as water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads and having a length measured along the center of roadway of more than 20 feet between undercopings of abutments or extreme ends of openings for multiple boxes.

(Length) The length of a bridge structure is the over-all length measured along the line of survey stationing back to back of backwalls of abutments, if present, otherwise end to end of the bridge floor; but in no case less than the total clear opening of the structure.

(Roadway Width) The clear width measured at right angles to the longitudinal centerline of the bridge between the bottom or curbs or guard timbers or in the case of multiple heights of curbs, between the bottoms of the lower risers.

Budget Project: A project financed by funds from General Tax levies and shared revenue funds set aside in the annual budget adopted by the Council or Board of Supervisors.

Building: Any structure built for the support, shelter, or enclosure of persons, animals, chattel or movable property.

Building Code: A regulation adopted by the governing body establishing minimum standards of construction for the protection of the public health, safety, and welfare in terms of measured performance rather than in terms of rigid specification of materials and methods.

Calendar Day: Every day shown on the calendar.

Call for Bids: The standard forms inviting proposals or bids.

"Careful and prudent manner": means conducting excavation in such a way that when it approaches within twenty-four inches of the underground facility located and marked by the owner or operator, by stakes, paint or in some customary manner, the exact location is manually determined, and the uncovered facility is supported and protected.

Change Order: A written order issued by the Engineer to the Contractor to make changes in the work or to perform extra work, and setting forth conditions for payment and/or adjustment in time of completion.

City: A municipal corporation, organized and existing under and by virtue of the laws of the State of Arizona.

City/County Clerk: The duly authorized person who performs the duties of clerk for the Contracting Agency.

Completion Time: The number of calendar days for completion of an act, including authorized time extensions. In case a calendar date of completion is shown in the proposal in lieu of the number of calendar days, the contract shall be completed by that date. The time within which an act is to be done shall be computed by excluding the first and including the last day; and if the last day be Sunday or a legal holiday, that shall be excluded.

Conflicting Utility: An existing utility, shown or not shown on the plans is conflicting when any part of the utility falls within the dimensions of the new installation, such that it would be in physical contact with the new installation.

Construction Project: The erection, installation, remodeling, alteration, of durable facilities upon, under, or over the ground. This shall include, but is not limited to buildings, roadways and utility pipes, lines, poles or other structures.

Contingent Bid Item: This is a minor bid item, which is likely, but not certain, to occur during the course of work. If the Engineer determines that this work is required, the Contractor will accomplish the work and payment will be made based on the contingent unit bid price included in the proposal. Since the quantity listed in the proposal is primarily for bid comparison, the amount of work required by the Engineer may vary materially from this.

Contract: The written instrument executed by the Contractor and the Contracting Agency by which the Contractor is bound to furnish all labor, equipment, and materials and to perform the work specified, and by which the Contracting Agency is obligated to compensate the Contractor therefore at the prices set forth therein. The Contract Documents are herewith by reference made a part of the contract as if fully set forth therein.

Contract Documents: All the integral documents of the contract, including but not limited to, Call for Bids, Plans, Standard Specifications and Details, Special Provisions, Proposal, Addenda, Performance Bond, Payment Bond, Certificates of Insurance, Ordinance, Contract, and Change Orders.

Contracting Agency: The legal entity that has contracted for the performance of the work or for whom the work is being performed.

Contractor: The individual, firm, partnership, corporation or combination thereof entering into a contract with the Contracting Agency to perform the advertised work.

Council: The City Council, which by law constitutes the Legislative Department of the City.

County: Maricopa County, organized and existing under and by virtue of the laws of the State of Arizona.

Culvert: Any structure not classified as a bridge, which provides an opening under or adjacent to the roadway.

Days: Unless otherwise designated, days will be understood to mean calendar days.

Deflection: The amount the certified mean inside diameter (CMID) of pipe has reduced under load, as applied to thermoplastic pipe. Deflection is expressed as a percentage reduction in the CMID.

Emergency: Unforeseen occurrences and combinations of circumstances involving the public welfare or the protection of work already done under the Contract Documents, or which endanger life or property and call for immediate action or remedy.

Engineer: The person, appointed as City or County Engineer by the Council or the Board of Supervisors, acting directly or through his duly authorized representative.

Equipment: (Construction) — All machinery and equipment, together with the necessary supplies for upkeep and maintenance, and also tools and apparatus necessary for the proper construction and acceptable completion of work. (Installed) — All material or articles used in equipping a facility as furnishings or apparatus to fulfill a functional design.

Extra Work: An item of work not provided for in the contract as awarded but found essential to the satisfactory completion of the contract within its intended scope.

Final Backfill: The material placed in a trench above the initial backfill to the top of the trench or to the bottom of the road base material.

Flooding: Flooding will consist of the inundation of the entire lift with water, puddle with poles or bars to insure saturation of the entire lift.

Force Account Work: Work done by personnel of the Contracting Agency as in-house work.

Foundation: For buildings or structures, this will be the substructure. For a trench, the foundation is the bottom of the required trench excavation. The foundation surface is either native material, or replacement material when unsuitable material occurs, and is removed and replaced at the bottom of the required trench excavation.

Full Depth Pavement: An asphalt concrete pavement structure in which the granular base and subbase are replaced by proportionate thicknesses of asphalt concrete.

Haunching: The area of a pipe trench between the bottom of the pipe and the springline of the pipe.

Improvement District Project: A project financed by assessments against the property included in a special assessment district authorized under, or implemented by an act of the legislature of the State and/or a procedural ordinance of the City or County.

Initial Backfill: The material placed in a trench between the springline and 12 inches above the crown of the conduit.

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

Jetting: Jetting is the densification of material, using a continuous supply of water, under pressure, transmitted to the material through a rigid pipe of sufficient length to reach the bottom of the lift being densified. In all cases, the entire lift will be completely saturated working from the top to the bottom.

Laboratory: The established materials testing laboratory of the Contracting Agency's Engineering Department, or other laboratories acceptable to and/or authorized by the Engineer to test materials and work involved in the Contract.

Major Item: A major item shall be the total of any item of work and/or materials specified in the bid schedule that exceeds the amount established in Table 109-1.

Materials: Any substance specified in the project, equipment and other material used or consumed in the performance of the work.

Median: The portion of a divided highway separating the roadways used by traffic going in opposite directions.

Non Pay Item: An item of work for which no separate payment will be made under the proposal, but which must be included as an incidental cost for payment on an associated item included in the proposal.

Notice of Award: A letter from the City or County Clerk advising the Contractor that he is the successful bidder and the Council or Board of Supervisors has accepted his proposal.

Notice to Proceed: A directive issued by the Engineer, authorizing the Contractor to start the work or improvements required in the Contract.

Obligee: One to whom another is obligated.

Open Trench: The excavated area shall be considered as open trench until all the aggregate base course for pavement replacement has been placed and compacted or, if outside of a pavement area, until the excavated area is brought to finish grade or natural grade.

Owner: The City or County, acting through its legally constituted officials, officers or employees.

Pavement: Any surfacing of streets, alleys, sidewalks, courts, driveways, etc., consisting of mineral aggregate bound into a rigid or semi-rigid mass by a suitable binder such as, but not limited to, Portland cement or asphalt cement.

Pavement Structure: The combination of subbase, base course, and surface course placed on a subgrade to support the traffic load and distribute it to the roadbed.

Pay Item: A detail of work for which separate payments are to be made under the Contract, as specified in the proposal.

Payment Bond: The security provided by the Contractor solely for the protection of claimants, supplying labor and materials to the Contractor or his Subcontractors.

Performance Bond: The security provided by the Contractor solely for the protection of the Contracting Agency and conditioned upon the faithful performance of the contract in accordance with the plans, specifications and conditions thereof.

Permit: The license to do construction in public rights-of-way and/or easements; issued by an Agency to a Contractor working for another party.

Pipe Embedment Zone: The area of a trench consisting of the bedding, haunching, and initial backfill areas.

Plans: All approved drawings or reproductions thereof pertaining to the work and details therefore, which are made a part of the Contract Documents.

Plant: The Contractor's and/or subcontractor's facilities, including but not limited to small tools and mobile equipment, located on and/or offsite, necessary for preparation of materials and prosecution of work for the project.

Principal: The individual, firm or corporation primarily liable on an obligation, as distinguished from a surety.

Professional Engineer: A person who has a current engineering registration granted by the Arizona State Board of Technical Registration in one or more branches of engineering recognized by the board.

Profile Grade: The trace of a vertical plan intersecting the top surface of the proposed wearing surface, usually along the longitudinal centerline of the roadbed. Profile grade means either elevation or gradient of such trace according to the context.

Project: A specific coordinated construction or similar undertaking identified by a single project number and bid and awarded as one contract. On occasion two or more projects may be bid and awarded as a single contract.

Proposal: The offer of a bidder on the prescribed form, to perform the work and to furnish the labor and materials at the prices quoted.

Proposal Form: The approved form on which the Contracting Agency requires bids to be prepared and submitted for the work.

Proposal Guarantee: The security furnished with a bid to guarantee that the bidder will enter into the contract if his bid is accepted.

Proposal Pamphlet: The book or pamphlet pertaining to a specific project, containing proposal forms, special provisions and other information necessary for and pertinent to the preparation of the proposal or bid.

Referred Documents: On all work authorized by the Contracting Agency, any referenced documents in the specification, i.e., Bulletins, Standards, Rules, Methods of Analysis or test. Codes and Specifications of other Agencies, Engineering Societies or Industrial Associations, refer to the Latest Edition thereof, including Amendments, which are in effect and published at the time of Advertising for Bids or the issuing of a permit for the work, unless otherwise stated.

Right-of-way: A general term denoting land, property, or interest therein, usually in a strip acquired for or devoted to a street, highway, or other public improvement.

Road: A general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way.

Roadside: A general term denoting the area adjoining the outer edge of the roadway. Extensive areas between the roadways of a divided highway may also be considered roadside.

Roadside Development: Those items necessary to the complete roadway which provide for the preservation of landscape materials and features; the rehabilitation and protection against erosion of all areas disturbed by construction through seeding, sodding, mulching and the placing of other ground covers; such suitable planting and other improvements as may increase the effectiveness and enhance the appearance of the roadway.

Roadway: The portion of the right-of-way intended primarily for vehicular traffic, and including all appurtenant structures and other features necessary for proper drainage and protection. Where curbs exist, it is that portion of roadway between the faces of the curbs.

Sewers: Conduits and related appurtenances employed to collect and carry off water and waste matter to a suitable point of final discharge.

Shop Drawings: Drawings or reproduction of drawings, detailing; fabrication and erection of structural elements, falsework and forming for structures, fabrication of reinforcing steel, installed equipment and installation of systems, or any other supplementary plans or similar data, which the Contractor is required to submit for approval.

Shoulder: The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of base and surface courses.

Sidewalk: That portion of the roadway primarily constructed for the use of pedestrians.

Special Provisions: The special conditions, requirements, additions, and/or revisions to the Standard Specifications, applicable to the work, to cover conditions or requirements peculiar to the project under consideration.

Specifications: The descriptions, directions, provisions, and requirement for performing the work as contained in the Contract Documents.

Standard Details: Uniform detail drawings of structures or devices adopted as Standard Details by the Engineer.

Standard Specifications: Uniform general specifications adopted as Standard Specifications by the Engineer.

Springline: The vertical location having a maximum horizontal dimension or in box sections, the mid-height of the vertical wall.

Storm Drain: Any conduit and appurtenance intended for the reception and transfer of storm water.

Street: Streets, avenues, alleys, highways, crossings, lanes, intersections, courts, places, and grounds now open or dedicated or hereafter opened or dedicated to public use and public ways.

Structures: Bridges, culverts, catch basins, drop inlets, retaining walls, cribbing, manholes, end walls, sewers, service pipes underdrains foundation drains, fences, swimming pools, and other features which may be encountered in the work and not otherwise classed herein.

Subbase: The lower course of the base of a roadway, immediately above the subgrade.

Subcontractors: Those having direct contracts with the Contractor and those who furnish material worked into a special design according to the Plans and Specifications for the work, but not those who merely furnish material not so worked.

Subgrade: The supporting structures on which the pavement and its special undercourses rest.

Substructure: All of that part of the structure or building below the bearings of simple and continuous spans, skewbacks of arches and tops of footings of rigid frames, together with the backwalls, wingwalls and wing protection railings.

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

Superintendent of Streets: The person duly appointed by the Council of the Contracting Agency, as provided by the Arizona Revised Statutes.

Superpave Mix: Asphalt mix in compliance with the Gyratory Mix design requirements of Section 710.3.2.2.

Superstructure: The entire structure or building except the substructure.

Supplemental Specifications: Additions and revisions to the Standard Specifications that are adopted subsequent to issuance of the printed book.

Supplementary General Conditions: Requirements, or revisions, to the Standard General Conditions, applicable to the work, and to cover conditions or requirements peculiar to the project under consideration.

Surety: The individual, firm or corporation, bound with and for the Contractor for the acceptable performance, execution, and completion of the work, and for the satisfaction of all obligations incurred.

Surface Course: The finished or wearing course of an asphalt concrete pavement structure.

Thermoplastic: A material, usually a plastic polymer, which becomes more soft when heated and hard when cooled, used in the production of various pipe products including high-density polyethylene (HDPE), polypropylene (PP), polyvinyl chloride (PVC) and steel-reinforced polyethylene (SRPE) pipes.

Title or Headings: The titles or headings of the sections and subsections herein are intended for convenience of reference and shall not be considered as having any bearing on their interpretation.

Township, City, Town or District: A subdivision of the County used to designate or identify the location of the proposed work.

Traveled Way: The portion of the roadway for the movement of vehicles, exclusive of shoulders and auxiliary lanes.

"Underground Facility": means any item which shall be buried or placed below ground for use in connection with the storage or conveyance of water, sewage, electronic, telephone or telegraphic communications, electric energy, oil, gas or other substances, and shall include, but not be limited to pipes, sewers, conduits, cables, valves, lines, wires, manholes, attachments and those portions of poles and their attachments below ground.

Utility: Pipe lines, conduits, ducts, transmission lines, overhead or underground wires, railroads, storm drains, sanitary sewers, irrigation facilities, street lighting, traffic signals, and fire alarm systems, and appurtenances of public utilities and those of private industry, businesses or individuals solely for their own use or use of their customers which are operated or maintained in, on, under, over or across public right-of-way or public or private easement.

Waterworks (Water Supply System): The reservoirs, pipe lines, wells, pumping equipment, purification works, mains, service pipes, and all related appliances and appurtenances utilized in the procurement, transportation and delivery of an adequate, safe, and palatable water supply for the Contracting Agency.

Work: Any or all of the improvements mentioned and authorized to be made, and the construction, demolition, reconstruction, and repair of all or any portion of such improvements, and all labor, services, incidental expenses, and material necessary or incidental thereto.

Working Day: A calendar day, exclusive of Saturdays, Sundays, and Contracting Agency recognized legal holidays, on which weather and other conditions not under the control of the Contractor will permit construction operations to proceed for the major part of the day with the normal working force engaged in performing the controlling item or items of work, which would be in progress at that time.

101.3: In order to avoid cumbersome and confusing repetition of expressions in these specifications, it is provided that whenever anything is, or is to be, done, if, as, or, when, or where contemplated required, determined, directed, specified, authorized, ordered, given, designated, indicated, considered necessary, deemed necessary, permitted, reserved, suspended, established, approval, approved, disapproved, acceptable, unacceptable, suitable, accepted, satisfactory, unsatisfactory, sufficient, insufficient, rejected, or condemned, it shall be understood as if the expression were followed by the words by the Engineer or to the Engineer.

- End of Section -

SECTION 102

BIDDING REQUIREMENTS AND CONDITIONS

102.1 ELIGIBILITY AND PREFERENCE:

The employment of Contractors and Subcontractors on Public Works shall be governed by the provisions of Section 34-241 of the Arizona Revised Statutes.

102.2 CONTENTS OF PROPOSAL PAMPHLET:

The prospective bidder may examine and/or purchase plans, special provisions, and proposal pamphlets at the Engineering Office of the Contracting Agency advertising for bids.

The proposal pamphlet will state the location of the contemplated construction; give the description of the various quantities of work to be performed or materials to be furnished, and have a bid schedule of pay items for which unit bid prices are invited. In addition, it will state the form and amount of the proposal guarantee, the time in which the work shall be completed and include additional instructions not included in these specifications.

The plans, the standard specifications, the standard details, the special provisions, the contracting agency's supplements and all supplementary documents are essential parts of the contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work. In a case of a discrepancy or conflict, the order in which the various documents shall govern is as follows from highest to lowest: addenda, special provisions, plans, agency's supplements to the standard specifications, agency's supplements to the standard details, standard specifications and standard details.

Each and every provision of law and clause required by law to be inserted in the contract shall be deemed to be inserted herein, and the contract shall be read and enforced as though it were included herein.

102.3 INTERPRETATION OF QUANTITIES IN PROPOSAL:

The quantities appearing in the proposal are approximate only and are to be used for the comparison of bids. Payment to the Contractor will be made only for the actual quantities of work performed and accepted or materials furnished in accordance with the contract at the unit bid price in the proposal.

After the contract is awarded the quantities of work listed by any pay item, or all pay items, may be increased or decreased a reasonable amount at the discretion of the Contracting Agency, without in any way invalidating the unit bid price.

102.4 EXAMINATION OF PLANS, SPECIAL PROVISIONS AND SITE OF WORK:

The Contracting Agency will prepare plans and special provisions in accordance with acceptable engineering standards, giving such direction as will enable any competent Contractor to carry them out.

The bidder shall examine the site of the proposed work and all documents pertaining to the work. It is mutually agreed that the submission of a proposal shall be considered prima facie evidence that the bidder has made such examination and is familiar with the character, quality and quantity of the work to be performed and material to be furnished.

Logs of the test holes, ground water levels, and any accompanying soil reports as furnished by the Contracting Agency are furnished for general information only. The field condition so set forth shall not constitute a representation or warranty expressed or implied that such conditions are actually existent. Bidders shall make their own investigations and form their own estimates of the site conditions.

After the submission of the proposal, no complaint or claim that there was any misunderstanding as to the quantities, conditions or nature of the work will be entertained.

102.5 PREPARATION OF PROPOSAL:

The bidder shall submit his proposal on the forms obtained from the Contracting Agency. The bidder shall specify a unit bid price and extension in words, figures or both, whichever is required, for each pay item where units and approximate quantities are given.

The proposal total will be obtained by adding the extension amount or lump sum indicated for the individual pay items. If there is a conflict between words and figures, the words shall apply. If there is a conflict between the unit bid price and the extension for a particular pay item, the unit bid price shall govern. In either case, the Contracting Agency shall correct the discrepancy in accordance with the above procedure and the corrected proposal total will apply.

In addition, the following shall be completed by the bidder on the proposal:

(A) Acknowledge receipt of and agree that the proposal is based on the listed Addenda received with and/or after receipt of the proposal pamphlet.

(B) Note the bidders Arizona State Contractor's License number and classification.

(C) Signatures in ink and attested or witnessed as applicable.

102.6 SUBCONTRACTORS LIST:

When required, the List of Subcontractors form will be attached to the proposal pamphlet. The bidder shall submit this form with his proposal, in a separate sealed envelope, listing the firm name and business address of each specialty subcontractor to whom he proposes to subcontract any portion of the work. Only one name shall be listed for each category.

The bidder may list himself to perform one or more of the listed categories of work for which he has any requisite State licenses when required.

102.7 IRREGULAR PROPOSALS:

Proposals will be considered irregular and may be rejected for the following reasons:

(A) If the proposal is on a form other than that furnished by the Contracting Agency; or if the form is altered or any part thereof is detached.

(B) If there are unauthorized additions, statements, conditional or alternate bids, or irregularities of any kind.

(C) If the bidder adds any provisions reserving the right to accept or reject an award, or to enter into a contract pursuant to an award.

(D) If the proposal does not contain a unit price for each pay item listed except in the case of authorized alternate pay items.

(E) If, when required, the bidder fails to accomplish and submit the List of Subcontractors form.

102.8 PROPOSAL GUARANTEES:

No proposal will be read unless accompanied by a proposal guarantee in the proper amount and in the form provided in the proposal pamphlet. The guarantee shall be made payable and acceptable to the Contracting Agency as a guarantee that the bidder, if awarded the contract, will execute the contract documents and furnish the required bonds and certificates of insurance to be forfeited if the Contractor fails or refuses to enter into a contract as required by the bid documents.

The proposal guarantee shall be in the form of a certified check, cashier's check, or surety bond for ten percent of the amount of the bid. The surety bond shall be executed solely by a surety company or companies holding a certificate of authority to transact surety business in the State of Arizona issued by the Director of the Department of Insurance. The surety bond shall

not be executed by an individual surety or sureties. In addition, said company or companies shall be rated "Best A-" or better as required by the Contracting Agency, as currently listed in the most recent Best Key Guide, published by the A.M. Best Company.

102.9 SUBMISSION OF PROPOSAL:

The proposal and proposal guarantee shall be submitted in a sealed envelope. The outside, lower right-hand corner of which shall be marked as follows:

Bid of _____, Contractor
For _____
_____ Project No. _____Contracting Agency

Envelopes shall be mailed or delivered to the office of the Contracting Agency, and must be received before the time and date specified in the Call for Bids or any Addenda.

Proposals received after the time and date specified will be returned, unopened, to the bidder.

102.10 WITHDRAWAL OR REVISION OF PROPOSAL:

Any bidder may withdraw or revise a proposal after it has been deposited with the Contracting Agency, provided his request is received by the Contracting Agency, in writing or by telegram, before the time specified for opening proposals or as stipulated herein.

102.11 PUBLIC OPENING OF PROPOSALS:

Proposals will be opened and read publicly at the time and place specified in the Call for Bids or any Addenda. Bidders, their authorized agents and other interested parties are invited to be present.

When proposals for more than one project are to be opened at the same time, any bidder may, after the time set for the opening proposals, request to withdraw his second or succeeding proposal prior to the opening of proposals for that project. Should this occur, there will be a brief delay in the opening of proposals to permit the bidder to submit his request. Upon receipt of the bidder's written request, by the Contracting Agency, his proposal will be returned unopened.

102.12 DISQUALIFICATION OF BIDDERS:

Either of the following reasons may be considered as being sufficient for the disqualification of a bidder and the rejection of his proposal:

(A) Receipt of more than one proposal for the same work from an individual, partnership or corporation under the same or different names.

(B) Evidence of collusion among bidders or assistance from any officer of the Contracting Agency, or of any Department thereof.

102.13 SUCCESSFUL BIDDERS:

Unless otherwise specified in the proposal pamphlet, the successful bidder may obtain seven (7) sets of plans and special provisions, for the project from the Contracting Agency, at no cost.

- End of Section -

SECTION 103

AWARD AND EXECUTION OF CONTRACT

103.1 CONSIDERATION OF PROPOSALS:

After the proposals, for the contemplated work, have been opened and read as provided in these specifications, the respective totals will be checked and compared by the Contracting Agency. The basis of comparison will be to verify the accuracy of the total proposal by checking the extensions and additions. In the event of a discrepancy, in the amount bid for a pay item, the unit bid price will govern unless obviously in error. The results of such comparison will be considered public information.

The right is reserved to award the contract to the lowest and/or best responsible bidder, or to reject all proposals and to re-advertise for any reason the Contracting Agency determines.

In case all proposals are rejected, any subsequent changes, additions, addenda, or new sets of plans and special provisions will be provided to all purchasers of the first issue of the plans and special provisions at no additional charge, except that out-of-town bidders will pay shipping charges.

103.2 RETURN OF PROPOSAL GUARANTEE:

All proposal guarantees, except those of: the two lowest responsible bidders on Bond Issue and Budget Projects; the lowest responsible bidder or the lowest responsible bidders of alternative plans and specifications on Improvement District Projects, will be returned immediately following the opening and checking of proposals. The retained proposal guarantee or guarantees will be returned immediately after the contract documents have been executed by all parties.

103.3 AWARD OF CONTRACT:

The Contracting Agency, through its duly authorized body or agent will award the contract to the lowest and/or best responsible bidder, or all proposals will be rejected, as soon as practicable after the date of opening proposals.

No proposal shall be withdrawn for a period of 50 days after opening without consent of the Contracting Agency through the body or agent duly authorized to accept or reject the proposal except that in the case of Federally-assisted projects, or other projects award of which is conditioned on the approval of an agency not under the control of the Contracting Agency, withdrawal shall be made within a period of 50 days after opening without such consent.

If written notice of the acceptance of a proposal is delivered to the successful bidder within the times noted above, or at any time thereafter before such proposal has been withdrawn, the bidder shall execute and deliver a contract in the prescribed form, within 10 days after receipt of such notice or his proposal guarantee shall be forfeited as provided elsewhere herein. Concurrently with the contract, the Contractor shall submit all documentation required to enable the agency to execute the contract.

The successful bidder will be furnished a Notice of Award on:

(A) Bond Issue or Budget Projects by letter, to the address shown on the proposal.

(B) Improvement District Projects by publication in accordance with the requirements of Arizona Revised Statutes, Section 9-681.

103.4 CANCELLATION OF AWARD:

The Contracting Agency reserves the right to cancel the award of any contract at any time before the execution of said contract by all parties, without any liability against the Contracting Agency.

103.5 REQUIREMENT OF CONTRACT BONDS:

Concurrently with the submittal of the contract, the Contractor shall furnish the Contracting Agency the following bonds, which shall become binding upon the award of the contract to the Contractor.

(A) A Performance Bond in an amount equal to the full contract amount conditioned upon the faithful performance of the contract in accordance with plans, specifications and conditions thereof. Such bond shall be solely for the protection of the Contracting Agency awarding the contract.

(B) A Payment Bond in an amount equal to the full contract amount solely for the protection of claimants supplying labor or materials to the Contractor or his Subcontractors in the prosecution of the work provided for in such contract.

Each such bond shall include a provision allowing the prevailing party in a suit on such bond to recover as a part of his judgment such reasonable attorney's fees as may be fixed by a judge of the court.

Each such bond shall be executed by a surety company or companies holding a certificate of authority to transact surety business in the State of Arizona issued by the Director of the Department of Insurance. The bonds shall not be executed by an individual surety or sureties. The bonds shall be made payable and acceptable to the Contracting Agency. The bonds shall be written or countersigned by an authorized representative of the surety who is either a resident of the State of Arizona or whose principal office is maintained in this State, as by law required, and the bonds shall have attached thereto a certified copy of Power of Attorney of the signing official. In addition, said company or companies shall be rated "Best A-" or better as required by the Contracting Agency, as currently listed in the most recent Best Key Rating Guide, published by the A.M. Best Company.

103.6 CONTRACTOR'S INSURANCE:

103.6.1 General: The Contractor shall agree to carry all insurance, which may be required by Federal and State Laws, County and City Ordinances, Regulations and Codes. Neither the Contractor nor any subcontractor shall commence work under a contract until the Contracting Agency has approved the insurance. The entire project covered by the contract will be at the Contractor's risk until final acceptance by the Contracting Agency.

Concurrently with the submittal of the contract, the Contractor shall furnish the Contracting Agency the following:

(A) **Public Liability and Property Damage Insurance:** The Contractor shall provide and maintain, during the life of the contract, General Liability, Automobile Liability, and Worker's Compensation Insurance as follows:

INSURANCE	**MINIMUM LIMITS OF LIABILITY**
GENERAL LIABILITY Comprehensive Form Premises/Operations Underground Explosion and Collapse Hazard Exclusions Deleted (where applicable) Products/Completed Operations Contractual Independent Contractors (OCP) Broad Form Property Damage Personal Injury with Exclusion "C" Deleted	$1,000,000 Combined Single Limit —
AUTOMOBILE LIABILITY Owned Hired Non-Owned	$1,000,000 Combined Single Limit

EXCESS LIABILITY Umbrella Form	As required
WORKER'S COMPENSATION & EMPLOYERS' LIABILITY	Statutory Limits
BUILDER RISK/COURSE OF CONSTRUCTION	As required

The Contracting Agency shall have no responsibility or liability for such insurance coverage.

The Contractor shall furnish a Certificate of Insurance on a form approved by the Contracting Agency. The Certificate shall be issued by an insurance company authorized to transact business in the State of Arizona, or be named on the list of Unauthorized Insurers maintained by the Arizona Department of Insurance. Insurance coverage shall not expire until all the work has been completed and the project has been accepted by the Contracting Agency. If an insurance policy does expire during the life of the contract, the Contractor shall provide a renewal certificate of the required insurance coverage to the Contracting Agency not less than thirty (30) days prior to the expiration date.

(B) **Worker's Compensation and Employer's Liability:** A Letter of Certification, from the Industrial Commission of Arizona, that the Contractor is insured by the State Compensation Fund or is an authorized self-insurer or a Certificate of Insurance issued by an insurance company authorized by the Arizona Department of Insurance to provide Workmen's Compensation and Employer's Liability Insurance in the State of Arizona.

(C) **Builders Risk/Course of Construction**: When the project includes construction of a new building or addition to an existing building, the Contractor shall also obtain insurance coverage for at least, as a minimum, the perils of fire, extended coverage, vandalism and malicious mischief for the full amount of the contract. The Contractor shall be responsible for any deductibles, mutual waiver of subrogation and any co-insurance for the construction that is the subject of this contract.

(D) **Additional Insured**: The Contracting Agency, its officers, agents and employees shall be named as insurers on policies listed in (A) and (C) and this shall also be indicated on the Certificates of Insurance issued to the Contracting Agency. The Contractor's coverage shall be primary for any and all losses arising out of the performance of this contract.

(E) **Owner Protective Policy**: In addition to other insurance the Contractor is required herein to provide and maintain in its own name, the Contractor shall also provide and maintain a separate policy of insurance, at its sole cost and expense, naming the Contracting Agency as the insured and providing primary coverage for the Contracting Agency in an amount not less than One Million Dollars, or other minimum amount determined by the Agency, for personal injury or death, per person and per occurrence, and not less than $500,000 for property damage for any damage or injury suffered as a result of any work performed by Contractor or its employees, representatives, contractors or subcontractors in connection with the Project or Permit. Such policy shall also provide the Contracting Agency coverage, in the amounts specified above, for any and all damages or injury suffered as a result of alleged acts or omissions of the Contracting Agency in connection with, directly or indirectly, the Project or Permit. Such policy shall be primary and not contributory to any insurance maintained by the Contracting Agency. The insurance company writing such policy must have a BEST rating of not less than "A-" and be licensed by the Arizona Department of Insurance to do business in the State of Arizona. The form of the policy must be approved by the Contracting Agency before the notice to proceed will be issued.

103.6.2 Indemnification of the Contracting Agency Against Liability: To the fullest extent permitted by law, the Contractor, its successors, assigns and guarantors, shall pay, defend, indemnify and hold harmless the Agency, its agents, representatives, officers, directors, officials and employees from and against all allegations, demands, proceedings, suits, actions, claims, damages, losses, expenses, including but not limited to, attorney fees, court costs, and the cost of appellate proceedings, all claim adjusting and handling expense, related to, arising from or out of or resulting from any actions, acts, errors, mistakes or omissions caused in whole or part by the Contractor relating to work or services in the performance of the Contract, including but not limited to, any Subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable and any injury or damages claimed by any of the Contractor's and Subcontractor's employees.

103.7 EXECUTION AND APPROVAL OF CONTRACT:

The Contractor shall execute the contract with the Contracting Agency as follows:

(A) Bond Issue or Budget Projects within 10 calendar days after the date of Notice of Award of contract from the Contracting Agency.

(B) Improvement District Projects, not less than 15 or more than 20 calendar days after the date of the first publication of Notice of Award, if no objections have been filed.

The Contracting Agency will approve and execute the contract within 10 calendar days following receipt of signed contract and acceptable bonds and certificates of insurance.

No contract shall be considered in effect until it has been fully executed by all parties concerned.

Information relative to the execution of contract documents may be obtained from the Engineering Office of the Contracting Agency advertising for bids.

103.8 FORFEITURE OF PROPOSAL GUARANTEES:

If the Contractor fails or refuses to enter into the contract, within the time stated, then the Contracting Agency may declare a forfeiture of his proposal guarantee as liquidated damages for failure to enter into the contract.

- End of Section -

SECTION 104

SCOPE OF WORK

104.1 WORK TO BE DONE:

104.1.1 General: The Contractor shall perform all work as may be necessary to complete the contract in a satisfactory and acceptable manner in full compliance with the plans, specifications and terms of the contract.

In the event a conflict exists between Contract Documents, the order of precedence listed in descending order shall be as follows:

Change Orders
Addenda
Special Provisions
Project Plans
Contracting Agency's supplements to the MAG Uniform Standard Specifications and Details
MAG Uniform Standard Specifications
MAG Standard Details

Unless otherwise specified in the special provisions, The Contractor shall furnish all labor, materials, equipment, transportation, utilities, services and facilities required to perform all work for the construction of the project within the time specified.

104.1.2 Maintenance of Traffic: The Contractor's operations shall be in accordance with the traffic manual and/or policies of the appropriate public agency having jurisdiction over the project and Section 401. These operations shall cause no unnecessary inconvenience to the public and public access rights shall be considered at all times. Unless otherwise authorized in the specifications or on a temporary basis by the Engineer, traffic shall be permitted to pass through the work area. The Contractor shall coordinate with the various agencies both commercial and public, involved in the collection and removal of trash and garbage, so that adequate services are maintained.

Safe and adequate pedestrian and vehicular access shall be provided and maintained to fire hydrants, commercial and industrial establishments, churches, schools, parking lots, motel, hospitals, fire stations, police stations, and establishments of a similar nature. Access to residential properties shall be in accordance with Section 107.

Grading operations, roadway excavation and fill construction shall be conducted and maintained in such a manner as to provide a reasonably satisfactory and safe surface for vehicular and pedestrian traffic. When rough grading is completed, the roadbed shall be brought to and maintained in a reasonably smooth condition, satisfactory and safe for vehicular traffic at the posted speed limit. Pedestrian walkways shall be provided and maintained in a like manner. The Contractor shall accomplish any additional grading operations and/or repairs, including barricade replacement or repairs during working and nonworking periods, which in the opinion of the Engineer, are required.

In the event of abnormal weather conditions, such as windstorms, rainstorms, etc., the Contractor shall immediately inspect his work area and take all necessary actions to insure that public access and safety are maintained.

The Contractor shall provide the Engineer with the emergency address of his representatives as required by Section 105.

104.1.3 Water Supply:

Water shall consist of providing a water supply sufficient for the needs of the project and the hauling and applying of all water required.

The Contractor shall make arrangements for and provide all necessary water for his construction operation and domestic use at his own expense.

If the Contractor purchases water from a water utility at a fire hydrant on or near the project, all arrangements shall be made by him at his own expense and payment made direct to the water utility as agreed upon.

The Contractor shall use only those hydrants designated by the water utility in charge of water distribution and in strict accordance with its requirements for hydrant use.

The Contractor shall furnish all connections, wrenches, valves and small tools that may be necessary to meet the requirements of the water utility pertaining to hydrant use.

The tank truck and/or trailer shall meet all safety and licensing regulations and the water shall be applied by sprinkling with tank trucks equipped with spray bars and suitable apparatus.

No measurement will be made of water, unless otherwise provided for in the special provisions or proposal.

The cost of watering will be included in the proposal price for the construction operation to which such watering is incidental or appurtenant.

104.1.4 Cleanup and Dust Control: Throughout all phases of construction, including suspension of work, and until final acceptance of the project, the Contractor shall keep the work area clean and free from rubbish, excess materials and debris generated by Construction Activities.

At disposal sites and storage sites, other than agency landfills, the Contractor shall be responsible for all required dust control measures. This includes temporary yard or staging areas.

The Contractor shall take whatever steps, procedures or means required preventing any dust nuisance due to his construction operations. The dust control measures shall be maintained at all times to the satisfaction of the Engineer and in accordance with the requirements of the Maricopa County Bureau of Air Pollution Control Rules and Regulations.

Failure of the Contractor to comply with the Engineer's cleanup orders may result in an order to suspend work until the condition is corrected. No additional compensation or time will be allowed as a result of such suspension and the Engineer has the authority to take such other measures as may be necessary to remedy the situation. Subsection 104.2.5 applies.

104.1.5 Final Cleaning Up: Before final acceptance, all private or public property and grounds occupied by the Contractor in connection with the work shall be cleaned of all rubbish, excess materials, temporary structures and equipment, and all parts of the work area shall be left in an acceptable condition.

104.2 ALTERATION OF WORK:

***104.2.1 By the Contracting Agency:** The Contracting Agency reserves the right to make, at any time during the progress of the work, such alterations in the details of construction and such increases or decreases in quantities as may be found necessary or desirable. Such alterations and changes shall not invalidate the contract nor release the surety and the Contractor agrees to perform the work as altered, the same as if it had been a part of the original contract. The Engineer will issue Change Orders to cover unforeseen circumstances, which make it impossible to carry out the work in accordance with the original contract plans and specifications.

If the alterations or changes made by the Contracting Agency increases or decreases the total cost of the contract or the total cost of any major item by more than 20 percent, either party may request an adjustment in payment in accordance with Section 109.

104.2.2 Due to Physical Conditions:

*(A) Should the Contractor encounter or discover during the process of the work, subsurface or latent physical conditions at the site differing materially from those indicated in the contract, or unknown physical conditions at the site of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract, the Engineer shall be promptly notified in writing of such conditions before they are disturbed.

*Not applicable to Improvement District Projects

The Engineer will thereupon promptly investigate the conditions and, if he finds they do so materially differ and cause an increase or decrease in the cost of or the time required for performance of the contract, an equitable adjustment will be made and the contract modified in writing accordingly.

*(B) If at the time of opening up any portion of the work, material from which the subgrade, backfill or bedding is to be constructed contains an excess of moisture so that the required compaction cannot be obtained without additional manipulation, the Engineer will determine the cause of such condition. If the cause of such condition is determined to have been unforeseeable and beyond the control of and without fault or negligence of the Contractor, the Engineer will determine whether the material shall be aerated or removed and replaced. Such work shall be done as directed and will be paid for as provided in Section 109.

*(C) Failure to notify the Engineer of the conditions described in A and B above prior to doing any work may be just cause to reject any claims for additional monies and/or time.

*(D) Material in ditches and ditch banks that contains moisture in an amount considered excessive by the Engineer shall be removed and shall be aerated to the extent required by the Engineer before compaction is affected. No measurement or direct payment for the removal and aeration of such material will be made.

*(E) After any portion of the work has been opened up, saturation of material caused by irrigation water, storm drainage, weather or such similar causes will be considered as within the responsibility of the Contractor.

***104.2.3 Due to Extra Work:** The Contractor shall perform unforeseen work, for which there is no unit bid price in the proposal, whenever it is deemed necessary or desirable by the Engineer in order to fully complete the work as contemplated. Such work shall be governed by all applicable provisions of the contract documents and payment will be made in accordance with the provisions set forth in Section 109.

Should the Contractor claim that any instructions received involve extra work under the contract, he shall give the Engineer written notice within two work days after receipt of such instructions, and in any event before proceeding to execute the work, except in emergencies endangering life or property. No claim shall be valid unless written notice is given.

If this extra work is performed by others, the Contractor agrees to cooperate fully with the other source accomplishing this work and agrees that this action shall not invalidate the Contract or release the surety.

104.2.4 At the Contractor's Request: Changes in the plans or specifications, which do not materially affect and are not detrimental to the work or to the interests of the Contracting Agency, may be granted to facilitate the work. Requests shall be in writing and submitted to the Engineer for approval. These changes, if approved and when resulting in a saving to the Contractor, will be made at an equitable reduction in cost or in no case at any additional cost to the Contracting Agency.

104.2.5 Due to the Failure of the Contractor to Properly Maintain the Project:

(A) If the Contractor fails to provide adequate Maintenance of Traffic or Cleanup and Dust Control or to correct deficiencies resulting from abnormal weather conditions, the Engineer has the authority to suspend the work wholly or in part until this condition has been corrected.

(B) If the Contractor fails to comply with the Engineer's written order to provide adequate maintenance of traffic, cleanup, dust control, or to correct deficiencies resulting from abnormal weather conditions, the Engineer has the authority to have this work accomplished by other sources.

(C) The Contractor agrees to cooperate fully with the other source accomplishing this work and agrees that this action shall not invalidate the Contract or release the surety.

- End of Section –

*Not applicable to Improvement District Projects

SECTION 105

CONTROL OF WORK

105.1 AUTHORITY OF THE ENGINEER:

The Engineer will decide all questions which may arise as to the quality and acceptability of materials furnished and work performed and as to the rate of progress of the work; all questions which may arise as to the interpretation of the plans and specifications; all questions as to the acceptable fulfillment of the contract on the part of the Contractor. The Engineer's estimates and decisions shall be final and conclusive. In case any question should arise, relative to the Contract Documents, the determination or decision of the Engineer shall be a condition precedent to the right of the Contractor to receive final approval of the work being questioned under the contract.

In giving instructions, the Engineer may make minor changes in the work, not involving extra work and not inconsistent with the purpose of the work, except in emergencies endangering life or property.

The Engineer will suspend the work wholly or in part due to the failure of the Contractor; to correct conditions unsafe for the workmen or the general public; for failure to carry out provisions of the contract; for failure to carry out orders; for such periods as he may deem necessary due to unsuitable weather; for conditions considered unsuitable for the prosecution of the work or for any other condition or reason deemed to be in the public interest.

105.2 PLANS AND SHOP DRAWINGS:

The Contractor shall submit, for review, a proposed schedule of shop drawings and product data submittals. This schedule will include concrete and asphalt concrete mix designs unless they are previously approved supplier's mix design. The schedule will show the needed response date for each submittal and will indicate the relationship of the submittal to the project construction schedule.

Shop drawings for major temporary support structures such as falsework, shoring, soldier piles, and other major temporary structures that facilitate construction shall be prepared by and bear the seal and signature of a Professional Engineer. Temporary support structures for Minor Structures as defined in Section 505.1.1 are exempt from this requirement.

The Contractor shall submit five (5) copies of each shop drawing, product data or mix design to the Engineer for review. Each submittal shall be numbered sequentially and shall be submitted in accordance with the schedule established in conjunction with the Contracting Agency so as to cause no delay in the work schedule. The Contractor shall certify, by stamp or letter, that he has reviewed and approved the submittal and that it conforms to the requirements of the contract documents. If this certification is not included, the submittal will be returned without action.

At the time of each submittal, the Contractor shall define and delineate in writing, separate from the certification, any deviations from the contract documents. If the Engineer accepts this deviation, he will authorize the deviation by issuing a change order or if the deviation is minor by endorsement to the letter.

The Engineer will review and return the submittals in accordance with the previously established response date. The review will be only for conformance with the design concept of the work and for compliance with the information contained in the contract documents. The review of a specified item, as such, will not indicate review of the assembly in which the item functions. Review by the Engineer will not relieve the Contractor from responsibility for any errors or omissions in the submittals nor from his responsibility for complying with the contract documents. The only exception is deviations accepted in accordance with the preceding paragraph.

If the submittal is acceptable, one (1) copy with each page stamped "Furnish as Submitted" will be returned to the Contractor. The Contractor shall submit additional copies (as required) to the Engineer.

If the Engineer determines that the submittal requires corrections or is to be rejected, one (1) copy stamped "Furnish as Noted" or "Revise and Resubmit" will be returned to the Contractor. The Contractor will submit five (5) corrected or new copies.

The copy stamped "Furnish as Submitted," returned to the Contractor, will become a part of the contract documents and will be kept at the job site. Any work done prior to the receipt of this review will be at the Contractor's risk and expense.

105.3 CONFORMITY WITH PLANS AND SPECIFICATIONS:

All work performed and all materials furnished shall be in conformity with the lines, elevations, grades, cross-sections, dimensions and material requirements, including tolerances, shown on the plans or indicated in the specifications.

In the event the Engineer finds the materials or the finished product in which the materials are used not in conformity with the plans and specifications, but that reasonably acceptable work has been produced, he shall then make a determination if the work shall be accepted and remain in place. In this event, the Engineer will document the basis of acceptance by contract modification, which will provide for an appropriate adjustment in the contract price for such work or materials, as he deems necessary to conform to his determination based on engineering judgment.

In the event the Engineer finds the materials or the finished product in which the materials are used or the work performed are not in conformity with the plans and specifications and have resulted in an inferior or unsatisfactory product, the work or materials shall be removed and replaced or otherwise corrected by the Contractor at no additional cost to the Contracting Agency.

In all instances wherein the items and/or specifications require installation or construction in accordance with either manufacturers' or suppliers' recommendations and/or instructions, said recommendations and/or instructions shall be submitted with the applicable portion clearly marked for approval prior to the commencement of work on that item or portions of the contract.

105.4 COORDINATION OF PLANS AND SPECIFICATIONS:

The Contractor shall take no advantage of any apparent error or omission in the plans or specifications. In the event the Contractor discovers such an error or omission, he shall immediately notify the Engineer. The Engineer will then make such corrections and interpretations as may be deemed necessary for fulfilling the intent of the plans and specifications.

105.5 COOPERATION OF CONTRACTOR:

The Contractor will be supplied with a minimum of seven sets of approved plans and special provisions, one set of which the Contractor shall keep available on the work site at all times.

The Contractor shall give the work the constant attention necessary to facilitate the progress thereof, and shall cooperate with the Engineer, his inspectors, and other Contractors in every way possible.

The Contractor shall at all times be present at the work in person or represented by a competent superintendent. The superintendent shall be authorized to receive and fulfill instructions from the Engineer and who shall supervise and direct the work. No less than fourteen days prior to the scheduled/planned Notice to Proceed, the Contractor shall submit to the Engineer for review and approval, the name and qualifications of the proposed superintendent. When the superintendent is approved, he shall not be changed by the Contractor without written approval of the Engineer. Instructions and information given by the Engineer to the Contractor's superintendent shall be considered as having been given to the Contractor.

(A) All phases of the project such as concrete work, pipe work, etc., shall be under the direct supervision of a foreman or his designated representative on the site who shall have authority to accept instructions, with respect to that particular phase of the project, and take action required to properly carry out the work.

(B) In the event of noncompliance with the above, the Engineer may require the Contractor to stop work on that part of the project until the required supervision is present.

The Contractor shall file with the Engineer, the names, addresses, and telephone numbers of representatives who can be contacted, at any time, in case of emergency. These representatives must be fully authorized and equipped to correct unsafe or excessively inconvenient conditions on short notice Emergencies may arise during the progress of the work, which may require special effort or require extra shifts of men to continue the work beyond normal working hours. The Contractor shall be prepared in case of such emergencies from whatever cause, to do all necessary work promptly.

105.6 COOPERATION WITH UTILITIES:

The Contracting Agency will notify all utility companies, all pipe line owners, or other parties affected, and endeavor to have all necessary adjustments of the public or private utility fixtures, pipe lines, and other appurtenances within or adjacent to the limits of construction, made as soon as practicable.

The Contractor shall comply with the requirements of Arizona Revised Statutes 40-360.21 through 40-360.29 (one-call notification center, Arizona 811) in notification to the interested utility owners prior to start of construction. The Contractor shall resolve all problems with the utility owners concerned.

Where water user's association facilities obstruct construction of the work, the Contractor shall contact officials of the association relative to the shutdown of irrigation water and shall acquaint himself with and conform to the requirements of the association.

Water lines, gas lines, wire lines, service connections, water and gas meter boxes, water and gas valve boxes, light standards, cableways, signals and all other utility appurtenances within the limits of the proposed construction which are to be relocated or adjusted are to be moved by the owners at their expense except as otherwise provided for in the special provisions or as noted on the plans. In the event an existing service is found to be in a materially different location than shown on the plans and requires additional or more costly work on the part of the Contractor, the procedures in Section 104, will apply.

It is understood and agreed that the Contractor has considered in his proposal all of the permanent and temporary utility appurtenances in their present or relocated positions as shown on the plans and that no additional compensation will be allowed for any delays, inconvenience, or damage sustained by him due to any interference from the said utility appurtenance or the operation of moving them. If delays are encountered because utility owners have not relocated or adjusted their facilities, the contract time will be adjusted in accordance with Section 108.

It shall be the responsibility of the Contractor to ascertain the need for bracing or shoring of utility poles during the construction of the project and no additional compensation will be allowed for such bracing or shoring.

In general, the contract will indicate various utility items, certain of which are to be relocated or adjusted by the utility owner and others by the Contractor. Any work performed by the Contractor for any utility company, separate from the contract shall be paid for by the utility company and will not be a part of the agency contract.

105.6.1 Notifications Requirement in the Event of Any Damage to or Dislocation of Underground Facilities: In the event of any damage to or dislocation of any underground facility, the Contractor responsible for the excavation operation shall immediately notify the owner of such facility and shall not attempt to repair any facility, except those intended for the conveyance or storage of water and sewage. The excavation shall be left open until the arrival of representatives of the owner. The owner will dispatch its representative promptly to examine the underground facility and, if necessary, make repairs.

105.6.2 Work Within a Railroad Right of Way: When a railroad right of way is included in the work, the Contractor shall:

(A) Comply with the rules and regulations of the railroad company relative to the required manner of constructing said portion of the work; and shall perform the work so as not to endanger or interfere with the safe operation of the track(s) and property of the railroad company and of the traffic moving on such track(s).

(B) Carry the kinds and amounts of insurance and bonds required by the railroad company for the period of time in which work is performed on or adjacent to the railroad company's property, and until such work has been satisfactorily completed and all tools, equipment and materials have been removed from the railroad company's property and such property is left in a clean and presentable condition.

(C) Contact the railroad company at least 48 hours in advance of performing any construction within the right of way of any track(s).

105.7 COOPERATION BETWEEN CONTRACTORS:

The Contracting Agency reserves the right at any time to contract for and perform other or additional work on or near the work covered by the contract.

When separate contracts are let within the limits of any one project, each Contractor shall conduct his work so as not to interfere with or hinder the progress or completion of the work being performed by other Contractors. Contractors working on the same project shall cooperate with each other as directed.

Each Contractor involved shall assume all liability, financial or otherwise, in connection with his contract and shall protect and save harmless the Contracting Agency from any and all damages or claims that may arise because of inconvenience, delay, or loss experienced by him because of the presence and operations of other Contractors working within the limits of the same project.

The Contractor shall arrange his work and shall place and dispose of the materials being used so as not to interfere with the operations of the other Contractors within the limits of the same project. He shall join his work with that of others in an acceptable manner and shall perform it in proper sequence to that of the others.

The Contracting Agency will not honor any claim for extra compensation due to delays, extra work, or extension of time caused by any other Contractors working within the limits of the same project.

105.8 CONSTRUCTION STAKES, LINES AND GRADES:

The Engineer will set construction stakes establishing lines and grades for roadwork, curbs, gutters, sidewalks, structures and centerlines for utilities and necessary appurtenances as he may deem necessary, he will furnish the Contractor with all necessary information relating to the lines and grades. These stakes and marks shall constitute the field control by and in accordance with which the Contractor shall establish other necessary controls and perform the work.

The Contractor shall perform the work in accordance with the Engineer's stakes and marks, and shall be charged with full responsibility for conformity and agreement of the work with such stakes and marks.

The Contractor shall be held responsible for the preservation of all stakes and marks, and if the construction stakes or marks have been carelessly or willfully destroyed or disturbed by the Contractor, the cost for replacing them will be charged against him and will be deducted from the payment for the work.

The Contractor shall give notice to the Engineer not less than two working days in advance of when he will require survey services in connection with any portion of the work.

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

105.9 DUTIES OF INSPECTOR:

The Engineer may provide the Inspector, assistants, and other field staff to assist the Engineer in observing performance of the work of the Contractor. Through onsite observations of the work in progress and field checks of materials and equipment, the Inspector shall endeavor to provide further protection for the Contracting Agency against defects and deficiencies in the work of the Contractor; but, the furnishing of such services will not make the Inspector responsible for or give the Inspector control over construction means, methods, techniques, sequences, or procedures or for safety precautions or programs, or responsibility for the Contractor's failure to perform the work in accordance with the contract documents.

Inspectors employed by the Contracting Agency will be authorized to inspect all work done and materials furnished. Such inspection may extend to all or any part of the work and to the preparation, fabrication or manufacture of the materials to be used. The inspector will not be authorized to alter or waive the provisions of the contract. The inspector will not be authorized to issue instructions contrary to the plans and specifications or to act as foreman for the Contractor.

The inspector will, however, have the authority to reject work or materials until any questions at issue can be referred to and decided by the Engineer.

105.10 INSPECTION OF WORK:

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

The Engineer shall be permitted to inspect all materials, and each part or detail of the work at any time for the purpose of expediting and facilitating the progress of the work. He shall be furnished with such information and assistance by the Contractor as is required to make a complete and detailed inspection.

Any work done or materials used without supervision and inspection by an authorized Contracting Agency representative may be ordered removed and replaced at no additional cost to the Contracting Agency. Failure to reject any defective work or materials shall not in any way prevent later rejection when such defect is discovered nor obligate the Engineer to final acceptance.

When any unit of government or political subdivision is to pay a portion of the cost of the work covered by the contract, its representatives shall have the right to inspect the work. Such inspection shall in no sense make any unit of government or political subdivision a party to the contract, and shall in no way interfere with the rights of either party to the contract.

105.11 REMOVAL OF UNACCEPTABLE AND UNAUTHORIZED WORK:

Unacceptable work, whether the result of poor workmanship, use of defective materials, damage through carelessness or any other cause, found to exist prior to the final acceptance of the work, shall be removed immediately and replaced in an acceptable manner.

No work shall be done without lines and grades having been given by the Engineer. Work done contrary to the instructions of the Engineer, work done beyond the lines shown on the plans, or as given, or any extra work done without authority, will be considered as unauthorized and will not be paid for under the provisions of the contract. Work so done may be ordered removed or replaced at no additional cost to the Contracting Agency.

105.12 MAINTENANCE DURING CONSTRUCTION:

The Contractor shall maintain the work during construction and until the project is accepted. This maintenance shall constitute continuous and effective work prosecuted day by day, with adequate equipment and forces to the end so that the roadway or structures are kept in satisfactory conditions at all times. In the case of a contract for the placing of a course upon a course or subgrade previously constructed, the Contractor shall maintain the previous course or subgrade during all construction operations. All cost of maintenance work during construction and before the project is accepted shall be included in the unit bid price on the various pay items.

105.13 FAILURE TO MAINTAIN ROADWAY OR STRUCTURE:

If the Contractor, at any time, fails to perform maintenance during construction, the Engineer will immediately notify the Contractor of such noncompliance. If the Contractor fails to remedy unsatisfactory maintenance within 24 hours after receipt of such notice, the Engineer may immediately proceed to maintain the project. The entire cost of this maintenance will be deducted from monies due or to become due the Contractor on his contract.

105.14 PARTIAL USE OR OCCUPANCY:

Should an urgent or unforeseen need occur, the Contractor agrees to let the Contracting Agency use or occupy a unit or portion of the project, such as a structure, utility service, or a section of road or pavement, prior to final acceptance.

Prior to such use or occupancy, the Contracting Agency will prepare a written agreement with the Contractor and accomplish a partial acceptance inspection. The written agreement will include a revised construction schedule, responsibilities for maintenance of the partial acceptance and continued construction of the original project to final acceptance, payments, insurance and bond requirements.

105.15 ACCEPTANCE:

(A) **Partial Acceptance:** If at any time during the prosecution of the project the Contractor substantially completes a unit or portion of the project, such as a structure, utility service, or a section of road or pavement, he may request the Engineer to make final inspection of that work. If the Engineer finds, upon inspection, that the work has been satisfactorily completed in compliance with the contract he may accept the work as being completed and the Contractor may be relieved of further responsibility for that work. Such partial acceptance shall in no way void or alter any terms of the contract.

(B) **Final Acceptance:** Upon due notice from the Contractor of presumptive completion of the entire project, the Engineer will make an inspection. If all construction provided for and contemplated by the contract is found completed to his satisfaction, the inspection shall constitute the final inspection and the Engineer will make the final acceptance. The Contractor will be notified in writing of this acceptance as of the date of the final inspection.

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

- End of Section -

SECTION 106

CONTROL OF MATERIALS

106.1 SOURCE OF MATERIALS AND QUALITY:

All construction materials to be used on the work or incorporated into the work, equipment, plant, tools, appliances or methods to be used on the work shall be subject to the inspection and approval or rejection of the Engineer.

The materials used on the work shall meet all quality requirements of the contract. In order to expedite the inspection and testing of materials, the Contractor shall notify the Engineer of his proposed source of materials prior to delivery. At the option of the Engineer, materials may be approved at the source of supply before delivery is started. If it is found after trial that sources of supply for previously approved materials do not produce specified products the Contractor shall furnish materials from other sources.

Unless otherwise noted, all materials used in the project shall be new and unused. Additionally, any new materials used in this project that are damaged during the construction of the project and prior to final acceptance, as determined by the Engineer, shall be replaced by the Contractor with new material at no additional cost to the Contracting Agency.

106.2 SAMPLES AND TESTS OF MATERIALS:

All materials to be incorporated in the work may be subject to sampling, testing and approval, and samples furnished shall be representative of the materials to be used. The Engineer may select samples, or may require that samples be delivered by the Contractor to a laboratory designated by the Engineer.

The Contracting Agency will pay for the initial or normal test required by the Engineer to guard against unsuitable materials or defective workmanship. Additional tests, required due to failure of the initial or normal test(s), shall be paid for by the Contractor. The Engineer will designate the laboratory which will accomplish the additional test(s).

The procedures and methods used to sample and test materials will be determined by the Engineer. Unless otherwise specified, samples and tests will be made in accordance with either: the Materials Testing Manual of the Contracting Agency; the standard methods of AASHTO or ASTM, which were in effect and published at the time of issuance of the solicitation for a construction price proposal (aka: at the time of advertising for bids).

The laboratory responsible for the test shall furnish at least one copy of the test results to the Engineer, to the Contractor, and to the appropriate material supplier.

With respect to certain manufactured materials, the Engineer may permit the use of some materials prior to sampling and testing provided they are delivered with either a certificate of compliance or analysis or both, stating that the materials comply in all respects with the requirements of the specifications. These certificates shall be furnished in triplicate and clearly identify each delivery of materials to the work area. The certificates shall be signed by a person having legal authority to bind the supplier or manufacturer.

106.2.1 Certificate of Compliance: A Certificate of Compliance shall be submitted on the manufacturer's or supplier's official letterhead, and shall contain the following information:

1. The current name, address, and phone number of the manufacturer or supplier of the material or equipment.
2. A description of the material or equipment supplied.
3. Quantity of material represented by the certificate.
4. Means of material identification, such as label, lot number, or marking.
5. A statement that the material complies in all respects with the requirements of the cited specifications. Certificates shall state the name of the specific cited specifications, such as AASHTO M-320, ASTM C494, or specific table or subsection of the Specifications or Special Provisions.
6. A statement that the individual identified in item eight below has the legal authority to bind the manufacturer or the supplier of the material.
7. Project identification: Project name and all associated numbers (agency, Federal, and ADOT TRACS).
8. The name, title, and signature of the responsible individual. The date of the signature shall also be given.

Each of the first six items specified above shall be completed prior to the signing of the certificate as defined in item eight. No certificate will be accepted that has been altered, added to, or changed in any way after the authorized signature has been affixed to the original certificate. However, notations related to project specifics such as project identification, contractor, or quantity shipped are acceptable, provided the basic requirements of the certificate (items one through six) are not affected.

A copy or facsimile reproduction of the original certificate will be acceptable; however, the original certificate shall be made available upon request.

106.2.2 Certificate of Analysis: A Certificate of Analysis shall include all the information required for a Certificate of Compliance and, in addition, shall include the results of all tests required by the specifications.

106.3 PLANT INSPECTION:

The Engineer may undertake the inspection of materials at the source. In this event, the following conditions shall be met:

(A) The Engineer shall have the cooperation and assistance of the Contractor and the producer with whom he has contracted for materials.

(B) The Engineer shall have full entry at all times to such parts of the plant as may concern the manufacture or production of the materials being furnished.

It is understood that the Contracting Agency reserves the right to retest all materials, prior to their use in the work, upon delivery.

106.4 TRADE NAMES AND SUBSTITUTIONS:

Plans and specifications may contain references to equipment, materials or patented processes by manufacturer, trade name, make or catalog number. Unless the name is followed by words indicating that no substitution is permitted, such references shall be regarded as establishing a standard of quality, finish, appearance, performance or, as indicated, a selection based upon compatibility with existing equipment or materials.

The use of an alternate or substitute item or source may be permitted, subject to the following:

(A) No consideration will be given to a substitution prior to the award of the contract.

(B) Only substitutions submitted by the Contractor will be accepted for review. The substitution shall be submitted in writing to the Engineer.

(C) The submittal shall certify that the substitution will perform the functions and achieve the results called for by the general design, be similar and of equal substance, and be suited to the same use as that specified.

(D) The submittal shall state any required changes in the contract documents to adapt the design to the proposed substitution. This will include all changes required of other contractors/subcontractors affected by the resulting changes.

(E) The submittal shall contain an itemized estimate of all costs and credits that will result directly or indirectly from the acceptance of such substitution, including costs of design, license fees, royalties, testing, Engineer's evaluation, claims of other contractors/subcontractors, etc. In addition, the submittal shall include any adjustment in the contract time created by the substitution.

(F) The Contractor, on request of the Engineer, shall submit samples or any additional information the Engineer may deem necessary to evaluate the acceptability of the substitution. The Engineer will evaluate the information provided, perform tests when necessary and make comparisons. The Engineer will then make the final decision as to the acceptability of the proposed substitution. The Contractor will be notified in writing by the Engineer as to whether his substitution has been accepted or rejected.

(G) The submittal, for purposes of review, number of copies, etc., shall follow the procedures as outlined in Section 105.2, except in the case of response time. If the Engineer does not respond in a timely manner, which in turn, impacts the substitution, the Contractor shall continue to perform the work in accordance with the contract and the substitution will be considered rejected. In addition, no adjustment in the contract time will be granted for nonacceptance of the substitution.

(H) There will be no additional costs to the Contracting Agency for the substitution. If the substitution yields a net savings in the contract price, the amount of savings shall be divided between the Contracting Agency and the Contractor in a percentage established by the Contracting Agency.

(I) If the substitution is accepted and an adjustment in the contract cost and/or contract time is in order, a change order will be issued to the Contractor for the changes.

106.5 STORAGE OF MATERIALS:

The Contractor shall provide storage facilities and exercise such measures as will insure the preservation of the quality and fitness of all materials and/or equipment to be used in the work. Stored materials and/or equipment, even though approved before storage, may again be inspected prior to their use in the work. Stored items shall be located so as to facilitate their prompt inspection. That portion of the right-of-way and easements not required for public travel may be used for storage purposes, when approved by the Engineer. Any additional storage area as required must be provided by the Contractor. Private property shall not be used for storage purposes without written permission of the owner or lessee. If requested, by the Engineer, copies of such written permission shall be made available.

106.6 HANDLING MATERIALS:

All materials and/or equipment shall be handled in such a manner as to preserve their quality and fitness for the work.

106.7 UNACCEPTABLE MATERIALS:

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

106.8 FURNISHED MATERIALS:

Materials and/or equipment, furnished by the Contracting Agency, will be delivered or made available to the Contractor as indicated in the special provisions. The cost of handling and placing shall be considered as included in the contract price for the pay item with which they are used.

The Contractor will be held responsible for all materials and/or equipment accepted by him and will make good any shortages, deficiencies and damages, which may occur after such acceptance.

- End of Section -

SECTION 107

LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC

107.1 COMPLIANCE WITH LAWS:

The Contractor shall keep fully informed of, observe and comply with all Federal and State laws, County and City ordinances, regulations, codes and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any way affect the conduct of the work. The Contractor warrants that all items supplied and work performed under the contract have been sold, produced, delivered and furnished in strict compliance with all such laws, ordinances, regulations, codes, orders and decrees to which the items, work and Contractor are subject. Upon request, Contractor shall execute and deliver to the Agency such documents as may be required by the Agency to evidence compliance with such laws, ordinances, regulations, codes, orders and decrees. The Contractor shall protect and indemnify the Contracting Agency and its representatives against any claim or liability arising from or based on the violation of such, whether by the Contractor or the Contractor's employees.

107.2 PERMITS:

Permits, bonding and insurance requirements shall be as required by statutes, codes, ordinances or regulations.

The Public Agency, when acting as the Contracting Agency, may obtain some of the required permits. It is the duty of the Contractor to determine that all necessary permits have been obtained. The Contractor shall, at the Contractor's own expense, obtain all the required permits, which have not been furnished. The Contractor shall comply with all permit requirements until the Contract is completed or the permit is closed-out or transferred. The Contractor shall be responsible to close out all permits except those authorized by special provision to be transferred.

In all cases, the Contractor or the person supervising the authorized work shall notify the appropriate permit agency so as to insure proper inspection by the agency concerned.

107.3 PATENTED DEVICES, MATERIALS AND PROCESSES:

If the Contractor employees any design, device, material, or process covered by letters of patent or copyright, he shall provide for such use by suitable legal agreement with the patentee or owner. The Contractor and the surety shall indemnify and save harmless the Contracting Agency, any affected third party or political subdivision from any and all claims for infringement by reason of the use of any such patented design, device, material or process, or any trademark or copyright, and shall indemnify the Contracting Agency for any costs, expenses, and damages which it may be obligated to pay by reason of any infringement, at any time during the prosecution or after the completion of the work.

107.4 ARCHAEOLOGICAL REPORTS:

Attention is directed to Sections 41-844 and 41-865 Arizona Revised Statues. In view of the above, it shall be a provision of every contract that when archaeological features are encountered or unearthed in the excavation of material pits or of the roadway prism, or other excavation, the Contractor shall report promptly to the Director of the Arizona State Museum and the Contracting Agency. The Contractor will be allowed extra time as appropriate in accordance with the provisions of Section 108.

107.5 SAFETY, HEALTH AND SANITATION PROVISIONS:

The Contractor shall provide and maintain in a neat, sanitary condition such accommodations for the use of his employees as may be necessary to comply with the requirements and regulations of the Arizona State Department of Health or as specified by the Maricopa County Health Department, Sanitary Code.

The Contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions, on his own responsibility or as the Engineer may determine, reasonably necessary to protect the life and the health of employees on the job, the safety of the public and to protect property in connection with the performance of the work covered by the contract.

Precaution shall be exercised by the Contractor at all times for the protection of persons (including employees) and property. The Contractor shall comply with the provisions of all applicable laws, pertaining to such protection including all Federal and State occupational safety and health acts, and standards and regulations promulgated there under.

107.5.1 Asbestos Materials: If asbestos materials are encountered during any building remodeling/demolition work, the Contractor shall comply fully with the Arizona Administrative Code, A.A.C. R18-2-901 and notify the Engineer. An extension of contract time will be granted for any delay resulting from the asbestos material in accordance with Section 108.

107.5.2 Lead-Containing Paint: Paint and similar surface coating materials that contain lead compounds and in which the lead content exceeds 0.06 percent of the total weight of the non-volatile content of the paint or the weight of the dried paint film is declared a banned hazardous product and will not be used (Consumer Product Safety Act Part 1303 dated 9-1-77).

107.6 PUBLIC CONVENIENCE AND SAFETY:

The Contractor shall at all times so conduct his work as to assure the least possible obstruction to traffic and adjacent residents. The safety, convenience, and the protection of persons and property, of the general public and residents along the street, highway, and areas adjacent to the work area shall be provided for by the Contractor.

107.6.1 Contractor's Marshaling Yard: If the Contractor or his subcontractor utilizes property outside the limits of the project in the performance of the contract, the Contractor/subcontractor shall comply with the following:

107.6.1.1 Contractor's Marshaling Yard when the Agency is the Contracting Party:

(A) Prior to occupying the property, the Contractor shall provide written notification as to the number and location of all properties to be used. The notification shall specify in detail how the Contractor proposes to use each property and how he proposes to comply with (B) through (D) below. In addition, the Contractor shall provide a statement, signed by the property owner(s), which gives the Contractor permission to use the property.

(B) The property(s) shall be adequately maintained to control dust, mud, trash and other pollutants from leaving the property.

(C) Work on the property(s) shall be scheduled so as to comply with the Agency Noise Ordinance.

(D) Use of the property(s) such as location of stored materials, service of equipment, etc., shall be conducted to minimize impact on adjacent properties.

(E) The Contractor shall leave the property in a condition, as determined by the Engineer, equivalent to that which existed prior to entry. In no case shall any use cause, or allow to remain, any negative impact to adjoining properties or right-of-way unless such impact existed prior to the Contractors' use.

(F) The Contractor shall obtain a written release signed and dated from each property owner after completion of use. Each release shall state that, at the time of signing, the owner accepts the property in its present condition from the Contractor and relieves the Contractor and the Agency from any or all claims for the use or damage to said property. A copy of each release shall be submitted to the Engineer.

(G) This Subsection also applies to all levels of subcontractors who will need to obtain marshaling yards for the project, which will be separate from that of the Contractor. It will be the responsibility of the Contractor to obtain copies of the various documents from the subcontractors, as required above, and provide them to the Engineer.

107.6.1.2 Contractor's Marshaling Yard when the Agency is not the Contracting Party (private development, utility work, subdivision construction, etc.): All conditions will apply as in Subsection 107.6.1.1 except that the permit holder will be responsible for obtaining all documents. The permit holder will retain the documents and make them available to the Agency upon request.

107.6.2 The Contractor shall comply with the Agency Code concerning work hours and noise level during construction.

107.7 BARRICADES AND WARNING SIGNS:

The Contractor shall provide, erect, and maintain all necessary barricades, suitable and sufficient lights, danger signals, signs and other traffic control devices, and shall take all necessary precautions for the protection of the work and safety of the public. Roads, partially or fully closed to traffic, shall be protected by effective barricades, and obstructions shall be illuminated during hours of darkness. Suitable warning signs shall be provided to properly control and direct traffic.

The Contractor shall erect warning signs in advance of any place on the project where operations may interfere with the use of the road by traffic, and at all intermediate points where the new work crosses or coincides with an existing road. Such warning signs shall be constructed and erected in accordance with the Traffic Barricade Manual prepared or adopted by the Contacting Agency's Traffic Engineering Department, which is hereby made a part of these specifications.

107.8 USE OF EXPLOSIVES:

The use of explosives or blasting agents is controlled by the Uniform Fire Code, which is generally administered by the Fire Department of the Agency. The Contractor shall obtain a special permit from the Agency's Fire Department for the use of explosives. A copy of this permit shall be delivered to the Engineer prior to the use of explosives. If the Agency does not use the Uniform Fire Code or have a department for enforcement of this Code, the Contractor shall use explosives only when authorized in writing by the Engineer. The approval by the Engineer for the use of explosives shall not relieve the Contractor from his responsibilities for proper use and handling of the explosives or for any and all damages resulting from their use.

Explosives shall be transported, stored, handled and used in accordance with the provisions and requirements of all applicable laws, ordinances and regulations. Work shall be done in accordance with recommendations of the AGC Manual of Accident Prevention in Construction, the Institute of Makers of Explosives, and the Occupational Safety and Health Administration Regulations (29 CFR 1926.1(U)). In addition to the applicable regulations, the Contractor shall:

(A) Exercise the utmost care not to endanger life or damage property.

(B) Furnish and erect special signs to warn the public of his blasting operations. They shall be located and maintained so as to be clearly evident to the public during all critical periods of blasting operations.

(C) Notify each public utility company, having structures adjacent to the work, of his intention to use explosives. Such notice shall be given sufficiently in advance to enable the companies to advise the Contractor of any precautions that should be taken to protect their structures from damage.

(D) Make a survey of adjacent properties, before commencing blasting operations, locating on drawings and by photographs all existing cracks and damages to structures. A copy shall be filed with the Engineer, including a report.

(E) Blasting shall be accomplished in such a manner that nearby buildings, structures, railways, highways, etc. will be safe from rocks and other projectiles. Adequate blasting mats or other means of protection shall be employed when blasting in congested area or close proximity to any of the above improvements. Steel mats shall not be allowed within 2,000 feet of power lines.

(F) At the time of firing, the Contractor shall station men along the road at sufficient distance from the blasting operation to flag down any vehicles.

The Contracting Agency reserves the right to order the discontinuance of blasting operations at any time.

107.9 PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE:

The Contractor shall be responsible for the preservation of all public and private property and shall protect carefully from disturbance or damage all land monuments and property marks until the Engineer has witnessed or otherwise referenced their location and shall not move them until directed. The Contractor shall be responsible for all damage or injury to property of any character, during the prosecution of the work, resulting from any act, omission, neglect, or misconduct in his manner or method of executing the work, or at any time due to defective work or materials, and said responsibility will not be released until the project shall have been completed and accepted.

When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work, or in consequence of the nonexecution thereof by the Contractor, he shall restore, at no cost to the Contracting Agency, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, rebuilding, or otherwise restoring as may be directed, or he shall make good such damage or injury in an acceptable manner. Such damage will include but not be limited to landscaped areas. The contractor shall regrade the disturbed area as directed and restore the surface material to match existing in type and quality.

When construction is within temporary construction easements, the Contractor shall restore all disturbed areas to a condition equal to or better than the existing improvements. Such restoration will include but not be limited to asphalt, walkways, fences, lights, sprinklers, landscaping, etc. In the case of landscaping, the Contractor may remove and store sod and plant material. If, in the determination of the Engineer, the sod and/or plant material did not survive the transplanting in good condition, the Contractor shall replace the sod and/or plant material to match in type and quality. In addition, the Contractor may salvage any sprinkler system materials, lighting materials, etc. In the event that it is not feasible to reinstall the salvaged material, new material shall be installed.

The Contractor shall not dump spoil or waste material on private property without first obtaining from the owner written permission for such dumping. All such dumping shall be in strict conformance with the Grading and Drainage Ordinance of the Contracting Agency.

Access to private property shall be maintained to keep inconvenience to the property owner to a minimum. Prior to any construction in front of driveways, the Contractor shall notify the property owner 24 hours in advance. Inconvenience caused by construction across driveways and sidewalks shall be kept to a minimum by restoring the serviceability as soon as possible. If it is necessary to leave open excavation for a long period of time, the Contractor shall provide structurally adequate steel plates to bridge the excavation.

107.10 CONTRACTOR'S RESPONSIBILITY FOR WORK:

The Contractor shall properly guard, protect, and take every precaution necessary against injury or damage to all finished or partially finished work, by the action of the elements or from any other cause until the entire project is completed and accepted by the Engineer. The Contractor shall rebuild, repair, restore, and make good all injuries or damages to any portion of the work before final acceptance at no cost to the Contracting Agency. Partial payment for completed portions of the work shall not release the Contractor from such responsibility.

In case of suspension of the work for any cause whatever, the Contractor shall be responsible for the project and shall take such precautions as may be necessary to prevent damage to the project and shall erect any necessary temporary structures, signs, or other facilities at no cost to the Contracting Agency.

107.11 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTY AND SERVICES:

At points where the Contractor's operations are adjacent to properties of utility firms or other property, damage to which might result in considerable expense, loss, or inconvenience, work shall not commence until all arrangements necessary for the protection thereof have been made.

The Contractor shall cooperate with the owners of any underground or overhead utilities in their removal and rearrangement operations in order that these operations may progress in a reasonable manner, that duplication of work may be reduced to a minimum, and that services rendered by those parties will not be unnecessarily interrupted.

If any utility service is interrupted as a result of accidental breakage, the Contractor shall promptly notify the proper authority and shall cooperate with the said authority in the restoration of service. No work shall be undertaken around fire hydrants until provisions for continued service have been approved by the local fire authority. The Contractor shall expose all underground utilities and structures, which might interfere with the construction of the project, in order to permit survey location prior to construction.

The Contractor shall assume full responsibility for damages to any underground facility/utility as a result of failing to obtain information as to its location, failing to excavate in a careful and prudent manner or failing to take measures for protection of

the facilities/utilities. The Contractor is liable to the owner of the underground facility/utility for the total cost of the repair.

107.12 FURNISHING RIGHT-OF-WAY:

The Contracting Agency will provide right-of-way and easements for all work in advance of construction. Any exceptions will be indicated in the special provisions.

107.13 PERSONAL LIABILITY OF PUBLIC OFFICIALS:

In carrying out any provisions of these specifications, or in exercising any power or authority granted to them by or within the scope of the contact, there shall be no liability upon the Contracting Agency, Engineer, or their authorized representatives, either personally or as officials of the Contracting Agency, it being understood that in all such matters they act solely as agents and representatives of the Contracting Agency.

107.14 NO WAIVER OF LEGAL RIGHTS:

Upon completion of the work, the Contacting Agency will expeditiously make final inspection and notify the Contractor of acceptance. Such final acceptance, however, shall not preclude or stop the Contracting Agency from correcting any measurement, estimate, or certificate made before or after completion of the work, nor shall the Contracting Agency be precluded or stopped from recovering from the Contractor or his surety, or both, such overpayment as it may sustain, or by failure on the part of the Contractor to fulfill his obligations under the contract. A waiver on the part of the Contracting Agency of any breach of any part of the contract shall not be held to be a waiver of any other or subsequent breach.

The Contractor, without prejudice to the terms of the contract and in addition to any specific remedy provided the Contracting Agency in the contract documents, shall be liable to the Contracting Agency for latent defects, fraud or such gross mistakes as may amount to fraud, or as regards the Contracting Agency's rights under any warranty or guaranty or remedy required by law.

- End of Section -

SECTION 108

COMMENCEMENT, PROSECUTION AND PROGRESS

108.1 NOTICE TO PROCEED:

(A) On Bond Issue and Budget Projects, neither the Contractor nor any Subcontractor shall commence work on a project prior to receipt of the written Notice to Proceed from the Contracting Agency. The Contractor shall commence work as soon as practicable after the starting date specified in the Notice to Proceed. All work under the contract shall be completed within the number of calendar days stated in the proposal, plus extensions, beginning with the day following the starting date specified in the Notice to Proceed.

(B) On Improvement District Projects, the Contractor shall commence work within 10 days from the date of execution of the contract with the Contracting Agency. All work under the contract shall be completed within the number of calendar days stated in the proposal, plus any days extended on the contract, beginning with the day following the date of execution of the contract. The time set for completion of the project will be established by the Contracting Agency, in accordance with Arizona Revised Statutes Section 9-683.

The Contractor shall notify the Field Engineering Inspection Section 24 hours in advance of the time and place where work will begin and the Survey Section two working days in advance for staking.

108.2 SUBLETTING OF CONTRACT:

The Contractor shall not sublet, sell, transfer, assign, or otherwise dispose of the contract or contracts, or of his right, title, or interest therein, without written consent of the Contracting Agency.

Subcontracts shall be in accordance with and the Contractor shall be bound by the following provisions:

(A) All subcontracts shall be subject to the approval of the Engineer.

(B) All subcontracts shall be in writing and shall provide that all work to be performed there under shall be performed in accordance with the terms of the contract.

(C) Subcontractors shall conform to the regulations governing employment of labor.

(D) The subcontracting of any portion of the work will in no way release the Contractor of his liability under the contract and bonds.

(E) On all contracts for pipeline construction, roadway construction or roadway maintenance, the Contractor shall perform, with his own organization, work amounting to not less than 50 percent of the total contract cost.

On other types of contracts the individual agency shall determine the percentage or waive this requirement.

108.3 CORRESPONDENCE TO THE CONTRACTOR:

A written notice, to the Contractor from the Contracting Agency, shall be considered delivered and the service thereof completed, when said notice is posted, by certified mail, to the said Contractor at his last given address, or delivered in person to the Contractor or his authorized representative on the work.

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*For Improvement District Project: The words “Superintendent of Streets” will be substituted for the word “Engineer.” Any extension contract time will be determined by the Superintendent of Streets with the consent of the governing body.

108.4 CONTRACTOR'S CONSTRUCTION SCHEDULE:

The Contractor, when required, shall furnish the Engineer a construction schedule for his review. The Engineer's review of the Contractor's schedule is for purposes of: (1) the Contracting Agency's staffing the project as may be required; (2) to insure general compliance with the contract documents as it relates to the completion of all work; and (3) to monitor and evaluate the construction status for purposes of approving progress payments. In the event the schedule does not contain sufficient information to meet the above purpose, as determined by the Engineer, the Contractor shall resubmit a new schedule with the additional information requested by the Engineer. The right to determine the sequence of the work is a function vested solely in the Engineer and the construction schedule, when established, shall not be changed without the written consent of the Engineer. The orderly procedure of all work to be performed shall be the full responsibility of the Contractor.

Review of a submitted schedule by the Engineer shall in no way be construed as an affirmation or admission that the schedule is reasonable or workable which responsibilities remain the obligations of the Contractor. When the schedule shows a completion prior to the contract completion date, this extra time between the contract completion date and the scheduled completion date (float), may be used by the Contracting Agency without additional compensation to the Contractor. The Contracting Agency shall not be liable to the Contractor for any damages for delay if the Contractor completes the work prior to expiration of the original Contract completion date or as modified by approved change orders, if any.

108.5 LIMITATION OF OPERATIONS:

The Contractor shall conduct the work at all times in such a manner and sequence that will assure the least interference with traffic and inconvenience to the public. The Engineer may require the Contractor to finish a section on which work is in progress before work is started on any additional sections if the opening of such section is essential to public convenience.

All traffic affected by the construction will be regulated in accordance with the current Traffic Barricade Manual prepared or adopted by the Contracting Agency's Traffic Engineering Department.

Except in emergencies endangering life or property, written permission shall be obtained from the Engineer to perform any work after regular working hours, on weekends, or legal holidays. Prior to the start of such work, the Contractor shall arrange with the Engineer for the continuous or periodical inspection of the work, surveys and tests of materials, when necessary.

If, in the opinion of the Engineer, the Contractor has fallen behind the approved progress schedule, the Contractor shall take such steps as may be required by the Engineer, including but not limited to, increasing the number of personnel, shifts, and/or overtime operations, days of work, and/or amount of construction equipment until such time as the work is back on schedule. He shall also submit for approval no later than the time of submittal of the next request for partial payment, such supplementary schedule or schedules as may be deemed necessary to demonstrate the manner in which the approved rate of progress will be regained, all at no additional cost to the Contracting Agency.

108.6 CHARACTER OF WORKMEN; METHODS AND EQUIPMENT:

The Contractor shall at all times employ sufficient labor and equipment for prosecuting the several classes of work to full completion in the manner and time required by the specifications.

All workmen shall be competent and have sufficient skill, knowledge and experience in their class of work and in the operation of equipment required to perform all work properly and satisfactorily.

Any person employed by the Contractor or any Subcontractor who, in the opinion of the Engineer, does not perform his work in a proper and skillful manner or is intemperate or disorderly shall, at the written request of the Engineer, be removed from the work by the Contractor or Subcontractor employing such person, and shall not be employed again in any portion of the work without the approval of the Engineer. The Contractor or Subcontractor shall keep the Contracting Agency harmless from damages or claims for compensation that may occur in the enforcement of this Section.

*For Improvement District Project: The words "Superintendent of Streets" will be substituted for the word "Engineer." Any extension contract time will be determined by the Superintendent of Streets with the consent of the governing body.

Should the Contractor or Subcontractor fail to remove such person as required above, or fail to furnish suitable and sufficient personnel for the proper prosecution of the work, the Engineer may suspend the work by written notice until such orders are complied with.

All equipment which is proposed to be used on the work shall be of sufficient size and in such mechanical condition as to meet requirements of the work and to produce a satisfactory quality of work. Equipment used on any portion of the project shall be such that it will not damage property adjacent to the work area.

When the methods and equipment to be used by the Contractor in accomplishing the construction are not prescribed, the Contractor is free to use any methods or equipment that he demonstrates to the satisfaction of the Engineer will accomplish the work in conformity with the requirements of the specifications.

When the specifications state the construction shall be performed by the use of certain methods and equipment, such methods and equipment shall be used unless others are authorized by the Engineer. If the Contractor desires to use a method or type of equipment other than those specified, he may request authority from the Engineer to do so. The request shall be in writing and shall include a full description of the methods and equipment proposed to be used and an explanation of the reasons for desiring to make the change. If approval is given, it will be on the condition that the Contractor will be fully responsible for producing construction work in conformity with the specifications. If, after trial use of the substituted methods or equipment, the Engineer determines that the work produced does not meet the specifications, the Contractor shall discontinue the use of the substitute method or equipment and shall complete the remaining construction with the specified methods and equipment. The Contractor shall remove the deficient work and replace it with work of specified quality, or take such other corrective action as the Engineer may direct. No change will be made in basis of payment for the construction items involved nor in contract time as result of authorizing a change in methods or equipment under these provisions.

108.7 DETERMINATION AND EXTENSION OF CONTRACT TIME:

The number of calendar days allowed for the completion of the work included in the contract will be as stated in the proposal and will be known as the contract time.

When the contract time is on a calendar day basis it shall consist of the number of calendar days specified, including all weekends and legal holidays. All calendar days elapsing between the effective dates of any written notice from the Engineer to suspend work and to resume work following suspensions, not the fault of the Contractor, shall be excluded.

When the contract completion time is a fixed calendar date it shall be the date on which all work on the project shall be completed and meet final inspection.

If the Contractor finds it impossible for reasons beyond his control to complete the work within contract time as specified or as extended, he shall immediately submit a written request to the Engineer for an extension of time setting forth therein the reasons, which he believes, will justify the granting of his request. The Contractor's plea that insufficient time was specified is not a valid reason for extension of time. If the Engineer* finds that the work was delayed because of conditions beyond the control and through no fault of the Contractor, he may extend the time for completion in such amount as the conditions justify. The extended time for completion shall then be in full force and effect the same as though it were the original time for completion.

108.8 GUARANTEE AND WARRANTY PROVISIONS:

The Contractor shall guarantee the work against defective workmanship and materials for a period of one year from the date of its final acceptance under the contract, ordinary wear and tear and unusual abuse or neglect excepted.

Any omission on the part of the Engineer to condemn defective work or materials at the time of construction shall not be deemed an acceptance, and the Contractor will be required to correct defective work or materials at any time before final acceptance and within one year thereafter.

*For Improvement District Project: The words "Superintendent of Streets" will be substituted for the word "Engineer." Any extension contract time will be determined by the Superintendent of Streets with the consent of the governing body.

Should any defects develop within one year from the date of final acceptance due to faults in workmanship or materials the Contractor shall, within 14 calendar days of receipt of written notice from the Contracting Agency, begin making the necessary repairs to the satisfaction of the Engineer. Such work shall include the repair or replacement of other work or materials damaged or affected by making the above repairs or corrective work, all at no additional cost to the Contracting Agency.

If defects develop which are determined by the Engineer to be an emergency, the Engineer shall notify the Contractor, via the most expeditious means, regarding the nature and condition of the defects. In turn, the Contractor shall immediately dispatch necessary forces to correct the defect or the emergency condition. If the Contractor, in his initial action, resolves the emergency condition but not the defect, a letter as discussed above will follow and normal procedures for corrections will be employed. If immediate or appropriate action, satisfactory to the Engineer, is not taken by the Contractor, or if the Contractor cannot be contacted, the Engineer will deploy necessary forces to correct and/or secure the deficiency. Costs of the Engineer's action shall be paid by the Contractor and/or his bonding agency. Should it later be determined that the defects requiring such emergency action are not the responsibility of the Contractor, the Contractor will be paid for all costs incurred as a result of these demands in accordance with Subsection 109.5. Such action by the Engineer will not relieve the Contractor of the guarantees required by this Section or elsewhere in the Contract Documents.

In case of work, materials, or equipment for which written warranties are required by the special provisions, the Contractor shall provide or secure from the appropriate Subcontractor or supplier such warranties addressed to and in favor of the Contracting Agency and deliver same to the Engineer prior to final acceptance of the work. Delivery of such warranties shall not relieve the Contractor from any obligation assumed under any other provisions of the contract.

The warranties and guarantees provided in this subsection of the contract documents shall be in addition to and not in limitation of any other warranties, guarantees or remedies required by law.

108.9 FAILURE TO COMPLETE ON TIME:

For each and every calendar day that work shall remain incomplete after the time specified for the completion of the work in the proposal, or as adjusted by the Engineer, the sum per calendar day shown in Table 108-1, unless otherwise specified in the proposal form, may be deducted from monies due to or to become due to the Contractor, not as a forfeit or penalty but as liquidated damages. This sum is fixed and agreed upon between the parties because the actual loss to the Contracting Agency and to the public caused by delay in completion will be impractical and extremely difficult to ascertain and determine.

Permitting the Contractor to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time fixed for its completion may have been extended, will in no way operate as a waiver on the part of the Contracting Agency of any of its rights under the contract.

TABLE 108-1
LIQUIDATED DAMAGES

Original Contract Amount		**Daily Charges**
From More Than	To and Including	Calendar Day or Fixed Date
$ 0	$ 25,000	$ 210
25,000	50,000	250
50,000	100,000	280
100,000	500,000	430
500,000	1,000,000	570
1,000,000	2,000,000	710
2,000,000	5,000,000	1,070
5,000,000	10,000,000	1,420
10,000,000	—	1,780

108.10 FORFEITURE AND DEFAULT OF CONTRACT:

It is further agreed to by the Contractor that if he:

(A) Fails to begin the work under the contract within a reasonable time, or

(B) Fails to perform the work with sufficient workmen and equipment or with sufficient materials to assure the prompt completion of said work, or

(C) Performs the work unsuitably or neglects or refuses to remove materials or to perform anew such work as may be rejected as unacceptable and unsuitable, or

(D) Discontinues the prosecution of the work, or

(E) Fails to resume work which has been discontinued within a reasonable time after notice to do so, or

(F) At any time colluded with any party or parties, or

(G) Allows any final judgment to stand against him unsatisfied for a period of 14 calendar days, or

(H) For any cause whatsoever, fails to carry on the work in an acceptable manner, the Engineer will give notice in writing to the Contractor and his surety of such delay, neglect, or default, and advise them that the work must be resumed immediately.

If the Contractor or surety, within a period of 14 calendar days after such notice, has not proceeded in accordance therewith, then the Contracting Agency will, upon written notification from the Engineer of the fact of such delay, neglect or default and the Contractor's failure to comply with such notice, have full power and authority without violating the contract, to take the prosecution of the work out of the hands of the Contractor. The Contracting Agency may appropriate or use any or all materials and equipment on the ground as may be suitable and acceptable and may enter into an agreement for the completion of said contract according to the terms and provisions thereof, or use such other methods as in the opinion of the Engineer will be required for the completion of said contract in an acceptable manner.

All costs and charges incurred by the Contracting Agency, together with the cost of completing the work under contract, will be deducted from any monies due or which may become due said Contractor. If such expense exceeds the sum, which would have been, payable under the contract, then the Contractor and the surety shall be liable and shall pay to the Contracting Agency the amount of such excess.

*108.11 TERMINATION OF CONTRACT:

The Contracting Agency may terminate the contract or a portion thereof if conditions encountered during the progress of the work make it impossible or impracticable to proceed with the work or a local or national emergency exists.

When contracts, or any portion thereof, are terminated before completion of all work in the contract, adjustments in the amount bid for the pay items will be made on the actual quantity of work performed and accepted, or as mutually agreed for pay items of work partially completed or not started. No claim for loss of anticipated profits will be considered.

Termination of the contract or any portion thereof shall not relieve the Contractor of his responsibilities for the completed work nor the surety of its obligation for and concerning any just claims arising out of the work performed.

- End of Section -

*For Improvement District Project: The words "Superintendent of Streets" will be substituted for the word "Engineer." Any extension contract time will be determined by the Superintendent of Streets with the consent of the governing body.

SECTION 109

MEASUREMENTS AND PAYMENTS

109.1 MEASUREMENT OF QUANTITIES:

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. A station, when used as a definition or term of measurement, will be 100 linear feet.

Unless otherwise specified, longitudinal measurements will be made along the grade line.

Unless otherwise specified, transverse measurements for area computations will be the neat dimensions shown on the plans or ordered in writing by the Engineer.

The term ton will mean the short ton consisting of 2,000 pounds avoirdupois.

Unless otherwise specified, structures will be measured according to neat lines shown on the plans or as altered to fit field conditions.

In computing volumes of excavations or fill, the average end area method or other acceptable methods as determined by the Engineer will be used.

Volumes will be computed at 60 F, using ASTM D1250 for asphalt or ASTM D633 for tars.

Lumber will be measured by the thousand board foot measure actually used in the work. Measurement will be based on nominal widths and thicknesses and the extreme length of each piece.

The term lump sum, when used as a pay item, will mean complete payment for the work described.

Sundry items which have a basis for measurement and payment herein and which are incidental to or required in the construction of the work but are not included as items in the fee schedule shall be considered an integral part of the contract, and all labor, materials, etc. required for such items shall be furnished by the Contractor and the cost of same included in the unit price.

Where the units of measurement shown on the proposal form or the methods of measurement specified in the project special provisions differ from the measurement and payment provisions of the Uniform Standard Specifications, the project documents shall have precedence.

109.2 SCOPE OF PAYMENT:

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

When payment is specified to be made on the basis of weight, the weighing shall be done by a licensed public weighmaster or the weighmaster's deputy on a device licensed or certified as defined by Arizona Revised Statutes Section 41-2091 and 41-2093. The Contractor shall furnish the Engineer with duplicate Weighmaster's Certificates showing the actual net weights together with the information required by the rules adopted by the Department of Weights and Measures as authorized by Arizona Revised Statutes Section 41-2065. The Contractor shall furnish the Engineer with duplicate Weighmaster's Certificates at the time of delivery unless the Engineer designates a different submittal time. The Contracting Agency will accept the certificates as evidence of the weight delivered.

Payment for the various items in the proposal will be made at the unit price in the proposal, and shall be compensation in full for furnishing all labor, materials, equipment and appurtenances necessary to complete the work in a satisfactory manner as shown on the plans and as required in the specifications, with all connections, testing, and related work completed.

Each item, fixture, piece of equipment, etc., shall be complete with all necessary connections and appurtenances, for the satisfactory use and operation of said item. No additional payment will be made for work related to any item unless specifically called for in the proposal. This compensation shall also cover all risk, loss, damage or expense of whatever character arising out of the nature of the work or the prosecution thereof, subject to the provisions of Section 107.

The unit prices shall include all costs for salaries and wages, all payroll additives to cover employee benefits, allowances for vacation and sick leave, company portion of employee insurance, social and retirement benefits, all payroll taxes, contributions and benefits imposed by any applicable law or regulation and any other direct or indirect payroll-related costs. The unit prices shall also include all costs for indirect charges, overhead, mileage, travel time, subsistence, materials, freight charges for materials to Contractor's facility or project site, equipment rental, consumables, tools, insurance costs, all applicable taxes and fees, as well as Contractor's fee and profit. The unit prices shall further include all site clean-up costs, hauling of construction debris, and proper disposal in accordance with all laws and regulations and the project plans and specifications.

Payment will be made for only those items listed in the proposal. All materials and work necessary for completion of the project are included in proposal items. Work or materials not specifically identified by a proposal item are considered as included in the unit price of related proposal items.

Unless otherwise specified, payment will not be made for unused materials.

109.2.1 Taxes and Fees: Taxes are deemed to include all sales, use, consumer and other taxes that are legally enacted at the time of submittal of the project fee proposal, whether or not they are yet effective or merely scheduled to go into effect. Any such taxes shall be paid by Contractor and shall be included in the unit prices.

The Contractor shall also be responsible to contact all municipalities and other governmental agencies having jurisdictional authority over the project or the project area to determine if they will charge the Contractor other fees (e.g., permit fees) for the project work. Unless otherwise specified in the project documents or on the proposal form, the Contractor shall include the cost of such fees in the unit prices on the proposal form.

109.3 ASSIGNMENT OF PAYMENTS:

The Contractor shall not assign payments of a contract or any portion thereof without approval of surety and written consent of the Contracting Agency.

Claims for monies due or to become due the Contractor may be assigned to a bank, trust company, or other financing institution, and may thereafter be further assigned and reassigned to any such institution. Any such assignment or reassignment may be made to one party as agent or trustee for two or more parties participating in such financing. Any assignment of money shall be subject to all proper setoffs and withholdings in favor of the Contracting Agency and to all deductions provided for in these specifications.

109.4 COMPENSATION FOR ALTERATION OF WORK:

All compensation due the Contractor for alteration of work shall be documented by a Change Order. Except in emergency situations or as otherwise directed by the Engineer, the Contractor shall not proceed with Change Order work until said Change Order has been approved by the Agency.

***109.4.1 By the Contracting Agency:**

(A) For a decrease greater than 20 percent in either the total cost of the contract or the total cost of a major item and when a reasonable cost analysis supports an increase in the pro rata share of fixed cost chargeable to this item in total, an increase adjustment in the monies due the Contractor may be made. This adjusted compensation will not exceed 80 percent of the original lump sum contract amount or, if for a unit price item, the adjustment will not exceed 80 percent of the original extended unit price. This does not apply to items labeled as contingent items in the proposal.

*Not applicable to Improvement District Projects

(B) For an increase greater than 20 percent in either the total cost of the contract or the total cost of a major item, any adjustment made will only apply to that cost in excess of 120 percent of the original total cost of the contract or, in the case of a major item, in excess of 120 percent of the original proposed extended unit price. If either party presents a reasonable cost analysis that shows a change in the pro rata share of fixed costs chargeable to this item in total, an increase or decrease adjustment will be made. This increase or decrease adjustment will be made on such basis as is necessary to cover a reasonable estimate of cost, plus an allowance, not to exceed 15 percent, for overhead and profit. If the parties are unable to reach an agreement, the Engineer has the authority to order the excess work done on an actual cost basis as specified in Section 109.5.

(C) For either an increase or decrease in cost, no claim shall be made by the Contractor for any loss of anticipated profits.

***109.4.2 Due to Physical Conditions:**

(A) If the Engineer, after his investigation of the site conditions, agrees that they materially differ from those indicated in the contract and would cause an increase in the Contractor's cost of accomplishing the work, new unit prices or a lump sum cost (for the additional work only) may be negotiated. If the parties are unable to reach an agreement on price, the Engineer has the authority to order this additional work accomplished on an actual cost basis as specified in Section 109.5.

(B) If the Engineer, after his investigation of the site conditions, finds that these conditions do not materially differ from those indicated in the contract, he has the authority to order the work to be accomplished at the original price(s).

***109.4.3 Due to Extra Work:** If the Contractor can present valid, factual evidence, satisfactory to the Engineer, that the work in question is an item not provided for in the contract as awarded then a unit price or lump sum cost, for this item only, may be negotiated. If the parties are unable to reach an agreement on price or cost, the Engineer has the authority to order the extra work accomplished on an actual cost basis as specified in Section 109.5.

109.4.4 Made at the Contractor's Request: Any alterations, if approved, will be a reduction in cost or at no additional cost to the Contracting Agency.

109.4.5 Due to Failure of Contractor to Properly Maintain the Project:

(A) For any suspension of work during normal working hours due to failure of the Contractor to properly maintain the project, there will be no additional compensation or time allowed.

(B) If the Engineer provides the Contractor with a written order to provide adequate maintenance of traffic, adequate cleanup, and adequate dust control or to correct deficiencies resulting from abnormal weather conditions and the Contractor fails to comply in the time frame specified, the Contracting Agency may have the work accomplished by other sources. The Contracting Agency will deduct the cost of accomplishing the work from monies due or to become due to the Contractor. Computation of the cost will be in accordance with Section 109.5.4.2.

109.4.6 Allowable Mark-Ups: Only the allowable mark-ups as defined in Section 109.5 shall be allowed. Additional compensation for other items, including extended overhead and conditions, shall not be considered or allowed.

***109.5 ACTUAL COST WORK:**

The compensation for actual cost work performed by the Contractor (Subcontractor) shall be determined by the Engineer in the following manner.

*Not applicable to Improvement District Projects

109.5.1 Equipment: For all equipment, the use of which has been authorized by the Engineer, except for small tools and manual equipment, the Contractor will be paid in accordance with the latest Schedule of Equipment Rates used by the Arizona Department of Transportation. Payment for equipment will be made following the calculations in Section 109 of the Arizona Department of Transportation Standard Specifications for Road and Bridge Construction. The value of 0.933 shall be used for the adjustment factor F used in the rental rate formulas (F = 0.933).

109.5.2 Material: For all material, accepted by the Engineer and used in the work, the Contractor will be paid the actual cost of such material including transportation cost, to which total cost will be added a sum equal to 15 percent thereof.

109.5.3 Labor: For all labor and for the foreman, when he is in direct charge of the operation, the Contractor will be paid:

(A) The actual wages paid plus the current percentage thereof as determined by the Arizona Department of Transportation, which is deemed to cover the Contractor's cost incurred as a result of payment imposed by State or Federal Law, and payments that are made to, or on behalf of, the workman other than the actual wage. Actual wage is defined as the required current hourly rate paid to the labor classification concerned and does not include any fringe benefits or dislocation allowances. If the Contractor is not required to pay fringe benefits equivalent to the Current rates published in the Federal Register, an equitable deduction will be made from the current percentage established by the Arizona Department of Transportation.

(B) For the first $50,000 of labor cost computed under paragraph (A) above, the Contractor will be paid an amount equal to (15) fifteen percent for overhead and profit.

(C) For all labor cost computed under paragraph (A) above, in excess of $50,000 but not exceeding $100,000, the Contractor will be paid an amount equal to (12) twelve percent for overhead and profit.

(D) For any labor cost computed under paragraph (A) above in excess of $100,000 the Contractor will be paid an amount equal to (10) ten percent for overhead and profit.

109.5.4 Work Performed by Subcontractors or Other Sources:

109.5.4.1 Work Performed by Subcontractors: If it is determined by the Engineer that portions of the Actual Cost Work to be performed requires specialized labor or equipment not normally used by the Contractor and such work is then authorized to be performed by a subcontractor(s), the subcontractor(s) will be paid by the Contractor in accordance with the actual cost work procedures outlined herein. The Contractor will be paid by the Contracting Agency the full amount of the subcontract plus the following percentages for administration and supervision.

(A) For the first $10,000 accumulated total of all change order work performed by subcontractors (less mark-up for overhead and profit), the Contractor will be paid an amount equal to 10 percent of the accumulated total for administration and supervision. If the accumulated total is $3,000 or less, the Contractor will be paid $300 for administration and supervision.

(B) For all change order work in excess of $10,000 accumulated total performed by subcontractors (less mark-up for overhead and profit), the Contractor will be paid an amount equal to five percent of the accumulated total for administration and supervision.

109.5.4.2 Work Performed by Other Sources: If the Contracting Agency has work performed by other sources, in accordance with Section 109.4.5 (B), the Contracting Agency will deduct, from monies due or to become due to the Contractor, the full amount of the cost of accomplishing the work by other sources plus the following percentages for administration and supervision:

(A) For the first $10,000 accumulated total of work performed by other sources, the Contracting Agency will deduct an amount equal to 10 percent of the accumulated total for administration and supervision. If the accumulated total is $3,000 or less, the Contracting Agency will deduct $300 for administration and supervision.

(B) For all work in excess of $10,000 accumulated total performed by other sources, the Contracting Agency will deduct an amount equal to 5 percent of the accumulated total for administration and supervision.

109.5.5 Documentation:

(A) Except in emergency situations, the Contracting Agency will not be liable for any Actual Cost Work performed by the Contractor prior to written authorization by the Engineer or prior to full execution of a written agreement by all parties concerned.

(B) Payment for work performed on an actual cost basis will not be made until the Contractor has furnished the Engineer, on forms agreed to by the Contracting Agency, duplicate itemized statements of such work, including subcontractor(s) costs, detailed as follows:

(1) Name, classification, date, daily hours, total hours, rate and extension for each laborer and foreman.

(2) Designation, dates, daily hours, total hours, rental rates and extension for each unit of equipment, and machinery.

(3) Quantities of material, prices, extension and transportation cost on a daily basis. These charges shall be substantiated by vendor invoices.

(C) The Engineer will compare his records with the statement furnished by the Contractor, resolving any differences and making the required adjustments. This statement when agreed upon and signed by both parties, shall be the basis of payment for the work performed.

109.5.6 Bonds and Insurance: The Contractor shall be paid for the actual cost plus (10%) ten percent for Administrative cost when the Contractor can provide evidence of payment for premiums on required payment and performance bonds, premiums on railroad and/or airport extended liability insurance, and premiums for property damage and/or public liability insurance. No duplication of payment for Contractor's costs included under Section 109.5.3 (A) will be allowed.

109.5.7 Authority of Engineer: The Engineer is in charge of Actual Cost Work and has the authority to direct which labor and equipment will be used, to suspend operations, and to refuse to pay for any labor or equipment, which he feels is not doing productive work.

109.6 PAYMENT FOR IMPROVEMENT DISTRICT PROJECTS:

Payment to the Contractor shall be made in accordance with ARS Sections 48-523 to 48-613, both inclusive.

As soon as the Contractor has fulfilled his contract, the Superintendent of Streets shall estimate the benefits arising from the work and make assessments to cover the work performed and specified in the contract, including incidental expenses in accordance with ARS Section 48-589.

The Contractor agrees to accept payment in the form of Assessments with attached Warrants and/or Improvement Bonds at the rate of interest declared in the resolution of intention prepared by the Contracting Agency.

***109.7 PAYMENT FOR BOND ISSUE AND BUDGET PROJECTS:**

(A) **Partial Payments**: The Contracting Agency will make a partial payment to the Contractor on the basis of an estimate prepared by the Contractor or Engineer for work completed through the last day of the preceding calendar month. Payment will be within 14 calendar days after the estimate has been certified and approved by the Engineer and received by the owner.

*Not applicable to Improvement District Projects

The Contracting Agency will retain 10 percent of all estimates as a guarantee for complete performance of the contract in accordance with Arizona Revised Statutes Section 34-221 or 34-607, unless the Contractor elects to deposit securities in accordance with Arizona Revised Statutes Section 34-221, Paragraph C.5. or 34-607, Paragraph B.5.

When the Contractor is fifty percent completed, one-half of the amount retained shall be paid to the Contractor provided he is making satisfactory progress on the contract and there is no specific cause or claim requiring a greater amount to be retained. After the contract is fifty percent completed, no more than five percent of the amount of any subsequent progress payments made under the contract will be retained providing the Contractor is making satisfactory progress on the project. Except that, if at any time the owner determines satisfactory progress is not being made, ten percent retention shall be reinstated for all progress payments made under the contract subsequent to the determination.

Any material or equipment, which will become an integral part of the completed project, will be considered for partial payment in the Contractor's monthly progress payments. The intent of making partial payments is to provide the Contractor payment for direct material or equipment purchased. The purpose is to minimize the effect of escalating costs by procuring key materials. It is not the intent to pay for all materials but only those meeting the following conditions.

(1) A total value of all items requested for payment must be greater than $20,000. No payment will be processed until the material or equipment has been observed, reviewed or verified by the Contracting Agent representative. Only the material or equipment meeting the requirements of the plans and specifications will be paid. Payment for material or equipment does not constitute final acceptance.

(2) Materials or equipment must be stored or stockpiled either on site, in a warehouse, or secured storage area. The Contractor assumes all responsibility for protection of these materials or equipment and shall insure them to cover loss or damage to same without additional liability or added costs to the Agency for providing this security, insurance, and storage.

(3) The Contractor will provide access to the storage area or warehouse upon request of the Contracting Agent's representative for the purpose of verifying the inventory of items paid for under this Section. None of the materials or equipment paid for under this Section will be removed from the storage site until incorporated into the work of the project. The storage site shall be within the general geographical area of the project.

(4) The Contractor shall provide a paid invoice and/or lien waiver for items paid for under this Section. The Agency will not pay more than the invoice price for the item or items, less retention.

(5) The Engineer may exclude individual payment requests, which in the Engineer's judgment do not warrant storage and prepayment under the intent of this Section.

(B) **Final Payment**: When the project has been accepted as provided in Section 105, and within 30 calendar days after final inspection of the work completed under the contract, the Engineer will render to the Contracting Agency and the Contractor, a final estimate, which will show the amount of work, performed and accepted under the contract. All prior estimates and partial payments will be subject to correction in the final estimate for payment.

Within sixty (60) calendar days after final acceptance, the Contracting Agency will pay the Contractor all amounts due him under the contract, except that before final payment will be made, the Contractor shall satisfy the Contracting Agency by affidavit that all bills for labor and materials incorporated in the work have been paid. The Contractor's Affidavit may be obtained from the Engineering Office of the Contracting Agency.

If payment will be longer than 60 days after final completion and acceptance, the owner will provide the Contractor specific written findings for reasons justifying the delay in payment.

The acceptance of the project and the making of the final payment shall not constitute a waiver by the Contracting Agency/Owner of any claims arising from faulty or defective work appearing after the completion or from failure of the Contractor to comply with the requirements of the contract documents.

109.8 PAYMENT FOR DELAY:

The procedures contained in this Section shall not be construed to void any provision of the contract, which require notice of delays, provides for negotiation of other procedures for settlement or provide for liquidated damages.

109.8.1 Failure to Locate or Incorrect Location of Utilities: Arizona Revised Statutes 40-360.28 indicates that "if a person (owner, operator, or agent) fails to locate or incorrectly marks the location of the underground facility in a timely manner, the person (owner, operator, or agent) becomes liable for resulting damages, costs and expense to the injured party." The Contracting Agency will deny any claims for damages or delays if another owner or operator is at fault.

109.8.2 Contracting Agency Delays: Arizona Revised Statutes 34-221 states "A contract for the procurement of construction shall include a provision which provides for negotiations between the Agent and the Contractor for the recovery of damages related to expenses incurred by the Contractor for a delay for which the Agent is responsible, which is unreasonable under the circumstances and which was not within the contemplation of the parties to the contract." In this case, if the Contractor sustains damages, which could not have been avoided by the judicious handling of forces, equipment and plant or by reasonable revision in the Contractor's schedule of operation, the compensation for such damages will be negotiated. The Contractor shall notify the Engineer of the condition in writing by the next work day. Failure to notify the Engineer within this time may be just cause to reject any claims for such damages.

Compensation for such damages will be negotiated as follows:

(A) The Engineer shall be satisfied that the Contractor has made every reasonable effort to prosecute the work despite any delays encountered or revisions in the Contractor's scheduling of work.

(B) The Compensation paid to the Contractor shall be in accordance with Section 109.

109.8.3 Extension of Contract Time: For any such delays, the contract time will be adjusted in accordance with Section 108.7.

109.9 DOLLAR VALUE OF MAJOR ITEM:

TABLE 109-1
DOLLAR VALUE OF MAJOR ITEM

Original Contract Amount	Dollar Value of Major Item
$0.00 to $1,000,000.00	$50,000 or 10% of original contract amount, whichever is less
$1,000,000.00 to $5,000,000.00	5.0% of original contract amount
$5,000,000.00 or greater	$250,000.00 or 2.5% of original contract amount, whichever is greater

109.10 PAYMENT FOR MOBILIZATION/DEMOBILIZATION:

The Agency will compensate Contractor for a single round trip mobilization/demobilization of Contractor's personnel, equipment, supplies and incidentals, including 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.

Mobilization/demobilization will be measured for payment by the lump sum as a single complete unit of work. Payment for mobilization/demobilization 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 the Contractor's initial billing. The second payment will be made when the total payments to the Contractor for the pay items, exclusive of payments for mobilization/demobilization, equal greater than one-half of the initial contracted amount, exclusive of mobilization/demobilization. The remaining one-third will be paid as part of the final payment due to the Contractor.

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 or additional mobilization/demobilization of personnel, material and/or equipment at the Engineer's express written request, the Agency 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.

For projects that do not list mobilization/demobilization as a pay item, a single round trip mobilization/demobilization shall be considered a non-pay item for said projects, the cost of which shall be spread across other appropriate items. Should a second or additional mobilization/demobilization be required at the Engineer's express written request, compensation for such shall be handled as detailed in the foregoing paragraph.

- End of Section -

SECTION 110

NOTIFICATION OF CHANGED CONDITIONS AND DISPUTE RESOLUTION

110.1 GENERAL:

When changes are initiated by the Contracting Agency, or as a result of decisions rendered by the Agency, inaction of the Agency or changed conditions unknown to all parties at the time of bid, the Contractor may request an adjustment to the contract amount and/or contract time. This Section does not preclude the use of legal remedies in the event of claims or litigation brought by third parties. The procedure for this adjustment is a two-step process, (1) Initial Notification and Dispute Resolution and (2) Administrative Process for Dispute Resolution, as discussed below:

110.2 INITIAL NOTIFICATION AND DISPUTE RESOLUTION:

110.2.1 Notification: As required by these Specifications or any time the Contractor believes that the action or decision of the Contracting Agency, lack of action by the Contracting Agency, or for some other reason will result in or necessitate the revision of the contract, the Engineer must be notified immediately. If within two working days the identified issue has not been resolved between the Contracting Agency and the Contractor, the Contractor shall provide a written notice. At a minimum, the written notice shall provide a description of the nature of the issue, the time and date the problem was discovered, and if appropriate, the location of the issue. After initial written notice has been provided, the Engineer will proceed in accordance with Subsection 104.2. In addition to proceeding in accordance with Subsection 104.2, the Contracting Agency and the Contractor must make every effort to resolve the issue identified in the initial notice. Only if the issue cannot be quickly resolved will it be necessary to proceed to the next step in this subsection.

110.2.2 Dispute Resolution: Once the above process has been exhausted or within seven calendar days of the date of the initial written notice, whichever is sooner, the following steps will be taken:

(A) The Contractor shall provide in writing the following information to the Engineer. If known, a cost analysis may be included with the information.

(1) The date of occurrence and the nature and circumstances of the issue for which initial notice was given.
(2) Name, title, and activity of each Contracting Agency or all other persons knowledgeable of the issue.
(3) Identity of any documents and the substance of any oral communication related to the issue.
(4) Basis for an assertion that the work required is a change from the original contract work or schedule.
(5) Identity of particular elements of contract performance for which a change in compensation and/or time may be sought, including:
    (a) Pay item(s) that have been or may be affected by the issue and any adjustments to unit price(s) that are required;
    (b) Labor and/or materials that will be added deleted or wasted by the problem and what equipment will be idled or required;
    (c) Delay and disruption in the manner and sequence of performance that has been or will be caused;
    (d) Adjustments to delivery schedule(s), staging, and contract time due to the dispute and
    (e) Estimate of the time within which the Contracting Agency must respond to the notice to minimize cost, delay, or disruption of issue.
(6) Any other items or information germane to the dispute.
(7) The Contractor's written certification, under oath, attesting to the following:
    (a) The request is made in good faith.
    (b) Supportive data is accurate and complete to the Contractor's best knowledge and belief.
    (c) When provided, the amount requested accurately reflects the Contractor's actual cost incurred.

In complying with this request, the Contractor shall use the Contracting Agency's certification form.

(B) Within ten calendar days after the Contractor's submission in accordance with the above paragraph, the Engineer will respond in writing to the Contractor to:

(1) Confirm that a supplemental agreement is necessary and, when necessary, give appropriate direction for further performance, or

(2) Deny that the contract has been revised and, when necessary, direct the Contractor to proceed with the contract work, or

(3) Advise the Contractor that adequate information has not been submitted to decide whether (1) or (2) applies, and indicate the needed information and date it is to be received by the Engineer for further review. The Contracting Agency will respond to such additional information within ten calendar days of receipt from the Contractor.

110.2.3 Conditions: The failure of the Contractor to comply with the requirements of this subsection constitutes a waiver of entitlement to additional compensation or a time extension.

110.3 ADMINISTRATIVE PROCESS FOR DISPUTE RESOLUTION:

110.3.1 General: If the Contractor rejects the decision of the Engineer in Subsection 110.2.2 (B) above, the Contractor may begin the Administration Process to resolve the dispute.

The notice provision set forth in Subsection 110.2 is a contractual obligation assumed by the Contractor in executing the contract. It is understood that the Contractor will be forever barred from recovering against the Contracting Agency if the Contractor fails to give notice of any act or failure to act, by the Engineer, or the happening of any event, thing, or occurrence, in accordance with Subsection 104.2 Alteration of Work.

The administrative process for the resolution of disputes is sequential in nature and is composed of the following levels:

Level I. (Representative reviewed by: *e.g. Construction Engineer*)
Level II. (Representative reviewed by: *e.g. Assistant County/City Engineer*)
Level III. (Representative reviewed by: *e.g. County/City Engineer*)

Note: The above stated titles may vary depending on the Contracting Agency's organization.

These three levels of review; the specific titles; the financial authority of each: and the names of people assigned to each level shall be provided at the preconstruction conference. The equivalent information regarding the Contractor's organization shall also be provided at the preconstruction conference.

Except as provided elsewhere herein, no dispute will be accorded a particular level of review unless the dispute has been reviewed at the preceding level and the Contractor rejects the decision in writing within the time period specified, or both parties agree that the decision for compensation is above that levels authority.

Unless specifically requested otherwise by the Contracting Agency, submission of additional information by the Contractor or Engineer, at any level of the review process shall cause the process to revert to Level I.

110.3.2 Required Information: At a minimum, the information described in Subsection 110.2 must accompany each dispute. If the following applies, it shall also be provided in addition to the information required by Subsection 110.2.

(A) If additional compensation is sought, the Contractor shall submit the exact amount sought as required by Subsection 110.2.2 (A) (5) broken down into the following categories:

(1) Direct Labor
(2) Direct Materials
(3) Equipment
(4) Job Overhead
(5) General and Administrative Overhead
(6) Subcontractor's Work (broken down as 1, 2, 3 and 4 above)
(7) Other categories as specified by the Contractor.

(B) If additional time is sought, the Contractor shall provide a comprehensive time impact analysis showing the delay(s) and how they affect the critical path. The time impact analysis must include both the original and as-built critical path schedules and must be supported by documentation such as delivery schedules, invoices, correspondence, memoranda of telephone calls, payroll data, daily work schedules, etc.

NOTE: The path of the longest duration of continuous and dependent work activities through the schedule network is identified as the Critical Path and is the minimum amount of time required to build the project as depicted by the schedule.

(C) The Contractor shall also notify the Contracting Agency's Level I Representative in writing that all documentation in support of the dispute has been provided and that the administrative review process should begin. No formal action will be taken by the Level I Representative until this written notification is received. The documentation provided to the Level I Representative shall serve as the basis for evaluating the Contractor's position regarding the dispute throughout the administrative process.

110.3.3 Process: The Contracting Agency's Level I Representative will render a written decision regarding the matter in dispute within two working days of receipt of the Contractor's notification that the dispute resolution process should begin.

The Contractor shall, upon receipt of the decision by the Level I Representative, either accept or reject the decision in writing. If the Contractor does not reject the Level I Representative's decision within two working days of its receipt, the Contractor will be deemed to have accepted the decision, the dispute will be considered withdrawn from the administrative process, and there will be no further remedy.

If the Contractor rejects the decision of the Level I Representative, the dispute will be forwarded by the Level I Representative to the Level II Representative. The Level II Representative will, within seven working days of receipt of the dispute information from the Level I Representative, schedule and hold a meeting to review the dispute with the Contractor. This time limit may be extended by mutual agreement of the parties. The Level II Representative will, within seven working days of the meeting, issue a written decision, with justification, regarding the dispute.

The Contractor shall, within seven working days of receipt of the decision, either accept or reject it in writing. If the Contractor does not reject the Level II decision within seven working days, the Contractor will be deemed to have accepted the decision and the dispute will be considered withdrawn from the administrative process and there will be no further remedy.

If the Contractor rejects the decision of the Level II Representative, the Level II Representative will forward the dispute to the Level III Representative. The Level III Representative will, within fourteen working days of receipt of the dispute information from the Level II Representative, schedule and hold a meeting with the Contractor. This time limit may be extended by mutual agreement of the parties. The Level III Representative will, issue a written decision within fourteen working days of the meeting, with justification, regarding the dispute.

The Contractor shall, within fourteen working days of the receipt of the decision of the Level III Representative, either accept or reject it in writing. If the Contractor does not reject the Level III Representative's decision within fourteen working days, the Contractor will be deemed to have accepted the decision, the dispute will be considered withdrawn from the administrative process, and there will be no further remedy.

If the Contractor rejects the decision of the Level III Representative, there will be no further administrative review of the dispute. The resolution will then proceed as follows:

(A) **Mediation**: Prior to filing for arbitration or litigation, the Contractor may request non-binding mediation by filing a request for mediation in writing with the Engineer. If agreeable, the Engineer will then arrange for a mutually agreeable mediator. Such request for mediation shall be made within thirty calendar days from the date of the Level III Representative's decision as provided for in this subsection.

In connection with the mediation, each party shall bear its own costs, attorney's fees, and expert fees. Any fees and expenses assessed by the mediator shall be borne equally by the parties.

(B) **Dispute Review Board/Arbitration:** The decision of the Level III Representative in relation to the claim shall be final unless the dispute review board or arbitration is chosen as follows:

(1) Where the amount in controversy is less than or equal to the amount authorized in Subsection 110.3.4, the sole remedy shall be the Dispute Review Board as prescribed in Subsection 110.5 unless both parties mutually agree to utilize arbitration

as prescribed in Subsection 110.4.

(2) Where the amount in controversy is more than authorized in Subsection 110.3.4, the Contractor reserves the right to initiate litigation pursuant to Section 12-821 et seq. of the Arizona Revised Statutes, or if mutually agreed upon, the parties may choose to resolve the controversy utilizing either the Dispute Review Board as prescribed in Subsection 110.5 or Arbitration as prescribed in Subsection 110.4.

110.3.4 Amount of Dispute: For the purposes of this subsection, the amount in controversy may not exceed $200,000.00. A claim for adjustment in compensation shall mean an aggregate of operative facts giving rise to the rights of the party for which it is seeking to enforce. That is to say, a claim under this subsection is defined as the event, transaction or set of facts that give rise to a claim for compensation, costs, expenses or damages.

In making a determination whether the amount in controversy is $200,000.00 or less, the parties shall not consider, quantify or take into account any requested extensions of contract time, or the release or remission of liquidated damages assessed or accrued prior to the dispute in question, under Subsection 108.7 and 108.9 of the Specifications.

Any party having a claim, adjustment or dispute for an amount in excess of $200,000.00 may waive or abandon the dollar amount of any such claim in excess of $200,000.00 so as to bring the claim, adjustment or dispute within the scope and coverage of this subsection, provided that the amount allowed to any such party by the arbitration award shall not exceed $200,000.00. Various damages claimed by the party for a single claim may not be divided into separate proceedings to create claims within the $200,000.00 limit.

110.4 ARBITRATION:

If the parties mutually agree to pursue arbitration as prescribed in Subsection 110.3.3, then a Demand for Arbitration shall be filed in writing with the American Arbitration Association or United States Arbitration and Mediation of Arizona, and a copy served thereof upon the Level III Representative or Contractor, whichever applicable. Such Demand for Arbitration shall be made by the party within thirty calendar days of the date of the Level III Representative's decision as provided for in Section 110.3 above, unless a mediation process is already underway, in which case the Demand for Arbitration shall be made within thirty days of the termination of the mediation process. The scope of the arbitration proceeding shall be restricted and limited to the matters originally presented to the Level III Representative for decision or determination and shall include no other matters. All arbitration of claims shall be conducted in Phoenix, Arizona or other mutually selected location in accordance with the rules of the arbitration service hearing the dispute.

The claim shall be submitted to a single arbitrator who shall be selected by the parties from a list of arbitrators furnished by the arbitration service. Each party shall alternately strike names from the list until only one name remains. The person whose name thus remains on the list of arbitrators is their first choice, but if that person is not available to serve, the two persons whose names were last stricken are acceptable, with the one whose name was last stricken being the first alternate.

Unless agreed to otherwise, the parties shall select the arbitrator within ten calendar days after each has received a copy of the list of arbitrators.

Each party to the arbitration shall bear its own costs, attorney fees and expert fees. Any other costs and fees assessed by the arbitration service shall be divided equally between the parties to the arbitration.

The decision or award of the arbitrator shall be supported by substantial evidence and, in writing, contain the basis for the decision or award and findings of fact. The decision or award by the arbitrator when made shall be final and nonappealable except as provided in Section 12-1512, Arizona Revised Statutes. Both parties to the Contract shall be bound by the Arbitration Award for all purposes and judgment may be entered upon it in accordance with applicable law in the Superior Court of Arizona.

110.5 DISPUTE REVIEW BOARD:

If the Dispute Review Board is utilized as prescribed in Subsection 110.3.3, the Engineer shall be notified within thirty days after the Level III Representative decision. The Dispute Review Board is a three-member board independent of the parties involved in the issue. The Agency and Contractor shall each select a member for this board. The third member shall be a mutually agreed upon independent member. This Review Board must be selected within fourteen calendar days after notice to the Level III Representative. Each member shall agree to impartially serve the Agency and Contractor. Fees and expenses of Board Members are to be shared equally by Agency and Contractor. The Dispute Review Board shall meet within thirty days of the selection of the board, unless, by mutual agreement, another date is selected. The scope of the Dispute Review Board shall be restricted and limited to the matters originally presented to the Level III Representative for decision or determination and shall include no other matters. The Board shall consider and evaluate the dispute and render a written decision that assigns financial responsibilities and allocates adjustments in the contact time, if applicable, within seven calendar days after the meeting. The decision of the dispute Review Board will be final.

110.6 FINAL DOCUMENTATION AND PAYMENT:

If at any step in the process a dispute is resolved, the Contractor must sign a supplemental agreement setting forth the resolution of the dispute and including an unconditional release as to any and all matters arising from the dispute. In addition, when the agreement results in a change in contract amount and/or time, a change order shall be prepared by the Contracting Agency for said changes and signed by both parties within 30 days from the date of the agreement. Payment of the change order will be made to the appropriate party(s) in accordance with Section 109.

- End of Section -

SECTION 205

ROADWAY EXCAVATION

205.1 DESCRIPTION:

Roadway excavation shall consist of excavation involved in the grading and construction of roadways, except structure excavation, trench excavation and any other excavation separately designated.

205.2 UNSUITABLE MATERIAL:

Material shall be considered unsuitable for fill, subgrade, shoulders and other uses if it contains organic matter, soft spongy earth, or other matter of such nature that compaction to the specified density is unobtainable.

Material that is unsuitable for the intended use shall be excavated and removed from the site or otherwise disposed of as directed by the Engineer.

The removal and disposal of such unsuitable material will be paid for as roadway excavation.

205.3 OVERSHOOTING:

Material outside the authorized cross-section, which may be shattered or loosened because of blasting, shall be removed by the Contractor at no additional cost to the Contracting Agency. The Contractor shall discontinue any method of blasting which in the opinion of the Engineer leads to excessive overshooting or is dangerous to the public or destructive to property or to natural features.

205.4 SLIDES AND SLIPOUTS:

Material outside the planned roadway or ditch slopes which in the opinion of the Engineer is unstable and constitutes potential slides, material which has come into the roadway or ditch, and material which has slipped out of new or old embankments shall be excavated to designated lines or slopes either by benching or in such manner as directed by the Engineer. Such material shall be used in the construction of the embankments or disposed of as directed by the Engineer.

The removal and disposal of slide and slip out material as specified above, not resulting from overshooting as specified above, will be paid for at the contract prices for roadway excavation. However, if due to the character of the work, the removal and disposal of such material is not properly compensable at the contract prices for roadway excavation, the work may be paid for as extra work provided the Contractor requests in writing such payment prior to performing any such work.

Only those quantities of slide or slip out material, which are actually removed as ordered by the Engineer, will be paid for.

205.5 SLOPES:

Excavation slopes shall be finished in conformance with the lines and grades shown on the plans. Debris and loose material shall be removed. When completed, the average plane of the slopes shall conform to the slopes indicated on the plans and no point on the completed slopes shall vary from the designated plane by more than 6 inches measured at right angles to the slope, except where excavation is in rock no point shall vary more than 2 feet from the designated plane of the slope. In no case shall any portion of the slope encroach on the roadbed.

Tops of excavation slopes and ends of excavations shall be rounded as shown on the plans and these quantities will not be included in the quantities of excavation to be paid for. This work will be considered as a part of finishing slopes and no additional compensation will be allowed therefore.

Embankment slopes shall be finished in conformance with lines and grades shown on the plans. When completed the average plane of slopes shall conform to slopes indicated on the plans and no point on the completed slopes shall vary from the designated plane by more than 6 inches measured at right angles to the slope.

205.6 SURPLUS MATERIAL:

Unless otherwise shown on the plans, specified in the special provisions, or approved by the Engineer, no surplus excavated material shall be disposed of within the right-of-way. The Contractor shall make all arrangements for disposal of the material at off-site locations as may be approved by the Engineer, and shall upon request file with the Engineer the written consent of the owner of the property upon which he intends to dispose of such material.

If the quantity of surplus material is shown on the plans or specified in the special provisions, the quantity shown or specified is approximate only. The Contractor shall satisfy himself that there is sufficient material available for the completion of the embankments before disposing of any indicated surplus material inside or outside the right-of-way. Any shortage of material caused by premature disposal of surplus material by the Contractor shall be replaced by him and no compensation will be allowed the Contractor for such replacement.

205.7 MEASUREMENT:

The following earthwork operations will be measured as roadway excavation for the quantities of material involved.

Excavating the roadway prism including public and private road approaches, connections and driveways; excavating unsuitable material when shown on the plans or specified in the special provisions; excavating slides and slip outs not resulting from overshooting; excavating surplus material; excavating selected material and topsoil from within the limits of project and removing such materials from stockpiles when stockpiling is ordered; excavating ditches and excavating borrow.

The Engineer will compute the quantities of material excavated by a method, which in his opinion is best suited to obtain an accurate determination.

Excavation in excess of the planned or authorized cross-section will not be paid for, except as provided above. The Contractor shall backfill and compact unauthorized excavated areas to the original ground elevation of authorized section at no additional cost to the Contracting Agency.

Material resulting from excavating ditches or channels may be used to construct roadway embankments, dikes, or for other purposes, or disposed of, as directed by the Engineer.

Care shall be exercised to prevent excavating below the grade for the bottom of the ditch and areas excavated below grade shall be filled with suitable material and compacted by the Contractor at no additional cost to the Contracting Agency.

205.8 PAYMENT:

Quantities of roadway excavation will be paid for at the contract unit price per cubic yard. Such price shall include excavating, sloping, rounding tops and ends of excavations, loading, depositing, conditioning, spreading, and compacting the material complete in place and disposal of surplus material.

When the proposal does not include a pay item for roadway excavation the cost thereof shall be considered as being included in the price bid for the construction or installation of the items to which such roadway excavation is incidental or appurtenant.

- End of Section -

SECTION 301

SUBGRADE PREPARATION

301.1 DESCRIPTION:

This Section shall govern the preparation of natural or excavated areas prior to the placement of sub-base material, pavement, curbs and gutters, driveways, sidewalks or other structures. It shall include stripping and disposal of all unsuitable material including existing pavement and obstructions such as stumps, roots, rocks, etc., from the area to be paved.

301.2 PREPARATION OF SUBGRADE:

With the exception of areas where compacted fills have been constructed as specified in Section 211, in the areas where new construction is required, the moisture content shall be brought to that required for compaction by the addition of water, by the addition and blending of dry, suitable material or by the drying of existing material. The material shall then be compacted to the specified relative density. If pumping subgrade should become evident at any time prior to paving, the Engineer may require proof rolling with a pneumatic-tire roller or other approved equipment in order to identify the limits of the unacceptable area. The proof rolling will be performed at no additional cost to the Contracting Agency.

Subgrade preparation shall also include preparing the subgrade to the required line and grade for paved or unpaved shoulders, tapers, turnouts, and driveways, and at all other project locations where aggregate base and/or select material courses are used in accordance with the Project Plans.

301.2.1: The Contractor may use removed existing asphalt concrete and other existing bituminous roadway surfacing materials originating on the project site, as embankment fill. All materials used shall be thoroughly crushed to sizes not exceeding four inches, or as approved by the Engineer. These asphalt/bituminous materials shall be placed not less than two feet below finished subgrade elevation.

Project earthwork quantities when included as separate contract pay items will include removed asphalt/bituminous material volumes, unless otherwise specified in the Special Provisions. All unsuitable material and all excess material shall be disposed of in accordance with the requirements of Sections 205.2 and 205.6, respectively. When additional material is required for fill, it shall conform to Section 210.

301.3 RELATIVE COMPACTION:

The subgrade shall be scarified and loosened to a depth of 6 inches. Rock 6-inches or greater in size that becomes exposed due to scarification shall be removed from the scarified subgrade. When fill material is required, a layer of approximately 3 inches may be spread and compacted with the subgrade material to provide a better bond. The subgrade cut and fill areas shall be constructed to achieve a uniform soil structure having the following minimum compaction, measured as a percentage of maximum dry density when tested in accordance with AASHTO T-99, Method A, and T191 or ASTM D6938 with the percent of density adjusted in accordance with the rock correction procedures for maximum density determination, ARIZ-227c[1] to compensate for the rock content larger than that which will pass a No. 4 sieve. Unless otherwise noted in the project plans or project specifications, compaction shall be performed within 2 percentage points of the optimum moisture content.

(A) Below pavement, curb and gutter, attached sidewalk, roadway shoulders, and other areas within right-of-way subject to vehicular traffic	95 percent
(B) Below detached sidewalk not subject to vehicular traffic	85 percent

301.4 SUBGRADE TOLERANCES:

Subgrade upon which pavement, sidewalk, curb and gutter, driveways, or other structures are to be directly placed shall not vary more than 1/4 inch from the specified grade and cross-section. Subgrade upon which sub-base or base material is to be placed shall not vary more than 3/4 inch from the specified grade and cross-section. Variations within the above specified tolerances shall be compensating so that the average grade and cross-section specified are met.

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(1) Arizona Department of Transportation test method

301.5 GRADING OF AREAS NOT TO BE PAVED:

Areas where grade only is called for on the plan shall be graded to meet the tolerances for the subgrade where subbase or base material is to be placed. The surface shall be constructed to a straight grade from the finished pavement elevations shown on the plans to the elevation of the existing ground at the extremities of the area to be graded.

301.6 PROTECTION OF EXISTING FACILITIES:

The Contractor shall exercise extreme caution to prevent debris from falling into manholes or other structures. In the event that debris should fall into a structure, it shall immediately be removed.

301.7 MEASUREMENT:

Measurement for Subgrade Preparation will be by the square yard. The area to be measured will be the total accepted area of new asphalt concrete pavement and new Portland cement concrete pavement (PCCP), including paved shoulders, tapers, turnouts, and unpaved roadway shoulders. Subgrade Preparation area measured will also include the accepted surface area of driveways that are surfaced with aggregate base, or select materials and non-surfaced areas designated for vehicle traffic.

Except for PCCP, the area under Portland cement concrete surfaces such as concrete curb and gutter, sidewalk, concrete driveways and driveway entrances, and concrete alley entrances will not be included in the Subgrade Preparation measurement.

Project earthwork quantities for Roadway Excavation, Borrow Excavation, and Fill Construction shall not be separately measured when they are not listed as separate line items on the fee proposal form. In such case, unless otherwise specified, payment for said earthwork items shall be included in the unit price for Subgrade Preparation.

301.8 PAYMENT:

Payment for Subgrade Preparation will be made only when it is performed for street or roadway paving projects.

Payment shall be compensation in full for stripping, scarifying, grading, excavating, hauling, filling, compacting, and disposing of excess or unsuitable materials, together with all costs incidental thereto.

- End of Section -

SECTION 310

PLACEMENT AND CONSTRUCTION OF AGGREGATE BASE COURSE

310.1 DESCRIPTION:

Aggregate base course shall comply with Section 702 unless the use of a different type of material is specifically authorized in the special provisions.

310.2 PLACEMENT AND CONSTRUCTION:

The compacted lift thickness shall not exceed 6 inches, unless approved by the Engineer. Based on the type of material, type of equipment and compaction methods used, the Contractor may propose a greater lift thickness to the Engineer for approval.

After distributing, the aggregate base course material shall first be uniformly watered and then graded to a uniform layer that will net, after compacting, the required thickness. The grading operation shall be continued to such extent as may be necessary to minimize segregation. The quantity of water applied shall be that amount which will assure proper compaction resulting in the density required by Section 310.3.

After placement, the aggregate base course surface shall be true, even and uniform conforming to the grade and cross-section specified. In no case shall the aggregate base course vary by more than ½ inch above or below required grade.

310.3 COMPACTION:

The contractor is responsible for providing appropriate equipment and techniques to achieve the compaction results required by this specification. The aggregate base course shall be compacted in lift thicknesses as allowed by Section 310.2.

The laboratory maximum dry density and optimum moisture content for the aggregate base course material shall be determined in accordance with AASHTO T-99 method "C" OR "D," with Rock Correction Procedure. Field 'one-point' maximum dry density and optimum moisture procedures will not be allowed for acceptance.

The in-place density shall be determined in the field by nuclear density testing in accordance with AASHTO T-310 or sand cone density testing in accordance with AASHTO T-191. In the event nuclear density testing is selected, and density results are in question, a sand cone correlation will be performed by the accepting agency at the contractor's request, not to exceed one sand cone for each ten nuclear density tests.

A rock correction, to compensate for rock content larger than the ¾ inch sieves (as required by the laboratory maximum dry density and optimum moisture procedure selected), shall be performed in accordance with AASHTO T-99 Annex A1. Specific gravity of the oversize particles shall be lab measured for use in the rock correction. The specific gravity shall be determined in accordance with AASHTO T-85.

For roadway construction, a minimum of one field density test shall be performed per lift per 660 feet per lane. For other aggregate base course applications, a minimum of one field density test shall be performed for each 800 square yards.

Unless otherwise noted in the project plans or project specifications, the moisture content of the aggregate base course at the time of compaction shall be the optimum moisture content +/- 3%.

The following percent compaction is required:

(A) Below asphalt concrete pavement	100%
(B) Below Portland cement concrete pavement, driveways, curb & gutter, sidewalks, and roadway shoulders	95%
(C) All other areas not subject to vehicular traffic	85%

Areas, which fail initial testing for density and/or moisture content, shall be reworked until passing tests for density and/or moisture content are achieved. Lower moisture content percentages at the time of field density testing may be allowed if significant time has passed since the time of compaction and the required density has been achieved.

310.4 THICKNESS AND/OR PLASTICITY INDEX DEFICIENCY:

When in the opinion of the Engineer there is reason to believe that a deficiency in thickness, or an excess of plasticity exists, measurements or samples will be taken in the same pattern as that defined in Section 321. If the base has been covered or it is otherwise impractical to correct the deficiency, the corrective measures in Table 310-1 shall be taken by the Contractor at no additional cost to the Contracting Agency.

TABLE 310-1

THICKNESS AND PLASTICITY DEFICIENCY

Type	Deficiency	Corrective Measure
I	Less than 1/2 inch of the required thickness	No corrective measure required.
II	1/2 inch or more but less than 1inch of the required thickness	(1) The contractor may choose to add additional material and rework the grade to meet the specification requirements. (2) The contractor may choose to increase the thickness of asphalt concrete by the amount of the aggregate base course thickness deficiency at no additional cost to the Owner. Required grade shall be met.
III	Thickness deficiency by greater than 1 inch	(1) The contractor will remove the aggregate base course and regrade the subgrade to allow the required aggregate base course layer thickness to be constructed. (2) If grades allow, the contractor may propose that the thickness of asphalt concrete be increased by the amount of the aggregate base course deficiency at no additional cost to the Owner.
IV	A plasticity index of 6 to 7 inclusive	(1) An Engineering Analysis (EA) that includes R-value testing may be prepared by the contractor to evaluate the expected performance of the aggregate base course layer. The EA may provide mitigation options for the Engineer to consider. If the Engineer accepts the plasticity index as a result of the EA, the material will be accepted at full payment. If the Engineer rejects the EA, the contractor will perform either option 2 or 3 below. (2) The contractor may choose to reprocess or treat the existing material to bring it within specification limits or remove deficient material from affected area and replace with material complying with the specifications. (3) If grades allow, the contractor may increase the thickness of asphalt concrete by ½-inch at no additional cost to the Owner.
V	A plasticity index of over 7	(1) The contractor may choose to reprocess or treat the existing material to bring it within specification limits or remove deficient material from affected area and replace with material complying with the specifications.

310.5 PAYMENT:

Payment for aggregate base course will be made on the basis of the contract unit price per ton unless an alternate basis of payment is provided in the proposal.

- End of Section -

SECTION 321

PLACEMENT AND CONSTRUCTION OF ASPHALT CONCRETE PAVEMENT

321.1 DESCRIPTION:

This section is to provide specifications for furnishing all materials, mixing at a plant, hauling and placing a mixture of aggregate materials, mineral admixture and asphalt binder to form a pavement course for placement upon a previously prepared base or sub base.

321.2 MATERIALS AND MANUFACTURE:

The materials shall conform to Section 710 for the type specified. Warm Mix Asphalt (WMA) technologies may be used within the mixture provided all requirements of the specifications are met, and the technology is on the ADOT approved product list. The specific required mix type shall be called out in the contract documents or as directed by the Engineer.

321.3 WEATHER AND MOISTURE CONDITIONS:

Asphalt concrete shall be placed only when the surface is dry, and when the atmospheric temperature in the shade is 40 degrees F. (50 degrees F for Asphalt Concrete lift less than 2-inch thick) or greater. No asphalt concrete shall be placed when the weather is foggy or rainy, or when the base or sub base on which the material is to be placed is unstable. Asphalt concrete shall be placed only when the Engineer determines that weather conditions are suitable.

321.4 APPLICATION OF TACK COAT:

A tack coat shall be applied to all existing and to each new course of asphalt concrete prior to the placing of a succeeding lift of asphalt concrete. If approved by the Engineer, the tack coat may be deleted when a succeeding layer of asphalt concrete is being applied over a freshly laid course that has been subjected to very little traffic.

The application of the tack coat shall comply with Section 329. The grade of emulsified asphalt shall be SS-1h or CSS-1h as specified in Section 713. The same material that is specified above for the tack coat shall be applied to the vertical surfaces of existing pavements, curbs, and gutters, against which asphalt concrete is to be placed.

The surface to be covered may require repair or patching as directed by the Engineer. This shall be addressed in the project specifications prior to the bidding of the project.

321.5 MIX DESIGN:

The mix design shall be submitted to the Engineer at least five working days prior to the start of asphalt concrete production. Mix designs provided by the agency may be utilized on projects at the Engineer's discretion. The Engineer will review and approve the mix design to assure it contains all of the required information as outlined in Section 710.3.1. If WMA technologies are used within the mix design, the type of WMA technology used shall be indicated on the mix design. The target values for gradations, binder contents, and air voids will be established as the accepted Job Mix Formula (JMF) based upon the mix design. Mix designs not containing all of the information will be returned within five working days of receipt of all mix design information, for action and resubmission by the contractor.

Once the mix design has been approved by the agency and the mixing plant selected, the Contractor and/or his supplier shall not change plants nor utilize additional mixing plants without prior approval of the Engineer.

If the contractor elects to change its source of material, the contractor shall furnish the Engineer with a new mix design, which meets the requirements of Section 710, as amended by the Project Specifications.

The contractor may make self-directed target changes to the approved mix design within the limits shown below. Requests for self-directed target changes shall be made in writing, acknowledged by the Engineer prior to the start of production of a lot, and will remain in effect until such time as any additional changes are implemented. The self-directed target changes must meet the contract requirements for mix design criteria and gradation limits.

TABLE 321-1 ALLOWABLE SELF-DIRECTED TARGET CHANGES	
MEASURED CHARACTERISTICS	ALLOWABLE SELF-DIRECTED TARGET CHANGES
Gradation (Sieve Size)	
3/8 inch	± 4% from mix design target value
No 8	± 4% from mix design target value
No 40	± 2% from mix design target value
No 200	+ 0.5% from mix design target value
Binder Content	± 0.2% from mix design target value
Effective Air Voids	None

The contractor may propose target changes, other than self-directed changes, to the approved mix design for the approval of the Engineer. The Engineer will determine if the proposed target change will result in mix production that meets the contract requirements for mix design criteria and gradation limits. The target changes will not be retroactive for the purpose of acceptance.

321.6 MIX PRODUCTION:

All materials shall be proportioned by weight in a hot mix asphalt plant in the proportions required by the mix design to provide a homogeneous and workable mass. Each hot mix asphalt plant shall be inspected in accordance with the provisions contained in the 'Hot Mix Asphalt Production Facilities' by the Arizona Rock Products Association and shall have a current inspection certificate. All measuring devices shall be calibrated at least annually by a technician licensed by the Arizona Bureau of Weights & Measures. Mixing plants shall conform to the requirements of AASHTO M-156, except as modified herein. If WMA technology is being used, any equipment associated with the production of hot mix asphalt shall be calibrated and in proper working order according to the WMA equipment specifications. If there are any deviations in the production or compacting temperatures of the hot mix asphalt with WMA technology, the mix design shall state the differences.

In drum mix plants, the mineral admixture shall be added and thoroughly mixed with the mineral aggregate by means of a mechanical mixing device prior to the mineral aggregate and mineral admixture entering the dryer. The moisture content of the combined mineral aggregate shall be a minimum of three percent by weight of the aggregate during the mixing process.

For drum-mix plants, the mineral admixture shall be weighed across a weight belt, or other approved alternative weighing system, with a weight totalizer prior to entry into the mechanical mixing device. The mechanical mixing device shall be a pug mill type mixer that is in good working condition. The rate of the aggregate feed shall not exceed the mixing device's capacity in ton per hour. The mixer shall be constructed to minimize the loss of mineral admixture and shall be located in the aggregate delivery system at a location where the mixed material can be readily inspected. The mixing device shall be capable of effective mixing in the full range of the asphalt concrete production rates.

The hot plant and equipment shall be constructed and operated to prevent loss of mineral admixture through the dust collection system of the plant.

A positive signal system shall be provided and used during production whereby the mixing shall automatically be stopped if the mineral admixture is not introduced into the mineral aggregate. The plant will not be permitted to operate unless the signal system is in good working condition.

The introduction of bituminous material shall be controlled by an automated system fully integrated with the controls or the mineral aggregate and mineral admixture. The production of the plant shall be controlled by the rate required to obtain a uniform mixture of all components. Drying and heating shall be accomplished in such a manner as to preclude the mineral admixture from becoming coated with un-spent fuel.

The completed asphalt concrete may be held in storage for up to 12 hours in insulated or heated silos, providing the minimum temperature noted herein for placement and compaction is met behind the placement device. If the Engineer determines that there is an excessive amount of heat, heat loss, drain down, segregation and/or oxidation of the mixture due to temporary storage, use of surge bins or storage bins will be discontinued.

The temperature of the asphalt concrete, with unmodified binders, upon discharge from the mixer shall not exceed 335 degrees F. The discharge temperature may be increased on the recommendation of the binder supplier, when approved by the Engineer. If the asphalt concrete is discharged from the mixer into a hopper, the hopper shall be constructed so that segregation of the asphalt concrete will be minimized.

321.7 TRANSPORTATION:

Petroleum distillates or other substances that will have a detrimental effect on the asphalt concrete shall not be used as a release agent.

The beds of all transportation units shall be clean and smooth to allow the free flow of material into the paving machine's hopper.

Tarpaulins shall be furnished on all trucks and used when weather condition warrant, or if directed by the Engineer.

321.8 PLACEMENT:

Placement of asphalt concrete pavement shall not commence until authorized by the Engineer. The Engineer's authorization to allow commencement of asphalt concrete paving will generally require all newly constructed valley gutters, curbing, and curb and gutters which new pavement is to be placed against to be in-place and in an acceptable condition. While it is preferred to have all newly constructed concrete items against which new pavement is to be placed be in an acceptable condition, the Engineer may allow paving to commence based on weather, the amount of defective concrete, or other considerations.

321.8.1 Placing: All courses of asphalt concrete shall be placed and finished by means of a self-propelled paving machine equipped with an automatically actuated control system, except under certain conditions or at locations where the Engineer deems the use of a self-propelled paving machine impracticable.

The control system shall control the elevation of the screed at each end by controlling the elevation of one end directly and the other end indirectly either through controlling the transverse slope or alternatively when directed, by controlling the elevation of each end independently.

The control system shall be capable of working with one of the following devices:

(a) Ski or non-contact device of not less than 30 feet in length, supported throughout its entire length
(b) Taut stringline or wire set to grade
(c) Short ski or sonar sensing units from curb control
(d) Joint matching shoe

Failure of the control system to function properly shall be cause for the suspension of asphalt concrete production. In order to achieve a continuous operation, the speed of the paving machine shall be coordinated with the hot mix plant and transport units.

If the asphalt concrete is dumped from the hauling vehicles directly into the paving machine, care shall be taken to avoid jarring the machine or moving it out of alignment. No vertical load shall be exerted on the paving machine by the truck.

If asphalt concrete is dumped upon the surface being paved and subsequently loaded in the paving machine, the loading equipment shall be self-supporting and shall not exert any vertical load on the paving machine. Substantially all of the asphalt concrete shall be picked up and loaded into the paving machine.

Self-propelled paving machines shall spread the mixture without segregation or tearing, true to line, grade and crown indicated on the project plans. Pavers shall be equipped with hoppers and augers that will distribute the mixture uniformly in front of an adjustable floating screed. The raising of the hopper wings must be minimized and the paving machine will not be operated when in an empty condition.

Screeds shall include any strike-off device operated by tamping or vibrating action which is effective, without tearing, shoving or gouging the mixture and which produces a course with a uniform texture and density for the full width being paved. Screeds shall be adjustable as to height and crown and shall be equipped with a controlled heating device for use when required. In the

case of the screed, auger extensions and vibrators shall be installed wherever the screed is extended more than one (1) foot beyond the end of the base auger or auger extension. However, when placing material against an extremely uneven curb or edge over a short distance, the Engineer may waive the auger extensions and vibrators.

At any place not accessible to the roller, the mixture shall be thoroughly compacted with tampers to provide a uniform and smooth layer over the entire area compacted in this manner.

321.8.2 Joints: Transverse joints, before a surface course is placed in contact with a cold transverse construction joint, the cold existing asphalt concrete shall be trimmed to a vertical face for its full depth exposing a fresh face. The fresh face shall be tack coated prior to placement of the new asphalt concrete. After placement and finishing the new asphalt concrete, both sides of the joint shall be dense and the joint shall be smooth and tight. The surface in the area of the joint shall not deviate more than 1/4 inch from a 12-foot straightedge, when tested with the straightedge placed across the joint, parallel to the centerline.

Longitudinal joints of each asphalt course shall be staggered a minimum of 6 inches with relation to the longitudinal joint of the immediate underlying course's cold longitudinal construction joint.

Longitudinal joints with existing or cold (more than 32 hours old) asphalt concrete shall require the existing pavement to be trimmed to a vertical face for its full depth exposing a fresh face. The fresh face shall be tacked prior to placement of the adjacent course. Longitudinal joints with an existing asphalt pavement that is less than 32 hours old that has had its edge protected from damage may have adjacent new asphalt concrete placed after applying the required tack coat. After placement and finishing of longitudinal joints, both sides of the joint shall be dense and the joint shall be smooth and tight. The surface in the area of the joint shall not deviate more than 1/4 inch from a 12-foot straightedge, when tested with the straightedge placed across the joint, in any direction.

321.8.3 Asphalt Leveling Course: A leveling course shall be used when specified, or as directed in writing by the Engineer, to bring existing pavement to a uniform grade prior to placing an overlay or other course. If a leveling course is being applied on an asphalt surface, a tack coat shall be applied. The compaction requirements contained in Section 321.10 do not apply to leveling courses.

321.8.4 Compaction - Asphalt Base Course and Surface Course: It is the contractor's responsibility to perform Quality Control monitoring and/or testing during compaction operations to achieve the required compaction. The temperature of the asphalt concrete immediately behind the laydown machine shall be at least 265 degrees F, unless WMA technology is being used. If WMA technology is being used then the minimum requirements will be stated within the mix design recommended by the WMA manufacturer. A probe type electronic thermometer with a current calibration sticker attached will be used to measure the temperature of the asphalt concrete mixture. When measuring the temperature of the mat, the probe shall be inserted at mid-depth and as horizontal as possible to the mat. The contractor is responsible to achieve the required compaction.

Asphalt compaction equipment shall be of sufficient size and weight to accomplish the required compaction. All compaction equipment shall be operated and maintained in accordance with the manufacturer's recommendations and the project requirements. During the rolling operation, the speed of the roller shall not exceed three miles per hour, unless otherwise approved by the Engineer.

Pneumatic tired compactors shall be equipped with skirt-type devices mounted around the tires so that the temperature of the tires will be maintained during the compaction process.

The Engineer will determine the acceptability of the pavement compaction in accordance with Section 321.10.

321.8.5 Smoothness: The completed surfacing shall be thoroughly compacted, smooth and true to grade and cross-section and free from ruts, humps, depressions or irregularities. An acceptable surface shall not vary more than 1/4 inch from the lower edge of a 12-foot straightedge when the straightedge is placed parallel to the centerline of the roadway.

321.8.6 Asphalt Concrete Overlay: Asphalt concrete overlay consists of the placing and compacting plant mix asphalt concrete over existing pavement. The mix design and thickness of the overlay shall be as shown on the plans or as specified in the special provisions.

Except when the existing asphalt surface is to be preheated and remixed, pavement surfaces shall be prepared as follows:

(a) Areas designated for pavement repair by the contract documents (which may include severely raveled areas, severely cracked areas, over-asphalted areas, and other defects) shall be cut out and replaced. Pavement repairs shall be completed and approved before placing asphalt concrete overlay.

(b) Before placing asphalt concrete overlay, raised pavement markers shall be removed, and milling shall be completed. Milling shall be as shown on the plans or specified in the special provisions and shall be in accordance with Section 317.

(c) After pavement repairs and milling have been completed, the entire surface shall be cleaned with a power broom.

(d) After surfaces have been prepared to the satisfaction of the Engineer, they shall receive a tack coat per Section 321.4. Traffic will not be permitted to travel over surfaces that have received a tack coat, except when tack coat is applied to milled surfaces in compliance with Section 317.2 for dust control purposes. When the overlay is to extend onto a concrete surface, the concrete surface shall be thoroughly cleaned of loose dust and cement particles and shall be tack coated.

Asphalt concrete overlay shall be placed as specified in Section 321.8.1 and compacted as specified in Section 321.8.4. The surface smoothness shall meet the tolerances specified in Section 321.8.5.

Frames and covers of manholes, survey monuments, valve boxes, clean-outs and other existing structures shall be adjusted in accordance with Section 345 to set flush with the finished surface of the new pavement. During adjustment, if pavement or base materials are removed or disturbed, they shall be replaced with approved materials installed in a manner acceptable to the Engineer.

On roads without curb and gutter, the existing unpaved shoulder elevation shall be adjusted by the Contractor to match the elevation at the edge of the new overlay and slope away from the new pavement surface at a rate that the existing quantity of shoulder material will allow. Shoulder material shall be compacted to a minimum of 95% of maximum density, determined in accordance with Section 301.3. Shoulder adjustment to match the new pavement surface elevation shall not be measured. The cost of shoulder adjustment shall be included in the price paid for the asphalt concrete overlay or other related pay items. When the Engineer determines an insufficient amount of material is available for shoulder adjustment, the Engineer may require the Contractor to provide additional material. Acceptable material for shoulders includes the existing shoulder material, millings, untreated base materials, or a granular material approved by the Engineer. Engineer requested imported material for shoulder adjustment is not included in the price paid for the asphalt concrete overlay.

321.8.7 Pavement Fabric Interlayer: Pavement fabric interlayer shall be used only when specified on the plans or in the specifications. Pavement fabric interlayer shall be in accordance with Table 796-1 and be the class designated on the plans or in the specifications.

Asphalt binder coat used to bond the fabric to the pavement shall be paving asphalt PG 70-10 asphalt cement conforming to the requirements of Section 711. The application and distributing equipment for the asphalt binder shall conform to the requirements of Section 330. The asphalt binder coat shall be uniformly spray applied to the prepared pavement surface at the rate of 0.20 gallons per square yard for Class B fabric or at the rate of 0.25 gallons per square yard for Class A fabric. Some underlying surfaces may require a higher or lower application rate. A test strip may be necessary to determine the proper application rate. The width of liquid asphalt cement application shall be the fabric width, plus six inches.

Neither the asphalt binder coat or fabric interlayer shall be placed when weather conditions, in the opinion of the Engineer, are not suitable. The asphalt binder and fabric interlayer shall only be placed when the pavement is dry, the ambient air temperature is 50 degrees F and rising, and pavement temperature is 40 degrees F and rising.

Equipment for placing the fabric shall be mechanized and capable of handling full rolls of fabric. The equipment shall be able to lay the fabric smoothly to maximize pavement contact and remove air bubbles. Stiff bristle brooms shall be used to smooth the fabric. The equipment used to place the fabric shall be in good working order and is subject to approval by the Engineer.

Pavement fabric interlayer shall not be placed if the in-place binder is hotter than 325 degrees F or has cooled to 180 degrees F or below (as determined by non-contact thermometer).

Pavement fabric interlayer shall be placed onto the asphaltic binder with the heat-bonded side up with a minimum amount of wrinkling or folding. Remaining wrinkles or folds 1-inch and larger shall be removed or slit and shingle-lapped in the direction of paving. Burning or torching of wrinkles is not allowed. Fabric shall overlap three to six inches to insure full closure of the joint. Transverse joints shall be shingle-lapped in the direction of paving to prevent edge pickup by the paver. A second application of hand-placed asphalt binder may be required at laps and repairs as determined by the Engineer to ensure proper binding of the narrow double fabric layer.

All areas where fabric has been placed shall be paved with asphaltic concrete during the same work shift. Placement of the asphaltic concrete shall closely follow fabric lay down. The temperature of the asphaltic concrete immediately behind the laydown machine shall not exceed 325 degrees F, unless modified by the WMA technology being used. If WMA technology is being used then the minimum requirements will be stated within the mix design recommended by the WMA manufacturer. In the event that the asphalt binder coat bleeds through the fabric causing construction problems before the overlay is placed, the affected areas shall be sanded with a sand blotter in compliance with Section 333. Excess sand shall be removed before beginning the paving operation. In the event of rainfall prior to the placement of the asphaltic concrete, the fabric shall be allowed to dry before the asphalt concrete is placed.

Turning of the paving machine or of other vehicles on the fabric shall be gradual and kept to a minimum to avoid damage to the fabric. Should equipment tires stick to the fabric during pavement operations, small quantities of paving asphalt concrete shall be broadcast on the fabric to prevent pick-up. Decrease of binder rate in order to minimize pick-up on tires is not allowed.

321.8.8 Thickened Edge: When the depth of the thickened edge extends four inches or more below the bottom of the asphalt pavement, the portion of the thickened edge extending below the asphalt pavement shall be placed and compacted prior to placement of the asphalt pavement. Placement of tack coat on the surface of the compacted thickened edge asphalt may be omitted when additional asphalt pavement is placed on the same day and the Engineer agrees that the surface of the thickened edge asphalt has remained clean.

When the depth of the thickened edge extends less than four inches below the bottom of the asphalt pavement, the portion below the asphalt pavement may be placed and compacted with the asphalt pavement in a single operation.

321.8.9 Safety Edge: The finished safety edge slope shall be planar forming a 30° ± 5° angle with the adjacent roadway surface and extend a minimum of five inches (5”) below the roadway pavement’s finished surface.

The safety edge shall be constructed with the top or final paving lift of a new pavement or overlay using a device that is mounted to or is a part of the screed portion of the laydown machine. The safety edge device shall be capable of constraining the asphalt concrete material to increase density of the extruded profile by reducing the volume. A conventional single strike-off plate is not acceptable. Compaction obtained from the extruded safety edge shall be acceptable when the extruded shape conforms to the specified shape.

During laydown operations if the extruded safety edge does not conform to the specified shape, the Contractor shall take immediate actions to correct the deficiency and to repair all non-compliant sections of safety edge. The Contractor shall stop paving operations until corrections to the laydown operation have been made and resumption of paving is approved by the Engineer or his designated representative.

321.8.10 Protection for Asphalt Base Course: Arterial roadway traffic shall not be allowed on a new asphalt base course that is less than five (5) inches in thickness without the written consent of the Engineer.

321.9 QUALITY CONTROL:

It is the contractor’s responsibility to perform Quality Control monitoring and/or testing during asphalt concrete production to achieve the required compaction and to perform Quality Control monitoring and/or testing during asphalt concrete production to achieve the required mix properties. The Engineer may obtain samples of any portion of any material at any point of the operations for his own use. Also, the Engineer may order the use of any drying, proportioning and mixing equipment or the handling of any material discontinued which, in his/her opinion, fails to produce a satisfactory mixture.

The asphalt concrete produced shall conform to the requirements of the production tolerances established in Section 321.10.

When the asphalt concrete does not conform to the production tolerances, it shall be reported to the Engineer, and corrective quality control measures shall be implemented, or production shall cease immediately at no additional cost to the contracting Agency.

Requests for referee testing as described in Section 321.11 will only be considered based on quality control test results performed by a laboratory accredited by the AASHTO Accreditation Program (AAP) for the tests being performed or a laboratory listed in the current ADOT Directory of Approved Materials Testing Laboratories for the set of tests in question. The laboratory shall use properly certified technicians in accordance with ASTM D3666, Section 7 (Personnel Qualifications).

321.10 ACCEPTANCE:

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

For permit work, testing that does not strictly adhere to the sampling and testing methodology and requirements outlined in this section shall be disregarded and not considered in any acceptance determination. All required retesting shall be at the expense of the permittee.

321.10.2 Gradation, Binder Content and Air Voids: The acceptance laboratory will take a sample of the asphalt concrete in accordance with the requirements of Section 2 or 4 of Arizona Test Methods 104 or AASHTO T-168 from each sublot. The minimum weight of the sample shall be 45 pounds. Asphalt binder content and gradation shall be determined in accordance with AASHTO T-308 using the ignition furnace for each sublot. The acceptance laboratory is responsible for obtaining the necessary materials and performing an ignition furnace calibration as outlined in AASHTO T-308 for each asphalt concrete mixture utilized on the project. The correction factor used for each test shall be clearly indicated on the report. Reports that do not include the correction factor, performed as stated in the previous sentences, shall be considered invalid and not allowed to be used for acceptance. The bulk density for Marshall Mix designs shall be tested in accordance with AASHTO T-245. The bulk density for Gyratory mix designs shall be determined in accordance with AASHTO T-312. The maximum theoretical density shall be determined in accordance with the requirements of AASHTO T-209 including fan drying per AASHTO T-209 Section 15. Effective voids of the laboratory compacted specimens will be determined at a minimum of once per lot in accordance with the requirements of AASHTO T-269. Should the testing for effective air voids not meet the "Full Payment" or "No Corrective Action" requirements of Table 321-5, additional testing for laboratory air voids on the remaining sublots will be performed as necessary to determine the extent of the deficiency. Acceptance testing results will be furnished to the contractor and the supplier within five working days of receipt of samples by the acceptance laboratory.

During production, the allowable deviations from the mix design gradation targets are listed in the tables below. The allowable production tolerances may fall outside of the mix design gradation bands.

TABLE 321-3A
GRADATION ACCEPTANCE LIMITS FOR MARSHALL MIXES

Sieve Size	3/8 inch Mix	1/2 inch Mix	3/4 inch Mix	Base Mix
1 inch	---	---	---	±7%
3/4 inch	---	---	±7%	±6%
1/2 inch	---	±7%	---	---
3/8 inch	±7%	±6%	±6%	±6%
No. 8	±6%	±6%	±6%	±6%
No. 40	±4%	±4%	±4%	±4%
No. 200	±2%	±2%	±2%	±2%

TABLE 321-3B GRADATION ACCEPTANCE LIMITS FOR GYRATORY MIXES			
Sieve Size	3/8 inch Mix	1/2 inch Mix	3/4 inch Mix
3/4 inch	---	---	±7%
1/2 inch	---	±7%	±6%
3/8 inch	±7%	±6%	---
No. 8	±6%	±6%	±6%
No. 40	±4%	±4%	±4%
No. 200	±2%	±2%	±2%

If the results from a single acceptance sample fall outside of the acceptance limits in Table 321-3A or 321-3B as applicable, a second sample shall be taken and if the second acceptance sample is also outside of the acceptance limits the Contractor shall cease production of asphalt concrete. Production shall not begin again until calibration test results verify that adjustments made to materials or proportions yield a gradation that falls within acceptance limits in Table 321-3A or 321-3B as applicable.

If the asphalt binder content is within ± 0.40% of the mix design target value, the asphalt concrete will be paid for at the contract unit price. If the asphalt binder content deviates by more than ± 0.40% from the mix design target value, the deficient area will be evaluated within the sublot by coring one additional location at a maximum interval of 100 feet on each side of the deficient sample. The asphalt content of the original deficient sample will be averaged with the asphalt binder content of the two additional cores to determine compliance with the acceptance requirements. If the resulting average of the asphalt binder content deviates by more than ± 0.40% from the mix design target value, then Table 321-4 shall apply to the sublot. If approved by the Engineer, the Contractor may obtain additional cores to assist in formulation of an Engineering Analysis, but the additional cores shall not be used for re-evaluating acceptance.

TABLE 321-4 ASPHALT BINDER CONTENT ACCEPTANCE AND PENALTIES		
Deviation from that permitted	When the contracting agency is the owner: Payment Reduction ($ per ton of asphalt concrete)	When the contracting agency is not the owner (i.e. permits): Corrective Action
Over 0.2% above that permitted	Removal* or EA	Removal* or EA
Over 0.1% to 0.2% above that permitted	$6.00	EA
Over 0.0% to0.1% above that permitted	$2.00	EA
Within permitted range	Full Payment	No Corrective Action
Over 0.0% to0.1% below that permitted	$2.00	EA
Over 0.1% to 0.2% below that permitted	$6.00	EA
Over 0.2% below that permitted	Removal* or EA	Removal* or EA

NOTES: *The Contractor shall remove and replace the entire sublot that is deficient.
EA = Engineering Analysis per Section 321.10.6

If the laboratory air voids fall within a range of 2.8% to 6.2%, the asphalt concrete will be paid for at the contract unit price. If the laboratory air voids are outside of this range, the deficient area will be evaluated within the sublot by coring one additional location at a maximum interval of 100 feet on each side of the deficient sample. The laboratory air voids of the original deficient sample will be averaged with the laboratory air voids obtained from each of the two additional cores to determine compliance with the acceptance requirements. If the resulting average of the laboratory air voids is outside the indicated range, then Table 321-5 shall apply to the sublot. If approved by the Engineer, the Contractor may obtain additional cores to assist in formulation of an Engineering Analysis, but the additional cores shall not be used for re-evaluating acceptance.

TABLE 321-5 LABORATORY VOIDS ACCEPTANCE AND PENALTIES		
Laboratory Air Voids (Measured at N_{des} or 75 blows as applicable)	When the contracting agency is the owner: Payment Reduction ($ per ton of asphalt concrete)	When the contracting agency is not the owner (i.e. permits): Corrective Action
Less than 1.5%	Removal* or EA	Removal* or EA
1.5-2.0%	$5.00	EA
2.1-2.7%	$2.00	EA
2.8-6.2%	Full Payment	No Corrective Action
6.3-6.9%	$2.00	EA
7.0-8.0%	$5.00	EA
Greater than 8.0%	Removal* or EA	Removal* or EA

NOTES: *The Contractor shall remove and replace the entire sublot that is deficient.
EA = Engineering Analysis per Section 321.10.6

If an agency or Engineer is purchasing asphalt concrete directly from a commercial material supplier, the agency or Engineer will use Section 321.10, and specifically Tables 321-3A or 321-3B as applicable, 321-4 and 321-5 from Section 321.10, when determining the acceptance of the asphalt concrete with the material supplier.

321.10.3 Surface Testing: If directed by the Engineer, surface drainage test shall be performed. The completed surfacing shall be thoroughly compacted, smooth and true to grade and cross-section, and free from ruts, humps, depressions or irregularities. An acceptable surface shall not vary more than 1/4 inch from the lower edge of a 12-foot straightedge when the straightedge is placed parallel to the centerline of the roadway. The straightedge shall be furnished by the contractor and shall be acceptable to the Engineer.

All streets shall be water tested for drainage in the presence of the Engineer or designated representative before final acceptance. Any areas not draining properly shall be corrected to the Engineer's satisfaction at the Contractor's expense. Water for this testing shall be provided and paid for by the Contractor.

When deviations in excess of the above tolerance are found, humps or depressions shall be corrected to meet the specified tolerance. The defective pavement shall be cut out along neat straight lines or for multiple course pavements the surface course may be milled out, and the removed pavement replaced with fresh hot mixture and thoroughly compacted to conform with and bond to the surrounding area. Materials and work necessary to correct such deviations shall be at no additional cost to the Contracting Agency.

When pavement is cut out along neat straight lines, full depth longitudinal joints shall not be located within a lane wheel path or within forty-eight inches (48") of an asphalt pavement edge. Longitudinal joints shall comply with the restrictions for Type A Trench Repairs in Section 336.3.

321.10.4 Asphalt Pavement Thickness: Asphalt pavement thickness will be determined from cores secured from each lift of each sublot. Such cores will be taken and measured by the Asphalt Concrete Coring Method. This method can be found in Section 321.14. Each core location will be patched by the party responsible for the testing.

Acceptance or assessment of penalties for asphalt pavement thickness will be based on the combined total thickness of all asphalt concrete layers omitting all layers of asphalt-rubber asphalt concrete. If the final total pavement thickness exclusive of all ARAC layers is deficient from the target thickness by 0.25 inches or less, it will be paid for at the contract unit price.

If the thickness deficiency of the pavement core exceeds 0.25 inch, the thickness deficiency shall be evaluated by coring at a maximum interval of 100 feet on each side of the deficient core. The thickness of the original deficient core will be averaged with the thicknesses of the cores taken from each side of it to determine compliance with the acceptance requirements.

If the pavement thickness deficiency is greater than 0.25 inches and the contracting agency is not the owner (i.e. permits) the following will apply:

(1) If the pavement thickness deviates from the target thickness by more than 0.25 inch but not more than 0.50 inch, corrective action will be required. This corrective action shall consist of application of a Type II slurry seal coat in accordance to Section 715. The Contractor may present an Engineering Analysis outlining other proposed remedial measures for the consideration by the Engineer. The Engineer will review the Engineering Analysis and decide within 30 working days whether to accept the proposed remedial measures.

(2) If the pavement thickness deviates from the target thickness by more than 0.50 inch, corrective action will be required. The deficient area shall be overlaid with no less than a 1 inch thick lift, for the full width of the pavement to meet or exceed the designed thickness, with appropriate end and edge milling, with a mixture approved by the Engineer. The Contractor may present an Engineering Analysis outlining other proposed remedial measures for the Engineer's consideration. The Engineer will review the Engineering Analysis and decide within ten working days whether to accept the proposed remedial measures. If the Engineer chooses to reject the Engineering Analysis, the indicated overlay shall be constructed by the Contractor at no additional cost to the Owner.

If the contracting agency is the owner and the pavement thickness deficiency is greater than 0.25 inches but less than 0.50 inches, Table 321-6 will apply. If the pavement thickness deficiency is greater than 0.5 inches, the deficient area shall be overlaid with no less than a 1-inch thick lift for the full width of the pavement to meet or exceed the designed thickness using an asphalt mixture approved by the Engineer. The Contractor shall provide appropriate end and edge milling. The overlay and milling shall be accomplished by the Contractor at no additional cost to the contracting agency.

TABLE 321-6
ASPHALT PAVEMENT THICKNESS PAYMENT REDUCTION
For Thickness Deficiency of More Than 0.25 inches and less than 0.50 inches

Total Specified Asphalt Pavement Thickness exclusive of ARAC (if any)	Reduction in Payment Applied to asphalt concrete Except ARAC layers (if any)
Less than 1.5 inches	50%
1.50 inches to 1.99 inches	33%
2.00 inches to 2.49 inches	25%
2.50 inches to 2.99 inches	20%
3.00 inches and greater	17%

321.10.5 Density:

321.10.5.1 Pavement 1-1/2 Inches or Less in Nominal Thickness:

Compaction shall consist of a "Rolling Method Procedure" using an established sequence of coverage with specified types of compactors. A pass shall be defined as one movement of a compactor in either direction. Coverage shall be the number of passes as are necessary to cover the entire width being paved.

The rolling sequence, the type of compactor to be used, and the number of coverages required shall be as shown in Table 321-7.

TABLE 321-7				
ROLLING SEQUENCE FOR LIFT THICKNESS 1½" OR LESS				
Rolling Sequence	Type of Compactor		No. of Coverages	
	Option No. 1	Option No. 2	Option No. 1	Option No. 2
Initial	Static Steel	Vibrating Steel	1	1
Intermediate	Pneumatic Tired	Vibrating Steel	4	2- 4*
Finish	Static Steel	Static Steel	1-3	1-3
* Based on the roller pattern which exhibits the best performance.				

The Contractor shall select the option for compaction and, when pneumatic-tired compactors are used will designate the tire pressure. Steel wheel compactors shall not be used in the vibratory mode for courses of one inch or less in thickness nor when the temperature of the asphaltic concrete falls below 180 degrees F. Initial and intermediate compaction shall be accomplished before the temperature of the asphaltic concrete falls below 200 degrees F.

Compaction will be deemed to be acceptable on the condition that the asphaltic concrete is compacted using the type of compactors specified, ballasted and operated as specified, and with the number of coverages of the compactors as specified.

321.10.5.2 Pavement Greater than 1-1/2 Inches in Nominal Thickness:

Achieving the required compaction is the responsibility of the contractor. The number and types of rollers is the contractor's responsibility and shall be sufficient to meet these requirements.

In-place air voids shall be determined in accordance with AASHTO T-269 utilizing cores taken from the finished pavement. The maximum theoretical density used in the determination of in-place air voids will be the average value from the acceptance samples determined for the lot as outlined in 321.10.1.

The Engineer will designate one random test location for each sublot and the acceptance laboratory will obtain one core from that location. Regardless of sublot quantities or boundaries, a minimum of one core will be obtained per residential street and a minimum of one core per travel lane for collector and arterial streets. The outside one foot of each pass of the pavement course or any unconfined edge will be excluded from testing. The Engineer may exclude areas from the compaction lot that are not accessible by normal compaction equipment.

The Contractor shall provide the traffic control to facilitate any coring operations necessary for compaction acceptance.

Cores will be taken per the Asphalt Concrete Coring Method. This method can be found in Section 321.14. Acceptance testing results will be furnished to the contractor within five working days of receipt of samples by the acceptance laboratory.

If the pavement density has in-place voids of between 4.0% and 8.0%, the asphalt concrete will be paid for at the contract unit price. If the acceptance core for a sublot indicates that the pavement density has in-place voids of less than 4.0% or greater than 8.0%, the deficient area will be evaluated by coring two additional locations at maximum intervals of 100 feet from the deficient core. The in-place voids of the original deficient core will be averaged with the in-place voids of the cores taken from 100 feet on each side of it to determine compliance with the acceptance requirements. If the resulting average of the in-place voids is outside the indicated range, then Table 321-8 shall apply to the sublot. If approved by the Engineer, the Contractor may obtain additional cores to assist in formulation of an Engineering Analysis, but the additional cores shall not be used for re-evaluating acceptance.

TABLE 321-8		
PAVEMENT DENSITY PENALTIES		
Limits of In-place Air Voids for design lift thicknesses 1.5 inches and greater	When the contracting agency is the owner Payment Reduction ($ per ton of asphalt concrete)	When the contracting agency is not the owner i.e. permits Corrective Action
Below 3.0%	Removal* or EA	Removal* or EA
3.0% to below 4.0%	$10.00	EA and Type II Surry Seal
4.0% to 8.0%	Full Payment	No Corrective Action
Greater than 8.0% to less than 9.0%	$6.00	EA
9.0% to 10.0%	$10.00	EA and Type II Surry Seal
Greater than 10.0%	Removal* or EA	Removal* or EA

NOTES: *The Contractor shall remove and replace the entire sublot that is deficient.
EA = Engineering Analysis per Section 321.10.6

321.10.6 Engineering Analysis (EA): Within 10 working days after receiving notice that a lot or sublot of asphalt concrete is deficient and is found to fall within the "Removal or EA" band per Table(s) 321-4, 321-5, and/or 321-8, the contractor may submit a written proposal (Engineering Analysis) to accept the material in place at the applicable penalties along with possible remediation(s) listed in the "Removal or EA" category. Engineering Analysis can also be proposed for non-removal categories of "Corrective Actions" when the contracting agency is not the owner (i.e. permits).

The Engineering Analysis shall contain an analysis of the anticipated performance of the asphalt concrete if left in place. The Engineering Analysis shall also detail the effect of any proposed corrective action to the material(s) in place as it relates to the in-place material's performance. The Engineering Analysis shall be performed by a professional engineer experienced in asphalt concrete testing and mix designs.

If a lot or sublot is accepted for referee testing and the referee test results still show a deficiency, the contractor shall have ten working days to submit an Engineering Analysis beginning upon notification of referee test results.

When an Engineering Analysis recommends that a specific lot or sublot should not be removed, the Engineering Analysis will recommend that the following penalties (Table 321-9) be paid when the contracting agency is the owner, for the specific criteria being reviewed by the EA.

TABLE 321-9		
ENGINEERING ANALYSIS PENALTIES for REMOVAL* LOTS/SUBLOTS LEFT IN-PLACE		
Acceptance Criteria	**Acceptance Limits**	**Penalty When Contracting Agency is the Owner ($/Ton)**
Asphalt Binder Content	Over 0.2% points from that Permitted	$9.00
Laboratory Air Voids (Measured at N_{des} or 75 blows as applicable)	Less than 1.5% or Greater Than 8.0%	$7.50
Limits of In-place Air Voids	Less than 3% or Greater than 10.0%	$15.00

Within 15 working days, the Engineer will determine whether or not to accept the Contractor's proposed Engineering Analysis.

321.11 REFEREE:

If the Contractor has reason to question the validity of any of the acceptance test results, the Contractor may request that the Engineer consider referee test for final acceptance. Any request for referee testing must describe the contractor's reasons for questioning the validity of the original acceptance test results and must clearly describe which set of acceptance tests are in question. The Engineer may either accept or reject the request for referee testing. When referee testing is accepted the Contractor (at the Contractors own expense) will engage an independent laboratory accredited by the AAP or a laboratory listed in the current ADOT Directory of Approved Materials Testing Laboratories as appropriate the acceptance tests that are being questioned. The independent referee laboratory shall use properly certified technicians in accordance with ASTM D3666, Section 7 (Personnel Qualifications). For the set of test results in question, the referee laboratory shall perform a new set of acceptance tests (as required by Section 321.10 representing the area for the set of tests in question). The referee tests will replace the original acceptance tests that were in question.

For permit work, the permittee, whose results necessitate referee testing, shall bear all expenses in the additional testing (i.e., secondary and the referee testing) if the original results are not substantiated by the referee testing procedure outlined in this section. Additionally, any testing performed that does not strictly adhere to the sampling and testing methodology and requirements in Section 321.10 shall be disregarded and not allowed in any acceptance determination. Disregarded tests will be re-performed at the expense of the permittee.

These tests may include asphalt binder content, aggregate gradation, Marshall or Gyratory unit weight, maximum theoretical unit weight, laboratory air voids and in-place air voids (compaction). All referee testing shall conform to Section 321.10. Samples for referee testing shall come from representative samples obtained from the completed pavement, as directed by the Engineer.

The number of samples taken will be the same as specified in Section 321.10. The independent laboratory shall compile the test results and transmit them to both the Engineer and the contractor. The independent laboratory shall include a report sealed and signed by an Engineer registered in the State of Arizona, who is experienced in asphalt concrete testing and mix design development. The signed report shall give an opinion that the material evaluated does or does not comply with project specifications, shall clearly describe any deficiencies, and the results will be binding between all parties.

321.12 MEASUREMENT:

Asphalt concrete pavement will be measured by the ton, or by the square yard, for the mixture actually used as allowed above, which shall include the required quantities of mineral aggregates, asphalt binder, and mineral admixture. Measurement shall include any tonnage used to construct intersections, roadways, streets, or other miscellaneous surfaces indicated on the plans or as directed by the Engineer.

Measurement for safety edge preparation only applies to overlays of existing pavements that require the construction of a safety edge when none exists. Safety edge preparation will be measured by the linear foot. Safety edge preparation will not be measured when a safety edge is part of new pavement construction, pavement widening, or when overlaying an existing pavement that contains a safety edge. The asphalt concrete pavement measurement shall include the tonnage used to construct safety edges or the square yard measurement for asphalt concrete pavement will be increased by the horizontal extension of the safety edge beyond the roadway pavement edge.

321.13 PAYMENT:

The asphalt concrete measured as provided above will be paid for at the contract price per ton or square yard, as adjusted per Section 321.10, which price shall be full compensation for the item complete, as herein described and specified.

Payment for tack coat will be by the ton diluted, based on the rate of application, as directed by the Engineer.

No payment will be made for any overrun in quantity of asphalt concrete in excess of 10 percent for newly constructed pavement having a total thickness equal to or greater than 2.5 inches. The overrun quantity is excess tonnage above the tonnage calculated based on actual field measurement of area covered, design thickness, and the mix design unit weight. The calculations for overrun will be by individual pay item. To compensate or adjust for a thickness deficiency in an underlying asphalt concrete

course, the Engineer may authorize a quantity increase in excess of 10 percent for a subsequent asphalt concrete course. In such cases, the quantity in excess of 10 percent will be paid for at the lowest unit price.

Removal of raised pavement markers, pavement repairs, and surface pavement replacements required prior to roadway overlay operations will be paid for by other pay items unless otherwise specified.

Except as otherwise specified, no separate payment will be made for work necessary to construct thickened edges, safety edges, or other miscellaneous items or surfaces of asphalt concrete.

Payment for safety edge preparation will be at the contract unit price for the quantities measured as described above.

321.14 ASPHALT CORE METHOD: Core Drilling of Hot Mix Asphalt (HMA) for Specimens of 4" or 6" diameter

321.14.1 Scope: This method is to establish a consistent method of the use of a diamond bit core to recover specimens of 4 or 6 inch diameter for laboratory analysis and testing. The method will require the use of: water, ice (bagged or other suitable type), dry ice, and a water-soap solution to be utilized when coring asphalt rubber concrete. Individuals doing the specimen recovery should be observing all safety regulations from the equipment manufacturer as well as the required job site safety requirements for actions, and required personal protective equipment.

For permit work, testing of cores obtained in a manner that does not strictly adhere to the methodology outlined in this section shall be disregarded and not considered in any acceptance determination. Retesting shall be at the expense of the permittee.

321.14.2 Core Drilling Device: The core drilling device will be powered by an electrical motor, or by an acceptable gasoline engine. Either device used shall be capable of applying enough effective rotational velocity to secure a drilled specimen. The specimen shall be cored perpendicularly to the surface of pavement, and that the sides of the core are cut in a manner to minimize sample distortion or damage. The machinery utilized for the procedure shall be on a mounted base, have a geared column and carriage that will permit the application of variable pressure to the core head and carriage throughout the entire drilling operation. The carriage and column apparatus shall be securely attached to the base of the apparatus; and the base will be secured with a mechanical fastener or held in place by the body weight of the operator. The core drilling apparatus shall be equipped with a water spindle to allow water to be introduced inside of the drill stem while operating. The cutting edge of the core drill bit shall be of hardened steel or other suitable material with embedded diamond chips in the cutting surface. The core barrel shall be of sufficient diameter to secure a specimen that is a minimum of four or six inches or whichever is prescribed for necessary testing. The core barrel shall not be missing more than one of the teeth used for cutting; if so, it shall be discarded and another barrel shall be used. The core barrel shall also be a minimum of two inches longer than the anticipated depth of pavement in accordance with project paving plans.

321.14.3 Accessory Equipment: A sufficient supply of ice and dry ice shall be provided to sufficiently cool the pavement prior to securing the samples from the designated areas in the pavement. The ice should also be used to adjust the temperature of the water used to cool the core bit. A water supply (usually a plastic 35 – 55 gallon drum) with sufficient hose to introduce the water into and through the spindle of the coring device by gravity feed. The drum should be white or light in color to minimize excessive thermal heating of the water (*for coring of asphalt rubber cores see Note 1*). At no time shall the water utilized in the coring operation exceed 65 degrees F during the coring operation. Ice shall be utilized to ensure the temperature control of the water being introduced during the cutting operation. An ice chest or other suitably insulated container that can maintain a temperature of less than 70 degrees F shall be used to secure the specimens during transport. The container will be equipped with flat shelving that will support the drilled cores throughout the entire specimen dimension during transport back to the testing facility.

Miscellaneous hand tools to remove the drilled specimen from the drill hole or the core barrel taking great care in not disturbing the specimen more than necessary (refer to fig. 1 in ASTM D5361).

321.14.4 Process: The pavement surface at the time of coring shall not exceed a temperature of 90 degrees F; the pavement shall be conditioned with ice or dry ice to ensure that this requirement is met. Immediately after it has been ensured that the pavement has dropped to the required temperature, core drilling shall begin. The operator will then apply an even and continuous pressure (Note 2) to penetrate through the full depth of the pavement. The operator will concurrently ensure that enough water is moving over the core surface as to adequately remove any and all cuttings that could damage the drilled core.

After the pavement thickness has been penetrated, the core shall be carefully removed from either the drill hole or the core barrel and be immediately transferred to an ice chest or other suitable container. Each individual core shall be placed on a shelf in the cooler with the exposed side of the specimen facing down, or the "top side" down. If the specimen is a two-lift core, the only acceptable means of separating lifts is with a power or other acceptable wet saw type of equipment (conforming to ASTM D5361); however, at no time shall cores be split using a mallet and screwdriver or metal straight edge when being tested for bulk density. Perpendicularity of the specimen shall be checked in the field after the specimen has been extracted from the surface. The core operator shall hold the core up to eye level and place the core top side down in a "speed square" or small carpenters square. The specimen placed in the square shall not depart from perpendicular to the axis more than 0.5° (approximately equivalent to 1/16 of an inch in 6 inches). If the specimen is outside of this distance from square, it shall be discarded in the field and another sample cored that falls within tolerance. The cores upon arriving at the laboratory for testing shall be carefully cleaned and measured for thickness in accordance with ASTM D3549. A speed square shall be used to measure perpendicularity as compared to a 90 degrees angle and shall not depart from perpendicular to the axis more than 0.5 degrees (approximately equivalent to 1/16 of an inch in 6 inches). All remaining testing shall be done within the parameters of the current project and/or agency required specification.

The core operator that obtained the cores is responsible for restoration of the core holes at the conclusion of the coring process. Immediately before restoration, standing water and errant debris shall be removed from the holes. Core holes shall be patched back with an agency-approved material. One typical material is hot mix asphalt conforming to Section 710, compacted in thin (1.5 inch) lifts with the temperature compaction range as specified on the mix design, or as established by the binder supplier. Another typical material is pre-packaged non-shrink grout conforming to ASTM C1107. If non-shrink grout is used, the individual restoring the core holes is responsible for protecting the finished work from tire traffic, etc. Other patch materials maybe used at the discretion of the Engineer.

- End of Section -

*Note 1 – It should be noted that when the material to be cored is a rubberized asphalt mixture a wetting agent such as liquid dish soap be added to the water barrel to hinder the material from sticking or allowing the binder to spread during coring.
*Note 2 – This refers to pressure exerted on the core barrel and machine during the coring process. Too much pressure can cause damage to the core barrel and the motor; and too little pressure can cause a glazing of the diamonds, reducing cutting efficiency and premature wear of the barrel.

SECTION 329

TACK COAT

329.1 DESCRIPTION:

Tack coat for bituminous paved surfaces shall consist of the application of emulsified asphalt as specified in Section 713.

329.2 PREPARATION OF SURFACE:

Surfaces to be treated shall be cleaned of all loose material as specified in Section 330.

329.3 APPLICATION:

Tack coat shall be diluted in the proportion of 50 percent water and 50 percent emulsion and applied at the rate of 0.05 to 0.10 gallons per square yard. Application shall be made in advance of subsequent construction as ordered by the Engineer.

329.4 EQUIPMENT:

Tack coat shall be applied by distributor trucks designed, equipped, maintained and operated in accordance with Section 330. Hand spray by means of hose or bar through a gear pump or air tank shall be acceptable for resurface work, corners or tacking of vertical edges. Care shall be taken to provide uniform coverage. Equipment that performs unsatisfactory shall be removed from the job.

329.5 PROTECTION FOR ADJACENT PROPERTY:

According to Section 333.

329.6 MEASUREMENT:

Bituminous emulsion that is diluted prior to application will be measured by the ton of diluted material. Any conversion from volumetric quantities shall be in accordance with Section 713.

329.7 PAYMENT:

Payment for the emulsified bituminous tack coat will be by the ton, diluted.

- End of Section -

SECTION 337

ASPHALT PAVEMENT CRACK SEALING AND CRACK FILLING

337.1 DESCRIPTION:

This work consists of furnishing and placing sealant or filler material in Contractor prepared cracks and joints of asphalt concrete pavements. All cracks and joints, including the space between asphalt concrete pavement and concrete curb and gutter, which have a clear opening of one-quarter inch (¼") or greater, shall be sealed for the length of the crack that equals or exceeds one-eighth inch (⅛") in width.

337.2 MATERIALS:

337.2.1 Material for Category 1 Cracks: Cracks and joints, which have a clear opening ranging from one-quarter inch (¼") to one and one-half inches (1½"), shall be classified as category 1 cracks. Sealant materials for category 1 cracks shall be a premixed, single component mixture of asphalt cement, aromatic extender oils, polymers, and granulized rubber in a closely controlled manufacturing process. Materials shall conform to the following specifications when heated in accordance with ASTM D5078 and the manufacturer's maximum safe heating temperature.

TEST	REQUIREMENT
Cone Penetration (ASTM D5329)	20-40
Resilience (ASTM D5329)	30% Minimum
Softening Point (ASTM D113)	210°F (99°C) Minimum
Ductility, 77°F (25°C) (ASTM D113)	30 cm Minimum
Flexibility (ASTM D3111 *Modified)	Pass at 30°F (-1°C)
Flow 140°F (60°C) (ASTM D5329)	3 mm Maximum
Brookfield Viscosity 380°F (193°C) (ASTM D2669)	90 Poise Maximum
Asphalt Compatibility (ASTM D5329)	Pass
Bitumen Content (ASTM D4)	60% Minimum
Tensile Adhesion (ASTM D5329)	400% Minimum
Maximum Heating Temperature	400°F (204°C)
Minimum Heating Temperature	380°F (193°C)
Flash Point (ASTM D92)	450°F Minimum

*Specimen bent 90° over a 1-inch mandrel within 10 seconds.

337.2.2 Material for Category 2 Cracks: Cracks and joints, which have a clear opening ranging from one and one-half inches (1½") to three inches (3"), shall be classified as category 2 cracks. Filler material for category 2 cracks shall be hot applied, pourable, high bonding mastic for application in unconfined areas and for vertical-side recessed configurations. Upon curing, the material shall provide a flexible waterproof seal. The material shall be traffic ready in thirty minutes or less when installed in accordance with the manufacturer's instructions. Agency approved material shall be used for sealing category 2 cracks.

337.2.3 Material for Category 3 Cracks: Cracks and joints which have a clear opening greater than three inches (>3") shall be classified as category 3 cracks. Material for filling category 3 cracks shall be asphalt concrete 3/8" Marshall mix compliant with Section 710 and have 100% of the aggregate passing the 3/8" sieve.

337.2.4 Product Submittals: Prior to application of category 1 crack sealant and category 2 crack filler material, the Contractor shall submit to the Engineer for approval the material manufacturer's product specifications and installation recommendations. Installation recommendations shall include surface preparation, product installation, and curing requirements. For sealant material, a Certificate of Compliance (per Section 106) shall be submitted to the Engineer. Asphalt mix design for category 3 crack filler material shall be submitted to the Engineer for approval.

Prior to and during production, when requested by the Engineer, the Contractor shall provide material samples to the Engineer for testing to verify the quality of the materials and to ensure conformance with specifications.

337.3 CLEANING AND PREPARING CRACKS OR JOINTS:

Immediately prior to application of sealant, all cracks and joints shall be cleaned of debris and dust. Cracks and joints shall be vacuumed during final cleaning.

337.3.1 Routing: When specified in contract documents, cracks shall be routed to remove loose asphalt edges creating a stable surface for sealant attachment. Routing shall remove at least 1/8" from each side and produce vertical, intact surfaces with no loosely bonded aggregate. Routing of joints and cracks shall produce clean stable edges extending to a depth of at least three quarters of an inch (¾"). Routed surfaces of cracks are subject to acceptance or rejection at the Engineer's discretion.

337.3.2 Vacuuming: Final cleaning shall thoroughly clean cracks and joints to a minimum depth of 1" for cracks that are ¾" or narrower and to the full asphalt depth for cracks that are wider than ¾". Surfaces are to be inspected to assure adequate cleanliness and dryness.

High pressure, 90 psi minimum, dry oil free compressed air shall be used for final cleaning and dust removal from cracks. The high-pressure tool shall be integral with a vacuum unit to collect the dust and residue. Both sides of the crack or joint shall be cleaned.

337.4 APPLICATION OF CRACK SEALANTS AND CRACK FILLERS:

337.4.1 Weather: In no case shall crack sealant or fillers be placed during damp roadway conditions such as wet roadway surfaces or with damp material inside the cracks. Operations stopped by the Engineer due to weather, shall be at no additional cost to the contracting Agency. If installing at night, ensure that dew is not forming on the pavement surface.

Sealant and filler material shall only be applied when pavement temperature exceeds 40°F (4°C). If pavement temperature is lower than 40°F (4°C), it may be warmed using a heat lance that puts no direct flame on the pavement.

337.4.2 Temperature: Sealant and category 2 filler material temperatures are to be maintained at the maximum heating temperature recommended by the manufacturer.

337.4.3 Sealant Equipment: The melter applicator unit shall be a self-contained double boiler device with the transmittal of heat through heat transfer oil. It shall be equipped with an on board automatic heat controlling device to permit the attainment of a predetermined temperature, and then maintain that temperature as long as required. The unit shall also have a means to vigorously and continuously agitate the sealant to meet the requirements of Appendix X1.1 of ASTM D6690. The sealant shall be applied to the pavement under pressure supplied by a gear pump with a hose and wand and direct connecting applicator tip. The pump shall have sufficient pressure to apply designated sealant at a rate of at least three (3) gallons (11.4 L) per minute. Melter applicators shall be approved for use by the sealant manufacturer.

337.4.4 Placement of Sealant and Crack Filler Materials: Sealant and crack filler materials shall be applied in cracks and joints uniformly from bottom to top and shall be filled without formation of entrapped air or voids.

Sealant placement in cracks and joints shall slightly overfill the crack or joint then be leveled with a 3" sealing disk or V-shaped squeegee to create a neat band extending approximately 1" on each side of the crack or joint for surface waterproofing. The band shall be as thin as possible and shall not extend more than 1/8-inch above the pavement surface. If the pavement is to be overlaid with hot mix asphalt within six months of sealant application, sealant placement shall be recessed ¼" in the crack with no over band.

Application of category 2 crack filler material shall comply with the material manufacturer's installation recommendations including but not limited to surface preparation, application equipment, and application procedures. No filler material shall be installed until all cracks to be filled have been inspected and approved by the Engineer.

All machines, tools, and equipment for installation of category 3 crack filler shall be subject to the Engineer's approval. Prior to application of category 3 crack filler, the prepared crack shall be inspected and approved by the Engineer. Tack coat shall be applied to both sides of the crack. Hand tamp, vibratory plate compactor and rollers are acceptable for final compaction of filler material. Depending on depth of crack, lower lifts shall be compacted using a steel rod with a 1½" diameter head.

During and after placement of sealant and crack filler materials, the Contractor shall protect against harm to persons or animals that may be exposed to the hot material.

337.4.5 Opening to Traffic: Sealant and mastic materials shall not be exposed to traffic until fully cured. If the area must be opened to traffic, blotter material shall be applied to the surface of all uncured material.

All sealant filled cracks that have a clear opening of 1½ inches or greater shall have blotter material applied prior to opening to traffic.

On two lane roads or where traffic may come in contact with hot sealant or mastic before it cures, a blotter or specialized bond breaking material shall be used to prevent asphalt bleeding and/or pickup of material by vehicular traffic. Blotter material shall be compatible with the crack sealant or mastic and any surface treatment being used.

337.5 UNACCEPTABLE WORK:

The Contractor, at no additional cost to the contracting Agency, shall correct unacceptable work.

Unacceptable work shall include, but not be limited to, unsealed or unfilled cracks, material wastage on the sides of the roadway, and excess quantities of material on the roadway that adversely affects driving.

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

337.6 MEASUREMENT:

The Contractor shall meet with the Engineer or the Engineer's designated representative on a daily basis and supply a signed daily report indicating the date and identifying for each road segment:

- The linear feet of crack routing performed.
- The amount of category 1 crack sealing material applied in total pounds and the total square yards of pavement sealed.
- The amount in pounds of category 2 crack filling material installed.
- The linear feet of category 3 cracks filled.

Crack routing will be measured by the linear foot. The measurement length will be the length of routed crack, not the length of each routed side.

Measurement for payment of category 1 crack sealing will be by the square yards of pavement surface area crack sealed or by the pounds of sealant placed.

Category 2 crack filling will be measured by the pounds of filler material placed or as otherwise indicated in the fee proposal.

Category 3 crack filling will be the measured linear feet of cracks filled.

337.7 PAYMENT:

Payment for accepted pavement crack routing, sealing, and crack filling will be at the contracted unit prices. Payment shall be full compensation for furnishing all labor, materials, equipment, tools, and incidentals used for surface preparation, placement of materials, and cleanup.

- ***End of Section*** -

SECTION 701

AGGREGATE

701.1 GENERAL:

Coarse and fine aggregates are defined in accordance with ASTM D2487. Material property requirements for specific uses are provided in applicable MAG sections.

Apparent specific gravity shall be at least 2.50, when tested in accordance with ASTM C127.

701.2 COARSE AGGREGATE:

Rock and gravel shall be clean, hard, sound, durable, uniform in quality, and free of any detrimental quantity of soft, friable, thin elongated, or laminated pieces, disintegrated material, organic matter, oil, alkali, or other deleterious substance. Aggregate sources shall include, but not be limited to alluvial deposits, terrace aggregates, quarry stone, or other suitable sources including recycled products that meet all material test requirements as approved by the Engineer. Aggregate classification shall be made by size as noted herein.

701.2.1 Boulders: Particles of rock that will not pass a 12-inch square opening.

701.2.2 Cobbles: Particles of rock that will pass a 12-inch square opening, but are retained on a 3-inch square opening.

701.2.3 Coarse Gravel: Particles of rock that will pass a 3-inch U.S. standard sieve, but are retained on a 3/4-inch U.S. standard sieve.

701.2.4 Fine Gravel: Particles of rock that will pass a 3/4-inch U.S. standard sieve, but are retained on a No. 4 U.S. standard sieve.

701.3 FINE AGGREGATE (SAND):

Fine aggregate (sand) shall be fine granular material produced by the crushing of rock or gravel or naturally produced by disintegration of rock and shall be sufficiently free of organic material, mica, loam, clay, and other deleterious substances to be thoroughly suitable for the purpose for which it is intended. Fine aggregates particles shall pass a No. 4 U.S. standard sieve, but are retained on a No. 200 U.S. standard sieve.

701.4 RECLAIMED CONCRETE MATERIAL (RCM):

Reclaimed concrete material (RCM) is defined as an aggregate material that is derived from the crushing, processing and classification of Portland cement concrete construction materials recovered, salvaged, or recycled from roadways, sidewalks, buildings, bridges, and other sources.

In accordance with Section 7 of AASHTO M-319, RCM shall not contain more than five percent by mass of brick or concrete block and shall be substantially free of wood, metal, plaster, and gypsum board, RCM shall be free of all materials that fall under the category of solid waste or hazardous materials as defined by the state or local jurisdiction. With the approval of the Engineer, these respective quantities may be adjusted if the performance of the RCM is not adversely impacted. RCM may be used alone or uniformly blended with other approved aggregate materials to obtain the applicable performance criteria. RCM shall not be used in Portland Cement Concrete without the prior approval of the Engineer.

701.5 RECLAIMED ASPHALT PAVEMENT (RAP):

Reclaimed asphalt pavement (RAP) is defined as all recovered, salvaged or recycled asphalt road waste, large particles or milled material that has been size-reduced, crushed and or screened appropriately, making it reusable. This material shall be of a consistent and relatively clean manner as to not adversely affect the final material usage. RAP may be used alone or uniformly blended with other approved aggregate materials to obtain the applicable performance criteria. RAP shall not be used in Portland Cement Concrete without the prior approval of the Engineer.

701.6 SAMPLING:

Sampling of aggregates shall be performed in accordance with ASTM D75.

- End of Section -

SECTION 702

BASE MATERIALS

702.1 GENERAL:

Base materials shall be as defined in Section 701, consisting of appropriately sized coarse and fine aggregates, Reclaimed Concrete Material (RCM) or Reclaimed Asphalt Pavement (RAP), other inert materials, and/or aggregates that have been treated for plasticity index mitigation, as approved by the Engineer. These materials, whether virgin or reclaimed or a uniform blend of both, shall conform to the end result quality requirements of this section.

When base material without further qualification is specified, the Contractor shall supply materials that meet the gradation and other quality requirements for Aggregate Base Course as defined in Table 702-1. When a particular classification of base material is specified, the Contractor may substitute materials meeting the gradation and other quality requirements for Aggregate Base Course for Select material, when approved by the Engineer.

The Contractor shall provide the Engineer laboratory testing documentation on the source of the base material showing compliance to Table 702-1 at least 10 business days prior to placement except where the base materials are being obtained from a currently approved source from a list maintained by the appropriate Agency or as determined by the Engineer. Included in the documentation shall be the percentage of RCM or RAP, if applicable.

RCM meeting the requirements of Section 701.4 can be utilized in base material at a maximum quantity of 50% and may be used in roadway applications or where otherwise specified by project plans or special provisions.

RAP meeting the requirements of Section 701.5 can be utilized in base material up to 100% and may be used in roadway applications or where otherwise specified by Project plans or special provisions.

702.1.1 Aggregate Base Course is primarily used in roadway applications or where otherwise specified by project plans or special provisions.

702.1.2 Select Material is primarily used, as a sub base in roadways, fill and embankment applications or where otherwise specified by project special provisions.

702.2 PHYSICAL PROPERTIES:

702.2.1 Base material shall meet the physical properties listed in Table 702-1.

Table 702-1			
Sieve Analysis: Test Methods AASHTO T-27, T-11			
Sieve Size	**Accumulative Percentage Passing Sieve, by Weight**		
	Select Material		**Aggregate Base Course**
	Type A	**Type B**	
3 in.	100	- -	- -
1-1/2 in.	- -	100	100
1 in.	- -	- -	90 – 100
No. 4	30 - 75	30 - 70	38 - 65
No. 8	20 - 60	20 - 60	25 – 60
No. 30	10 - 40	10 - 40	10 – 40
No. 200	0 - 12	0 - 12	3 – 12
Plasticity Index: Test Methods AASHTO T-89 Method A, T-90, T146 Method A			
Maximum allowable value	5	5	5
Fractured Face, One Face: Test Method ARIZ 212, Percent by Weight of the Material Retained on a #4 Sieve			
Minimum required value	50	50	50
Resistance to Degradation and Abrasion by the Los Angeles Abrasion Machine: Test Method AASHTO T-96, Percent Loss by Weight			
Maximum allowable value at 100 revolutions	10	10	10
Maximum allowable value at 500 revolutions	40	40	40

702.2.2: When tested for acceptance, Base material that does not meet Table 702-1 properties for gradation or PI may be approved at the Engineer's discretion if the R-Value is at least 70, when determined by test method AASHTO T-190 (see Table 310-1).

- End of Section -

SECTION 710

ASPHALT CONCRETE

710.1 GENERAL:

Asphalt concrete shall be a mixture of asphalt cement and mineral aggregates. Mineral admixture shall be included in the mixture when required by the mix design or by the Engineer. Asphalt concrete shall be produced in accordance with Section 321.

The designation for asphalt concrete mixes shall be based on the nominal maximum aggregate size of the mix. The applicable mix designations are 3/8 inch, 1/2 inch, 3/4 inch. Each mix shall be designed using Marshall or Gyratory compaction methods.

The following table (Table 710-1) displays the recommended range for lift thickness for various asphalt concrete mix designations found within Section 710. Please note that the minimum lift thicknesses are based on each mix designation's "Nominal Aggregate Size" and the relative coarseness of its gradation. The compacted thickness of layers placed shall not exceed the Maximum Lift Thickness of Table 710-1 except as otherwise provided in the plans and specifications, or if approved in writing by the Engineer.

TABLE 710-1

RECOMMENDED LIFT THICKNESS FOR ASPHALT CONCRETE MIXES

Asphalt Concrete Mix Designation (inches)	Minimum Lift Thickness Marshall Mixes	Maximum Lift Thickness Marshall Mixes	Minimum Lift Thickness Gyratory Mixes	Maximum Lift Thickness Gyratory Mixes
3/8"	1.0 inches	2.0 inches	1.5 inches	3.0 inches
1/2"	1.5 inches	3.0 inches	2.0 inches	3.0 inches
3/4"	2.5 inches	4.0 inches	3.0 inches	4.0 inches

710.2 MATERIAL:

710.2.1 Asphalt Binder: The asphalt binder specified in this section has been developed for use in desert climate conditions. When used in other climates, consideration should be given to adjustments in the asphalt binder selection. The asphalt binder shall be Performance Grade Asphalt conforming to the requirements of Section 711 for PG 70-10, unless otherwise approved by the Engineer or specified differently in the plans or special provisions.

710.2.2 Aggregate: Coarse and Fine aggregates shall conform to the applicable requirements of this section. Coarse mineral aggregate shall consist of crushed gravel, crushed rock, or other approved inert material with similar characteristics, or a combination thereof, conforming to the requirements of these specifications.

Coarse aggregate for hot mix asphalt is material retained on or above the No. 4 sieve and Fine aggregate is material passing the No. 4 sieve. Aggregates shall be relatively free of deleterious materials, clay balls, and adhering films or other material that prevent coating with the asphalt binder. Coarse and Fine aggregates shall conform to the following requirements when tested in accordance with the applicable test methods.

TABLE 710-2		
COARSE/FINE AGGREGATE REQUIREMENTS		
Characteristics	Test Method	Requirements
Fractured Faces, % (Coarse Aggregate Only)	Arizona 212	85, 1 or more 80, 2 or more
Uncompacted Voids, % Min.	AASHTO T-304, Method A	45
Flat & Elongated Pieces, % 5:1 Ratio	ASTM D4791	10.0 Max.
Sand Equivalent, %	AASHTO T-176	50 Min.
Plasticity Index	AASHTO T-90	Non-plastic
L.A. Abrasion, % Loss	AASHTO T-96	9 max. @ 100 Rev. 40 max. @ 500 Rev
Combined Bulk Specific Gravity	AI MS-2/SP-2	2.35-2.85
Combined Water Absorption	AI MS-2/SP-2	0-2.5%

Tests on aggregates used in asphalt concrete outlined above, shall be performed on materials furnished for mix design purposes and composited to the mix design gradation.

Blend sand (naturally occurring or crushed fines) shall be clean, hard and sound material, which will readily accept asphalt binder coating. The blend sand grading shall be such that, when it is mixed with the other mineral aggregates, the combined product shall meet the requirements of Table 710-2.

The natural sand shall not exceed 20 percent for the Marshall mixes and 15 percent for the Gyratory mixes by weight of the total aggregate for a mix.

710.2.3 Reclaimed Asphalt Pavement (RAP): When allowed by the Engineer, Reclaimed Asphalt Pavement (RAP), as defined in Section 701.5, may be used in asphalt concrete provided all requirements of Section 710 are met. References to use of RAP in Section 710 apply only if RAP is used as part of the mixture.

When RAP is used in asphalt concrete, it shall be of a consistent gradation, asphalt content, and properties. When RAP is fed into the plant, the maximum RAP particle size shall not exceed 1 1/2 in. The percentage of asphalt in the RAP shall be established in the mix design. The percentage of RAP binder shall be established in the mix design.

When RAP is used in base and intermediate courses, the amount of RAP aggregate and RAP binder should not exceed 30% contribution; Surface courses should be limited to 20% RAP aggregate and RAP binder contribution.

In addition to the requirements of Section 710.3.1, the job mix formula shall indicate the percent of asphalt RAP and the percent and performance grade of virgin (added) asphalt binder.

When less than or equal to 15% RAP binder is used by weight of total binder in the mix, the added virgin binder shall meet the requirements for PG 70-10 as shown in Section 711. When greater than 15% RAP is used by weight of the total binder in the mix, the added virgin binder will be dropped one grade for low and high temperature properties to a PG 64-16, unless testing indicates that the blend of the recovered RAP binder and virgin binder meets the requirements for PG 70-10 as shown in Section 711. The virgin asphalt binder shall not be more than one standard asphalt material grades different than the specified mix design binder grade.

710.2.4 Mineral Admixture: Mineral admixture when used as an anti-stripping agent in asphalt concrete shall conform to the requirements of AASHTO M-17. Mineral admixture used in asphalt concrete shall be dry hydrated lime, conforming to the requirements of ASTM C1097 or Portland cement conforming to ASTM C150 Type II or ASTM C595 Type IP. The amount

of hydrated lime or Portland cement used shall be determined by the mix design. The minimum mineral admixture content within a mix will be 1.00 percent, by weight of total aggregate.

710.3 MIX DESIGN REQUIREMENTS:

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

The mix design report shall include the following elements as a minimum.

(1) The name and address of the testing organization and the person responsible for the mix design report.

(2) The mix plant identification and/or location, as well as the supplier or producer name.

(3) A description of all products that are incorporated in the asphalt concrete along with the sources of all products, including admixtures and asphalt binder, and their method of introduction.

(4) The supplier and grade of asphalt binder, the source and type of mineral aggregate, and the percentage of asphalt binder and mineral admixture used.

(5) The percentage of RAP and RAP Binder being contributed to the total mix shall be included in the mix design report.

(6) The mix design report shall state whether it is Gyratory or Marshall, and the size designation.

(7) The results of all testing, determinations, etc., such as: specific gravity and gradation of each component, water absorption, sand equivalent, loss on abrasion, fractured coarse aggregate particles, Tensile Strength Ratio (ASTM D4867), Marshall stability and flow, asphalt absorption, percent air voids, voids in mineral aggregate, and bulk density. Historical abrasion values may be supplied on existing sources. The submittal should include a plot of the gradation on the Federal Highway Administration's 0.45 Power Gradation Chart, plots of the compaction curves and the results of moisture sensitivity testing.

(8) The laboratory mixing and compaction temperature ranges for the supplier and grade of asphalt binder used within the mix design.

(9) A specific recommendation for design asphalt binder content and any limiting conditions that may be associated with the use of the design, such as minimum percentages of crushed or washed fine aggregate.

(10) The supplier's product code, the laboratory Engineer's seal (signed and dated), and the date the design was performed.

(11) If a Warm Mix Technology or additive is used, the following shall be included:

- Technology type and supporting manufacturer information; including instructions pertaining to laboratory mixture temperatures and curing.
- Amount (%) of additive (technology) used in the mixture.
- Attached copy of the ADOT approved product list, showing additive/technology
- Minimum plant production temperature shall not fall below manufacturer's recommendation.
- Minimum field compaction temperature shall be identified.
- Identify any special mixing or compaction temperatures or special methods to be used when conducting Quality Assurance or Quality Control testing of field collected samples. Example: if the field collected samples of warm mix asphalt can be treated as conventional hot asphalt mix, provide the equivalent conventional hot asphalt mix compaction temperature.

The mix design shall be submitted to the Agency or Engineer by the Contractor/Supplier for which it was developed as part of his project submittals. Once the mix design has been approved by the agency or Engineer, the Contractor and/or his supplier shall not change plants nor use additional mixing plants without prior approval of the Engineer. Any changes in the plant operation, the producer's pit, the asphalt binder, including modifiers in the asphalt binder, or any other item that will cause an adjustment in the mix, shall be justification for a new mix design to be submitted.

710.3.2 Mix Design Criteria: The mix design shall be performed by one of two methods, Marshall Mix Design or Gyratory Mix Design. The method shall be specified on the plans, special provisions, or by the Engineer. A minimum of 4 points will be used to establish the mix design results. The oven aging period for both Marshall and Gyratory mix design samples shall be 2 hours.

710.3.2.1 Marshall Mix Design: The Marshall Mix Design shall be performed in accordance with the requirements of the latest edition of the Asphalt Institute's Manual, MS-2 "Mix Design Methods for Asphalt Concrete." The mix shall use the compactive effort of 75 blows per side of specimen. The mix shall comply with the criteria in Table 710-3.

TABLE 710-3

MARSHALL MIX DESIGN CRITERIA

Criteria	Requirements			
	3/8" Mix	1/2" Mix	3/4" Mix	Designated Test
1.Voids in Mineral Aggregate: %, min	15.0	14.0	13.0	AI MS-2
2.Effective Voids: %, Range	4.0±0.2	4.0 ±0.2	4.0 ±0.2	AI MS-2
3.Absorbed asphalt: %, Range*	0-1.0	0-1.0	0-1.0	AI MS-2
4.Dust to Eff. Asphalt Ratio, Range **	0.6-1.4	0.6-1.4	0.6-1.4	AI MS-2
5.Tensile Strength Ratio: % Min.	65	65	65	ASTM D4867
6.Dry Tensile Strength: psi, Min.	100	100	100	ASTM D4867
7.Stability: pounds, Minimum	2,000	2,500	2,500	AASHTO T-245
8.Flow: 0.01-inch, Range	8-16	8-16	8-16	AASHTO T-245
9.Mineral Aggregate Grading Limits				AASHTO T-27
		Percent Passing with Admix		
Sieve Size	3/8 inch Mix	1/2 inch Mix	3/4 inch Mix	
1-1/4 inch				
1 inch			100	
3/4 inch		100	90 – 100	
1/2 inch	100	85 – 100	---	
3/8 inch	90-100	62 – 85	62 – 77	
No. 8	45-60	40 – 50	35 – 47	
No. 40	10-22	10 – 20	10 – 20	
No. 200	2.0 – 10.0	2.0 – 10.0	2.0 – 8.0	

* Unless otherwise approved by the Engineer.

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

710.3.2.2 Gyratory Mix Design: Gyratory Mix Designs shall be performed in accordance with the requirements of latest edition of the Asphalt Institute's SP-2 manual. Mix design laboratory compacted specimens shall be prepared using a gyratory compactor in accordance with AASHTO T-312.

The mix design shall be formulated in a manner described for volumetric mix designs in the current edition of the Asphalt Institute Manual SP-2, except the number of trial blend gradations necessary will be determined by the mix design laboratory. Duplicate gyratory samples shall be prepared at a minimum of four (4) binder contents to select the recommended binder content. The gyratory specimens shall be compacted to 160 gyrations. Volumetric data for the design number of gyrations, N_{des}, and the initial number of gyrations, N_{ini}, are then back calculated based on the bulk specific gravity, G_{mb}, of the N_{max} specimens and the height data generated during the compaction process of those same specimens.

TABLE 710-4	
Number of Gyrations	
N_{ini}	8
N_{des}	100
N_{max}	160

The corrected density of the specimens shall be less than 89.0 percent of maximum theoretical density at N_{ini}. The corrected density of the specimens shall be less than 98.0 percent of maximum theoretical density at N_{max}. The Gyratory mix shall comply with the criteria in Table 710-5.

TABLE 710-5				
GYRATORY MIX DESIGN CRITERIA				
Criteria	**Requirements**			**Designated Test**
	3/8" Mix	**1/2" Mix**	**3/4" Mix**	**Method**
1. Voids in Mineral Aggregate: %, Min.	15.0	14.0	13.0	AI SP-2
2. Effective Voids: %, Range	4.0 ± 0.2	4.0 ± 0.2	4.0 ± 0.2	AI SP-2
3. Absorbed Asphalt: %, Range *	0 - 1.0	0 - 1.0	0 - 1.0	AI SP-2
4. Dust to Eff. Asphalt Ratio, Range **	0.6 – 1.4	0.6 – 1.4	0.6 – 1.4	AI SP-2
5. Tensile Strength Ratio: %, Min.	75	75	75	ASTM D4867
6. Dry Tensile Strength: psi, Min.	75	75	75	ASTM D4867
7. Mineral Aggregate Grading Limits				AASHTO T-27
	Percent Passing with Admix			
Sieve Size	**3/8 inch Mix**	**1/2 inch Mix**	**3/4 inch Mix**	
1 inch			100	
3/4 inch		100	90-100	
1/2 inch	100	90-100	43-89	
3/8 inch	90-100	53-89	-	
No. 8	32-47	29-40	24-36	
No. 40	2-24	3-20	3-18	
No. 200	2.0-8.0	2.0-7.5	2.0-6.5	

* Unless otherwise approved by the Engineer.

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

710.3.2.3 Moisture Sensitivity Testing: Moisture sensitivity testing will be performed in accordance with ASTM D4867 for both Marshall and Gyratory mix designs, without the freeze/thaw cycles. The minimum required Tensile Strength Ratio is indicated in the tables above.

- End of Section -

SECTION 711

PAVING ASPHALT

711.1 GENERAL:

The asphalt shall be produced from crude asphalt petroleum or a mixture of refined liquid asphalt and refined solid asphalt. It shall be free from admixture with any residues obtained by the artificial distillation of coal, coal tar, or paraffin oil and shall be homogeneous and free from water.

Polymer modified asphalt cement shall be produced from crude asphalt petroleum and a polymer or blend of polymers mixed to produce a homogeneous material free from water.

Asphalt shall not be heated during the process of its manufacture, storage, or during construction so as to cause injury as evidence by the formation of carbonized particles.

711.2 TESTING REQUIREMENTS:

Paving asphalt shall be classified by the Performance Grading System and shall conform to the requirements set forth in Table 711-1 and AASHTO M-320 with the PAV temperature changes noted in the table. On all grades, flash point temperature AASHTO T-48: minimum 230 °C and mass loss, maximum 1.00 percent.

TABLE 711-1
PERFORMANCE GRADING SYSTEM

	PG 58-22	PG 64-16	PG 70-10	PG 76-16
Original Asphalt				
Viscosity, AASHTO T-316 (Note 1) Max. 3 Pa-s, Test Temp, °C	135	135	135	135
Dynamic Shear AASHTO T-315 (Note 2) G*/Sin δ, Min., 1.0 kPa Test Temp. @ 10 rad/s, °C	58	64	70	76
Tests Using Rolling Thin Film Oven Residue (AASHTO T-240)				
Mass Loss, Maximum %	1.0	1.0	1.0	1.0
Dynamic Shear AASHTO T-315 G*/Sin δ, Min., 2.20 kPa Test Temp. @ 10 rad/s, °C	58	64	70	76
Tests Using Pressure Aging Vessel Residue (AASHTO R-28)				
PAV Aging Temperature, °C (AASHTO R-28)	100	100	110	110
Dynamic Shear AASHTO T-315 G*·Sin δ, Max., 5000 kPa Test Temp. @ 10 rad/s, °C	22	28	34	34
Creep Stiffness, AASHTO T-313 (Note 3) S, Maximum, 300.0 Mpa *m*-value, Minimum, 0.300 Test Temp. @ 60s, °C	-12	-6	0	-6
Direct Tension, AASHTO T-314 (Note 3) Failure Strain, Minimum 1.0% Test Temp. @ 1.0 mm/min. °C	-12	-6	0	-6

NOTES:

(1) This requirement may be waived at the discretion of the specifying agency if the supplier warrants that the asphalt binder can be adequately pumped and mixed at temperatures that meet all applicable safety standards.

(2) For quality control of unmodified asphalt cement production, measurement of the viscosity of the original asphalt cement may be substituted for dynamic shear measurements of G*/sin (d) at test temperatures when the asphalt is a Newtonian fluid. Any suitable standard means of viscosity measurement may be used, including capillary or rotational viscometer (AASHTO T-210 or AASHTO T-202).

(3) If the creep stiffness is below 300 MPa, the direct tension test is not required. If the creep stiffness is between 300 and 600 MPa, the direct tension failure strain requirement can be used in lieu of the creep stiffness requirement. Direct tension test is recommended for polymer modified asphalt binders. The m-value requirement must be satisfied in all cases.

Polymer modified paving asphalt shall be classified by the Performance Grading System and shall conform to the requirements set forth in Table 711-2 and AASHTO M-320 with the PAV temperature changes noted in the table. On all Grades Flash Point Temperature AASHTO T-48: Minimum 230 °C and Mass Loss, Maximum 1.00 percent. P is for Polymer and TR is for Tire Rubber.

TABLE 711-2
PERFORMANCE GRADING SYSTEM

	PG 64-28P	PG-76-22P	PG76-22TR Type 1 (Note 4)	PG76-22TR Type 2 (Note 4)
Viscosity, AASHTO T-316 (Note 1) Max. 3 Pa-s, Test Temp, °C	135	135	135	135
Dynamic Shear, AASHTO T-315 (Note 2) G*/Sin δ, Min., 1.0 kPa Test Temp. @ 10 rad/s, °C	64	76	76	76
Elastic recovery, ASTM D6084 Procedure "B" @ 10°C	65	65	65	55
Phase Angle, Max	75	75	75	75
Separation test, Texas 540 % Max	4	4	4	4
Solubility in Trichloroethylene, ASTM D2042 or n-propyl bromide, ASTM D7553 % Minimum	–	–	97.5	–
Tests Using Rolling Thin Film Oven Residue (AASHTO T-240)				
Mass Loss, Maximum %	1.0	1.0	1.0	1.0
Dynamic Shear, AASHTO T-315 G*/sin δ, Min., 2.20 kPa Test Temp. @ 10 rad/s, °C	64	76	76	76
Tests Using Pressure Aging Vessel Residue (AASHTO R-28)				
PAV Aging Temperature, °C (AASHTO R-28)	100	110	110	110
Dynamic Shear, AASHTO T-315 G*sin δ, Max., 5000 kPa Test Temp. @ 10 rad/s, °C	22	31	31	31
Mass Loss, AASHTO T-240 Weight % Max	1.0	1.0	1.0	1.0
Creep Stiffness, AASHTO T-313 S, Maximum, 300 Mpa *m*-value, Minimum, 0.300 Test Temp. @ 60s, °C	-18	-12	-12	-12
Direct Tension, AASHTO T-314 (Note 3) Failure Strain, Minimum 1.0% Test Temp. @ 1.0 mm/min. °C	-18	-12	-12	-12

NOTES: (continued on next page.)

(1) This requirement may be waived at the discretion of the specifying agency if the supplier warrants that the asphalt binder can be adequately pumped and mixed at temperatures that meet all applicable safety standards.

(2) For quality control of unmodified asphalt cement production, measurement of the viscosity of the original asphalt cement may be substituted for dynamic shear measurements of G*/Sin δ, at test temperatures when the asphalt is a Newtonian fluid. Any suitable standard means of viscosity measurement may be used, including capillary or rotational viscometer (AASHTO T-210 or AASHTO T-202).

(3) If the creep stiffness is below 300 MPa, the direct tension test is not required. If the creep stiffness is between 300 and 600 MPa, the direct tension failure strain requirement can be used in lieu of the creep stiffness requirement. Direct tension test is recommended for polymer modified asphalt binders. The m-value requirement must be satisfied in all cases.

(4) "TR" binders shall have 9% to 11% reclaimed tire rubber and enough virgin polymer to meet all performance grade criteria specified. The blend percentages shall be listed on the Certificate of Compliance by the manufacturer. Type 1 shall meet solubility limits.

711.3 TEST REPORT AND CERTIFICATION:

Test reports and certifications shall be provided to the Engineer when requested by the Engineer. At the time of delivery of each shipment of asphalt, the supplier supplying the material shall deliver to the purchaser a certified copy of the test report which shall indicate the name of the refinery and supplier, type and grade of asphalt delivered, date and point of delivery, quantity delivered, delivery ticket number, purchase order number, and results of the above specified tests. The test report shall be signed by an authorized representative of the supplier certifying that the product delivered conforms to the specifications for the type and grade indicated.

Until the certified test reports and samples of the material have been checked by the Engineer, that material will be only tentatively accepted by the Contracting Agency. Final acceptance will be dependent upon the determination of the Engineer that the material involved fulfills the requirements prescribed. The certified test reports and the testing required in connection with the reports shall be at no additional cost to the Contracting Agency.

711.4 TEMPERATURES:

Paving asphalt shall be heated in such a manner that steam or hot oils will not be introduced directly into the paving asphalt during heating.

711.5 CONVERSION OF QUANTITIES:

When pay quantities of paving asphalt are determined from volumetric measurements, the volumetric measurement at any temperature shall be reduced to the volume the material would occupy at 60 degrees F. in accordance with ASTM D1250. In converting volume to weight, the computations shall be based on Table 711-3.

TABLE 711-3
ASPHALT CEMENT QUANTITY CONVERSION

Grade of Material	Gals. Per Ton of 60 °F.	Lbs. Per Gal at 60 °F.
PG 58-22	236	8.47
PG 64-16	235	8.51
PG 70-10	235	8.51
PG 64-28P	236	8.47
PG 76-22P,TR	236	8.47
PG 76-16	233	8.58

- End of Section -

SECTION 712

LIQUID ASPHALT

712.1 GENERAL:

Liquid asphalt shall consist essentially of either natural crude or refined asphalt petroleum, or a residual product thereof.

The liquid asphalt shall be medium curing product designed by the letters MC, and shall consist of a paving asphalt conforming to the provisions in Section 711, fluxed or blended with a kerosene type solvent.

The asphalt shall not be heated during the process of its manufacture or during construction so as to cause injury as evidence by the formation of carbonized particles.

712.2 TEST REQUIREMENTS:

The liquid asphalt shall consist of materials specified above and shall conform to the requirements set forth in Table 712-1.

712.3 TEST REPORTS AND CERTIFICATIONS:

Test reports and certifications will be furnished in accordance with Section 711.

712.4 CONVERSION OF QUANTITIES:

When pay quantities of liquid asphalt are determined from volumetric measurements, the volumetric measurement at any temperature shall be reduced to the volume the material would occupy at 60 degrees F. in accordance with ASTM D1250. In converting volume to weight, the computations shall be based on the data contained in Table 712-2.

TABLE 712-1

AASHTO M-82 TABLE 1

	MC-30		MC-70		MC-250		MC-800		MC-3000	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Kinematic Viscosity at 60°C (140°F) centistokes	30	60	70	140	250	500	800	1600	3000	6000
Flash point (Tab. open-cup), degrees C° (F)	38 (100)	. . .	38 (100)	. . .	66 (150)	. . .	66 (150)	. . .	66 (150)	. . .
Water percent	. . .	0.2	. . .	0.2	. . .	0.2	. . .	0.2	. . .	0.2
Distillation test: Distillate percentage by volume of total distillate to 360°C (680°F)										
to 225°C (437°F)	. . .	25	0	20	0	10	. . .	. . .	. . .	. . .
to 260°C (500°F)	40	70	20	60	15	55	0	35	0	15
to 315°C (600°F)	75	93	65	90	60	87	45	80	15	75
Residue from distillation to 360°C (680°F) Volume percentage of sample by difference	50	. . .	55	. . .	67	. . .	75	. . .	80	. . .
Tests on residue from distillation:										
Absolute viscosity at 60°C (140°F) poises	300	1200	300	1200	300	1200	300	1200	300	1200
Ductility, 5 cm/min, cm.	100	. . .	100	. . .	100	. . .	100	. . .	100	. . .
Solubility in Trichloroethylene, percent	99	. . .	99	. . .	99	. . .	99	. . .	99	

TABLE 712-2		
LIQUID ASPHALT QUANTITY CONVERSION		
Grade of Materials	**Gals. Per Ton at 60 Degrees F.**	**Lbs. Per Gals. at 60 Degrees F.**
70	253	7.90
250	249	8.03
800	245	8.16
2000	241	8.30

- ***End of Section*** -

SECTION 713

EMULSIFIED ASPHALTS MATERIALS

713.1 GENERAL:

Emulsified asphalts shall be composed of a paving asphalt base uniformly emulsified with water and an emulsifying or stabilizing agent, which stabilizes the mixture and provides a charge. The resultant charge is either positive, cationic (C) or negative, anionic. The emulsion shall be homogeneous throughout and if stored, shall show no separation of ingredients within 30 days after delivery. Emulsified asphalt shall be classified by charge, set time, penetration, and viscosity. Paving asphalts may be modified with the use of solid polymer or latex modifiers.

Emulsified asphalt shall be classified as follows:

(A) Charge: Positive charge, cationic (C) or negative charge, anionic.
(B) Modifier: Polymer Modified (PM), Latex Modified (LM)
(C) Set Time: Slow Set (SS), Medium Set (MS), Quick Set (QS), Rapid Set (RS).

713.2 TESTING REQUIREMENTS:

The emulsified asphalt shall conform to the requirements set forth in Table 713-1 or Table 713-2.

713.3 TESTS REPORT AND CERTIFICATION:

Test reports and certifications shall be made in accordance with Section 711.

TABLE 713-1

REQUIREMENTS FOR ANIONIC EMULSIFIED ASPHALT (Specification Designation)

	Type	Quick Setting	Rapid-Setting		Medium-Setting			Slow-Setting	
ASTM Test Method	Grade	QSH	RS-1	RS-2h	MS-1	MS-2	MS-2h	SS-1	SS-1h
	Laboratory Tests	Min Max	Max Max	Min Max	Min Max	Min Max	Min Max	Min Max	Min Max
D7496	**Tests on emulsions:** Viscosity, Saybolt Furol at 77°F (25°C), sec.	20 100	20 100		20 100	100	100	20 100	20 100
D7496	Viscosity, Saybolt Furol at 122°F (50°C), sec.			75 400					
D6936	Demulsibility, 35 ml. 0.02 N. $CaCl_2$, percent		60	60					
D244	Coating ability and water resistance								
	Coating, dry aggregate				good	good	good		
	Coating, after spraying				fair	fair	fair		
	Coating, wet aggregate				fair	fair	fair		
	Coating, after spraying				fair	fair	fair		
D6935	Cement mixing test, percent							2	2
D6933	Sieve test, percent	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
D6997	Residue by distillation, percent	57	55	63	55	65	65	57	57
D5	**Tests on Residue from Distillation Test:** Penetration 77°F (25°C), 100g, 5 sec.	40 110	100 200	40 90	100 200	100 200	40 90	100 200	40 90
D113	Ductility, 77°F (25°C), 5 cm/min. cm.	40	40	40	40	40	40	40	40
D2402	Solubility in trichloroethylene, %	98	97.5	97.5	97.5	97.5	97.5	97.5	97.5

TABLE 713-2

REQUIREMENTS FOR CATIONIC (C) EMULSIFIED ASPHALT (Specification Designation)

ASTM Test Method	Type	Quick Setting	Rapid Setting		Medium Setting		Slow Setting		Modified Quick Setting
	Grade	CQSH	CRS-1	CRS-2P	CMS-2	CMS-2h	CSS-1	CSS-1h	PMCQS-1h LMCQS-1h
	Laboratory Tests	Min Max	Min Max	Min Max	Min Max	Min Max	Min Max	Min Max	Min Max
	Tests on emulsions:								
D7496	Visc., Saybolt Furol at 77°F., sec.	20 100					20 100	20 100	20 100
D7496	Visc., Saybolt Furol at 122°F., sec.		20 100	100 400	50 450	50 450			
D6930	Storage Stability Test, 1 day, %	1	1	1	1	1	1	1	1
D6936	Demulsibility, 35 ml 0.8% sodium dioctyl sulfosuccinate, %		40	40					
D244	**Coating ability and water resistance:**								
	Dry aggregate				Good	Good			
	After spraying				Fair	Fair			
	Wet aggregate				Fair	Fair			
	After spraying				Fair	Fair			
D7402	Particle charge test	Positive	Positive	Positive	Positive	Positive	Positive (1)	Positive (1)	Positive
D6933	Sieve Test, %	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.30
D6935	Cement Mixing test, %						2.0	2.0	
D6997	Distillation:								
D6997	Oil distillate, by volume of emulsion, %		3	3	12	12			
D6997	Residue, %	57	60	65	65	65	57	57	
Arizona 512 (2)	Residue by Evaporation, %								60
	Test on residue from distillation test:								Arizona 504 (3)
D5	Penetration, 25°C (77°F), 100 g. 5 sec.	40 110	100 250	40 90	100 250	40 90	100 250	40 90	40 90
D113	Ductility, 25°C (77°F.) 5 cm per min, cm. (4)	40	40	40	40	40	40	40	40
D36	Ring and Ball Softening Point (5)								130
D6084 (Procedure b)	Elastic Recovery, %			55					55
D2402	Solubility in trichloroethylene, %	98	98	97.5	98	98	97.5	97.5	97.5

(1)* If the Particle Charge Test result is inconclusive for CSS-1 or CSS-1h, material having a maximum pH value of 6.7 will be accepted.
(2) Residue by evaporation may be determined in accordance with the requirements of Arizona Test Method 512; however, in case of dispute, ASTM D6934 shall be used.
(3)* If using PMCQS-1h or LMCQS-1h the residue from distillation shall be obtained from ARIZ-504. In case of dispute, testing on residue by distillation at 350° F (ASTM D6997) shall be performed.
(4) When Micro-surfacing emulsion is specified, the ductility shall be a minimum of 60 cm.
(5) When Micro-surfacing emulsion is specified, the softening point shall be a minimum of 140° F.

713.4 TEMPERATURES:

Unless otherwise specified, the various grades of emulsified asphalt shall be applied at temperatures within the limits specified in Table 713-3 the exact temperature to be determined by the Engineer. Emulsified asphalt shall be reheated if necessary. However, at no time, after loading into a tank car or truck for transportation to the work site, shall the temperature of the emulsion be raised above the maximum temperature shown in Table 713-3. During all reheating operations, the emulsified asphalt shall be agitated to prevent localized overheating. Emulsified asphalt shall not be permitted to cool to a temperature of less than 40 degrees F.

TABLE 713-3		
APPLICATION TEMPERATURE OF EMULSIFIED ASPHALT		
Grade of Emulsified Asphalt	**Minimum °F**	**Maximum °F**
RS-1, MS-1, SS-1, SS-Ih, CSS-1, CSS-1h	70° F	140° F
RS-2, MS-2, MS-2h, CRS-1, PMCQS-1h, LMCQS-1h, CRS-1h, CRS-2h, CMS-2, CMS-2h, QSH, CQSH	125° F	185° F

Emulsified asphalt shall be heated in such a manner that steam or hot oils will not be introduced directly into the emulsified asphalt during heating.

713.5 CONVERSION OF QUANTITIES:

When pay quantities of emulsified asphalt are determined from volumetric measurements, the volumetric measurement at any temperature shall be reduced to the volume the material would occupy at 60 degrees F in accordance with ASTM D1250. In converting volume to weight, the computations shall be based on Table 713-4.

TABLE 713-4		
EMULSIFIED ASPHALTS QUANTITY CONVERSION		
Grade of Material	**Gals Per Ton at 60° F**	**Lbs. Per Gal. at 60° F**
All grades	238	8.40

- ***End of Section*** -

SECTION 796

GEOSYNTHETICS

796.1 GENERAL:

This section defines the requirements for geosynthetic fabrics, grids and membranes typically used as pavement fabric beneath asphalt concrete overlays, filtration/drainage separation between soil/aggregate layers, erosion control filter/separators for riprap protection, and soil or base reinforcement to improve the stability of weak soils or reinforce aggregate bases.

796.2 MATERIALS AND REQUIREMENTS:

Identification, packaging, delivery, storage and handling of geosynthetic materials shall be in accordance with manufacturer's recommendations and ASTM D4873. Each roll shall be labeled or tagged to provide product identification sufficient to determine the product type, manufacturer, quantity, lot number, roll number date of manufacture, and shipping date.

Geosynthetic materials shall be inert to commonly encountered chemicals, resistant to rot and mildew, and shall have no tears or defects which adversely affect or alter its physical properties.

Geosynthetic materials shall be packaged with material that will protect the geosythetic (including ends of rolls) from damage due to shipment, water, sunlight and contaminates. During storage, geosynthetic materials shall be elevated off the ground and protected from the following: site construction damage, precipitation, extended ultraviolet radiation, strong acid or strong base chemicals, flames (including welding sparks), temperatures in excess of 160°F, and any other environmental condition that may damage geosynthetic material property values. Protection shall be in accordance with manufacturer's specifications and shall be maintained during periods of shipment and storage.

Materials required for complete and proper installation of geosynthetic materials that are not specifically described herein (such as pins, nails, washers, etc.) shall conform to the manufacturer's recommendations and be as selected and supplied by Contractor subject to final approval by the Engineer.

Requirements represent minimum average roll values in the weaker principal direction. Average of test results from any sampled roll in a lot shall meet or exceed the minimum values noted herein. Lot sampling shall be in accordance with ASTM D4354.

796.2.1 Pavement: Pavement fabric geosynthetics are non-woven polyester or polypropylene fabrics that are field saturated with an asphalt binder and placed as an interlayer beneath a pavement overlay or between pavement layers. When placed, the fabric becomes an integral part of the roadway section, forming a barrier to water infiltration and absorbing stresses to reduce reflective and fatigue cracking of the new pavement surface layer.

Pavement fabric shall be constructed of at least 95 percent (by weight) nonwoven synthetic fibers of polyester or polypropylene, thermally bonded on one side. The fabric material shall additionally conform to the physical properties shown in Table 796-1.

TABLE 796-1

PAVEMENT GEOSYNTHETIC PROPERTIES

Property	Class A	Class B	Test Method
Weight: oz./yd^2	4.1 min.	4.0 min.	ASTM D3776
Grab tensile strength: lbs.	100 min.	90 min.	ASTM D4632
Elongation at break: %	50 min.	50 min.	ASTM D4632
Melting point: degree F	300 min.	300 min.	ASTM D276
Asphalt retention: gal/yd^2	0.25 min.(1)	0.20 min.	ASTM D6140

(1) May be reduced within street intersections, on steep grades or in other zones where vehicle braking is common, but not less than 0.20 gal/yd^2, when approved by the Engineer.

796.2.2 Filtration (Drainage) and Separation: Filtration and separation fabrics are nonwoven or woven polypropylene or polyester fabrics with specified strength characteristics used as permeable separators to restrain soil or other particles subjected

to hydrodynamic forces while allowing the passage of fluids into or across a geotextile and to prevent inter-migration of adjacent soil layers of vastly different particle sizes and particle distributions.

Filtration and separation fabrics shall be nonwoven or woven fabric consisting only of long chain polymeric filaments such as polypropylene or polyester formed or woven into a stable network such that the filaments retain their relative position to each other. The fabric material shall additionally conform to the physical properties shown in Table 796-2.

TABLE 796-2
FILTRATION & DRAINAGE GEOSYNTHETIC PROPERTIES

Property	Class A (1)	Class B (2)	Test Method
Grab tensile strength: lbs.	180 min.	80 min.	ASTM D4632
Seam strength: lbs.	160 min.	70 min.	ASTM D4632
Puncture strength: lbs.	80 min.	25 min.	ASTM D4833
Trapezoidal tear: lbs.	50 min.	25 min.	ASTM D4533
Apparent opening size: US Standard sieve size	>50	>50	ASTM D4751
Ultraviolet Stability: %	50 min.	50 min.	ASTM D4355

(1) Class A - Use where installation stresses are more severe than for Class B application (i.e. very coarse sharp angular aggregate or high compaction requirements).
(2) Class B – Use with smooth graded surface having no sharp angular projections and sharp angular aggregate.

796.2.3 Erosion Control: Erosion control fabrics are used below areas to receive aggregate or riprap slope protection and act as filter/separators to provide sustained permeability while maintaining structural stability.

Erosion control fabrics shall be a woven monofilament fabric or a nonwoven fabric consisting only of long chain polymeric filaments such as polypropylene or polyester formed into a stable network that the filaments retain their relative position to each other. The fabric material shall additionally conform to the physical properties shown in Table 796-3.

TABLE 796-3
EROSION CONTROL GEOSYNTHETIC PROPERTIES

Property	Class A	Class B	Test Method
Grab tensile strength: lbs.	270 min.	200 min.	ASTM D4632
Elongation at break: %	45min., 115 max.	15 min., 115 max.	ASTM D4632
Puncture strength: lbs.	110 min	75 min.	ASTM D4833
Burst strength: psi	430 min.	320 min.	ASTM D3786
Trapezoidal tear: lbs.	75 min.	50 min.	ASTM D4533
Permittivity: $second^{-1}$	0.07 min.	0.07 min.	ARIZ-730 (1)
Apparent opening size: US Standard sieve size	30 – 140	30 - 140	ASTM D4751
Ultraviolet Stability: %	70 min.	70 min.	ASTM D4355

(1) Arizona Department of Transportation test method.

796.2.4 Soil or Base Reinforcement: Geogrid geosynthetic materials are used for improving the stability of weak soils or reinforcing aggregate bases. Geogrids are defined as biaxial or triaxial polymeric grids formed by a regular network of integrally connected polymer tensile elements with apertures of sufficient size to permit significant mechanical interlock with the surrounding soil, aggregate, or other fill materials to function primarily as reinforcement.

The geogrid structure shall be dimensionally stable and able to retain its geometry under manufacture, transport and installation. Geogrids shall be integrally formed and deployed as a single layer; comprised of 100 percent polypropylene or high-density polyethylene. Geogrids shall additionally conform to the physical properties shown in Table 796-4.

TABLE 796-4

REINFORCEMENT GEOGRID PROPERTIES

Property	Type 1	Type 2	Test Method
Aperture size: inches	1 min.	1-3/8 min.	ID callipered
Ultimate Tensile Strength: lb./ft.	850 min.	1300 min.	ASTM D4945
Flexural Rigidity: Mg-cm	250,000 min.	750,000 min.	ASTM D1388
Tensile Strength @ 2% Strain: lb./ft. MD (1)	270 min.	410 min.	ASTM D6637
Tensile Strength @ 2% Strain: lb./ft. CMD (2)	380 min.	620 min.	ASTM D6637
Tensile Strength @ 5% Strain: lb./ft. MD (1)	550 min.	810 min.	ASTM D6637
Tensile Strength @ 5% Strain: lb./ft. CMD (2)	720 min.	1340 min.	ASTM D6637
Junction Efficiency: % Ultimate Tensile Strength	75 min.		GRI-GG2 (3)
Ultraviolet Stability: % Retained Strength	70 min.		ASTM D4355

(1) MD = Test in the machine direction along roll length
(2) CMD = Test in the cross-machine (transverse) direction across roll width
(3) Geosynthetic Research Institute test method

796.3 TEST AND CERTIFICATION REQUIREMENTS:

Upon request, a Certificate of Compliance shall be submitted to the Engineer for material to be used. Samples of materials shall be submitted for testing. Each geosynthetic material lot or shipment is to be approved by the Engineer before the material is incorporated into the work.

Testing methods and results shown in the Certificate of Compliance shall conform to the listed specifications for the proposed geosynthetic. Manufacturer's supporting documentation including, but not limited to, product information sheets, installation procedures and recommendations, recommended use, and project references shall be submitted to the Engineer for product evaluation and approval.

- End of Section -

PART 100 - GENERAL CONDITIONS

SECTION 101
ABBREVIATIONS AND DEFINITIONS

101.1 ABBREVIATIONS: *Add the following abbreviation*:

COS = City of Scottsdale

101.2 DEFINITIONS AND TERMS:

Delete the following definitions and substitute the following:

Engineer: For all bond, Capital Improvement, and Improvement District projects, the Engineer shall be the City Engineer acting directly or through a duly authorized representative. For all Private Development projects, the Engineer shall be the Development Engineering Manager acting directly or through a duly authorized representative. For all references throughout Section 430 Landscape and Planting and Section 440 Sprinkler Irrigation System Installation, the Engineer shall be the COS Parks Department Landscape Specialist acting directly or through a duly authorized representative.

Inspector: The Engineer's authorized representative assigned to make detailed inspections of contract performance. For bond, Capital Improvement, and Improvement District projects the Inspector is from Capital Project Management, for Private Development projects the Inspector is from Inspection Services.

Add the following definitions:

Primary Electrical Conductors: Primary electrical conductors shall be those conductors designed with a rating capacity of 12.5 kV or less, single phase or three phase, or conduits designed or intended to carry those lines.

Service Conductors: Service conductors shall be those electrical lines designed for direct service to commercial, industrial, residential, streetlight, or other direct users, or conduits designed or intended to carry those lines.

Trash and Litter: Any item not installed as part of the landscape or hardscape. This includes but is not limited to leaves, wind-blown material, cigarette butts and tree limbs.

101.3 *Add the following paragraph*:

Also, in order to avoid cumbersome and confusing repetition of expressions in these specifications, it is provided that whenever MAG Uniform Standard Specifications (or Details) for Public Works Construction are referenced using, for example, such phrases as MAG Detail No.____, MAG Standard Detail No. ____, MAG Standard Specification Section ____, MAG Section ____, MAG Subsection ____, etc., it shall be understood as if the phrase were followed by the words, "as amended by the COS Supplement, latest version." Similarly, it is provided that whenever a COS Supplement to MAG Uniform Standard Specifications (or Details) for Public Works Construction are referenced using, for example, such phrases as COS Detail No. ____,

COS Supplemental Detail No.____, COS Supplemental Specification Section ____, COS Section ____, COS Subsection ____, COS Supplement ____, etc., it shall be understood as if the phrase were followed by the words, "as it amends the MAG Uniform Standard Specifications (or Details) for Public Works Construction, latest version."

SECTION 102
BIDDING REQUIREMENTS AND CONDITIONS

102.4 EXAMINATION OF PLANS, SPECIAL PROVISIONS AND SITE OF WORK:
At the end of the third paragraph, Add the following:

If no information is given, i.e. soils report or logs of test bores, bidders shall make their own investigations and form their own estimates of the surface and sub-surface conditions of the project, especially in the vicinity of utilities.

102.6 SUBCONTRACTORS LIST: *Add the following:*

For Landscape Subcontractor include qualification data for firms and persons specified to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and address of architects and owners, and other information specified. Landscape installer shall be an experienced Installer who has completed landscaping work similar in material, design, and extent to that indicated for this Project and with a record of successful landscape establishment. Landscape Installer shall maintain an experienced full-time supervisor on the project site during times that landscaping is in progress.

SECTION 103
AWARD AND EXECUTION OF CONTRACT

103.6.1 General: *Add the following paragraph:*

(F) Prior to obtaining an encroachment permit, the Contractor must have on file with the City a Certificate of Insurance verifying the following coverages: Commercial General Liability insurance with a limit of not less than $1,000,000 for each occurrence, $2,000,000 Products and Completed Operations Annual Aggregate, and a $2,000,000 General Aggregate Limit. The General Liability /General Aggregate Limit must be a Per Location General Aggregate. The policy must cover liability arising from premises, operations, independent Contractors, and personal injury and advertising injury, or as required. If any Excess insurance is utilized to fulfill the requirements of this paragraph, the Excess insurance must be "follow form" equal or broader in coverage scope than underlying insurance. The City, its officers, officials, and employees must be additional insureds to the full limits of the Contractor's automobile and general liability policies. Call the City of Scottsdale, Risk Management Office for any changes in the figures listed above.

SECTION 105
CONTROL OF WORK

105.6 COOPERATION WITH UTILITIES: *Add the following paragraph:*

Contractor is advised that the location, number, and type of utilities shown on the plans are based on information made available by public utilities, owners, and users at the time the plans were prepared. Underground utilities may be present on this project which were not disclosed to the Engineer. No representation is made that the utility locations indicated on these plans are accurate, complete, or exclusive. It shall be the Contractor's responsibility to field verify all 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. In addition, the City will not consider additional compensation requests from the Contractor to perform any potholing, utility company coordination, etc. needed to locate or verify utility location, to adjust contract work items as necessary to avoid utility line conflict, to cooperate with utilities in adjusting schedule as needed to allow for utility company work, relocations, etc. The Contractor's bid shall include the above coordination, work, and adjustments.

105.8 CONSTRUCTION STAKES, LINES AND GRADES: *Delete the entire Subsection and replace it with the following:*

The Contractor shall set construction stakes establishing lines and grades for roadwork, curbs, gutters, sidewalks, structures and centerlines for utilities and necessary appurtenances as he may deem necessary. These stakes and marks shall constitute the field control by and in accordance with which the Contractor shall establish other necessary controls and perform the work. Contractor’s field control may be checked by City at their discretion at any time during the project. Deviation of the field control from the control shown on Plans shall be corrected by Contractor at no additional cost to City.

The Contractor shall furnish all materials, personnel, and equipment necessary to perform all surveying, staking, layout and verifications of the accuracy of all existing control points which are delineated in the contract documents.

The Contractor shall perform the work in accordance with his established field control and shall be charged with full responsibility for conformity and agreement of the work with such stakes and marks.

The Contractor shall be held responsible for the preservation of all stakes and marks. Construction stakes or marks destroyed or disturbed by the Contractor, shall be re-established at no additional cost to the City.

The Contractor shall set the construction stakes for buildings establishing lines, grades, and elevations to include necessary utilities and appurtenances and shall be responsible for their conformance with the contract documents.

105.15 ACCEPTANCE: *Add the following paragraphs:*

Prior to partial or final acceptance of all public improvements, a full size reproducible set of the approved As-built construction drawings and electronic copy of the subject improvements must be submitted to the City. In addition, an electronic copy of any Traffic Signal Plans shall be submitted to the Traffic Signal Supervisor at 9191 E. San Salvador, Scottsdale, AZ 85258.

A certificate of occupancy for on-site improvements will not be issued until the Contractor is provided with a letter from the City that the work is complete and accepted by the City.

SECTION 106
CONTROL OF MATERIALS

106.2 SAMPLES AND TESTS OF MATERIALS: *Add the following:*

Samples: 5 lbs. of granite stone mulch for each color and texture of stone required for project, in labeled plastic bags.

COS Parks Department reserves the option of sampling 2% plant material prior to installation.

106.5 STORAGE OF MATERIALS:

Delete the following sentences:

That portion of the right-of-way and easements not required for public travel may be used for storage purposes, when approved by the Engineer. Any additional storage area required must be provided by the Contractor.

Add the following paragraph:

Temporary construction storage sites located outside of the limits of construction as shown on the plans require the submittal of a site plan for separate permitting and approval prior to any site disturbance. Written proof of permission from the owner or lessee of the private parcels will be required. Storage sites shall conform to the requirements of MAG Subsection 107.6.1, as amended by the COS Supplement, latest version.

SECTION 107
LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC

Add the following Subsections:

107.2.1 AZPDES Permit:

(A) General requirements:

The Contractor shall comply with the Arizona Pollutant Discharge Elimination System (AZPDES) Stormwater requirements for construction sites under the Arizona Department of Environmental Quality (ADEQ) General Permit for Discharge from Construction Activities to Waters of the United Stated (Permit). Under provisions of the Permit, the Contractor shall be designated as the site operator who has day-to-day operational control of those activities at the project which are necessary to ensure compliance with the storm water pollution prevention plan or other Permit conditions. The Contractor shall be responsible for providing necessary materials and for taking appropriate measures to minimize pollutants in storm water runoff from the project.

It shall be the responsibility of the Contractor to select, implement and maintain Best Management Practices (BMPs) (including sediment and erosion control measures) to prevent potential pollutants from entering storm water.

The Contractor shall be responsible for preparing the Storm Water Pollution Prevention Plan (SWPPP) for the project. This plan shall incorporate the post construction storm water management measures shown on the project plans (i.e. retention basins, landscaping, etc.) and any other measures prescribed by the City and meet all of the requirements described in the Permit available through an internet search engine and typing "ADEQ SWPPP".

The Flood Control District of Maricopa County has prepared a manual titled "Drainage Design Manual for Maricopa County Arizona, Erosion Control" to assist in the preparation of the SWPPP. It is available through an internet search engine and typing in the title. The U.S. Environmental Protection Agency (EPA) has published a guide entitled "Developing Your Stormwater Pollution Prevention Plan: A Guide For Construction Sites" (EPA 833-R-06-004). It is available from the National Service Center for Environmental Publications (NSCEP) at 800-490-9198 or through an internet search engine and typing in the title or visiting the National Service Center for Environmental Publications website and typing in the EPA publication number "833R06004".

The plans may include preliminary erosion control measures and additional information to be included in the project's Storm Water Pollution Prevention Plan (SWPPP). The Contractor shall finalize the SWPPP before submitting a Notice of Intent (NOI) to ADEQ. Except for the NOI, all signatures required of the Contractor by the AZPDES Construction General Permit (CGP), including those required for the NOT, SWPPP, and inspection reports, shall be provided by a duly authorized representative of the Contractor, as defined in Part VIII.J.2 of said permit. Signature of the NOI shall be by a responsible corporate officer, as defined in Part VIII.J.1 of the CGP.

The plans may include descriptions of temporary and permanent erosion control measures, a project description, and site-specific diagrams indicating proposed locations where erosion and sediment control devices or pollution control measures may be required during successive construction stages. The plans

may also include an initial schedule detailing the proposed sequence of construction and related erosion control measures.

(B) Submittals:

The SWPPP shall be submitted to the City for approval at least 14 calendar days prior to issuance of the notice to proceed. The SWPPP will be reviewed by the City only to ensure that it includes the information required by the Permit. Development and compliance with other components of the SWPPP are solely the Contractor's responsibility. The City's approval of the SWPPP applies only to its contents and is neither comprehensive nor does it make the City responsible for the Contractor's noncompliance. The Contractor shall complete, certify and submit the Notice of Intent (NOI) online to ADEQ using "myDEQ" website with a copy to the City. The myDEQ website is available through an internet search engine and typing "myDEQ". The Contractor shall provide the City with a copy of their Authorization to Discharge from ADEQ before the start of construction.

This certification shall be received no later than three (3) working days prior to the Notice to Proceed.

The Contractor shall submit two copies of the SWPPP, including all information specified herein, to the Project Manager at the pre-construction conference, if possible, for approval. The SWPPP shall contain an executed letter of delegation, obtained from the Project Manager, which delegates the responsibilities for compliance with the Arizona Construction General Permit and Site Storm Water Pollution Prevention Plan to the Contractor.

Submission of the Contractor's NOI shall certify that the Contractor and its Subcontractors have read and will comply with all provisions of the project specific SWPPP and the (current) ADEQ Arizona Pollutant Discharge Elimination System Construction General Permit (CGP).

Within 10 calendar days from the SWPPP submittal, the Contract Administrator, or designee, will review the Contractor's SWPPP; the Contractor will include any additional revisions directed by the Contract Administrator. The finalized SWPPP shall meet the terms and conditions of the CGP and be compatible with construction. Upon approval of the SWPPP, the Contractor shall file an NOI.

The Contract Administrator shall withhold the Notice to Proceed until an Authorization to Discharge from ADEQ has been issued to the Contractor, and a copy has been provided to the Contract Administrator.

(C) Contractor's Responsibilities

It shall be the Contractor's responsibility to perform inspections of all storm water pollution control devices on the project in accordance with Permit requirements. The Contractor shall also be responsible for maintaining those devices in proper working order, including cleaning and/or repair. The Maricopa County Flood Control District (MCFCD) provides access to real time rainfall information via the internet. Type "MCFCD" into an internet search engine in order to access the website.

All SWPPP reports required under this contract shall be made available to the public in accordance with the requirements of Section 308(b) of the Clean Water Act. The storm water regulations require that the records be maintained at the construction site or that notice be provided indicating where the records are kept.

No condition of the AZPDES Permit shall release the Contractor from any responsibilities or requirements under other environmental statutes or regulations.

Within 30 calendar days after completion of all work (including final stabilization when applicable), the Contractor shall complete, certify and submit a Notice of Termination (NOT) form to the ADEQ with a copy to the City, thereby terminating all AZPDES Permit coverage for the project.

The Contractor shall review the preliminary information, including erosion control features and phasing, evaluate all SWPPP requirements for adequacy in addressing pollution prevention during construction and modify as needed per Contractor's operations.

The Contractor shall designate the erosion control coordinator as an authorized representative of the Contractor in accordance with Part VIII.J.2 of the CGP. The erosion control coordinator shall be responsible for finalization and implementation of the SWPPP as well as all other applicable requirements of the CGP.

The SWPPP shall include all information required in the CGP, including, but not limited to, a site map; identification of receiving waters and wetlands impacted by the project; a list of potential pollutant sources; inspection schedule; inspection form; any onsite or off-site material storage sites; additional or modified stormwater, erosion, and sediment controls; procedures for maintaining temporary and permanent erosion control measures; a list of the Contractor's "good housekeeping practices"; and other permit requirements as stipulated in the CGP as well as other applicable state or local programs and below.

The SWPPP shall identify and address erosion and pollution control at on-site fueling operations, waste piles, material storage sites, concrete washout areas, off-site dedicated asphalt and concrete plants, Contractor-use areas, storage areas, and support activity locations which are used solely for the project and are covered by the CGP. In addition, the SWPPP shall specifically identify the erosion control measures proposed by the Contractor during any vegetation removal and salvaging phases of the project.

The Contractor shall give installation of permanent erosion control measures priority over reliance on temporary measures. Permanent erosion control measures and drainage structures shall be installed as soon as possible in the construction sequencing of the project, preferably concurrent with construction of the related sub-area or drainage device. However, except as specified in Part IV, Section B.2 of the CGP and approved by the Engineer, erosion control measures shall be installed no later than 14 calendar days after construction activity has temporarily or permanently ceased for the affected sub-area.

The SWPPP shall specify the mechanism whereby revisions may be proposed throughout the project and incorporated into the plan, including review and approval procedure. The Construction Admin Supervisor and Contractor shall jointly approve and sign each revision to the SWPPP before implementation. Any subsequent submittals required by the Contractor to revise or update the SWPPP may require at least 48 hours for review.

Contractors and Subcontractors responsible for implementing all or portions of the SWPPP shall be identified, with contact information, in the SWPPP, along with the measures for which they are responsible.

No clearing, grubbing, earthwork, or other work elements affected by the erosion control requirements in the SWPPP, shall be started until the SWPPP has been approved, the NOI completed and filed, copies of the NOI and Authorization to Discharge from ADEQ provided to the Contract Administrator, and the SWPPP

implemented. The Contractor shall post the ADEQ Authorization Number in a conspicuous location, near the construction entrance or construction yard, whichever is more visible to the public.

The Contractor shall give attention to the effect of the Contractor's operations upon the landscape and shall take care to maintain natural surroundings undamaged and keep all operations within the project limits as defined on the plans.

The Contractor shall maintain all related erosion control elements in proper working order throughout the project. Work under this Section also includes inspections, record-keeping, and implementation of "good housekeeping". If existing erosion and sediment control measures (BMPs) need to be repaired, modified or increased, implementation shall be completed within 7 calendar days or before the next rain event (whichever is sooner).

The approved SWPPP shall be updated whenever a change in design, construction method, operation, maintenance procedure, or other activity may cause a significant effect on the discharge of pollutants to surface waters, or when a change is proposed to the personnel responsible for implementing any portion of the SWPPP. The SWPPP shall also be amended if inspections indicate that the SWPPP is ineffective in eliminating or significantly reducing pollutants in the discharges from the construction site. All necessary modifications to the SWPPP shall be made within seven calendar days following the inspection that revealed the deficiency.

The Contractor's erosion control coordinator shall maintain two copies of the SWPPP, in two separate binders, including amendments, completed inspection records, and all data used to complete the NOI, Notice of Termination (NOT) and any other AZPDES records in a three ring binder. The SWPPP shall remain at the job site, or at the location identified in the SWPPP, from the time construction begins until completion of the project. The SWPPP shall be available for City or public inspection upon request.

Upon acceptance of the project, and after the Contractor has filed their NOT, the Contractor shall submit one complete copy of the SWPPP binder along with the as-built plans to the Construction Admin Supervisor and retain its own records for a period of at least three years from the filing of the Contractor's NOT.

No condition of the CGP or the SWPPP shall release the Contractor from any responsibilities or requirements under other environmental statutes or regulations.

(D) Payment:

There shall be no separate payment made to the Contractor for all material, labor, and other incidental costs relating to the provision, installation, and maintenance of items relating to this permit during project construction. Such incidental costs shall include:

- Preparing, updating, and changing the SWPPP
- Installation and maintenance of all structural and non-structural BMPs either identified in the SWPPP or specified by the City in the bid document,
- All clean-up and disposal costs associated with clean-up and repair following storm events and other runoff or releases on the project,
- Implementation and maintenance of other activities identified in the SWPPP (i.e. inspections, record keeping), and
- Preparation of the Notice of Intent and Notice of Termination.

107.2.2 Air Quality Permit:

(A) General Requirements: The Contractor shall comply with the Maricopa County Air Pollution Control Regulations, as revised July 6, 1993, governing construction activities. Under provisions of this regulation, the Contractor shall be designated as permittee and shall be responsible for providing the necessary labor and materials, and for taking the appropriate measures, to assure compliance with the regulations. As the permittee, the Contractor is responsible for completing all documentation required by the regulation, including the following:

(1) Application for Earth Moving Equipment Permits and Permits to Operate required by Rule 200 and Rule 310 of the above regulations.

(2) Control Plan to prevent or minimize fugitive dust will be submitted with the completed Application for Permit.

Copies of permit applications and sample control plan formats may be obtained from the Maricopa County Air Quality Department by typing "Maricopa County Air Quality Dust Control Permit" into an internet search engine.

(B) Haul Trucks: The following requirements shall apply to the use and operation of any haul truck:

(1) The cargo compartment of a haul truck shall be constructed and maintained so that no spillage or loss of bulk materials can occur from holes or other openings in the cargo compartment.

(2) Any haul truck carrying bulk materials shall be properly loaded so that the freeboard is not less than three inches and be effectively covered with a tarp or other suitable enclosure in such a manner so as to prevent or minimize fugitive dust.

(3) Any haul truck shall be cleaned or kept covered once emptied and/or between cargoes when the residual particulate matter remaining in the cargo space is capable of becoming fugitive dust.

(C) Submittals:

(1) Preliminary copies of the Contractor's permit application and control plan shall be submitted to the Engineer at the time of the pre-construction conference. Any necessary revisions recommended by the Engineer will be made prior to submission to the County.

(2) The Contractor shall submit the completed application and control plan to the County, at the above address, at least 48 hours prior to the projected start of construction.

(3) Failure of the Contractor to obtain a signed Earth Moving Air Quality Permit from the County may result in delay of the start of construction. The Contractor shall submit a signed copy of the permit, with the control plan, to the Contract Administrator and maintain a copy in a conspicuous location at the construction site.

(D) Contractor's Responsibilities:

(1) It is the Contractor's responsibility to apply Reasonably Available Control Measures (RACM) to all phases of construction activities to prevent or minimize the generation, emission, entrainment, suspension and/or airborne transport of fugitive dust. Typical RACM are identified in the Regulations, which may be obtained at the above address.

(2) If the Contractor or Contract Administrator determines during construction activities that the initial control plan is inadequate, revisions to the plan will be made by the Contractor and submitted to the Engineer for approval.

(E) Payment: There shall be no separate payment made to the Contractor for material, labor, and other incidental costs relating to the provision, installation, and maintenance of items relating to this permit during project construction.

107.2.3 Marshalling Yard Permit:

The Contractor is required to obtain a permit from the City when using vacant property to park and service equipment and store material for use on City construction contracts. This permit will conform to the requirements of MAG Subsection 107.6.1, as amended by the COS Supplement, latest version.

Modify the following Subsections:

107.6.1 Contractor's Marshalling Yard: *Add the following paragraphs before the first paragraph:*

The Contractor shall not store equipment, personal vehicles or materials within the right-of-way without providing written notification, obtaining prior approval of the City Inspector and permit from the City.

The Contractor shall obtain a permit from the City for marshalling areas they propose to use. Minimum requirements include the following:

107.6.1.1 Contractor's Marshalling Yard when the Agency is the Contracting Party: *Add the following paragraphs :*

(H) The Contractor shall notify adjacent property owners/residents of the proposed use.

(I) An appropriate distance from adjacent property will be set by the City on a case-by-case basis based on the size and type of equipment to be used on the project.

(J) A sight or sound barrier may be required if deemed necessary by the City.

107.9 PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE: *Add the following paragraphs:*

All areas that are shown on the plans as Natural Area Open Space (NAOS) shall be staked and flagged prior to any grading activity. Inadvertently disturbed areas shall be revegetated with indigenous material in natural densities.

Native plants protected by City of Scottsdale Zoning Ordinance Sec. 7.500 shall not be disturbed without proper permit and approval. Protected native plants within the construction limits shall not be destroyed unless tagged with blue plastic tape in accordance with Chapter 46, Article V of the Scottsdale Revised Code.

The Contractor shall submit a revegetation and irrigation plan to the City Inspector within 14 days of the disturbance. Following City approval of the revegetation and irrigation plan, the Contractor shall repair the disturbed area within 14 days unless a time extension is granted by the Engineer.

107.11 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTY AND SERVICES: *Add the following paragraphs:*

Existing in-service water valves, sewer manholes, or sewer clean-outs that are damaged during construction or are inaccessible due to construction shall be repaired or made accessible within seven (7) working days. If the deficiencies are not corrected within the prescribed time period, the necessary repairs will be performed by the City of Scottsdale or it's designee at the expense of the Contractor.

The Contractor shall be responsible for the immediate repair and reporting of any damage to any traffic signal equipment. This shall include, but shall not be limited to, such items as: underground conduit, detectors, detector lead-in wiring, signal heads, signal poles, mast arms, cables, controller, and other signal-related equipment. Wire splicing will not be permitted. Modification of traffic signals for construction shall require advance design and approval prior to the start of construction. All materials and installations shall conform to the latest Arizona Department of Transportation standard drawings and specifications for traffic signals, except as approved by the COS Transportation and Streets Director.

SECTION 108
COMMENCEMENT, PROSECUTION AND PROGRESS

108.8 GUARANTEE AND WARRANTY PROVISIONS: *Add the following*:

The Contractor shall guarantee the irrigation work against defective workmanship and materials for a period of two years from the date of its final acceptance under the contract, ordinary wear and tear and unusual abuse or neglect excepted.

PART 300 - STREETS AND RELATED WORK

SECTION 321
PLACEMENT AND CONSTRUCTION OF ASPHALT CONCRETE PAVEMENT

321.2 MATERIALS AND MANUFACTURE: *Add the following paragraphs:*

All street sections without curb and gutter are required to have an Asphalt Pavement Safety Edge per MAG Detail 201.

Preservative seal on streets classified as residential and local collector shall be in accordance with MAG Section 718, Type 3 (Acrylic polymer modified). Preservative seal shall be applied no earlier than 48 hours after completion of surface course paving, and no later than the end of the warranty period.

321.4 APPLICATION OF TACK COAT: *Modify the first paragraph to read as follows:*

A tack coat shall be applied to all existing and to each new course of asphalt concrete prior to the placing of a succeeding lift of asphalt concrete.

321.5 MIX DESIGN: *Delete the entire Subsection and replace it with the following:*

All asphalt concrete pavement mix designs shall be on the East Valley Asphalt Committee's (EVAC) list of Approved Asphalt Mixes, latest edition, as posted at http://www.mesaaz.gov , search "Approved Products".

321.8.2 Joints: *Delete the first and second paragraph in its entirety and replace it with the following:*

Transverse joints, before a surface course is placed in contact with a cold transverse construction joint, the cold existing asphalt concrete shall be trimmed to a vertical face for its full depth exposing a fresh face. The fresh face shall be tack coated with two coats of emulsion as approved by the Engineer prior to placement of the new asphalt concrete. After placement and finishing the new asphalt concrete, both sides of the joint shall be dense and the joint shall be smooth and tight. The surface in the area of the joint shall not deviate more than ¼ inch from a 12-foot straightedge, when tested with the straightedge placed across the joint, parallel to the centerline.

Longitudinal joints of each asphalt course shall be staggered a minimum of 12 inches with relation to the longitudinal joint of the immediate underlying course's cold longitudinal construction joint. A tack coat shall be applied to all existing and to each new course of asphalt concrete prior to the placing of a succeeding lift of asphalt concrete.

321.8.5 Smoothness: *Delete the entire Subsection and replace it with the following*:

The completed surfacing shall be thoroughly compacted, smooth and true to grade and cross-section within the tolerances specified herein and free from ruts, humps, depressions or irregularities. An acceptable surface shall not vary more than one-fourth (¼) inch from the lower edge of a 12-foot straightedge when the straightedge is placed parallel or perpendicular to the centerline of the roadway. In addition to the smoothness requirements specified above, asphalt concrete pavement shall be true to the grades shown or indicated on the plans and shall not vary more than 1/4-inch from the plan elevations.

Finish pavement grades adjacent to curbs shall be within 1/8-inch of the design elevation but in no case below the lip of the gutter.

321.10.3 Surface Testing: *Delete the second paragraph in its entirety and replace it with the following:*

All streets and parking lots shall be water tested for drainage in the presence of the Engineer or designated representative before final acceptance. The surface test shall be conducted a minimum of two hours after pavement is flooded. Any areas not draining properly shall be corrected to the Engineer's satisfaction at the Contractor's expense. Water for this testing shall be provided and paid for by the Contractor.

PART 700 - MATERIALS

SECTION 710
ASPHALT CONCRETE

710.1 GENERAL: *Add the following paragraphs:*

Mixes shall be designated as "R" type (such as R ½", R ¾", etc.) conforming to low traffic design criteria (Marshall Mixes), or "A" type (such as A ½", A ¾", etc.) conforming to medium and high traffic design criteria (Gyratory Mixes) and the East Valley Asphalt Committee designation.

Unless otherwise noted, all hot asphalt pavement mix design shall appear on the latest "Approved List of Asphalt Mixes" as distributed by the East Valley Asphalt Committee.

PART 2

FAA STANDARD SPECIFICATIONS FOR CONSTRUCTION OF AIRPORTS

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Item P-620 Runway and Taxiway Marking

DESCRIPTION

620-1.1 This item shall consist of the preparation and painting of numbers, markings, and stripes on the surface of runways, taxiways, and aprons, in accordance with these specifications and at the locations shown on the plans, or as directed by the Resident Project Representative (RPR). The terms "paint" and "marking material" as well as "painting" and "application of markings" are interchangeable throughout this specification.

MATERIALS

620-2.1 Materials acceptance. The Contractor shall furnish manufacturer's certified test reports, for materials shipped to the project. The certified test reports shall include a statement that the materials meet the specification requirements. This certification along with a copy of the paint manufacturer's surface preparation; marking materials, including adhesion, flow promoting and/or floatation additive; and application requirements must be submitted and approved by the Resident Project Representative (RPR) prior to the initial application of markings. The reports can be used for material acceptance or the RPR may perform verification testing. The reports shall not be interpreted as a basis for payment. The Contractor shall notify the RPR upon arrival of a shipment of materials to the site. All material shall arrive in sealed containers that are easily quantifiable for inspection by the RPR.

620-2.2 Marking materials.

Table 1. Marking Materials

Paint[1]				Glass Beads[2]	
Type	**Color**	**Fed Std. 595 Number**	**Application Rate Maximum**	**Type**	**Application Rate Minimum**
Waterborne Type II	White	37925	115 ft^2/gal	None	None

[1] See paragraph 620-2.2a

[2] See paragraph 620-2.2b

a. Paint. Paint shall be waterborne in accordance with the requirements of this paragraph. Paint colors shall comply with Federal Standard No. 595.

Waterborne**.** Paint shall meet the requirements of Federal Specification TT-P-1952F, Type II. The non-volatile portion of the vehicle for all paint types shall be composed of a 100% acrylic polymer as determined by infrared spectral analysis.

b. Reflective media. Not used.

CONSTRUCTION METHODS

620-3.1 Weather limitations. Painting shall only be performed when the surface is dry, and the ambient temperature and the pavement surface temperature meet the manufacturer's recommendations in accordance with paragraph 620-2.1. Painting operations shall be discontinued when the ambient or

surface temperatures does not meet the manufacturer's recommendations. Markings shall not be applied when the wind speed exceeds 10 mph unless windscreens are used to shroud the material guns. Markings shall not be applied when weather conditions are forecasts to not be within the manufacturers' recommendations for application and dry time.

620-3.2 Equipment. Equipment shall include the apparatus necessary to properly clean the existing surface, a mechanical marking machine, a bead dispensing machine, and such auxiliary hand-painting equipment as may be necessary to satisfactorily complete the job.

The mechanical marker shall be an atomizing spray-type or airless type marking machine with automatic glass bead dispensers suitable for application of traffic paint. It shall produce an even and uniform film thickness and appearance of both paint and glass beads at the required coverage and shall apply markings of uniform cross-sections and clear-cut edges without running or spattering and without over spray. The marking equipment for both paint and beads shall be calibrated daily.

620-3.3 Preparation of surfaces. Immediately before application of the paint, the surface shall be dry and free from dirt, grease, oil, laitance, or other contaminates that would reduce the bond between the paint and the pavement. Use of any chemicals or impact abrasives during surface preparation shall be approved in advance by the RPR. After the cleaning operations, sweeping, blowing, or rinsing with pressurized water shall be performed to ensure the surface is clean and free of grit or other debris left from the cleaning process.

a. Preparation of new pavement surfaces. The area to be painted shall be cleaned by broom, blower, water blasting, or by other methods approved by the RPR to remove all contaminants, including PCC curing compounds, minimizing damage to the pavement surface.

b. Preparation of pavement to remove existing markings. If pavement marking removal is required, existing pavement markings shall be removed by rotary grinding, water blasting, or by other methods approved by the RPR minimizing damage to the pavement surface. The removal area may need to be larger than the area of the markings to eliminate ghost markings. After removal of markings on asphalt pavements, apply a fog seal or seal coat to 'block out' the removal area to eliminate 'ghost' markings.

c. Preparation of pavement markings prior to remarking. If remarking is required, prior to remarking existing markings, loose existing markings must be removed minimizing damage to the pavement surface, with a method approved by the RPR. After removal, the surface shall be cleaned of all residue or debris.

Prior to the application of markings, the Contractor shall certify in writing that the surface is dry and free from dirt, grease, oil, laitance, or other foreign material that would prevent the bond of the paint to the pavement or existing markings. This certification along with a copy of the paint manufactures application and surface preparation requirements must be submitted to the RPR prior to the initial application of markings.

620-3.4 Layout of markings. The proposed markings shall be laid out in advance of the paint application. The locations of markings to receive glass beads shall be shown on the plans.

620-3.5 Application. A period of 48 hours shall elapse between placement of asphalt surface course or seal coat and application of the initial coat of markings. A period of 30 days shall elapse between placement of surface course or seal coat and application of the final coat of markings. Paint shall be applied at the locations and to the dimensions and spacing shown on the plans. Paint shall not be applied until the layout and condition of the surface has been approved by the RPR.

The edges of the markings shall not vary from a straight line more than 1/2 inch in 50 feet, and marking dimensions and spacing shall be within the following tolerances:

Marking Dimensions and Spacing Tolerance

Dimension and Spacing	Tolerance
36 inches or less	±1/2 inch
greater than 36 inches to 6 feet	±1 inch
greater than 6 feet to 60 feet	±2 inch
greater than 60 feet	±3 inch

The paint shall be mixed in accordance with the manufacturer's instructions and applied to the pavement with a marking machine at the rate shown in Table 1. The addition of thinner will not be permitted.

620-3.6 Application--preformed thermoplastic airport pavement markings.

620-3.7 Control strip. Prior to the full application of airfield markings, the Contractor shall prepare a control strip in the presence of the RPR. The Contractor shall demonstrate the surface preparation method and all striping equipment to be used on the project. The marking equipment must achieve the prescribed application rate of paint per Table 1.

620-3.8 Protection and cleanup. After application of the markings, all markings shall be protected from damage until dry. All surfaces shall be protected from excess moisture and/or rain and from disfiguration by spatter, splashes, spillage, or drippings. The Contractor shall remove from the work area all debris, waste, and by-products generated by the surface preparation and application operations to the satisfaction of the RPR. The Contractor shall dispose of these wastes in strict compliance with all applicable state, local, and federal environmental statutes and regulations.

METHOD OF MEASUREMENT

620-4.1 The quantity of markings to be paid for shall be measured by the number of square feet of painting performed in accordance with the specifications and accepted by the RPR. Pavement marking shall include surface preparation. Pavement marking shall include two coats of paint for the initial and final application, unless otherwise approved by Airport to complete one coat 30 days after the completion of asphalt paving.

BASIS OF PAYMENT

620-5.1 This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item complete in place and accepted by the RPR in accordance with these specifications. Payment for pavement marking shall be made at the contract price for the number of square feet of painting.

Payment will be made under:

Item P-620-5.1 Pavement Marking, White – per square foot

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM D476	Standard Classification for Dry Pigmentary Titanium Dioxide Products
ASTM D968	Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D1652	Standard Test Method for Epoxy Content of Epoxy Resins
ASTM D2074	Standard Test Method for Total, Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method
ASTM D2240	Standard Test Method for Rubber Property - Durometer Hardness
ASTM D7585	Standard Practice for Evaluating Retroreflective Pavement Markings Using Portable Hand-Operated Instruments
ASTM E303	Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
ASTM E1710	Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer
ASTM E2302	Standard Test Method for Measurement of the Luminance Coefficient Under Diffuse Illumination of Pavement Marking Materials Using a Portable Reflectometer
ASTM G154	Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

Code of Federal Regulations (CFR)

40 CFR Part 60, Appendix A-7, Method 24	Determination of volatile matter content, water content, density, volume solids, and weight solids of surface coatings
29 CFR Part 1910.1200	Hazard Communication

Federal Specifications (FED SPEC)

FED SPEC TT-B-1325D	Beads (Glass Spheres) Retro-Reflective
FED SPEC TT-P-1952F	Paint, Traffic and Airfield Marking, Waterborne
FED STD 595	Colors used in Government Procurement

Commercial Item Description

A-A-2886B	Paint, Traffic, Solvent Based

Advisory Circulars (AC)

AC 150/5340-1	Standards for Airport Markings
AC 150/5320-12	Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces

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PART 3

SPECIAL PROVISIONS FOR AIRPORT CONSTRUCTION

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Item SP-100 Special Provisions for Airport Construction

DESCRIPTION

100-1.1 General. This section provides for construction safety in an airport environment; limitations on construction operations; minimum requirements for construction management and scheduling; and site-specific information pertaining to potential impacts on construction activities. Unless otherwise noted, all costs associated with related work shall be included in the Contract pay item for Airfield Safety and Traffic Control.

100-1.2 Construction Safety and Phasing Plan. A Construction Safety and Phasing Plan (CSPP) has been prepared for this project and is included as Part 2 of "Project-Specific Requirements for Airport Construction". Contractor shall comply with the CSPP. Included as part of the requirements of the CSPP is the Safety Plan Compliance Document (SPCD) to be completed by the Contractor.

100-1.3 Airfield Safety and Traffic Control. Airfield Safety and Traffic Control shall include the special requirements with respect to safely conducting construction activities, coordinating construction with aircraft operations, and maintaining the construction site in a manner that is compatible with aircraft. Unless otherwise noted, all costs associated with related work (including work required as described in the CSPP) shall be included in the Contract pay item for Airfield Safety and Traffic Control.

100-1.4 Construction Schedule and Progress Schedule. A construction schedule and progress schedule shall be submitted to the Engineer by the Contractor within five (5) working days prior to the preconstruction conference. A City-approved schedule will be required prior to issuing a Notice to Proceed for the Construction Element.

Schedule shall be a Critical Path Method (CPM) Baseline type. Schedule shall indicate the complete sequence of each construction category, indicating a time bar for each major category or unit of work to be performed. Work shall be properly sequenced and indicate being fully completed within the scheduled time of completion or substantial completion. The schedule shall also include manpower, equipment utilization and resource needs (resource loading) in order to meet the schedule.

Schedule shall be coordinated with all other Contractors, subcontractors and material suppliers prior to submission. Contractor shall update the schedule for each weekly construction meeting or whenever there is a significant change in progress, whether in a particular phase or total job progress.

Progress schedule shall incorporate, submittals, product data, and sample submissions. Schedule shall indicate preparation time, approval time, resubmissions, fabrications, delivery dates and installation time.

100-1.5 Lines and Grades. Contractor shall provide construction staking and survey layout in accordance with the requirements of these Special Provisions and Technical Specifications. Contractor shall protect and preserve all marks set by others and shall be liable for replacement of marks destroyed during construction. Survey shall be performed by or under the supervision of a Registered Land Surveyor in the State of Arizona.

Prior to the start of construction, the Contractor shall check all control points for horizontal and vertical accuracy and certify in writing to the Resident Project Representative (RPR) that the Contractor concurs with survey control established for the project. All lines, grades, and measurements from control points necessary for the proper execution and control of the work on this project shall be provided to the RPR. Contractor is responsible for establishing all control points and layout required for the construction of the project.

Copies of survey notes shall be provided to the RPR for each area of construction and for each placement of material as specified to allow the RPR to make quality acceptance checks for conformance with plan grades, alignments and grade tolerances required by the applicable technical specifications. Surveys shall be provided to the RPR prior to commencing work items that cover or disturb the survey staking. Survey(s) and notes shall be provided electronically in the following formats: AutoCAD Civil 3D Drawings, PNEZD text files, and/or stamped surveyed drawings.

Laser, GPS, String line, or other automatic control shall be checked with temporary control as necessary. In the case of error, on the part of the Contractor, their surveyor, employees or subcontractors, resulting in established grades, alignment or grade tolerances that do not concur with those specified or shown on the plans, the Contractor is solely responsible for correction, removal, replacement and all associated costs at no additional cost to the Owner. The Contractor shall notify the RPR / Engineer immediately of any discrepancies between spot elevations at match points in the field and on the plans.

RPR shall be given 48 hours' notice of subgrade, and aggregate base course completion, each lift of asphalt surface course completed, and pavement marking layout so finished grades and layouts may be checked. Contractor shall include all associated costs in the Contract pay item for Construction Staking and Survey Layout.

100-1.6 Prepare and Monitor Stormwater Pollution Prevention (SWPPP) Plan. The Contractor shall prepare and monitor a SWPPP plan in accordance with City of Scottsdale Supplement to MAG Uniform Standard Specifications Section 107 and the construction documents. There are no specific best management practices (BMPs) to be installed as part of this project, however the Contractor is required to comply with all ADOT, ADEQ, and City of Scottsdale Requirements for construction. The existing crushed aggregate slope protection rock (CASPR) in the infield of the airfield is sufficient for stormwater mitigation.

100-1.7 Record Drawings. Contractor shall maintain Record Drawings of all work continuously as the job progresses. A separate set of prints, for this purpose only, shall be kept at the job site at all times. It shall be required that these Drawings be up to date and be reviewed by the RPR at the time each progress bill is submitted. All deviations from the Drawings, exact locations and sizes of all utilities and electrical lines, equipment details, and all stub outs and connections for future expansion, shall be incorporated. Documentation of Record Drawings shall be included in other items of work and no separate payment will be made.

100-1.8 Material Testing and Retesting. All Quality Control shall be performed by the Contractor and will be used for quality acceptance verification by the Engineer as detailed in these Special Provisions and Technical Specifications. Quality Control Testing shall include but is not limited to:

A. Compaction testing for soils, aggregates, and pavements.
B. Gradation and thickness verification for aggregates.
C. Grade and smoothness verification for soils, aggregates, and pavements.
D. Mix design conformance and other material testing required for asphalt surface course.
E. Prequalification material testing for soils, aggregates, and pavements.

Contractor shall include all associated costs in the Contract pay item for Contractor Material Testing.

100-1.9 Schedule of Values. A schedule of value(s) shall be provided for each lump sum bid item within five (5) days of request, but not later than ten (10) working days before the first progress payment. The schedule of values shall be in the form of a detailed, itemized cost breakdown of the lump sum amount that includes the profit and overhead costs for each item including a line-by-line breakdown of labor and materials. All work to be performed by subcontractors shall be listed. The schedule of values, once

established, will serve as the basis for estimating or evaluating the percentage of lump sum work completed for progress payments. Progress payments on Unit Price Work will be based on the number of units completed. The schedule of values may also be used to evaluate the impact of unbalanced pricing.

100-1.10 Phasing and Time Limitations. The Project is divided into two main elements, Mobilization and Construction. A separate Notice to Proceed shall be issued for the Mobilization Element and the Construction Element. The Notice to Proceed for the Construction Element will not be issued until the Mobilization Element is substantially complete. The Construction Element shall be completed in three (3) phases. Each of the work elements and affected airfield areas within the aircraft operations area (AOA) are detailed in the CSPP and summarized below. If the Contractor fails to meet any of these time limitations, liquated damages will be assessed as described in Section 100-1.11. Refer to the CSPP for detailed phasing and time limitations for the specific work areas. A summary of contract time is divided as follows:

A. Mobilization Element. Notice to Proceed (NTP) with Mobilization shall be given immediately after award of Contract. All work included in Mobilization shall be completed prior to the NTP for Construction is issued and shall be completed within forty-five (45) calendar days. During this Element of the project, no work shall be conducted that in any way restricts Airport operations except as noted below. Mobilization work shall include, but not be limited to, the following:

1) Processing of required submittals including the Contractor's construction schedule.
2) Preparation and submission of the Safety Plan Compliance Document.
3) Preparation and submission of the Stormwater Pollution Prevention Plan.
4) All prequalification testing, review, and approval.
5) Mix design preparation, review, and approval.
6) Procurement of airfield safety devices including low-profile barricades, flashing lights, flags, temporary signage, and traffic cones.
7) Procurement of long lead materials or equipment.
8) All miscellaneous Mobilization efforts required to commence construction.

Prior to the commencement of work at the site, a preconstruction conference will be held at a mutually agreed time at the Airport, which shall be attended by the Contractor's project management team, including the superintendent, and all primary subcontractors. Other attendees will include, but are not limited to, the Engineer, RPR, representatives of the Airport, ADOT, and other agency representatives, as appropriate. Unless previously submitted to the Engineer, the Contractor shall bring to the conference the following:

1) A preliminary construction schedule in accordance with Section 100-1.4.
2) Procurement schedule of equipment, materials, and items requiring long lead time.
3) List of Key Personnel, Telephone Numbers, and Emergency Telephone Numbers.

The purpose of this conference is to identify key project personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established. The agenda will include, but is not limited to, the following:

1) Project administration
2) Contractor's schedule(s)
3) Closure periods and critical work sequencing
4) Airport operational requirements
5) Field decisions and change orders
6) Use of project site, staging areas, security, haul routes, and housekeeping
7) Major work priorities

All preliminary work required in the Contract Documents and as determined by the Contractor to pursue an efficient sequence of construction to completion, shall be completed during the Mobilization Element to minimize delays once the Notice to Proceed within construction is issued.

The work will begin on the date specified in the NTP and the construction working day count will begin on this date.

B. Construction Element. The NTP for Project work shall be issued at the City's discretion after the Mobilization Element is complete and necessary permits are issued. The overall construction duration and contract time shall be determined based on the project elements awarded. The following list details the possible bid award scenarios:

a. Base Bid
b. Base Bid + Bid Alternate 1
c. Base Bid + Bid Alternate 1 + Bid Alternate 2

All work included in the Base Bid shall be completed within **eight (8) working days**. All work included Bid Alternate 1 shall be completed in **nine (9) working days.** All work included Bid Alternate 2 shall be completed in **eight (8) working days.** The Construction Element shall be performed in the sequence and time limitations defined in the CSPP and as summarized below.

Element / Phase	**Requirement**
Base Bid – Phase 1	8 Working Days (Night Work Only from 9:00 PM to 6:00 AM)
Bid Alternate 1 – Phase 2	9 Working Days (Night Work Only from 9:00 PM to 6:00 AM)
Bid Alternate 2 – Phase 3	8 Working Days (Night Work Only from 9:00 PM to 6:00 AM)

100-1.11 Liquidated Damages. If the approved time limitation for any phase of work is not met, liquidated damages per each calendar day will be assessed in accordance with Maricopa Association of Government (MAG) Uniform Standard Specifications for Public Works Construction, Section 108.9 *Failure to Complete on Time*. In addition to the liquidated damages accessed per calendar day, the Contractor shall pay for the time required for the RPR to inspect all construction activities at the hourly rate of $178.50. The Scottsdale Airport, at its own discretion, may allow additional time for delays caused by factors beyond the Contractor's control.

100-1.12 Material and Equipment Submittals. All materials and equipment used to construct this work shall be submitted to the Engineer for approval prior to ordering the materials and equipment. Manufacturer's catalogs (or excerpts thereof) and affidavits of compliance with the Contract Documents shall be submitted for all materials to be used on the project. The data submitted shall be sufficient, in the opinion of the Engineer, to determine compliance with the Drawings and Contract Documents. The Engineer reserves the right to reject any and all equipment, materials or procedures, which, in the Engineer's opinion, do not meet the system design and the standards and codes specified. Issuance of a Notice to Proceed is dependent on the proper level of detail of these submittals. Submit electronic submittals via Newforma Project Center, whenever possible.

Alternate products may be approved by the Engineer upon submittal of the product information and are subject to the acceptance of the FAA. The Engineer will not consider an alternate product that does not have adequate demonstrated experience and meets all performance requirements of this specification. Contractor shall allow a minimum of ten (10) working days for evaluation of requests for substitution or deviation from the Contract Documents.

100-1.13 Barricades and Traffic Cones. The Contractor shall provide all low-profile barricades and traffic cones as shown on the CSPP for use during this project. Low-profile barricades shall be safety orange in color and shall measure eight (8) feet in length, ten (10) inch in width and a maximum of eighteen (18)

inches in height. They shall be high impact, UV resistant, high-density polyethylene, equipped with orange/white reflective striping on each side and two (2) red flashing, solar or battery powered hazard lights. The barricades shall be spaced a maximum of four (4) feet apart and filled with water. Additionally, the Contractor shall provide traffic cones as required to barricade hazardous areas at the project site and to place along designated haul routes and at limits of paving. Traffic cones shall be florescent orange with reflective stripes and supplied with a weighted base. Traffic cones shall be spaced a maximum of five (5) feet apart. The Contractor shall be responsible for determining the number of barricades and traffic cones needed for the project and having an adequate amount available for use during the project for each phase. The Contractor shall be responsible for placing, filling with water, maintaining and moving the barricades and traffic cones as necessary during the project and as directed by the Airport or RPR. All barricades and traffic cones shall remain property of the Contractor.

100-1.14 Access and Security.

A. Contractor Access. Contractor access to the project site shall vary based on the phase. During Phase 1, the contractor shall access the project site through the existing Aircraft Operations Area (AOA) access gate at Scottsdale Fire Department Station 9 and exit the site through the existing double manual swing gate on Frank Lloyd Wright Blvd at the north end of the Airport. During Phase 2, the Contractor shall enter and exit the AOA through the existing double manual swing gate on Frank Lloyd Wright Blvd at the north end of the Airport. During Phase 3, the Contractor shall access the project site through the existing double manual swing gate at 73rd Street on the south end of the airfield and exit the project site through the existing AOA vehicle access gate at Scottsdale Fire Department Station 9. Contractor shall coordinate use of all AOA access gates with Airport Operations and obtain required approvals and/or permits from the City of Scottsdale. A traffic control plan shall be prepared in accordance with the City of Scottsdale Transportation Department and Manual on Uniform Traffic Control Devices (MUTCD). The traffic control plan shall be submitted to the City of Scottsdale for approval of a lane closure on Frank Lloyd Wright Boulevard when utilizing the existing double manual swing gate at the north end of the airfield. All approved haul routes on Airport property within the AOA are indicated on the CSPP. Any deviations to the haul routes by the Contractor will require review and approval by the Airport. All access points and haul routes shall be kept clean and free of debris. Dust control shall be maintained at all times. Traffic control across active airfield pavements shall be coordinated with the Airport. A full-time gate guard will be required during all hauling operations or when the gate cannot be secured. Damage to pavements, structures, gates, fences, utilities, or other existing improvements shall be repaired by the Contractor at the Contractor's expense.

B. Access Security Control. The Contractor shall be responsible for maintaining Airport security at all locations designated for construction access. When not actively in use, the gates or temporary security fencing shall be kept closed and locked. During periods of operation, the gate must be secured after each vehicle enters and departs. A gate guard shall be posted and provided by the Contractor so that inadvertent entry onto the Airport by an unauthorized vehicle and/or pedestrian is prevented. All construction access points shall be kept clear of equipment and materials. The Contractor shall provide the gate guard with a list of authorized personnel for the project. The gate guard will be responsible for keeping a record of personnel access. At a minimum, the gate guard will record the company name, driver name, entrance time and exit time for each individual allowed access to the AOA. Airport badging is not required.

100-1.15 Hearing Protection. Due to the nearby aircraft operations, the Contractor shall provide all necessary hearing protection for workers.

100-1.16 Application for Payment and Required Items. Applications for payment shall follow the standard City format based on the schedule of items included in the proposal forms. The Contractor shall also supplement the pay application with amounts being paid to subcontractors and the amounts being paid to DBE firms. Subcontractor and DBE amounts shall be delineated by bid items in the proposal forms.

100-1.17 Construction Water, Electricity, and Other Utilities. The source of construction water, electricity, or other utilities required for the project shall be coordinated by the Contractor. Possible locations for construction water are shown on the plans. The Contractor shall pay all applicable fees and make all necessary arrangements with the appropriate local utility to secure construction utility service for the duration of the contract, including identifying and coordination of an acceptable utility source for the project. No direct payment will be made for this work.

100-1.18 Vacuum Sweeper Truck. All pavement surfaces used for hauling or otherwise become covered with dirt, debris, gravel, or FOD as a direct or indirect result of construction activities, shall be swept and vacuumed immediately. The Contractor shall maintain a vacuum sweeper truck without metal bristles onsite throughout the project duration. The vacuum sweeper truck shall be included in the Contract pay item for Airfield Safety and Traffic Control.

100-1.19 Dust Control. Contractor shall complete a dust control application and obtain a permit from Maricopa County through the online dust portal. Contractor shall submit an electronic copy of the dust control permit to the RPR. Contractor shall control dust at all times during the project and coordinate with Airport Operations and RPR to determine what methods of controlling dust are acceptable and allowable on the jobsite. Contractor shall include all costs associated with dust control in the Contract pay item for Prepare and Monitor Stormwater Pollution Prevention Plan.

100-1.20 Cooperation between Contractors. Construction may be underway by other forces and by other contractors within or adjacent to the limits of the work in this contract. The Contractor shall cooperate with all such other contractors or other forces to the end that any delay or hindrance to their work will be avoided. The right is reserved to perform other or additional work at or near the site (including material sources) at any time, by the use of other forces.

Each Contractor shall be responsible to the other for any damage to work, to persons or property caused to the other by his operations, and for loss caused the other due to his unnecessary delays or failure to finish the work within the time specified for completion.

100-1.21 Removal and Disposal of Waste. Contractor is responsible for the cost to remove and dispose all waste products including excess material which will not be incorporated into the work under this contract. The waste product referred to herein shall become property of the Contractor and disposed of off Airport property. The cost to dispose of these materials including any associated hauling and environmental testing shall be included in the applicable bid item.

100-1.22 Construction Activity. Closure of the AOA will be required when work is conducted within 200 feet of the runway centerline (runway safety area) and within 65.5 feet of the taxiway centerline (taxiway object free area). There is planned work within 65.5 feet of a taxiway centerline and the Contractor shall keep the areas clear at all times during construction. Contractor shall coordinate with Airport Operations for all work within taxiway object free area and runway safety area.

Contractor shall submit to the Engineer in writing, a detailed work plan for each phase of the project. The work plan shall include, but not be limited to, sequence of removals, temporary electrical facilities, installation sequence of underground wet and dry utilities, earthwork operations, paving sequence and marking application. The work plan shall include details for controlling construction equipment and

vehicular movements within the AOA and on haul routes. This plan shall be submitted at the preconstruction conference. No work may commence until the work plan is approved by the Engineer.

Contractor shall be responsible for determining means and methods to meet the safety standards included in this section and in the project CSPP.

100-1.23 Unsuitable Subgrade Repair. Soils encountered at the project site may be sensitive to construction traffic and to changes in moisture content resulting from significant precipitation and over watering of base course materials. An increase in the moisture content of the soil can cause significant reduction in the soil support capabilities for construction equipment. Potential for pumping of soils may be anticipated if high moisture content combined with heavy loading are present.

If over optimum soil moisture content conditions are encountered during construction, disking to aerate, replacement with imported material, stabilization with a multi-axial geogrid, and/or other approved methods will likely be required to facilitate earthwork operations. A recommended repair method has been provided in the plans to facilitate the repair of these areas. The applicable means and method of stabilization is the Contractor's responsibility and shall comply to applicable MAG standard specifications.

Therefore, if over optimum soil moisture content conditions are encountered during construction, the Contractor shall review the site conditions with the RPR and provide recommendations for their repair. Limits of unsuitable subgrade repair shall be approved in the field by the RPR prior to commencing the work.

100-1.24 Pavement Removal, Full Depth. Pavement to be removed shall be sawcut to the full depth of the pavement around the perimeter of the area prior to being removed. After sawcut, the Contractor shall remove the full depth of the existing pavement. The material is to be hauled off Airport property, unless otherwise approved by Airport Operations.

METHOD OF MEASUREMENT

100-2.1 Airfield Safety and Traffic Control will be measured as a lump sum item.

100-2.2 Construction Staking and Survey Layout will be measured as a lump sum item.

100-2.3 Prepare and Monitor Stormwater Pollution Prevention Plan (SWPPP) will be measured as a lump sum item.

100-2.4 Contractor Material Testing will be measured as a lump sum item.

100-2.5 The quantity of Unsuitable Subgrade Repair to be paid for shall be the number of square yards completed and accepted work measured in its original position and approved by the RPR. Any pavement removed outside the limits of removal because the pavement was damaged by negligence on the part of the Contractor shall not be included in the measurement for payment.

100-2.6 The quantity of Pavement Removal, Full Depth to be paid for shall be the number of square yards completed and accepted worked measured in its original position and approved by the RPR.

BASIS OF PAYMENT

100-3.1 Airfield Safety and Traffic Control will be paid for at the Contract lump sum price. This price shall include full compensation for all labor, materials, tools, equipment, CSPP compliance, SPCD preparation and compliance, and incidentals necessary to complete the work as specified in the Contract Documents. Based upon the contract lump sum price for "Airfield Safety and Traffic Control" partial payments will be allowed as follows:

a. With first pay request, 50%.
b. With the second pay request, an additional 40%.
c. After final inspection, project work area and staging area clean-up, and removal of all airfield safety and traffic control measures, the final 10%.

100-3.2 Construction Staking and Survey Layout will be paid for at the Contract lump sum price and shall include all staking and survey required to construct the project to the lines and grades as indicated on the Plans to meet the specified tolerances. Based upon the contract lump sum price for "Construction Staking and Survey Layout" partial payments will be allowed as follows:

a. With the first pay request, 50%.
b. With the second pay request, an additional 40%.
c. After final inspection, project work area and staging area clean-up, and removal of all airfield safety and traffic control measures, the final 10%.

100-3.3 Prepare and Monitor Stormwater Pollution Prevention Plan (SWPPP) shall be paid for at the Contract lump sum price and shall include costs for the preparation and approval of the SWPPP and NOI, installation of temporary erosion control devices as shown on plans and materials, labor, equipment, tools, and incidentals necessary to complete this item. Based upon the Contract lump sum price for "Prepare and Monitor Stormwater Pollution Prevention Plan (SWPPP)" partial payments will be allowed as follows:

a. With the first pay request, 50%.
b. With the second pay request, an additional 40%.
c. After final inspection, project work area and staging area clean-up, completion of punch list and removal of all traffic control measures, the final 10%.

100-3.4 Contractor Material Testing shall be paid for at the Contract lump sum price and shall include costs for the personnel, tests, facilities, and documentation required to meet all MAG Standard Specifications. Based upon the Contract lump sum price for "Contractor Material Testing" partial payments will be allowed as follows:

a. With the first pay request, 50%.
b. With the second pay request, an additional 40%.
c. After final inspection, project work area and staging area clean-up, completion of punch list and removal of all traffic control measures, the final 10%.

100-3.5 Unsuitable Subgrade Repair payment shall be paid at the Contract unit price per square yard. The price shall be full compensation for excavation; disposal of unsuitable material; replacement of unsuitable material with aggregate base course; and geogrid, watering, compacting, and finish grading the aggregate base course to the elevations necessary to meet the construction drawings.

100-3.6 Pavement Removal, Full Depth payment shall be paid at the Contract unit price per square yard. The price shall be full compensation for furnishing all materials and for all preparation, hauling, and place of the material and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

Item SP-100-3.1 Airfield Safety and Traffic Control – per lump sum
Item SP-100-3.2 Construction Staking and Survey Layout – per lump sum
Item SP-100-3.3 Prepare and Monitor Stormwater Pollution Prevention Plan (SWPPP) – per lump sum
Item SP-100-3.4 Contractor Material Testing – per lump sum
Item SP-100-3.5 Unsuitable Subgrade Repair – per square yard
Item SP-100-3.6 Pavement Removal, Full Depth – per square yard

END OF ITEM SP-100

Item SP-102 Crushed Aggregate Slope Protection Rock

DESCRIPTION

102-1.1 This item consists of a protection course composed of crushed aggregates constructed on a prepared base in accordance with these Specifications and in conformity to the dimensions and typical cross sections shown on the Plans. Existing crushed aggregate slope protection rock (CASPR) shall be salvaged from on-site material and reused as shown on the plans. Salvaged material will not require recertification.

MATERIALS

102-2.1 Aggregate. Aggregates shall consist of clean, sound, durable particles of crushed stone or crushed gravel and shall be free from coatings of clay, silt, organic matter, clay lumps or balls, or other materials or coatings. The color of the provided material shall match existing CASPR located at the Airport.

The crushed aggregate shall contain no more than 15 percent, by weight, of flat or elongated pieces as defined in ASTM D693 and shall have at least 60 percent by weight of particles with at least two fractured faces and 75 percent with at least one fractured face. The area of each face shall be equal to at least 75 percent of the smallest mid-sectional area of the piece. When two fractured faces are contiguous, the angle between the planes of fractures shall be at least 30 degrees to count as two fractured faces.

The percentage of wear shall not be greater than 40 percent when tested in accordance with ASTM C535. The sodium sulfate soundness loss shall not exceed 12 percent, after five cycles, when tested in accordance with ASTM C88.

102-2.2 Gradation Requirements. The gradation (job mix) of the final mixture shall fall within the design range indicated in Table 1, when tested in accordance with ASTM C117 and C136. The final gradation shall be continuously well graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on an adjacent sieve or vice versa.

Table 1. Requirements for Gradation of CASPR

ASTM D448 – Size No. 24 (Modified)	
Sieve Size (inches)	Design Range Percentage by Weight Passing
3	100
2-3/4	100
2-1/2	90-100
2	45-80
1-1/2	25-60
3/4	0-10
1/2	0-5

102-2.3 Sampling and Testing. The Contractor shall take samples of the CASPR in accordance with ASTM D75 to verify initial CASPR requirements and gradation. Material shall meet the requirements in paragraph 102-2.2. The samples shall be taken from the in-place, un-compacted material at sampling points and intervals designated by the RPR. A five-gallon sample of CASPR material shall be brought to the Airport to verify material color and gradation is comparable with existing onsite material. Onsite sample verification shall be completed as a part of the material prequalification efforts prior to construction.

CONSTRUCTION METHODS

102-3.1 Removal. Existing CASPR material temporarily removed for unclassified excavation and/or embankment operations, shall be salvaged and stockpiled at locations shown on the Plans. Existing CASPR material called out to be hauled off shall become the property of the Contractor and shall be disposed off site.

102-3.2 Preparing underlying subgrade and/or subbase. The underlying subgrade and/or subbase shall be prepared, checked, and accepted by the RPR in accordance with Item P-152 before CASPR placement and spreading operations begin. In those areas on which CASPR is to be placed, the top 6 inches of subgrade shall be compacted to not less than 100% of maximum density for non-cohesive soils, and 95% of maximum density for cohesive soils as determined by ASTM D1557. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318. Re-proof rolling of the subgrade and/or subbase may be required if the Contractor fails to ensure proper drainage or protection of the subgrade and/or subbase. Any ruts or soft, yielding areas due to improper drainage conditions, hauling, or any other cause, shall be corrected before CASPR is placed at the Contractor's expense. A pre-emergent herbicide shall be applied to the surface of the subgrade prior to placement of the CASPR. Pre-emergent herbicide shall be considered incidental to CASPR work and no separate measurement or payment shall be made.

102-3.3 Production. The aggregate shall be uniformly blended during crushing operations or mixed in a plant. The plant shall blend and mix the materials to meet the Specifications and to secure the proper moisture content. On-site salvaged aggregates shall not require remixing at a plant.

102-3.4 Hauling. All hauling will be considered a necessary and incidental part of the work. The Contractor shall include the cost in the contract unit price for the pay of items of work involved. No payment will be made separately or directly for hauling on any part of the work.

The Contractor's equipment shall not cause damage to any excavated surface, compacted lift or to the subgrade as a result of hauling operations. Any damage caused as a result of the Contractor's hauling operations shall be repaired at the Contractor's expense.

102-3.5 Placement. CASPR shall be placed at a minimum depth of four (4) inches. The underlying subgrade and/or subbase should be cleaned of loose and foreign material prior to placement of CASPR. Upon completion of CASPR placement, Contractor will apply sufficient water to the entire surface area in order to settle all fines to the bottom of the course.

102-3.6 Finishing. The surface of the CASPR shall be finished by blading and rolling with automated equipment specifically designed for this purpose. The finished surface shall be rolled a minimum of three (3) passes with a steel wheel power roller weighing not less than 8 tons.

102-3.7 Surface Tolerances. In those areas on which CASPR is to be placed, the surface shall be tested for smoothness and accuracy of grade, when required by the RPR. Any portion lacking the required smoothness or failing in accuracy of grade shall be reshaped and re-compacted to grade until the required smoothness and accuracy are obtained and approved by the RPR. The Contractor shall perform all final smoothness and grade checks in the presence of the RPR. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense.

a. Smoothness. The finished surface shall not vary more than +/- 1/2 inch when tested with a 12-foot straightedge applied parallel with and at right angles to the centerline. The straightedge shall be moved continuously forward at half the length of the 12-foot straightedge for the full length of each line on a 50-foot grid.

b. Grade. The grade shall be measured on a 50-foot grid and shall be within +/- 0.10 feet of the specified grade.

102-3.8 Thickness. Depth tests shall be made by test holes at least 3 inches in diameter that extend through the CASPR. The thickness of the CASPR shall be within +1 and -1/2 inch of the specified thickness as determined by depth tests taken by the Contractor in the presence of the RPR for each area. Where the thickness is deficient by more than 1/2-inch, the Contractor shall correct such areas at no additional cost by adding new material of proper gradation, blended and recompacted to grade. The Contractor shall replace, at his expense, CASPR where depth tests have been taken. Additional test holes may be required to identify the limits of deficient areas.

102-3.9 Maintenance. CASPR shall be maintained in a condition that will meet all specification requirements. When material has been exposed to excessive rain or freeze-thaw conditions, prior to placement of additional material, the Contractor shall verify that materials still meet all specification requirements. Any damage resulting to the CASPR from routing equipment over the CASPR shall be repaired by the Contractor at the Contractor's expense.

METHOD OF MEASUREMENT

102-4.1 The quantity of crushed aggregate slope protection rock to be paid for will be determined by measurement of the number of square yards of material actually hauled off to the stockpile location on Airport property and accepted by the RPR as complying with the Plans and Specifications.

102-4.2 The quantity of crushed aggregate slope protection rock, salvaged, to be paid for will be determined by measurement of the number of square yards of material actually removed, windrowed or stockpiled, salvaged, placed, watered, compacted, and fully constructed and accepted by the RPR as complying with the Plans and Specifications and Airport expectations.

102-4.3 The quantity of crushed aggregate slope protection rock, push back and restore, to be paid for will be determined by measurement of the number of square yards of material actually pushed back, windrowed or stockpiled, salvaged, placed, watered, compacted, and fully constructed and accepted by the RPR as complying with the Plans and Specifications and Airport expectations.

BASIS OF PAYMENT

102-5.1 Payment shall be made at the contract unit price per square yard for "Crushed Aggregate Slope Protection Rock, Haul Off." This price shall be full compensation for furnishing all materials, for hauling, preparing, stockpiling, and placing these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

102-5.2 Payment shall be made at the contract unit price per square yard for "Crushed Aggregate Slope Protection Rock, Salvaged." This price shall be full compensation for furnishing all materials, for preparing and placing these materials including removal and stockpiling, and for all labor, equipment, tools, and incidentals necessary to complete the item.

102-5.3 Payment shall be made at the contract unit price per square yard for "Crushed Aggregate Slope Protection Rock, Push Back and Restore." This price shall be full compensation for furnishing all materials, for preparing and placing these materials including removal and stockpiling, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item SP-102-5.1	Crushed Aggregate Slope Protection Rock, Haul Off – per square yard
Item SP-102-5.2	Crushed Aggregate Slope Protection Rock, Salvaged – per square yard
Item SP-102-5.3	Crushed Aggregate Slope Protection Rock, Push Back and Restore – per square yard

TESTING REQUIREMENTS

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM C29	Unit Weight of Aggregate
ASTM C88	Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Materials Finer than (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C535	Resistance to Abrasion of Large Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Sieve or Screen Analysis of Fine and Coarse Aggregate
ASTM D75	Sampling Aggregate
ASTM D448	Standard Classification for Sizes of Aggregate for Road and Bridge Construction
ASTM D693	Crushed Stone, Crushed Slag, and Crushed Gravel for Dry- or Water-Bound Macadam Base Courses and Bituminous Macadam Base and Surface Courses of Pavements
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3)
ASTM D 4318	Liquid Limit, Plastic Limit, and Plasticity Index of Soils

END OF ITEM SP-102

Item SP-103 Pavement Pulverization

DESCRIPTION

SP-103-1.1 General. This item shall consist of pulverizing and blending existing asphalt surface course and underlying base course; pavement cold milling for overlay transitions; and stockpiling blended AC/AB material; and placing recycled materials as base courses. All work shall conform to the grades, depths, dimensions, and typical sections shown on the plans and be in compliance with these specifications.

This work shall consist of the milling of designated asphalt concrete pavements. Only suitable material shall be used for recycling. All unsuitable material shall be disposed of as indicated in SP-100, Special Provisions for Airport Construction.

SP-103-1.2 Pavement Pulverization. The existing bituminous surface course and underlying base material shall be pulverized and blended together to create a composite recycled material with gradation conforming to the following table:

TABLE 1

Sieve Size	Percent Passing
2 inch	100
11/2 inch	90 - 100
1 inch	70 - 90
3/4 inch	55 - 70

Approximately five percent (5%) oversized material (3 inch maximum) may be allowed as approved by the Resident Project Representative (`). The gradation of oversized material will be based on visual inspection by the RPR. Except as noted above, no oversized material will be allowed and shall be crushed or removed from the job site. Material crushing methods shall be approved by the RPR. Recycled AC/AB Material shall be stockpiled in-place for use as recycled shoulder base or base courses.

CONSTRUCTION METHODS

SP-103-2.1 Equipment. All equipment necessary for the proper construction of this work shall be on the Project, in good working condition, and approved by the RPR before construction is started.

The equipment must have a pulverization rate and capacity sufficient to keep the progress of the Project on schedule.

SP-103-2.2 Mixing and Stockpiling. The recycled AC/AB material shall be uniformly mixed and blended prior to placement. The placing methods shall not cause segregation and shall be approved by the RPR.

SP-103-2.3 Placing Materials. Recycled AC/AB material shall be constructed to form a smooth, uniform surface true to line, grade, and cross-section, spread in layers of not less than 2-1/2 inches nor more

than 8 inches of compacted thickness. No material shall be placed on a soft, muddy, or frozen underlying course.

The Contractor shall sample and perform laboratory tests on the material samples to determine maximum density and optimum moisture content of a placed layer. This information will be made available to the RPR. The material shall have satisfactory moisture content when rolling is started, and moisture content variations that may occur prior to or during rolling shall be corrected by adding water or aeration, as necessary.

SP-103-2.4 Compaction. After spreading, the material shall be thoroughly compacted to 100% of the maximum density of laboratory specimens prepared from samples of the AC/AB material on the project site. The laboratory specimens shall be compacted and tested in accordance with ASTM D1557. The moisture content of the material testing during placing operations shall be within 2 percentage points of the optimum moisture content as determined by ASTM D1557. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

The rolling shall progress gradually from the sides to the center of the lane under construction, or from one side toward previously placed material by lapping uniformly each preceding pass. Rolling shall continue until the entire area of the course has been rolled and the stone is thoroughly set; the interstices of the material are reduced to a minimum; and until creeping of the stone ahead of the roller is no longer visible. Blading and rolling shall be done alternately, as required or directed, to obtain smooth, even, and uniformly compacted material. The number, type, and weight of rollers shall be sufficient to compact the material to the required density.

The course shall not be rolled when the underlying course is soft or yielding or when the rolling causes undulation in the underlying material.

The watering during rolling shall be in the amount and by equipment necessary to achieve the required compaction without causing excessive moisture.

SP-103-2.5 Finishing. The surface of the recycled base course shall be finished by blading or with automated equipment especially designed for this purpose.

In no case will the addition of thin layers of material be added to the top layer of *t*he recycled base course to meet grade. If the elevation of the top layer is 3/8-inch or more below grade, the top layer of recycled material shall be scarified to a depth of at least 3 inches, new material added, and the layer shall be bladed to bring it to plan grade and compacted. If the finished surface is above plan grade, the surface shall be trimmed back to grade and rerolled.

SP-103-2.6 Surface Test. After the course has been completely compacted, the surface shall be tested for smoothness and accuracy of grade and crown, as requested by the RPR. Any portion lacking the required smoothness or failing in accuracy of grade or crown shall be scarified, reshaped, compacted, and otherwise manipulated as the RPR may direct until the required smoothness and accuracy are obtained. The finished surface shall not vary more than 3/8-inch from a 12-foot straightedge when applied to the surface parallel

with, and at right angles to, the centerline. The Contractor shall furnish the 12-foot straightedge for use by the RPR.

SP-103-2.7 Protection. Hauling equipment may be routed over completed portions of the recycled base course, provided no damage results and provided that such equipment is routed over the full width of the area to avoid rutting or uneven compaction. The RPR shall have full and specific authority to stop all hauling over completed or partially completed course when, in his opinion, such hauling is causing damage. Any damage resulting to the recycled base course from routing of equipment shall be repaired by the Contractor at his own expense.

SP-103-2.8 Maintenance. The Contractor shall perform all maintenance work necessary to keep the completed recycled base course in a satisfactory condition prior to placement of subsequent courses. The recycled course shall be properly drained at all times. If cleaning is necessary, any work or restitution necessary shall be performed at the expense of the Contractor.

MEASUREMENT

SP-103-3.1 Pavement pulverization shall be measured by the square yard, regardless of depth.

PAYMENT

SP-103-4.1 Payment for Pavement Pulverization shall be made at the contract unit price per square yard. This price shall be full compensation for all preparation, milling, crushing, blending, screening, hauling, finishing, and compacting of existing asphalt and aggregate base material in preparation for paving.

TESTING REQUIREMENTS

ASTM C 29	Unit Weight of Aggregate
ASTM C 88	Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C 117	Materials Finer than 75um (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C 131	Resistance to Abrasion of Small Size Coarse Aggregate by Use of the Los Angeles Machine
ASTM C 136	Sieve or Screen Analysis of Fine and Coarse Aggregate
ASTM D 75	Sampling Aggregate
ASTM D 693	Crushed Stone, Crushed Slag, and Crushed Gravel for Dry-or Water-Bound Macadam Base Courses and Bituminous Macadam Base and Surface Pavements

ASTM D 1557	Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb Rammer and 18 in Drop
ASTM D 2419	Sand Equivalent Value of Soils and Fine Aggregate
ASTM D 3665	Random Sampling of Paving Materials
ASTM 6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
ASTM D 4318	Liquid Limit, Plastic Limit, and Plasticity Index of Soils

END OF SECTION

PART 4

CONSTRUCTION SAFETY AND PHASING PLAN

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Scottsdale Airport

Construction Safety and Phasing Plan

for

Perimeter Road Rehabilitation Project

ADOT No.: E2S4Y01C

City Project No.: AI03A

City Bid No.: IFB-032023-71

Prepared by:

Mead & Hunt

meadhunt.com

September 2022

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CONSTRUCTION SAFETY AND PHASING PLAN

1. OVERVIEW

The City of Scottsdale (City) is required to adhere to the standards contained in the various Federal Aviation Administration (FAA) Advisory Circular (AC) 150 series as part of the Scottsdale Airport's (Airport) grant assurance obligations in return for accepting federal funds under the Airport Improvement Program (AIP) for the design and construction of airport projects. The goal of this Construction Safety and Phasing Plan (CSPP) is to achieve and maintain a desirable level of operational safety during construction. This plan provides information, responsibilities, and procedures to implement the requirements of the contract safety provisions and FAA AC 150/5370-2G, *Operational Safety on Airports During Construction*.

Hazardous practices and marginal conditions created by construction activities can decrease, or jeopardize, operational safety at the Airport. To minimize disruption of normal aircraft operations and avoid situations that compromise the Airport's operational safety, ALL construction activity that occurs within the boundaries of the Airport must be carefully planned, scheduled, and coordinated with the City and FAA.

This CSPP is intended to provide general information to all contractors, subcontractors, or suppliers (Contractor) on the requirements and procedures for accident prevention, safety, and security at the Airport during the Perimeter Road Rehabilitation Project (Project). Contractors shall conduct their operations in a manner that will provide safe working conditions for all personnel, in addition to protection of the Airport tenants and users who may be affected by the Project's construction activities.

Nothing contained in this CSPP is intended to relieve the Contractor of the obligations assumed by the Contractor under contract with the City, or as required by law. Safety must be an integral part of each job. Full participation, cooperation, and support are necessary to ensure the safety and health of all persons and property involved in the Project.

The purpose of marking, barricading, and lighting airside construction areas is to delineate potentially hazardous areas and prevent unauthorized incursions into the area by personnel, vehicles, and equipment during construction. Visible barricade lines will be established prior to construction activity within the Air Operations Area (AOA). All vehicles will be marked in accordance with FAA AC 150/5210-5D, *Painting, Marking, and Lighting of Vehicles Used on an Airport.*

Requirements and procedures in this CSPP may be altered on a case-by-case basis if the City determines that safety is not compromised, and the proposed alternative is better suited for operational or Project needs. Any such alterations or deviations shall be at the sole discretion of the City.

The critical operational areas at the Airport are defined as follows:

1.1 The AOA, for the purpose of this document, is defined as any part of the Airport utilized for aircraft operations and includes any area inside the perimeter fence. (See *Attachment 1.*)

1.2 Runway Safety Area (RSA) and Taxiway Object Free Area (TOFA) / Taxilane Object Free Area (TLOFA), as described in FAA AC 150/5370-2G, are restricted areas. The dimensions are described in FAA AC 150/5300-13B, *Airport Design*.

2. AIRPORT CONTACT NUMBERS

The following are the contact persons and numbers for this Project.

TITLE	NAME	MOBILE PHONE
Airport Operations Manager	Chris Read	(480) 312-2674
Airport Operations	On-Duty Personnel	(480) 312-8478
Engineer of Record	Brad Mikulecky	(630) 995-6222
Construction Manager	Greg Mead	(602) 432-4621
Resident Project Representative (RPR)	Sean Noel	(623) 688-6243

Injuries are to be reported to the City and Airport Operations personnel immediately. Medical and Police assistance may be reached by calling 911. All phone numbers should be placed on the Project phone list that shall be kept in all Contractor supervisor vehicles.

3. PROJECT SCOPE OF WORK

In this project, the existing asphalt concrete pavement and aggregate base course will be pulverized and compacted. Afterwards, 2-inch asphalt concrete surface course will be paved on top of the pulverized asphalt and aggregate base course mix.

The proposed improvements will include salvaging and replacing existing crushed aggregate slope protection rock (CASPR), pulverizing existing asphalt concrete and aggregate base, constructing new portions of perimeter service road, paving asphalt surface course, and applying new pavement markings.

The Project phasing has been coordinated with the Contractor to minimize Airport closures and optimize construction sequencing. The location of these improvements is depicted on Plan Sheets G-081 through G-085. (See *Attachment 1.*)

4. CONSTRUCTION SAFETY AND PHASING PLAN REQUIREMENTS

The requirements outlined below correspond with the subjects contained in FAA AC 150/5370-2G, Chapter 2, Section 2.4. The FAA's Construction Safety and Phasing Plan Checklist was utilized in the preparation of this CSPP and all items required on the checklist have been addressed.

4.1 Coordination

Airport staff will coordinate with the tenants and operators at the Airport as they will all be affected by the construction activity and perimeter road closures for the Project. Additional information regarding notification of construction activities is contained in Section 12 of this CSPP. The locations of these facilities are depicted in *Attachment 1*.

Prior to the start of construction, the Airport will host a mandatory preconstruction meeting with the Contractor and at least one representative from each of its subcontracting companies. The meeting will discuss all items listed on the Construction Safety and Phasing Plan Checklist and items in this CSPP, to include:

4.1.1 Submission of Contractor's preliminary construction schedule, barricade plan, list of equipment, list of subcontractors, Contractor's emergency phone number list, and items required by the Project Safety Plan Compliance Document (SPCD).

4.1.2 Identification of the Contractor's superintendent and a discussion of his authority and responsibilities.

4.1.3 Designation of the City representative responsible for notifying the Flight Service Station serving the Airport of the proposed start and completion dates of construction, or any circumstances requiring a Notice to Airmen (NOTAM).

4.1.4 Scheduling of work and the need to perform certain items at various stages of the Project, including operational safety issues which might arise because of the proposed work.

4.1.5 Establish a desired date for issuance of a Notice to Proceed (NTP).

4.2 Contractor Progress Meetings

Progress meetings to discuss construction scheduling and safety issues will be held on a regular basis at the Airport for the duration of the Project. The agenda will include a standing item to discuss safety issues at these meetings.

4.3 Scope or Schedule Changes

After the initial approval of the Contractor's schedule, the construction schedule will be a standing agenda item for discussion at the construction progress meetings. Any changes to the Project scope of work or change of schedule will require approval by the City.

4.4 FAA Air Traffic Organization (ATO) Coordination

Airport staff will coordinate with the Airport's Air Traffic Control Tower (ATCT) before and during construction of this Project to verify that construction activities are on schedule and progressing according to plan. Submittal of this CSPP will be in accordance with FAA requirements.

5. PHASING

This Project has been phased to minimize operational impact at the Airport. The scope of work for this Project is described in Section 3 of this CSPP. The construction limits for each phase of work are shown on Plan Sheets G-081 through G-084. (See *Attachment 1.*) A general description of the construction work and special phasing requirements are as follows.

5.1 Phase 1

Location	The portion of perimeter road from Scottsdale Fire Department Station 9 to the northernmost Signature Main apron connector.
Total Duration	8 Working Days.
Runway Closures	None.
Operational Impact	None.
Contractor Restrictions	Night work only, 21:00-06:00.
Work Elements	Description: • Place low-profile barricades. • Remove and salvage existing CASPR.

- Pulverize existing asphalt concrete and aggregate base course (six-inch depth minimum).
- Pave two- and one-half inches of asphalt concrete.
- Application of new pavement markings.
- Replacement of salvaged CASPR.
- Remove barricades.

5.2 Phase 2

Location	Portion of perimeter road from northernmost Signature Main apron connector to the Kilo Apron.
Total Duration	9 Working Days.
Runway Closures	None.
Operational Impact	None.
Contractor Restrictions	Night work only, 21:00-06:00.
Work Elements	Description:

- Place low-profile barricades.
- Remove and salvage existing CASPR.
- Pulverize existing asphalt concrete and aggregate base course (six-inch depth minimum).
- Construct new section of perimeter road.
- Pave two- and one-half inches of asphalt concrete.
- Application of new pavement markings.
- Replacement of salvaged CASPR.
- Remove barricades.

5.3 Phase 3

Location	The portion of perimeter road from Scottsdale Fire Department Station 9 to the double manual swing gate at the south end of the airfield on 73rd Street.
Total Duration	8 Working Days.
Runway Closures	None.
Operational Impact	None.
Contractor Restrictions	Night work only, 21:00-06:00.
Work Elements	Description:

- Place low-profile barricades.
- Remove and salvage existing CASPR.
- Full depth removal of existing asphalt.
- Pulverize existing asphalt concrete and aggregate base course (six-inch depth minimum).
- Pave two- and one-half inches of asphalt concrete.
- Application of new pavement markings.

- Placement of new and salvaged CASPR.
- Remove barricades.

Total contract time allowed for construction work shall be <u>25 working days</u>.

6. AREAS AND OPERATIONS AFFECTED BY CONSTRUCTION

This CSPP presents possible safety problems that could occur during a typical airport construction project. Any of these safety problems could occur if this plan is not followed in any part of the Project areas. The rehabilitation of the perimeter road pavement will impact operations and facilities as described above. Portions of the service road will be required to accomplish the work. The work is not expected to impede firefighting access. Details depicting phasing limits, general barricade placement, access routes, and other information are contained in *Attachment 1*.

7. PROTECTION OF NAVIGATIONAL AIDS (NAVAIDS)

The Airport's Precision Approach Path Indicators (PAPIs), Runway End Identifier Lights (REILs), Wind Cone, and Beacon are not within the Project limits and will be functional while construction occurs.

8. CONTRACTOR ACCESS

Maintaining control of construction personnel within the AOA is crucial for the safety of workers and aircraft. The Contractor's personnel will only be permitted access to the Airport at designated locations and will be restricted from entering all areas outside the limits of construction. Contractor access and haul routes are depicted on the Project plan and contained in *Attachment 1*. The Contractor's personnel will not be allowed to leave the Project area unless escorted by Airport Operations personnel. Cones and barricades will be used to keep the Contractor's personnel from inadvertently entering active aircraft areas. The Contractor will acknowledge and comply with the following requirements.

8.1 Location of Stockpiled Construction Materials

Stockpiled material must be stored in the staging yard or within the Project limits until needed for placement. Stockpiled soils and aggregate materials shall be watered and consolidated as necessary to prevent airborne particulates. Material stockpile heights shall not exceed 15 feet.

8.2 Vehicle and Pedestrian Operations

No unauthorized entry to the AOA will be permitted. Workers and equipment will be restricted to the approved entry points and access routes to work areas. The Contractor shall provide a trained gate guard any time the access gate is not secured. The gate guard shall prevent unauthorized vehicles and pedestrians from entering the AOA. Additionally, the gate guard shall ensure authorized construction and delivery vehicles are properly marked and lit prior to allowing them to enter the AOA.

8.3 Construction Equipment / Personnel Parking

Contractor employees will park on public streets, except those with signage denoting restricted parking areas. No personal vehicles will be allowed in the AOA. Construction equipment will be parked at the designated staging areas when not in use. No construction equipment will be left unattended at the work locations.

8.3.1 Access and Haul Roads

The locations of construction traffic routing are depicted in the Construction Safety and Phasing Plan, included as *Attachment 1*, and the Project plan set. Access to the work areas will be delineated with traffic cones or other approved traffic control devices.

8.3.2 Marking and Lighting of Vehicles

All Contractor and Airport Operations vehicles involved with this Project will comply with FAA AC 150/5210-5D, *Painting, Marking, and Lighting of Vehicles Used on an Airport,* by mounting a 3-foot by 3-foot orange and white checked flag or an amber beacon on the highest part of the vehicle while at the Airport during daylight hours. Vehicles operating at night are required to use an amber beacon. All hauling vehicles require a 3-foot by 3-foot orange and white checked flag during daytime operations and a flashing amber beacon during nighttime operations at all times within AOA

8.3.3 Description of Proper Vehicle Operations

If the Contractor leaves the closed Project area and becomes disoriented, Contractor shall remain in place and call Airport Operations.

8.3.4 Required Escorts

Escorts will be required for every vehicle in and out of the Project area during construction when crossing areas open to aircraft operations. If a work crew needs to travel inside the Taxiway Object Free Area (TOFA), Airport Operations shall be notified and provide an escort.

8.3.5 Requirement for Vehicle Drivers

The Contractor will be required to train all personnel in ground vehicle operations. This will be done for all vehicle drivers who will be at the Airport daily and not merely transitory, such as delivery vehicles. These daily drivers will be required to read the FAA Guide to Ground Vehicle Operations. The Contractor will be required to secure the signatures of all employees who have reviewed the guide prior to start of construction. All vehicle drivers must be aware of their environment at the Airport and confirm by personal observation that no aircraft are approaching their position (either in the air or on the ground) when crossing any area of the Airport open to aircraft movements.

8.3.6 Situational Awareness

The Contractor's personnel and equipment will be restricted to the closed areas in which work is to be performed. The Contractor shall train their personnel to recognize and avoid the hazards of jet blast when in proximity to active areas. The Contractor shall train their personnel to be aware of all aircraft movement areas outside the Project limits.

8.3.7 Two-Way Communication Procedure

This section is not applicable for this Project. Airport Operations personnel will communicate with ATCT during all construction operations.

8.3.8 Maintaining the Secured Area of the Airport Security

The access points and haul routes identified on the CSPP sheets are the only access points approved for use by the Contractor. (See *Attachment 1).* The gates shall be closed and locked

when not in use. During periods of operation, the gates must be closed after each vehicle enters or departs, or a gate guard shall be posted at the access gates to prevent inadvertent entry to the Airport by unauthorized vehicles and / or pedestrians.

9. WILDLIFE MANAGEMENT

The Contractor must remove any / all food or construction-related trash after each shift. The Contractor shall also ensure that their water supply tankers and lines are not leaking to prevent the attraction of birds or other animals to the site as a result of standing water.

10. FOREIGN OBJECT DEBRIS MANAGEMENT

Foreign Object Debris (FOD) management will be controlled by only allowing the Contractor's personnel to travel on the established haul routes. They will not be allowed to travel freely on the runway and taxiway system. The Contractor must possess a power vacuum sweeper, available at all times, while working on this Project. The Contractor shall continuously monitor and clean all haul routes and paved areas within the Project limits during their work shifts and at the direction of Airport Operations and the RPR. Airport Operations personnel will conduct inspections intermittently throughout construction or at the conclusion of each working day.

11. HAZARDOUS MATERIALS (HAZMAT) MANAGEMENT

There are no hazardous materials associated with this Project except vehicular fluids, such as fuel. If the Contractor spills a small amount of fuel or other fluid, they shall immediately contain and remove it from the Airport and legally dispose of it.

If the Contractor spills five or more gallons of fuel or other fluid, they shall immediately notify Airport Operations personnel so that the Airport's spill procedures can be followed.

12. NOTIFICATION OF CONSTRUCTION ACTIVITIES

To maintain operational safety during construction, Airport Operations personnel will follow the procedures listed below. The Contractor must immediately notify the Airport so that Airport Rescue and Fire Fighting (ARFF) personnel, Airport users, and the FAA are aware of any conditions adversely affecting operational safety during this Project.

12.1 List of Responsible Representatives (Project Directory)

Once the Engineer receives the Contractor's list of personnel, they shall compile a list of all Project stakeholders before construction begins. This list will be used to determine who is permitted access to the work areas. It shall include points of contact for the Airport, Engineer, and Contractor.

This Project Directory will include office contact phone numbers, email addresses, and 24-hour emergency point of contact cell phone numbers. The Contractor supervisors must always keep the Project Directory in their vehicles. Airport Operations personnel shall also keep this list in their vehicles during the Project.

12.2 Notice to Airmen Issuance

Airport personnel will issue all NOTAMS associated with this Project in accordance with FAA AC 150/5200-28F, *Notices to Airmen (NOTAMs) for Airport Operators*, as amended.

12.3 Emergency Notification Procedures

The City provides Fire and Police response for the Airport. Contact these services for an emergency by calling 911.

12.4 Coordination with Fire Department Personnel

Scottsdale Fire Department personnel will be advised of the construction activity via email or face-to-face meetings. Fire services will be minimally affected.

12.5 Notifications to the FAA (Filing of Form 7460-1)

FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, will be prepared and submitted by the Engineer prior to the start of construction.

13. INSPECTION REQUIREMENTS

The Contractor's personnel and City representatives will be responsible for conducting inspections of work areas to ensure that those areas are safe for aircraft operations.

13.1 Daily Inspections

Airport Operations personnel shall conduct a post construction inspection at the end of each calendar day. The Airport Special Inspection Sheet for post construction is included as *Attachment 3*.

The Contractor shall be advised that Airport Operations have the final authority to determine whether aircraft movement areas surrounding the Project are safe for aircraft operations.

Temporarily closed areas will only open after the Project area is complete. These areas will remain closed to all aircraft traffic from the start of construction to its completion. Airport Operations Personnel will then determine if the Project area is suitable for opening.

13.2 Final Inspections

Airport Operations will conduct a final inspection of the perimeter road pavement prior to construction completion. They will have the final authority to determine whether the Project area is safe to open after construction. Significant penalties have been established to ensure the Contractor understands the seriousness of this issue.

14. UNDERGROUND UTILITIES

Known utilities are shown on the construction plans. The Contractor must comply with Arizona Blue Stake requirements. Storm drain, sanitary sewer, water, fiber optic, and electrical utilities cross the perimeter road. The Contractor is required to pothole at locations for existing utility conflicts when needed. In the event a utility is disrupted, the Contractor is responsible for contacting the utility company and requesting repair.

15. PENALTIES

If the Contractor's personnel fail to comply with any Airport rule or the provisions of this CSPP, Airport Operations personnel will immediately stop the Project. Violations of the rules and regulations are subject to the Airport's enforcement policies, which include civil penalties up to $250.00 per occurrence. The penalties also include the assessment of liquidated damages, in accordance with the contract, for failure to complete the Project on time.

16. SPECIAL CONDITIONS

Airport Operations personnel will be required to monitor the ATCT frequency while on the construction site. If an inbound aircraft issues an alert, the Airport Operations personnel will contact the construction site supervisor, advise them to stop construction, and immediately move all personnel off to the Airport perimeter fence line closest to them. The Contractor's personnel cannot resume work until Airport Operations personnel have issued the all-clear.

17. RUNWAY AND TAXIWAY VISUAL AIDS

Runway and taxiway visual aids and NAVAIDs will not be impacted by the Project.

18. MARKINGS AND SIGNS FOR ACCESS ROUTES

The Contractor will be required to submit a traffic control plan for operations on and off the Airport to the City for approval prior to construction. The Contractor's approved traffic control plan will be distributed to all vehicle drivers working in the AOA.

Routing will include the Airport ramp areas and perimeter road. Routes will be marked by traffic cones or other devices, as approved by the Airport. See *Attachment 1* for additional information.

19. HAZARD MARKING AND LIGHTING

The CSPP depicts anticipated locations of construction barricades. These identify work limits during each phase of the Project and alert pilots to recognizable locations of potential hazards. A detail depicting the barricade devices to be used is included in the Construction Safety and Phasing Plan. (See *Attachment 1*.)

Airport Operations personnel will direct placement of all barricades and hazard markings to be used for the Project. The Contractor must prominently mark open trenches and excavations at the construction site and light them with red omni-directional lights during hours of restricted visibility or darkness. The Contractor shall check lighting on the barricades for proper operation at least once per day, preferably at dusk.

20. PROTECTION OF SAFETY AREAS, OBJECT FREE AREAS, AND APPROACH AND DEPARTURE SURFACES

Runway and taxiway safety areas, Obstacle Free Zones (OFZ), Object Free Areas (OFA), and Approach / Departure Surfaces are described in FAA AC 150/5300-13B. When working in these areas, construction will be limited in accordance with the Project specifications.

20.1 Runway Safety Area (RSA)

This Project does not require work within the RSA. The RSA has an established setback limit of 200 feet from Runway 3-21 centerline and 1,000 feet from the Runway 3-21 threshold. The Contractor shall remain clear of the RSA at all times when Runway 3-21 is open.

20.2 Runway Object Free Area (ROFA)

This Project does not require work within the ROFA. The ROFA has an established setback limit of 400 feet from Runway 3-21 centerline and 1,000 feet from the Runway 3-21 threshold.

20.3 Taxiway Safety Area (TSA)

This Project does not require work within the TSA. The TSA has an established setback limit of 39.5 feet from the taxiway centerline. No construction will be permitted within the TSA of any taxiway open for aircraft operations.

20.4 Taxiway Object Free Area (TOFA)

This Project does not require work within the TOFA. The TOFA has an established setback limit of 65.5 feet from the taxiway centerline. No construction will be permitted within the TOFA of any taxiway open for aircraft operations.

20.5 Taxilane Object Free Area (TLOFA)

This Project does not require work within the TLOFA. The TLOFA has an established setback limit of 57.5 feet from the taxilane centerline. No construction will be permitted within the TLOFA of any taxilane open for aircraft operations.

20.6 Obstacle Free Zones (OFZ)

This Project does require work within the OFZ. The OFZ has an established setback limit of 200 feet from Runway 3-21 centerline.

20.7 Construction Activity in a Runway Approach / Departure Area

This Project does not require partial closure of the runway or the need to displace the existing runway threshold. The runway will be open during construction.

20.8 Coordination of RSA / TSA Adjustments

This Project does not require RSA / TSA adjustments.

20.9 Blasting Operations

This Project does not require blasting operations.

20.10 Open Trenches or Excavations

No open trenches, excavations, or stockpiled materials will be permitted within the taxiway or taxilane safety areas while the associated taxiways or taxilanes are open to aircraft operations, in accordance with Project specifications.

20.11 Covering of Excavations

Excavations within the taxiway or taxilane safety areas that cannot be backfilled before the associated taxiway or taxilane is reopened must be covered with steel plates capable of supporting a 100,000-pound dual-wheel aircraft load.

20.12 Marking of Open Trenches or Excavation

At the end of each working shift, the Contractor shall clearly mark open trenches or excavation areas with barricades, in accordance with Project specifications.

20.13 Removal of Equipment

Construction equipment must return to the specific staging area at the completion of each work shift. All construction equipment within the AOA at the completion of a work shift shall have a 3-foot by 3-foot orange and white checked flag.

20.14 Other Limitations on Construction

20.14.1 The Contractor must conduct work in conformance with requirements of the City and the FAA at all times.

20.14.2 The use of open flame welding or torches is prohibited unless approved by the Airport.

20.14.3 The use of blasting caps is not applicable to this Project.

20.14.4 The use of flare pots is not applicable to this Project.

20.14.5 The Contractor shall at all times conduct their work in a manner that does not create any hindrance, hazard, or obstacle to aircraft using the Airport.

20.14.6 The Airport environment requires a high degree of care to control debris and dust. Spilled material on active roadways and aircraft pavements shall be swept up immediately.

20.14.7 Sanitary facilities must be provided by the Contractor for use by the Contractor's employees. Public facilities at the Airport are not to be used. Sanitary facilities must be located at the Contractor's staging area, unless otherwise approved by the City.

20.14.8 Contractor vehicles will obey all posted speed limits on Airport roadways. The maximum speed when operating inside the Airport perimeter fence is 15 mph maximum, consistent with safety.

20.14.9 All personnel operating a motor vehicle on Airport property shall have a valid state-issued driver's license.

20.14.10 Use of audio earphones and headsets are prohibited on the Airport unless directly related to job requirements.

20.14.11 Beacons and flags must be maintained in good working condition, and flags shall be replaced if they become faded, discolored, or ragged.

20.14.12 Lighted barricades and runway closure markers shall be maintained, kept in good working order, and repaired and / or replaced if they are not operating properly.

21. SAFETY PLAN COMPLIANCE DOCUMENT (SPCD) OVERVIEW

The Contractor is required to read, acknowledge, and abide by this CSPP. Additionally, all required information for compliance will not be available until a construction award for the Project has been made by the City. The following section provides for supplemental information and acknowledgement of the requirements of this CSPP. The Contractor shall not duplicate information in the subject requirements as contained in this CSPP. If no supplemental information is needed, the Contractor shall enter "No Supplemental Information." The Contractor shall provide the information and execute the acknowledgement statement as part of their Project submittals. Additional guidance is contained in FAA AC 150/5370-2G.

22. CONTRACTOR CONTACT NUMBERS AND SUPPLEMENTAL INFORMATION

General Contractor: _____
Address: _____
_____
Office Phone: _____
Fax: _____

Contractor Personnel

TITLE	NAME	MOBILE PHONE
Project Manager:	_____	_____
Project Superintendent:	_____	_____
Safety Officer:	_____	_____

Construction Schedule

The Notice to Proceed (NTP) Date is: _____

The Official Start Date is: _____

The Project Duration is: **25 Working Days**

The Project Completion Date is: _____

Acknowledgement: I,_____, have read the **Scottsdale Airport Perimeter Road Rehabilitation Project** Construction Safety and Phasing Plan, approved on _____ _____and will abide by it as written and with the following additions as noted.

Supplemental Information: (Insert "No Supplemental Information" if none is needed.)

1. Coordination:
2. Phasing:
3. Areas and Operations Affected by Construction:
4. Protection of NAVAIDS:
5. Contractor Access:
6. Wildlife Management:
7. Foreign Object Debris (FOD) Management:
8. Hazardous Material (HAZMAT) Management:
9. Notification of Construction Activities:
10. Inspection Requirements:
11. Underground Utilities:
12. Penalties:
13. Special Conditions:
14. Runway and Taxiway Visual Aids:
15. Marking and Signs for Access Routes:
16. Hazard Marking and Lighting:
17. Protection of Runway and Taxiway Safety Areas, Object Free Areas Obstacle Free Areas:
18. Other Limitations on Construction:

ATTACHMENTS

ATTACHMENT 1

CONSTRUCTION SAFETY AND PHASING PLAN SHEETS

PHASING OVERVIEW:

PHASE 1 (BASE BID):

PHASE 1 CONSISTS OF THE FOLLOWING WORK ELEMENTS:
- PLACE LOW-PROFILE BARRICADES
- REMOVE AND SALVAGE EXISTING CASPR
- PULVERIZE EXISTING ASPHALT CONCRETE AND AGGREGATE BASE COURSE (6" DEPTH MIN.) AND COMPACT TO 95% R.C.
- PAVE ASPHALT CONCRETE PAVEMENT
- APPLY PAVEMENT MARKINGS
- PLACE SALVAGED CASPR
- REMOVE BARRICADES

PHASE 1 DURATION:
- 8 WORKING DAYS (NIGHT WORK ONLY, 2100 - 0600)

PHASE 1 OPERATIONAL IMPACT:
- PERIMETER SERVICE ROAD CLOSED FROM FIRE STATION TO NORTH END OF SIGNATURE FBO.

PHASE 2 (BID ALTERNATE 1):
PHASE 2 CONSISTS OF THE FOLLOWING WORK ELEMENTS:
- PLACE LOW-PROFILE BARRICADES
- REMOVE AND SALVAGE EXISTING CASPR
- PULVERIZE EXISTING ASPHALT CONCRETE AND AGGREGATE BASE COURSE (6" DEPTH MIN.) AND COMPACT TO 95% R.C.
- SUBGRADE PREPARATION
- CONSTRUCT AGGREGATE BASE COURSE
- PAVE ASPHALT CONCRETE PAVEMENT
- APPLY PAVEMENT MARKINGS
- PLACE NEW / SALVAGED CASPR
- REMOVE BARRICADES

PHASE 2 DURATION:
- 9 WORKING DAYS (NIGHT WORK ONLY, 2100 - 0600)

PHASE 2 OPERATIONAL IMPACT:
- PERIMETER ROAD CLOSED FROM SIGNATURE FBO APRON NORTH CONNECTOR TO KILO APRON.
- RUNWAY 3-21 CLOSURE REQUIRED FOR WORK WITHIN RUNWAY SAFETY AREA. AIRPORT OPERATIONS TO PROVIDE ALL RUNWAY CLOSURE MARKERS.

PHASE 3 (BID ALTERNATE 2):

PHASE 3 CONSISTS OF THE FOLLOWING WORK ELEMENTS:
- PLACE LOW-PROFILE BARRICADES
- REMOVE AND SALVAGE EXISTING CASPR
- PULVERIZE EXISTING ASPHALT CONCRETE AND AGGREGATE BASE COURSE (6" MIN. DEPTH) AND COMPACT TO 95% R.C.
- PAVE ASPHALT CONCRETE PAVEMENT
- APPLY PAVEMENT MARKINGS
- PLACE NEW / SALVAGED CASPR
- REMOVE BARRICADES

PHASE 3 DURATION:
- 8 WORKING DAYS (NIGHT WORK ONLY, 2100 - 0600)

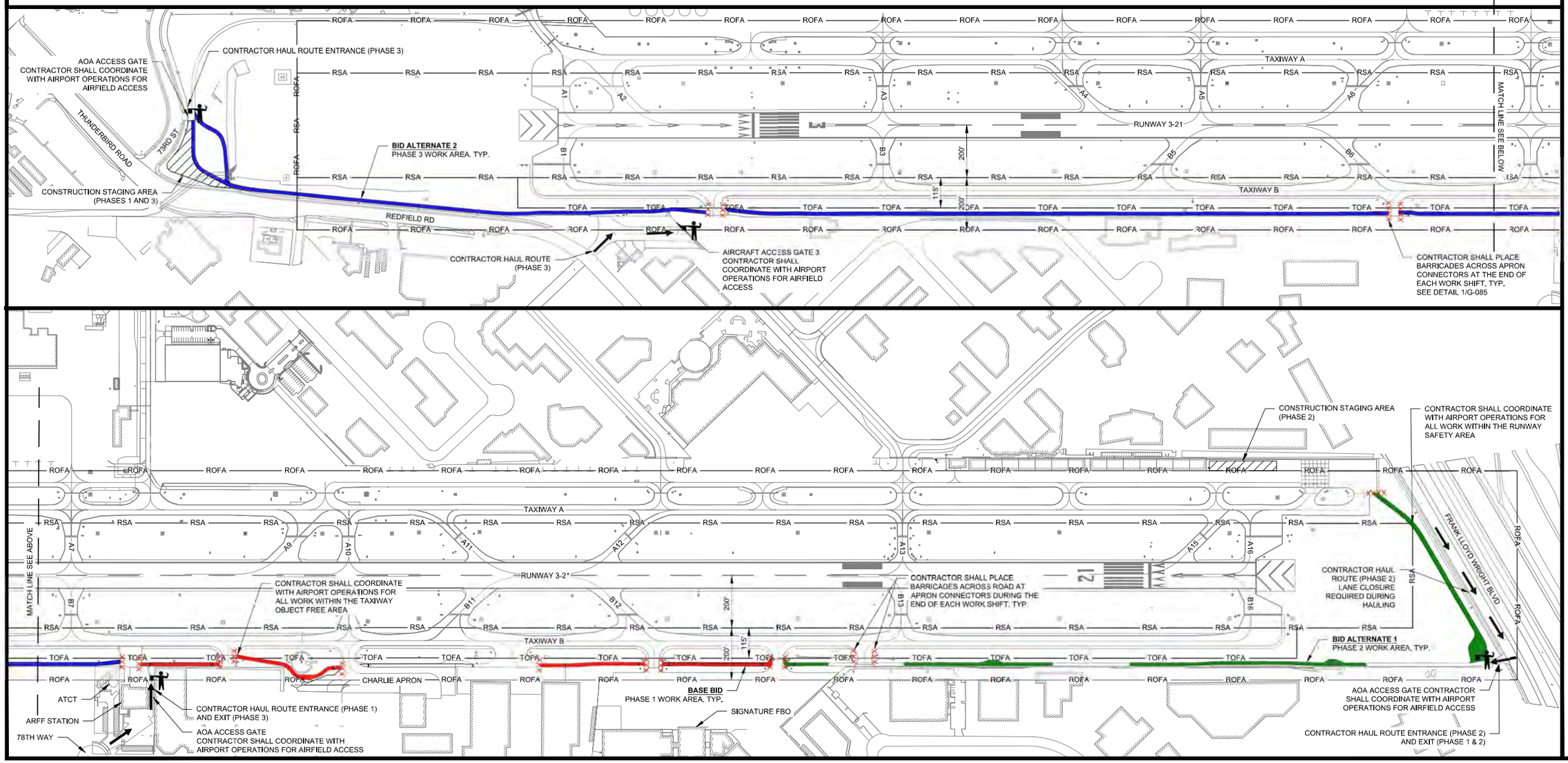
PHASE 3 OPERATIONAL IMPACT:
- PERIMETER ROAD CLOSED FROM 73RD STREET GATE TO FIRE STATION.

OVERALL PROJECT DURATION - 25 WORKING DAYS

GENERAL PHASING NOTES:

1. REVIEW STANDALONE CSPP DOCUMENT IN PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. ALL CONSTRUCTION VEHICLES AND EQUIPMENT OPERATING IN THE AOA DURING DAYLIGHT HOURS SHALL BE PROVIDED WITH A FLAG ATTACHED TO THE VEHICLE SO THAT THE FLAG WILL BE READILY VISIBLE. THE FLAG SHALL BE THREE FEET SQUARE CONSISTING OF AVIATION ORANGE AND WHITE SQUARED ON EACH SIDE.
3. ALL CONSTRUCTION VEHICLES AND EQUIPMENT OPERATING ON AIRPORT PROPERTY AT NIGHT SHALL BE PROVIDED WITH A 360 DEGREE FLASHING AMBER BEACON ATTACHED TO THE VEHICLE SO THAT THE LIGHTS WILL BE READILY VISIBLE.
4. ALL CONSTRUCTION VEHICLES AND EQUIPMENT PARKED WITHIN THE AOA AFTER A SHIFT IS COMPLETED SHALL BE EQUIPPED WITH A FLAG.
5. CONTRACTOR SHALL COORDINATE TRAFFIC CONTROL PLAN AND PERMIT REQUIREMENTS FOR NORTH HAUL ROUTE ONTO FRANK LLOYD WRIGHT BLVD WITH CITY OF SCOTTSDALE. SECURITY SHALL BE MAINTAINED AT ALL TIMES AND A GATE GUARD SHALL BE POSTED WHILE IN USE.
6. ALL PAVEMENT SHALL BE VACUUM SWEPT PRIOR TO REOPENING TO AIRCRAFT OPERATIONS.
7. CONTRACTOR SHALL TEMPORARILY REMOVE AND SALVAGE EXISTING CASPR FROM THE STAGING AND STOCKPILE AREA WITHIN THE AOA, THIS WORK IS INCIDENTAL TO MOBILIZATION.
8. CONTRACTOR AND HAULING TRUCKS SHALL YIELD TO AIRCRAFT OPERATIONS AT ALL TIMES DURING CONSTRUCTION WHEN CROSSING APRON CONNECTORS.
9. CONTRACTOR SHALL NOT USE AIRCRAFT PAVEMENT, INCLUDING APRONS, TAXIWAYS, AND APRON CONNECTORS. FOR HAULING TRUCK TURN-AROUND AREAS UNLESS OTHERWISE COORDINATED WITH AIRPORT OPERATIONS.
10. ALL PAVEMENT MARKINGS MAY BE COMPLETED AS ONE SEPARATE CONSTRUCTION PHASE AFTER ALL PROJECT ELEMENTS WITHIN AWARDED PHASES ARE COMPLETE. PAVEMENT MARKINGS COMPLETED AS ONE PHASE SHALL BE DONE 30 DAYS AFTER THE COMPLETION OF ALL ASPHALT PAVING, PER P-620 SPECIFICATION REQUIREMENTS, OR SHALL BE PAINTED IN TWO APPLICATIONS.

LEGEND:
- PHASE 1 WORK AREA (BASE BID)
- PHASE 2 WORK AREA (BID ALTERNATE 1)
- PHASE 3 WORK AREA (BID ALTERNATE 2)
- CONTRACTOR STAGING AND STOCKPILE AREAS
- CONTRACTOR HAUL ROUTE
- GATE GUARD MUST BE PRESENT
- XXXXXX CONTRACTOR PROVIDED LOW-PROFILE BARRICADES, SEE DETAIL 1/G-085



Mead & Hunt

Mead and Hunt, Inc.
8800 E Raintree Dr, Ste 285
Scottsdale, AZ 85260
phone: 480-718-1896
meadhunt.com

SCOTTSDALE AIRPORT
PERIMETER ROAD REHABILITATION

15000 N AIRPORT DRIVE
SCOTTSDALE, AZ 85260

ISSUED
CONSTRUCTION DOCUMENTS

ADOT NO.:	E2S4Y01C
M&H NO.:	2886300-220408.01
DATE:	SEPTEMBER 2022
DESIGNED BY:	BJM
DRAWN BY:	SKN
CHECKED BY:	DPS

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SHEET CONTENTS
CONSTRUCTION SAFETY AND PHASING PLAN - OVERVIEW

SHEET NO. 6 of 26

G-081

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PHASE 1 (BASE BID):

PHASE 1 CONSISTS OF THE FOLLOWING WORK ELEMENTS:
- PLACE LOW-PROFILE BARRICADES
- REMOVE AND SALVAGE EXISTING CASPR
- PULVERIZE EXISTING ASPHALT CONCRETE AND AGGREGATE BASE COURSE (6" DEPTH MIN.) AND COMPACT TO 95% R.C.
- PAVE ASPHALT CONCRETE PAVEMENT
- APPLY PAVEMENT MARKINGS
- PLACE SALVAGED CASPR
- REMOVE BARRICADES

TOTAL DURATION:
- 8 WORKING DAYS (NIGHT WORK ONLY, 2100 - 0600)

OPERATIONAL IMPACT:
- PERIMETER SERVICE ROAD CLOSED FROM FIRE STATION TO NORTH END OF SIGNATURE FBO.

LEGEND:

PHASE 1 (BASE BID) WORK AREA

GATE GUARD

XXXXXX CONTRACTOR PROVIDED LOW-PROFILE BARRICADES, SEE DETAIL 1/G-085

CONTRACTOR HAUL ROUTE

AIRPORT PROVIDED BARRICADE

NOTE:
1. CONTRACTOR SHALL MEET TEMPORARY GRADING REQUIREMENTS WITHIN 65.5-FT OF ALL APRON CONNECTOR CENTERLINES AT CONCLUSION OF EACH WORK SHIFT. TEMPORARY GRADING REQUIREMES NO SLOPES GREATER THAN 5% AND NO VERTICAL DROP OFFS GREATER THAN 3-INCHES.

0 100 200

TOFA

RSA

TWY A7

TWY A9

TWY A10

TWY A11

TWY A12

RUNWAY 3-21

200'

115'

85'

65.5' TYP.

TWY B7

TWY B10

TWY B11

TWY B12

CONTRACTOR SHALL COORDINATE WITH AIRPORT OPERATIONS FOR ALL WORK WITHIN THE TOFA

CONTRACTOR SHALL PLACE BARRICADES ACROSS APRON CONNECTORS AT THE END OF EACH WORK SHIFT, TYP. SEE DETAIL 1/G-085 SEE NOTE 1

(E) PRIMARY WIND CONE AND SEGMENTED CIRCLE PROTECT IN PLACE

ATCT

GATE GUARD MUST BE PROVIDED DURING ALL HAULING OPERATIONS

AOA ACCESS GATE CONTRACTOR SHALL COORDINATE WITH AIRPORT OPERATIONS FOR AIRFIELD ACCESS PRIOR TO EACH SHIFT

ARFF STATION

CONTRACTOR HAUL ROUTE ENTRANCE

CONTRACTOR CAN STAGE TRUCKS ON CHARLIE APRON AT APPROVAL OF AIRPORT OPERATIONS

CONTRACTOR SHALL REMAIN CLEAR OF (E) APRON

CONTRACTOR SHALL REMAIN CLEAR OF (E) APRON

CONTRACTOR SHALL REMAIN CLEAR OF (E) APRON

SIGNATURE FBO APRON

CONTRACTOR HAUL ROUTE EXIT AT (E) MANUAL SWING GATE ALONG FRANK LLOYD WRIGHT BLVD (SEE SHEET G-081)

78TH WAY

Mead & Hunt

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8800 E Raintree Dr, Ste 285
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ISSUED

CONSTRUCTION DOCUMENTS

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DESIGNED BY:	BJM
DRAWN BY:	SKN
CHECKED BY:	DPS

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SHEET CONTENTS

CONSTRUCTION SAFETY AND PHASING PLAN PHASE 1 - BASE BID

SHEET NO. 7 of 26

G-082

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PHASE 2 (BID ALTERNATE 1):

PHASE 2 CONSISTS OF THE FOLLOWING WORK ELEMENTS:
- PLACE LOW-PROFILE BARRICADES
- REMOVE AND SALVAGE EXISTING CASPR
- PULVERIZE EXISTING ASPHALT CONCRETE AND AGGREGATE BASE COURSE (6" DEPTH MIN.) AND COMPACT TO 95% R.C.
- SUBGRADE PREPARATION
- CONSTRUCT AGGREGATE BASE COURSE
- PAVE ASPHALT CONCRETE PAVEMENT
- APPLY PAVEMENT MARKINGS
- PLACE NEW / SALVAGED CASPR
- REMOVE BARRICADES

TOTAL DURATION:
- 9 WORKING DAYS (NIGHT WORK ONLY, 2100 - 0600)

OPERATIONAL IMPACT:
- PERIMETER ROAD CLOSED FROM SIGNATURE FBO APRON NORTH CONNECTOR TO KILO APRON.

LEGEND:

- PHASE 2 WORK AREA (BID ALTERNATE 1)
- CONTRACTOR STAGING AREA
- GATE GUARD
- CONTRACTOR HAUL ROUTE
- CONTRACTOR PROVIDED LOW-PROFILE BARRICADES, SEE DETAIL 1/G-085
- AIRPORT PROVIDED BARRICADE

0 100 200

NOTE:
1. CONTRACTOR SHALL MEET TEMPORARY GRADING REQUIREMENTS WITHIN 65.5-FT OF ALL APRON CONNECTOR CENTERLINES AT CONCLUSION OF EACH WORK SHIFT. TEMPORARY GRADING REQUIREMES NO SLOPES GREATER THAN 5% AND NO VERTICAL DROP OFFS GREATER THAN 3-INCHES.

CONSTRUCTION STAGING AREA (PHASE 2)
NORTH GA HANGARS
NORTH GA HANGARS
KILO APRON
(E) BLAST FENCE
TOFA
RSA
TWY A18
125'
137'
TWY A13
TWY A15
TWY A16
FRANK LLOYD WRIGHT BLVD
CONTRACTOR SHALL COORDINATE WITH AIRPORT OPERATIONS FOR ALL WORK WITHIN THE RUNWAY 3-21 SAFETY AREA
RUNWAY 3-21
21
CONTRACTOR HAUL ROUTE
CONTRACTOR SHALL PLACE BARRICADES ACROSS APRON CONNECTORS AT THE END OF EACH WORK SHIFT, TYP. SEE DETAIL 1/G-085 SEE NOTE 1
TWY B13
TWY B16
200'
115'
65.5' TYP.
CONTRACTOR SHALL REMAIN CLEAR OF TAXIWAY B OBJECT FREE AREA AT ALL TIMES DURING CONSTRUCTION
TOFA
SD
SR
TCFA
SIGNATURE FBO APRON
GATE GUARD MUST BE PROVIDED DURING ALL HAULING OPERATIONS
AOA ACCESS GATE
CONTRACTOR SHALL COORDINATE WITH AIRPORT OPERATIONS FOR AIRFIELD ACCESS PRIOR TO EACH SHIFT

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ISSUED
CONSTRUCTION DOCUMENTS

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DESIGNED BY:	BJM
DRAWN BY:	SKN
CHECKED BY:	DPS

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SHEET CONTENTS
CONSTRUCTION SAFETY AND PHASING PLAN PHASE 2 - BID ALTERNATE 1

SHEET NO. 8 of 26

G-083

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PHASE 3 (BID ALTERNATE 2):

PHASE 3 CONSISTS OF THE FOLLOWING WORK ELEMENTS:
- PLACE LOW-PROFILE BARRICADES
- REMOVE AND SALVAGE EXISTING CASPR
- PULVERIZE EXISTING ASPHALT CONCRETE AND AGGREGATE BASE COURSE (6" MIN. DEPTH) AND COMPACT TO 95% R.C.
- PAVE ASPHALT CONCRETE PAVEMENT
- APPLY PAVEMENT MARKINGS
- PLACE NEW / SALVAGED CASPR
- REMOVE BARRICADES

TOTAL DURATION:
- 8 WORKING DAYS (NIGHT WORK ONLY, 2100 - 0600)

OPERATIONAL IMPACT:
- PERIMETER ROAD CLOSED FROM 73RD STREET GATE TO FIRE STATION.

LEGEND:

- PHASE 3 WORK AREA (BID ALTERNATE 2)
- GATE GUARD REQUIRED
- XXXXXX CONTRACTOR PROVIDED LOW-PROFILE BARRICADES, SEE DETAIL 1/G-085
- CONTRACTOR HAUL ROUTE
- AIRPORT PROVIDED BARRICADE
- CONTRACTOR STAGING AREA

NOTE:
1. CONTRACTOR SHALL MEET TEMPORARY GRADING REQUIREMENTS WITHIN 65.5-FT OF ALL APRON CONNECTOR CENTERLINES AT CONCLUSION OF EACH WORK SHIFT. TEMPORARY GRADING REQUIREMES NO SLOPES GREATER THAN 5% AND NO VERTICAL DROP OFFS GREATER THAN 3-INCHES.

0 100 200

AOA ACCESS GATE. CONTRACTOR SHALL COORDINATE WITH AIRPORT OPERATIONS FOR AIRFIELD ACCESS.

GATE GUARD MUST BE PROVIDED DURING ALL HAULING OPERATIONS

CONTRACTOR STAGING AREA

73RD ST

REDFIELD RD

CONTRACTOR SHALL REMAIN CLEAR OF RUNWAY 3-21 SAFETY AREA AT ALL TIMES DURING CONSTRUCTION

CONTRACTOR SHALL REMAIN CLEAR OF TAXIWAY B OBJECT FREE AREA AT ALL TIMES DURING CONSTRUCTION

RSA

TOFA

TWY A1

TWY A2

TWY A3

RWY 3-21

TWY B1

TWY B3

CONTRACTOR SHALL PLACE BARRICADES ACROSS APRON CONNECTORS AT THE END OF EACH WORK SHIFT, TYP. SEE DETAIL 1/G-085 SEE NOTE 1

200'

65.5' TYP.

MATCH LINE SEE BELOW

GATE GUARD MUST BE PROVIDED DURING ALL HAULING OPERATIONS

CONTRACTOR HAUL ROUTE

AOA AIRCRAFT ACCESS GATE 3. CONTRACTOR SHALL COORDINATE WITH AIRPORT OPERATIONS FOR AIRFIELD ACCESS.

CONTRACTOR SHALL REMAIN CLEAR OF TAXIWAY B OBJECT FREE AREA AT ALL TIMES DURING CONSTRUCTION

MATCH LINE SEE ABOVE

TWY B5

TWY B6

TWY B7

RWY 3-21

200'

TWY B

115'

65.5' TYP.

32.5'

CONTRACTOR SHALL PLACE BARRICADES ACROSS APRON CONNECTORS AT THE END OF EACH WORK SHIFT, TYP.

AOA ACCESS GATE. CONTRACTOR SHALL COORDINATE WITH AIRPORT OPERATIONS FOR AIRFIELD ACCESS.

ARFF STATION

CONTRACTOR HAUL ROUTE

Mead & Hunt

Mead and Hunt, Inc.
8800 E Raintree Dr, Ste 285
Scottsdale, AZ 85260
phone: 480-718-1896
meadhunt.com

SCOTTSDALE AIRPORT
PERIMETER ROAD REHABILITATION

15000 N AIRPORT DRIVE
SCOTTSDALE, AZ 85260

ISSUED

CONSTRUCTION DOCUMENTS

ADOT NO.:	E2S4Y01C
M&H NO.:	2886300-220408.01
DATE:	SEPTEMBER 2022
DESIGNED BY:	BJM
DRAWN BY:	SKN
CHECKED BY:	DPS

DO NOT SCALE DRAWINGS

SHEET CONTENTS

CONSTRUCTION SAFETY AND PHASING PLAN PHASE 3 - BID ALTERNATE 2

SHEET NO. 9 of 26

G-084

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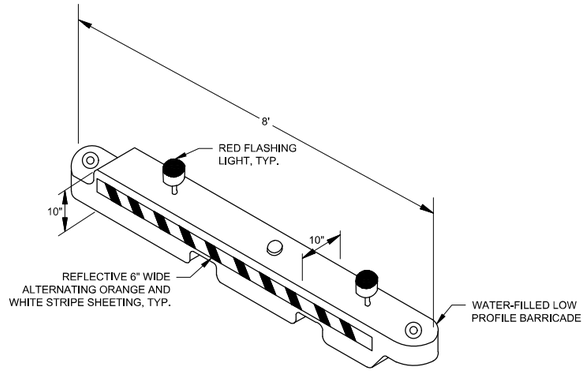

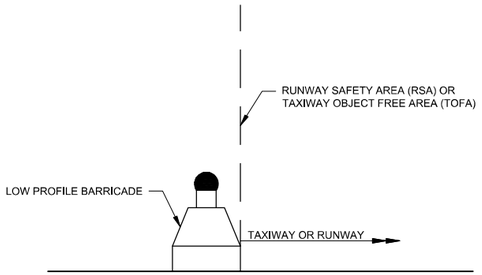

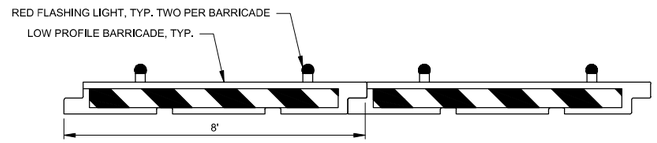

CONTINUOUSLY LINKED BARRICADES

LOW PROFILE BARRICADE NOTES:

1. CONTRACTOR SHALL DETERMINE THE NUMBER OF LOW PROFILE BARRICADES AND LIGHTS REQUIRED TO COMPLETE THE PROJECT BASED ON THE PHASING REQUIREMENTS SHOWN ON THESE PLANS.
2. INSTALL LOW PROFILE BARRICADES WHERE INDICATED ON PLANS OR AS INSTRUCTED BY THE RPR OR AIRPORT OPERATIONS.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PLACING, MOVING, LIGHTING, AND MAINTAINING THE BARRICADES DURING THE ENTIRE PROJECT.
4. BARRICADES SHALL BE FILLED WITH WATER AT ALL TIMES DURING CONSTRUCTION AND WEIGHTED AGAINST JET BLAST.
5. INSTALL SOLAR/BATTERY POWERED LIGHTS EQUALLY SPACED PER EACH BARRICADE AS SHOWN ON THESE PLANS. LIGHTS SHALL MAINTAIN SUCH INTENSITY SO AS TO BE READILY IDENTIFIED FROM DISTANCES OF 200' OR GREATER DURING PERIODS OF DARKNESS.
6. FOR TAXIWAY CLOSURES, BARRICADES SHALL BE PLACED ACROSS ENTIRE TAXIWAY PAVEMENT INCLUDING PAVED SHOULDERS. (IF PRESENT)

1 **LOW PROFILE BARRICADE**
NO SCALE

Mead & Hunt

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8800 E Raintree Dr, Ste 285
Scottsdale, AZ 85260
phone: 480-718-1896
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ADOT NO.: E2S4Y01C
M&H NO.: 2886300-220408.01
DATE: SEPTEMBER 2022
DESIGNED BY: BJM
DRAWN BY: SKN
CHECKED BY: DPS
DO NOT SCALE DRAWINGS

SHEET CONTENTS
CONSTRUCTION SAFETY AND PHASING DETAILS

SHEET NO. 10 of 26

G-085

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ATTACHMENT 2

DAILY SAFETY INSPECTION CHECKLIST

(for Contractor's use)

CONSTRUCTION PROJECT DAILY SAFETY INSPECTION CHECKLIST

The situations identified below are potentially hazardous conditions that may occur during airport construction projects. Safety area encroachments, unauthorized and improper ground vehicle operations, and unmarked or uncovered holes and trenches near aircraft operating surfaces pose the most prevalent threats to airport operational safety during airport construction projects. The list below is one tool that the airport operator or contractor may use to aid in identifying and correcting potentially hazardous conditions. It should be customized as appropriate for each project.

Potentially Hazardous Conditions

Item	Action Required	or	None
Excavation adjacent to runways, taxiways, and aprons improperly backfilled.			☐
Mounds of earth, construction materials, temporary structures, and other obstacles near any open runway, taxiway, or taxi lane; in the related Object Free area and aircraft approach or departure areas/zones; or obstructing any sign or marking.			☐
Runway resurfacing projects resulting in lips exceeding 3 in (7.6 cm) from pavement edges and ends.			☐
Heavy equipment (stationary or mobile) operating or idle near AOA, in runway approaches and departures areas, or in OFZ.			☐
Equipment or material near NAV AIDs that may degrade or impair radiated signals and/or the monitoring of navigation and visual aids. Unauthorized or improper vehicle operations in localizer or glide slope critical areas, resulting in electronic interference and/or facility shutdown.			☐
Tall and especially relatively low visibility units (that is, equipment with slim profiles) – cranes, drills, and similar objects – located in critical areas, such as OFZ and approach zones.			☐
Improperly positioned or malfunctioning lights or unlighted airport hazards, such as holes or excavations, on any apron, open taxiway, or open taxi lane or in a related safety, approach, or departure area.			☐
Obstacles, loose pavement, trash, and other debris on or near AOA. Construction debris (gravel, sand, mud, paving materials) on airport pavements may result in aircraft propeller, turbine engine, or tire damage. Also, loose materials may blow about, potentially causing personal injury or equipment damage.			☐

Item	Action Required	or	None
Inappropriate or poorly maintained fencing during construction intended to deter human and animal intrusions into the AOA. Fencing and other markings that are inadequate to separate construction areas from open AOA create aviation hazards.			☐
Improper or inadequate marking or lighting of runways (especially thresholds that have been displaced or runways that have been closed) and taxiways that could cause pilot confusion and provide a potential for a runway incursion. Inadequate or improper methods of marking, barricading, and lighting of temporarily closed portions of AOA create aviation hazards.			☐
Wildlife attractants – such as trash (food scraps not collected from construction personnel activity), grass seeds, tall grass, or standing water – on or near airports.			☐
Obliterated or faded temporary markings on active operational areas.			☐
Misleading or malfunctioning obstruction lights. Unlighted or unmarked obstructions in the approach to any open runway pose aviation hazards.			☐
Failure to issue, update, or cancel NOT AMs about airport or runway closures or other construction related airport conditions.			☐
Failure to mark and identify utilities or power cables. Damage to utilities and power cables during construction activity can result in the loss of runway / taxiway lighting; loss of navigation, visual, or approach aids; disruption of weather reporting services; and/or loss of communications.			☐
Restrictions on ARFF access from fire stations to the runway / taxiway system or airport building.			☐
Lack of radio communications with construction vehicles in airport movement areas.			☐
Objects, regardless of whether they are marked or flagged, or activities anywhere on or near an airport that could be distracting, confusing, or alarming to pilots during aircraft operations.			☐
Water, snow, dirt, debris, or other contaminants that temporarily obscure or derogate the visibility of runway/taxiway marking, lighting, and pavement edges. Any condition or factor that obscures or diminishes the visibility of areas under construction.			☐
Spillage from vehicles (gasoline, diesel fuel, oil) on active pavement areas, such as runways, taxiways, aprons, and airport roadways.			☐

Item	Action Required	or	None
Failure to maintain drainage system integrity during construction (for example, no temporary drainage provided when working on a drainage system).			☐
Failure to provide for proper electrical lockout and tagging procedures. At larger airports with multiple maintenance shifts/workers, construction contractors should make provisions for coordinating work on circuits.			☐
Failure to control dust. Consider limiting the amount of area from which the contractor is allowed to strip turf.			☐
Exposed wiring that creates an electrocution or fire ignition hazard. Identify and secure wiring, and place it in conduit or bury it.			☐
Site burning, which can cause possible obscuration.			☐
Construction work taking place outside designated work areas and out of phase.			☐

ATTACHMENT 3

AIRPORT SPECIAL INSPECTION SHEET

(for Airport's use)

Log Entered | Entered By

Event Date/Time | Days Open

SDL SPECIAL INSPECTION - POST CONSTRUCTION

SPECIAL INSPECTION - POST CONSTRUCTION

(complete prior to reopening a portion of the air operations area)

Date of Inspection:

Time of Inspection:

Enter Satisfactory, Unsatisfactory, Corrected or Not Applicable

Pavement

F.O.D.

Other Deficiencies

Other

Markings

Retroreflectivity

Daytime Visibilty

Safety Areas

Ruts/Humps

Pavement Edges

Sign/Light Base Edges

Stockpiles

Barricades (removed)

Location of Deficiency/Actions Taken: