

TECHNICAL PROVISIONS

for

**010 MA 149 F0072 01C
PHOENIX-CASA GRANDE HIGHWAY (I-10)
I-17 (SPLIT) TO SR 202L (SANTAN)**

between



ARIZONA DEPARTMENT OF TRANSPORTATION

and

**Pulice Construction, Inc., FNF Construction, Inc., and
Flatiron Constructors, Inc., A Joint Venture**

Dated as of: January 5, 2021

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Division I, General Provisions

100 GENERAL

100.01 Requirements

Developer shall perform all Work set forth in the Technical Provisions (TPs). Headings and captions in the TPs are subject to Sections 1.3.3 and 24.17 of the Agreement and are for convenience only. Such headings and captions shall not in any manner be construed to limit Developer's responsibilities hereunder. As an example, certain construction requirements may be included under "design" sections, and vice-versa. In either case, such requirements shall apply to both the design and construction of the Project.

Developer shall perform all Work in compliance with the requirements of Section 100 of the TPs.

100.02 Compatibility

The Project must meet the intent of the recommended improvements as described in the approved NEPA document and these Technical Provisions.

When seeking review of the Design Documents and Plans, Developer shall demonstrate that the Project design does not add construction cost to implementing the following future I-10 improvements and does not require additional infrastructure:

A. MAG SPINE Corridor Master Plan Components

1. Baseline Road Improvements
2. Baseline Road to Elliot Road Collector-Distributor
3. I-10/I-17 Split Interchange Improvements

B. ADOT I-17 Near-Term Auxiliary Lane Study

The Schematic Design, subject to Section 6.4.2 of the Agreement, and requirements of the Technical Provisions are to be considered Compatible with these future improvements. The noise barriers south of Baseline Road shall be designed and constructed as described in the TPs.

100.03 References

100.03.01 Applicable Standards

Developer shall design and construct the Project in accordance with the Contract Documents, Good Industry Practice, and Occupational Safety & Health Administration requirements and in compliance with all Laws. Developer shall design and construct in accordance with ADOT standards, manuals, and guidelines, unless otherwise specified in the Contract Documents. For elements outside ADOT maintenance limits, Developer shall design and construct in accordance with the applicable Governmental Entity or third-party standards, manuals, and guidelines of the maintaining entity, unless otherwise specified in the Contract Documents. Applications for Deviations shall be in accordance with Section 6.2.4 of the Agreement.

Developer shall use the most current version of each standard, manual, and guideline as of the Setting Date, unless otherwise specified in the Contract Documents. If the standard, manual, or guideline is superseded, expires, or revisions are issued during the Project, Developer shall contact ADOT to determine whether to continue to use the current, revised, or replaced standard, manual, or guideline identified by ADOT. If Developer becomes aware of any ambiguities or conflicts relating in any way to the standards, manuals, or guidelines, Developer shall immediately notify ADOT. Refer to Section 1.2 of the Agreement for Contract Documents; Order of Precedence. If there is any unresolved ambiguity in the applicable standards, Developer shall obtain clarification from ADOT before proceeding with design, or construction.

All references to “as-built” and “as-built drawings” in the ADOT standards, manuals, and guidelines shall be defined as Record Drawings. If ADOT issues a safety change to the applicable standards, Developer shall immediately contact ADOT for direction and shall obtain ADOT’s approval of Developer’s proposed course of action prior to implementing such change.

100.03.02 Basis of Design Report

Developer shall prepare a Basis of Design Report for the Project that includes, at a minimum, the following:

- A. Cover sheet;
- B. Table of contents;
- C. A summary of specific methodologies, manuals, or references that Developer proposes to use for the analysis and design of the Project for each technical discipline outlined in the TPs;
- D. A summary of all anticipated software and the applications for each proposed software for the design and analysis of the Work;
- E. A summary of specific methodologies, manuals, or references that Developer proposes to use to construct the Project; and
- F. All other items as required by the Contract Documents.

Within 20 Business Days of NTP 1, Developer shall submit the Basis of Design Report to ADOT. Developer shall immediately amend and prepare an updated Basis of Design Report, as required to identify new methodologies, manuals, and references that are added to the Project. When the Basis of Design Report or revised versions of the Basis of Design Report are amended, Developer shall submit an updated Basis of Design Report to ADOT. Plans will not be reviewed prior to the Basis of Design Report approval. ADOT may elect to reject a Design Submittal when the Basis of Design Report update has not been approved.

100.03.03 Reference Information Documents

ADOT and Governmental Entities have undertaken planning and preliminary concept work concerning the Project development, which is included in the Reference Information Documents (RIDs). Except as expressly provided elsewhere in the Contract Documents, the RIDs are not Contract Documents.

1 **100.04 Work Performed by Developer**

2 Developer shall:

- 3 A. Manage, plan, execute, and control all aspects of the Work;
- 4 B. Coordinate its activities with Governmental Entities and other Persons that are directly or
5 indirectly impacted by the Work; and
- 6 C. Document and report all Work in accordance with the Contract Documents, applicable
7 Governmental Entities' requirements, and Good Industry Practice.

8 **100.04.01 Basic Configuration**

9 The Basic Configuration is the Project elements referenced in the Contract Documents including
10 dimensions, details, access requirements, criteria, restrictions, and the following roadway and bridge
11 features:

- 12 A. Number and types of mainline lanes, including;
- 13 1. 3 continuous general purpose lanes from I-17 SB to I-10 EB at the I-10/I-17 system
14 interchange;
- 15 2. 6 general purpose lanes and 1 HOV lane on I-10 EB and I-10 WB at 24th Street;
- 16 3. 6 general purpose lanes and 2 HOV lanes on I-10 EB between 24th Street and the I-10/US
17 60 system interchange, with 1 auxiliary lane between 24th street and 48th Street/Broadway
18 Road/SR 143 interchange; and on I-10 WB with 1 auxiliary lane between 24th Street and
19 32nd Street and between 40th Street and the I-10/US 60 system interchange;
- 20 4. 7 general purpose lanes, 2 HOV lanes, and 1 auxiliary lane on I-10 WB between 32nd
21 Street and 40th Street
- 22 5. 3 general purpose lanes and 1 HOV lane on I-10 EB and WB through the I-10/US 60
23 system interchange;
- 24 6. 5 general purpose lanes, 1 HOV lane and 1 auxiliary lane on I-10 EB between Baseline
25 Road and Elliot Road and on I-10 WB between Baseline Road and Guadalupe Road;
- 26 7. 5 general purpose lane and 1 HOV lane on I-10 WB between Guadalupe Road and Elliot
27 Road;
- 28 8. 4 general purpose lanes, 1 HOV lane and 1 auxiliary lane on I-10 EB and WB between
29 Elliot Road and Ray Road;
- 30 9. 3 general purpose lanes, 1 HOV lane, and 2 auxiliary lanes on US 60 WB between I-10
31 and Hardy Drive;
- 32 10. 5 general purpose lanes, 1 HOV lane, and 1 auxiliary lane on US 60 EB between I-10 and
33 Hardy Drive;

11. 3 general purpose lanes and 1 auxiliary lane on SR 143 NB and SB.
- B. Number and types of Collector-Distributor (C-D), ramp, and crossroad lanes as shown in the Schematic Design included in the RIDs and subject to Section 6.4.2 of the Agreement;
- C. Number of entrance and exit ramps at interchanges as shown in the Schematic Design included in the RIDs and subject to Section 6.4.2 of the Agreement;
- D. Free-flow, access controlled, WB C-D road that;
 1. Parallels I-10, beginning at the I-10 WB exit over Baseline Road and terminating at the tie in with I-10 WB adjacent to the 40th Street WB exit ramp;
 2. Provides access to US 60 EB, Broadway Road/52nd Street intersection, SR 143 NB, University Drive, 40th Street, and I-10 WB;
 3. Receives traffic from I-10 WB, Baseline Road, US 60 WB, SR 143 SB, and University Drive.
- E. Free-flow, access controlled, EB C-D road that;
 1. Parallels I-10, beginning as a direct connector from SR 143 SB and terminating at the tie in with I-10 EB just south of Western Canal;
 2. Provides access to US 60 EB, I-10 EB, and Baseline Road;
 3. Receives traffic from SR 143 SB and Broadway Road.
- F. DHOV from I-10 WB to SR 143 NB and from SR 143 SB to I-10 EB, 1 lane in each direction;
- G. New bridges crossing I-10 for the northbound 48th Street, southbound 48th Street, and Broadway Road movements;
- H. Location of pedestrian crossing widening of structure at Guadalupe Road and I-10;
- I. Type, size, and location of I-10 and Alameda Drive Pedestrian Bridge UP (Bridge 70) and ramps (see TP Attachment 600-5); and
- J. Approximate location of pedestrian crossing bridge of I-10 at Western Canal.

All elements of the Project, whether listed above or not, shall be per the TPs.

100.04.02 Coordination of the Work

Developer shall coordinate the Work with all development planning, design, and construction projects that may impact the Project. Developer shall monitor and coordinate Work with such projects, whether administered by ADOT or a Governmental Entity, community groups, landowners, Utility Companies, Utility Companies' consultants or contractors, resource agencies, environmental groups, or any other

Person. Developer shall be aware of the impact all such work may have on the Project and shall account for all such impacts in the Design Documents and Construction Documents.

Developer shall identify and examine features of any work for each project that may impact the Project and shall demonstrate full compatibility in horizontal and vertical alignment and other pertinent technical data between the Work and the work of such project(s). The Design Documents shall resolve any inconsistencies or design conflicts between the Design Work and the work of such project(s).

Developer shall provide Project documents, including CAD files, to outside entities and Governmental Entities as directed by ADOT.

100.04.03 Future Projects

It is anticipated that work by other contractors on the projects listed in Table 100-1 may be in progress adjacent to or within the Site during progress of the Work. The anticipated future projects shown in Table 100-1 are nonexclusive and may be incomplete. During the design and construction of the Project, Developer shall actively and aggressively pursue and implement measures to facilitate the overall construction and maintenance of traffic of the Project in coordination with Adjacent Work.

Developer shall prepare a Future Projects List that includes the projects in Table 100-1, any other projects that may impact the Project, and the project status. The Future Projects List shall be discussed, updated, and maintained as part of the Project Specific Transportation System Management Meeting requirements as identified in Section 108.03.04 of the TPs. The Future Projects List shall be updated and submitted to ADOT quarterly through Final Acceptance.

Table 100-1 Future Projects
City of Tempe - Alameda Street Scape
Town of Guadalupe - Avenida Del Yaqui (Road Improvements)
City of Phoenix - Sewer Pump Station Expansion, Ray Road
ADOT - South Mountain Capital Improvement

Developer shall immediately notify ADOT of Future Projects that impact the Work. Developer shall identify design, maintenance of traffic, construction, material, and schedule impacts of any potential changes given the timing of Future Project. Changes caused by Future Projects may result in an ADOT-Directed Change.

100.05 Third-Party Agreements

100.05.01 General Requirements

Developer shall perform all Third-Party Agreement Work delegated to Developer in compliance with the requirements of Section 100.05 of the TPs.

100.05.02 Administrative Requirements

Third-Party Agreements are listed in Table 100-2 and included in the RIDs.

Table 100-2 Third-Party Agreements				
IGA/JPA No.	Entity	Project	IGA Description	Developer Responsibility
18-0006976-1	City of Phoenix	Master Roadway Maintenance Agreement	Maintenance responsibility between City of Phoenix and ADOT in city ROW	Complete Maintenance During Construction as specified in <u>TP Attachment 105-1</u>
2012-0641	City of Phoenix	Rio Salado Pathway	City to design, construct, and maintain a pathway along the Salt River	Restore the pathway to existing conditions should there be any Developer construction impacts
DRAFT 19-007450	City of Phoenix	Project Specific Agreement	Temporary Right of Entry into City of Phoenix ROW, Crossroad maintenance limits and responsibilities, and limits of abandonment from ADOT to City of Phoenix after completion of the Project	Complete Maintenance During Construction as specified in <u>TP Attachment 105-1</u>
DRAFT 20-0007679-1	City of Phoenix	Project Specific Agreement	Water & sewer inspection costs	Meet the requirements specified in <u>TP Attachment 107-2</u> and <u>Section 5.4.4.10 of the Agreement</u>
1989-160	City of Tempe	Traffic Signal and Lighting (Various Locations)	Maintenance responsibility between City of Tempe and ADOT in city ROW	Meet the requirements of <u>Section 700.01.03.04</u> and <u>700.01.03.05 of the TPs</u>
1993-043	City of Tempe	Master Roadway Maintenance	Maintenance responsibility between City of Tempe and ADOT in city ROW	Complete Maintenance During Construction as specified in <u>TP Attachment 105-1</u>

Table 100-2 Third-Party Agreements				
IGA/JPA No.	Entity	Project	IGA Description	Developer Responsibility
DRAFT 19-0007451	City of Tempe	Project Specific Agreement	Design and construction of pedestrian bridge aesthetics developed concepts at Alameda and Western Canal pedestrian bridges	Meet the requirements of <u>Section 100.05.03 of the TPs</u>
DRAFT 19-0007455	City of Tempe	Project Specific Agreement	Temporary Right of Entry into City of Tempe ROW and limits of abandonment from ADOT to City of Tempe after completion of the Project	Complete Maintenance During Construction as specified in <u>TP Attachment 105-1</u>
DRAFT 19-0007456	City of Tempe	Project Specific Agreement	Definition of post Project maintenance responsibilities between ADOT and City of Tempe	Complete Maintenance During Construction as specified in <u>TP Attachment 105-1</u>
1988-02	City of Phoenix City of Tempe FCDMC SRP	Tempe Drain	Design, construction, ROW, maintenance, flow allocations, and funding	Meet the requirements of <u>Section 500.03.06.03 of the TPs</u>
20-0007816-1 (Executed)	FCDMC	Tempe Drain	Design and construction of vegetation removal and concrete channel lining within the FCDMC maintenance area	Meet the requirements of <u>Section 500.03.06.03 of the TPs</u>

1 **100.05.03 City of Tempe Pedestrian Bridges Aesthetic Coordination**

2 Developer shall incorporate aesthetic components for the Alameda and Western Canal pedestrian
3 bridges per the information provided in TP Attachment 800-1. Structural components of the pedestrian
4 bridges, including these aesthetic components, shall be per Section 600 of the TPs. Materials, conceptual
5 design, colors, mounting details, and other specific information provided in TP Attachment 800-1 shall
6 not be modified without prior approval of City of Tempe. Other aesthetic elements not covered in this
7 attachment shall be per Section 800 of the TPs. Developer shall coordinate and finalize details for the
8 design, fabrication, and installation of the aesthetic concept with the City of Tempe. Developer shall

submit all pedestrian bridge plans and related aesthetic plans to the City of Tempe for review and approval.

100.06 Submittals

Table 100-3 reflects a nonexclusive list of Submittals identified in Sections 100.03 and 100.04 of the TPs and is not intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 100-3 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronics		
Basis of Design Report	3	0	1	Within 20 Business Days of NTP 1	100.03.02
Updated Basis of Design Report	3	0	1	When the Basis of Design Report or subsequent updates are amended	100.03.02
Future Projects List	5	0	1	Quarterly	100.04.03
*Levels of Review					
1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement)					
2. Good faith discretion approval (Section 3.1.3.2 of the Agreement)					
3. Reasonableness approval (Section 3.1.4.1 of the Agreement)					
4. Review and comment (Section 3.1.5 of the Agreement)					
5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

101 DEFINITIONS AND TERMS

Exhibit 1 to the Agreement contains the defined terms and acronyms used in the Contract Documents. Defined terms not defined in Exhibit 1 to the Agreement or otherwise herein shall have the meaning provided in Section 101 of the ADOT Standard Specifications and Stored Specifications 101ABRV and 101DEFN.

104 SCOPE OF WORK

104.08 Prevention of Air and Noise Pollution

Developer shall be responsible for the requirements in the ADOT Standard Specifications and Stored Specification 104MTBRN.

104.09 Prevention of Landscape Defacement; Protection of Streams, Lakes, and Reservoirs

104.09.01 General

Developer shall give attention to the effect of Developer's operations upon the landscape and shall take care to maintain natural surroundings undamaged.

Developer shall be responsible to implement the requirements of the Arizona Pollutant Discharge Elimination System (AZPDES) for erosion and sediment control as specified in the "General Permit For Discharge From Construction Activities To the Waters Of The United States," issued by the Arizona Department of Environmental Quality (ADEQ). That document is hereinafter referred to as the AZPDES *General Permit*.

Useful information related to stormwater controls and erosion and sediment control measures is presented in the *Fact Sheet For The Issuance Of An AZPDES Construction General Permit*, available from ADEQ, and ADOT's *Erosion and Pollution Control Manual*, available on the Department's website at <https://azdot.gov/node/5373>.

The Work shall include providing, installing, maintaining, removing, and disposing of erosion and sediment control measures such as gravel filter berms, dikes, catch basin inlet protection, end-of-pipe filtering devices, silt fences, dams, sediment basins, earth berms, netting, geotextile fabrics, slope drains, seeding, stream stabilization, and other erosion and sediment control devices or methods. Erosion control, as hereinafter referenced, shall be deemed to include control of erosion and the mitigation of any resulting sediment. Erosion control measures may be temporary or permanent. Developer shall also be responsible for the preparation and processing of all documents required in the AZPDES *General Permit*.

The Plans shall include preliminary erosion control measures and additional information to be included in the Project's Storm Water Pollution Prevention Plan (SWPPP), as specified in Section 104.09.02 of the TPs. Developer, with input from ADOT, shall finalize the SWPPP, file a Notice of Intent (NOI), implement the SWPPP, and file a Notice of Termination (NOT), all as described herein.

Except for the NOI, all signatures required of Developer by the AZPDES *General Permit*, including those required for the NOT, SWPPP, and inspection reports, shall be provided by a duly authorized representative of Developer, 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 AZPDES *General Permit*.

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 reviewed and approved by ADEQ, the NOI completed and filed in accordance with Section 104.09.03 of the TPs, and the SWPPP implemented.

Submission of Developer's NOI shall certify that Developer and its Subcontractors have read and will comply with all provisions of the AZPDES *General Permit*.

Developer may elect to prepare and process all documents for a separate SWPPP specific to geotechnical explorations for design that is in accordance with Section 104.09.02 of the TPs. The Project's SWPPP shall supersede and incorporate all remaining geotechnical explorations for design.

104.09.02 Stormwater Pollution Prevention Plan (SWPPP)

The SWPPP shall include descriptions of temporary and permanent erosion control measures; a Project description; percent impervious area, including paved areas, rooftops, and other similar surfaces, for both pre-construction and post-construction conditions; inspection schedule; 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 SWPPP shall also include an initial schedule detailing the proposed sequence of construction and related erosion control measures.

Developer shall review the preliminary information, including the erosion control features and phasing, evaluate all SWPPP requirements for adequacy in addressing pollution prevention during construction, and prepare a draft SWPPP for review by ADOT.

Developer shall designate an Erosion Control Coordinator (ECC), in accordance with Section 114.03.07 of the TPs, to be responsible for finalization and implementation of the SWPPP, as well as all other applicable requirements of the AZPDES *General Permit*. Developer's ECC must be approved as specified in Section 114.03.07 of the TPs before the draft SWPPP can be finalized and submitted to ADOT. After approval, Developer shall designate the ECC as an authorized representative of Developer in accordance with Part VIII.J.2 of the AZPDES *General Permit*.

The draft SWPPP shall include all information required in the AZPDES *General Permit*, including a site map; identification of receiving waters and wetlands impacted by the Project; a list of potential pollutant sources; inspection schedule; 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 Developer's pollution prevention practices; and other permit requirements stipulated in the AZPDES program as well as other applicable state or local programs. Developer shall coordinate with ADOT on all such additional information.

The draft SWPPP shall identify any potential for discharge into a municipal separate storm sewer system (MS4), including the name of the owner/operator of the system. Developer shall also comply with the requirements of Section 119.03.08 of the TPs.

Unless otherwise approved by ADOT, Developer shall not expose a surface area of greater than 750,000 square feet to erosion through clearing and grubbing, or excavation and filling operations within the Project Limits until temporary or permanent erosion control devices for that portion of the Project have been installed and accepted by the IQF.

Developer shall indicate each 750,000 square foot sub-area in the draft SWPPP, along with proposed erosion control measures for each sub-area. The draft SWPPP shall also include the sequence of construction for each sub-area, and installation of the required temporary or permanent erosion control measures.

Developer 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 AZPDES *General Permit* and approved by ADOT, Developer shall install erosion control measures no later than 14 Days after construction activity has temporarily or permanently ceased for the affected sub-area.

Temporary or permanent sedimentation basins may be required for reducing or eliminating sediment from stormwater runoff. When required, such basins shall be completed before any clearing and grubbing of the site is initiated. Developer shall evaluate the need and attainability of installing sediment basins as described in the AZPDES permit and include the basins into the draft SWPPP as appropriate. The draft SWPPP shall also include sediment basins as part of the preliminary information.

The draft SWPPP shall also identify and address erosion control at on-site fueling operations, waste piles, material storage sites, and off-site dedicated asphalt and concrete plants, Developer-use areas, storage areas, and support activity locations which are used solely for the Project and are covered by the AZPDES *General Permit*. The draft SWPPP shall also accommodate all requirements for Developer's pollution prevention practices specified in Section 104.09.05 of the TPs. In addition, the draft SWPPP shall specifically identify the erosion control measures proposed by Developer during any vegetation removal and salvaging phases of the Project.

1 The draft SWPPP shall specify the mechanism whereby revisions may be proposed by Developer or
2 ADOT throughout the Project and incorporated into the SWPPP, including review and approval
3 procedure. ADOT and Developer shall jointly approve and sign each revision to the SWPPP before
4 implementation. Any subsequent submittals required by Developer to revise or update the SWPPP will
5 require 10 days for review.

6 Developer and Subcontractors responsible for implementing all or portions of the SWPPP shall be listed
7 in the draft SWPPP, along with the measures for which they are responsible.

8 Developer shall submit two copies of the draft SWPPP, including all information specified herein, to ADOT
9 in accordance with Section 110 of the TPs, but not later than 14 Days from the Department's approval of
10 Developer's ECC.

11 Notice of Intent and Notice of Termination blank forms are available on the internet at
12 <https://azdeq.gov/node/2964>.

13 Within 10 Business Days from the SWPPP submittal, ADOT and Developer will jointly review Developer's
14 draft SWPPP, and Developer will include any additional revisions directed by ADOT. The finalized
15 SWPPP shall meet the terms and conditions of the AZDPES *General Permit* and be compatible with
16 construction sequencing and maintenance of traffic plans.

17 When agreement has been reached, ADOT and Developer's authorized representative will sign the
18 finalized SWPPP. ADOT's signature will constitute approval of the SWPPP. Upon approval of the
19 SWPPP, Developer shall file a Notice of Intent (NOI) as specified in Section 104.09.03 of the TPs.

20 After the time period specified in Section 104.09.03 of the TPs, Developer shall implement the
21 requirements of the SWPPP. No clearing, grubbing, earthwork, or other work elements affected by the
22 erosion control requirements in the SWPPP, shall be started until the SWPPP has been approved, the
23 NOIs completed and filed in accordance with Section 104.09.03 of the TPs, and the SWPPP
24 implemented.

25 Developer shall maintain all related erosion control elements in proper working order throughout the
26 Project. Work under this section also includes inspections, record-keeping, and implementation of
27 pollution prevention practices as described in Section 104.09.05 of the TPs.

28 The approved SWPPP shall be updated whenever a change in design, construction method, operation,
29 maintenance procedure, or other activity may cause a significant effect on the discharge of pollutants to
30 surface waters, or when a change is proposed to the personnel responsible for implementing any portion
31 of the SWPPP. The SWPPP shall also be amended if inspections indicate that the SWPPP is ineffective
32 in eliminating or significantly reducing pollutants in the discharges from the construction site. All
33 necessary modifications to the SWPPP shall be made within 7 Days following the inspection that revealed
34 the deficiency.

35 ADEQ may notify Developer at any time that the SWPPP does not comply with the permit requirements.
36 Developer shall immediately notify ADOT of any such ADEQ notifications. The notification will identify
37 the provisions of the permit that are not being met and parts of the SWPPP that require modification.
38 Within 15 Business Days of receipt of the notification from ADEQ, Developer shall make the required
39 changes to the SWPPP and submit a written certification to ADEQ that the requested changes have been
40 made.

Developer's ECC shall maintain the SWPPP along with completed inspection forms and other AZPDES records in a three-ring binder. The ECC shall maintain a current copy of the SWPPP, including all associated records and forms, at the job site from the time construction begins until completion of the Project. The SWPPP shall be available for inspection by ADEQ, FHWA, and other entities identified in the AZPDES *General Permit*, and for use by IQF and ADOT. The ECC shall provide copies of all such documents to IQF and ADOT upon request. When requested, such copies shall be provided within 3 Days of the request.

The SWPPP (including inspection forms) and all data used to complete the NOI and NOT shall be provided to the Department at the completion of the Project. Developer shall retain its own records for a period of at least three years from the filing of Developer's NOT.

No condition of the AZPDES *General Permit* or the SWPPP shall release Developer from any responsibilities or requirements under other environmental statutes or regulations.

104.09.03 Notice of Intent (NOI)

After the Project SWPPP has been approved, Developer shall complete a NOI form for the Project. The NOI includes a certification statement which must be signed and dated by a responsible corporate officer of Developer, as defined in Part VIII.J.1 of the AZPDES *General Permit*, and include the name and title of that officer.

The NOIs shall be submitted to the Arizona Department of Environmental Quality (ADEQ) at the following address:

Arizona Department of Environmental Quality
Surface Water Section/Permits Unit/Stormwater NOIs (5415A-1)
1110 W. Washington Street
Phoenix, Arizona 85007
or fax to (602) 771-4528

The submittals shall be made to allow for the 7-Day review period required by ADEQ before the anticipated start of construction. Developer shall also allow sufficient time, depending on the manner of submittal, for the NOIs to be received by ADEQ before commencement of the 7-Day review period. An Authorization Certificate will be issued by ADEQ and, unless otherwise notified, the construction activities that are covered by the terms and conditions of the AZPDES permit may begin after the submittal period plus the 7-Day review period, or upon receipt of the Authorization Certificate, whichever occurs first. Developer shall provide a copy of the authorization certificate to IQF and ADOT, and keep a copy with the NOI.

The NOI may also be submitted electronically, through ADEQ's myDEQ website at <https://azdeq.gov/mydeq>. Regardless of the method of submittal, Developer shall provide a copy to IQF and ADOT within 2 days of submittal.

At any time after authorization, ADEQ may determine that Developer's stormwater discharges may cause or contribute to non-attainment of any applicable water quality standards. If ADEQ makes that determination, Developer will be notified in writing. Developer shall develop a supplemental erosion control action plan describing SWPPP modifications to address the identified water quality concerns. If the written notice from ADEQ requires a response, failure to respond in a timely manner constitutes a permit violation. All responses shall be in accordance with the AZPDES *General Permit*.

1 If there is a potential to discharge into a municipal separate storm sewer system (MS4), a copy of the
2 Authorization Certificate shall be submitted to the owner/operator of the system. Also, Developers
3 operating under an approved local sediment and erosion plan, grading plan, or stormwater management
4 plan shall submit a copy of the Authorization Certificate to the local authority upon their request.

5 Developer shall post its NOI and the information required in the AZPDES *General Permit* on the
6 construction-site bulletin board throughout the duration of the Project. A copy of the AZPDES *General*
7 *Permit* shall also be kept at the construction site at all times.

8 **104.09.04 Developer's Erosion and Pollution Control Coordinator**

9 Refer to Section 114.03.07 of the TPs for Erosion and Pollution Control Coordinator requirements.

10 **104.09.05 Pollution Prevention Practices and Requirements**

11 The SWPPP shall specify Developer's pollution prevention practices and requirements, including vehicle
12 wash-down areas, onsite and off-site tracking control, protection of equipment storage and maintenance
13 areas, methods to minimize generation of dust, and sweeping of highways and roadways related to
14 hauling activities. Developer shall show each planned location of service and refueling areas on the
15 SWPPP's site map. Changes to Developer's pollution prevention practices that are related to construction
16 phasing shall also be shown on the SWPPP.

17 Developer shall take aggressive actions, considering all conditions, to prevent pollution of streams, rivers,
18 lakes, and reservoirs with fuels, oil, bitumens, calcium chloride, fresh Portland cement, fresh Portland
19 cement concrete, raw sewage, muddy water, chemicals, or other harmful materials. None of these
20 materials shall be discharged into any channels leading to streams, rivers, lakes, or reservoirs. The
21 SWPPP shall include the implementation of spill prevention and material management controls and
22 practices to prevent the release of pollutants into stormwater. The SWPPP shall also provide storage
23 procedures for chemicals and construction materials; disposal procedures; cleanup procedures;
24 Developer's plans for handling such pollutants; and other pollution prevention measures as required.

25 Machinery service and refueling areas shall be located away from streambeds or washes, and in a
26 manner which prevents discharges into streams, rivers, or washes.

27 Waste materials from blasting, including explosives containers, shall be disposed of off-site in accordance
28 with applicable federal regulations. Other waste materials, such as used cans, oils, machine and
29 equipment parts, paint, hazardous materials, plastic and rubber parts, discarded metals, and building
30 materials, shall be removed from the construction site and disposed of according to applicable state and
31 federal regulations.

32 Where Developer's working area encroaches on a running or intermittent stream or river, barriers shall
33 be constructed and maintained between the working areas and the stream or river bed adequate to
34 prevent the discharge of any contaminants. The SWPPP shall identify the location of streams and rivers
35 that may be affected and the specific types of barriers proposed for protecting these resources.

36 Unless otherwise approved in writing by ADOT, fording of running streams or rivers with construction
37 equipment will not be permitted; therefore, temporary bridges or other structures shall be used whenever
38 an appreciable number of crossings is necessary.

39 Temporary bridges or other structures proposed by Developer shall be designed to accommodate the
40 ten-year storm event if to remain in place for up to a one-year period. If a structure is planned to remain

1 in place for longer than one year, the hydraulic conveyance may be subject to more stringent
2 requirements. Developer shall be responsible for all permits, authorizations, and environmental
3 clearances that may be necessary to approve the use of such structures. Developer shall submit the
4 design and all required documentation to ADOT for approval. Developer is advised that the review and
5 approval process for such structures could be lengthy. Developer shall be responsible for all costs
6 associated with the design and construction of such structures. Also, no increase in the Contract Price,
7 adjustment of a Completion Deadline, or other Claim will be allowed for any review and approval periods,
8 or for the time required to construct temporary bridges proposed by Developer.

9 Mechanical equipment shall not be operated in running streams or rivers.

10 Material which is to be stockpiled or disposed of off-site shall be in accordance with Section 107.11 of
11 the ADOT Standard Specifications.

12 Streams, lakes, rivers, and reservoirs shall be cleared of all falsework, piling, debris, or other obstructions
13 resulting from Developer's activities, inadvertently placed thereby, or resulting from construction
14 operations, within 24 hours from the time the obstruction was observed.

15 Spill prevention, containment, and counter-measures shall be included in the SWPPP if the volume of
16 fuel in a single container on the Site exceeds 660 gallons, or if the total fuel storage volume at one facility
17 exceeds 1,320 gallons.

18 In the event of a spill of a hazardous material, Developer shall follow the provisions of Section 107.07 of
19 the ADOT Standard Specifications. In addition, the ECC shall modify the SWPPP as necessary within 14
20 Days of the discharge. The SWPPP shall be modified to include a description of the release, the
21 circumstances leading to the release, and the date of the release.

22 Developer shall assist in any efforts to clean up hazardous material spills, as directed by ADOT or other
23 authorities. Soil contaminated from spills shall be disposed of in accordance with applicable state and
24 federal regulations.

25 **104.09.06 Inspections**

26 **104.09.06.01 General**

27 ADOT, IQF, and the ECC shall inspect the Project at least every 14 Days, and within 24 hours after any
28 storm event of 0.50 inches or more. The inspections shall include disturbed areas that have been
29 temporarily stabilized, areas used for storage of materials, locations where vehicles enter or exit the site,
30 and all of the erosion and sediment controls included in the SWPPP. Developer shall monitor rainfall on
31 the site with a commercially manufactured rain gauge accurate to within 0.10 inches of rain. Rainfall
32 records shall be submitted to IQF and ADOT on a weekly basis.

33 For each inspection, Developer's ECC shall complete and sign a Compliance Evaluation Report as
34 described in the permit. Copies of the completed reports shall be retained on-site in the SWPPP file
35 throughout the construction period. The ECC shall also provide a copy of the report to IQF and ADOT
36 following each inspection.

37 All inspections shall be made jointly with IQF, ADOT and the ECC.

104.09.06.02 Adjustments

When deficiencies are noted during scheduled inspections, Developer shall take immediate steps to make the required corrections as soon as practical. Deficiencies shall be fully corrected, to the satisfaction of IQF, within 4 Days or by the next anticipated storm event, whichever is sooner. Deficiencies noted between designated inspections shall be corrected no later than 4 Days after observation.

Direct inflows of sediment into a watercourse shall be corrected by the end of the same Day or work shift in which the inflow was observed.

In accordance with Section 104.09.07 of the TPs, failure to implement adjustments within the specified time periods may be cause for ADOT to reject Developer's ECC and issue a stop work order for the affected portions of the Project.

104.09.07 Non-Compliance

ADOT may remove Developer's ECC if ADOT determines in its good faith discretion that the conditions of the AZPDES *General Permit* or the approved SWPPP are not being fulfilled. Rejection of Developer's ECC shall be for failure to complete any of the following:

- A. Should ADOT determine that the SWPPP is not being properly implemented, Developer will be notified in writing of such deficiencies. Developer's ECC shall fully implement, to the satisfaction of ADOT, the requirements of the approved SWPPP within 4 Days.
- B. Should any corrective measures required in Section 104.09.06.02 of the TPs not be completed within the time periods specified therein, ADOT will notify Developer in writing. Developer's ECC shall complete all required corrective measures within 2 Days of such notification, except that direct inflows of sediment into a watercourse shall be corrected within 24 hours.
- C. Should ADOT determine that routine maintenance of the Project's erosion control measures is not being adequately performed, Developer will be notified in writing. Within 4 Days, Developer's ECC shall demonstrate, to the satisfaction of ADOT, that such steps have been taken to correct the problem.

In the event of the ECC's failure to comply with any of the above requirements, ADOT may direct Developer to stop all affected work and propose a new ECC as soon as possible. However, all erosion and pollution control items specified in the SWPPP shall be maintained at all times. ADOT may direct that no additional work on construction items affected by the SWPPP will be allowed until a new ECC has been approved by ADOT. Developer shall not be entitled to an increase in the Contract Price, adjustment of a Completion Deadline or any other Claim for any delays to the Work because of the failure of Developer's ECC to properly fulfill the requirements of the approved SWPPP.

104.09.08 Record of Major Construction and Erosion Control Measures:

In addition to the compliance evaluation report, Developer shall keep records of the major construction activities, including the erosion control measures associated with these activities. In particular, Developer shall keep a record of the following activities:

- A. The dates when major grading activities (including clearing and grubbing, excavation and embankment construction) occur in a particular area or portion of the site.

B. The dates when construction activities cease in an area, temporarily or permanently.

C. The dates when an area is stabilized, temporarily or permanently.

Such information shall be noted within 2 Days of the occurrence of any of the listed activities, and a copy of the report shall be included in the SWPPP. Developer shall also provide one copy of such records, and any subsequent up-dated information, to IQF and ADOT within 3 Days of completion or amendment of the report.

104.09.09 Notice of Termination (NOT)

Upon Final Acceptance, Developer shall complete and mail a Notice-of-Termination (NOT) for the Project to the address shown below. Developer shall submit a NOT which includes a certification statement signed and dated by an authorized representative of Developer, as defined in Part VIII.J.2 of the AZPDES *General Permit* and shall include the name and title of that authorized representative.

Arizona Department of Environmental Quality
Surface Water Section/Stormwater & General Permits (5415A-1)
1110 W. Washington Street
Phoenix, Arizona 85007
or fax to (602) 771-4528

The NOT may also be submitted electronically, through ADEQ's myDEQ website at <https://azdeq.gov/mydeq>. Regardless of the method of submittal, Developer shall provide a copy to IQF and ADOT.

Seeded areas shall be maintained for 45 Days and approved by ADOT before Developer's NOT can be submitted. Seeding will not be considered as part of any Landscaping Establishment Phase that may be included with the Project.

104.10 Developer's Responsibility for Work

Developer shall implement the requirements of the Arizona Pollutant Discharge Elimination System (AZPDES) for erosion control due to storm water runoff during construction, as specified above in Section 104.09 of the TPs.

Until Final Acceptance and obtaining final stabilization in accordance with the Arizona Pollution Discharge Elimination System (AZPDES) General Construction Permit, Developer shall have the charge and care thereof and shall take every precaution against injury or damage to any part thereof by the action of the elements, or from any other cause, whether arising from the execution or from the nonexecution of the Work. Developer shall rebuild, repair, restore and make good all injuries or damages to any portion of the Work occasioned by any of the above causes before Final Acceptance.

In case of suspension of work for any cause whatsoever, unless otherwise directed by ADOT, Developer shall be responsible for the Project and shall take such precautions as may be necessary to prevent damage to the Project and provide for normal drainage and shall erect any necessary temporary structures, signs, or other facilities without the right to an increase in the Contract Price, adjustment of a Completion Deadline or any other Claim. During such period of suspension of Work, Developer shall properly and continuously maintain in an acceptable growing condition all living material in newly established plantings, seedings, and soddings furnished hereunder and shall take adequate precautions to protect new tree growth and other important vegetative growth against injury.

1 **104.15 Providing Magnetic Detection for Underground Facilities**

2 Developer shall provide magnetic detection in accordance with the ADOT Standard Specifications and
3 Stored Specification 104MAGDET.

4 All new and extended drainage facilities shall be magnetically detectable.

5 Developer shall prepare a Tracer Wire Report for each element requiring magnetic detection that includes
6 all conductivity test results of tracer wires installed. Within 10 Business Days after testing, Developer shall
7 submit the Tracer Wire Report to ADOT.

8 **104.20 Submittals**

9 Table 104-1 reflects a nonexclusive list of Submittals identified in Section 104 of the TPs and is not
10 intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit
11 all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental
12 Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and
13 hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer
14 shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 104-1 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronics		
Draft SWPPP	3	0	1	No Later than 14 Days from the approval of the Developer's ECC	104.09.02
SWPPP	3	1	1	Prior to clearing, grubbing, earthwork, Geotech exploration or other work elements affected by the erosion control requirements in the SWPPP	104.09.02, 104.09.05, 300.03.01
Revisions to the SWPPP	3	1	1	Prior to clearing, grubbing, earthwork, or other work elements affected by the erosion control requirements in the SWPPP	104.09.02
NOI approval	3	0	1	7 Days prior to Construction Activities	104.09.03
SWPPP Inspection Report	3	0	1	Every 14 Days and within 24 hours after any storm event of 0.50 inches or more	104.09.06
NOT	3	0	1	Prior to Final Acceptance	104.09.09
Tracer Wire Report	5	0	1	Within 10 Days after testing	104.15

*Levels of Review

1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement)
2. Good faith discretion approval (Section 3.1.3.2 of the Agreement)
3. Reasonableness approval (Section 3.1.4.1 of the Agreement)
4. Review and comment (Section 3.1.5 of the Agreement)
5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)

1 **105 CONTROL OF WORK**

2 **105.12 Inspection of Work**

3 All materials and each part or detail of the Work shall be subject to inspection by the IQF and ADOT.
4 Developer shall allow the IQF and ADOT access to all parts of the Work and furnish any information and
5 assistance as required to make a complete and detailed inspection.

6 Governmental Entities or Utility Companies may have the right to inspect the Work. Such inspection does
7 not make any Governmental Entity a party to the Agreement and does not interfere with the rights of the
8 Parties to the Agreement.

9 **105.15 Maintenance During Construction**

10 Developer shall perform all maintenance work in accordance with Section 105.15 of the TPs, TP
11 Attachment 105-1, and TP Attachment 118-2. Refer to TP Attachment 105-1 for Landscape, Pest Control,
12 and Irrigation Maintenance.

13 Developer is responsible for the complete maintenance of all new and existing facilities within the Project
14 ROW and as listed herein beginning at NTP 2 through Substantial Completion.

15 Developer has 90 Days from NTP 1 to satisfy itself of the preconstruction condition of the existing lighting
16 system, landscape and irrigation systems, FMS system, and drainage system. Developer shall schedule
17 field meetings with ADOT to review and document the preconstruction condition of the lighting system,
18 landscape and irrigation systems, FMS system, and drainage system in a manner acceptable to ADOT.
19 Any deficiencies shall be documented in writing and brought to the attention of ADOT within the 90 Day
20 period. Work needed to repair the preconstruction existing facilities shall be paid for as Extra Work Costs
21 through an ADOT-Directed Change; provided, however, that any facility that will be replaced as part of
22 Developer's design for the Work shall not be considered an ADOT-Directed Change. All maintenance of
23 existing facilities beginning at NTP 2 through the Substantial Completion shall be the responsibility of
24 Developer.

25 Maintenance of existing facilities will also include the repair or replacement of any existing facility
26 damaged by Developer activities at no cost to ADOT, regardless of location. Utility Services shall be in
27 accordance with Section 2.2.2 of the Agreement.

28 **105.15.01 General Requirements**

29 Developer shall designate a Maintenance Coordinator who is available both during and after normal work
30 hours and able to authorize maintenance work on behalf of Developer. The Maintenance Coordinator
31 shall hold a monthly Maintenance Coordination Meeting in accordance with Section 108.03.08 of the
32 TPs.

33 Any existing facility or feature maintained by Developer shall be replaced when repairs to the facility, in
34 ADOT's Good Faith Discretion, would not restore the facility to at least the same condition (in terms of
35 operational and safety characteristics, and aesthetics) as before it was damaged.

36 **105.15.02 Equipment**

37 Developer shall provide and maintain, during the performance of the Work, equipment sufficient in
38 number, operational condition, and capacity to efficiently perform the Work and render the services
39 required by the Contract Documents.

All vehicles shall comply with Section 112.03.04 of the TPs. All vehicles must be maintained in good repair, appearance, and sanitary condition at all times. Truck beds shall be tight and have enclosed sideboards and covered tops capable of containing the refuse collected. Equipment, machinery, component, or system failures, which affect the safe operation of any equipment, shall be corrected prior to using the equipment.

106 CONTROL OF MATERIAL

106.05 Certificates

Developer shall provide Certificates of Compliance and/or Certificates of Analysis in accordance with Stored Specification 106CERT.

106.06 Inspection of the Plant (Plant Access)

Developer shall ensure that ADOT and the IQF have full entry at all times to such parts of the plant as may be involved in the manufacture or production of the materials being furnished. Developer shall ensure adequate safety measures are provided.

106.14 Approved Products List

Use of products shall be in accordance with Stored Specification 106APL. Barrier Gate Systems shall meet the requirements of Section 200.03.02.14 of the TPs and are not required to be identified on the Approved Product List.

107 LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

107.15 Developer's Responsibility for Utility Property and Services

107.15.01 General Requirements

Developer shall perform all Work related to Utilities in compliance with the requirements of Section 107.15 of the TPs. Traffic signals, street lighting, and Intelligent Transportation Systems (ITS) and freeway management systems are not considered "Utilities" to be adjusted under Section 107.15 of the TPs.

107.15.02 Administrative Requirements

107.15.02.01 Standards

Developer shall perform all Utility Coordination and Design Work in accordance with the standards, manuals, and guidelines listed in Table 107-1, which are shown in no order of precedence; however, in the event of a conflict, the more stringent requirement shall prevail.

Table 107-1 Design Standards		
No.	Agency	Title
1	ADOT	Guideline for Accommodating Utilities on Highway Rights-of-Way
2	ADOT	Encroachment Permit (http://azdot.gov/business/permits/encroachment-permits)
3	Varies	Utility Company Standards
4	ADOT	ADOT Utility and Coordination Guide for Design Consultants

Developer shall perform the Utility Adjustment Work in accordance with the applicable Utility Company's standards, 23 C.F.R. 645 for Utilities, and the Contract Documents.

107.15.03 Water and Sewer Lines

107.15.03.01 Developer Qualifications for Water and Sewer Lines

Developer shall ensure that any personnel of either Developer or a Subcontractor assigned to perform any work on water or sewer lines has experience doing work for and are familiar with the requirements of the water/sewer owner/operator.

107.15.03.02 Sewage Discharge Prevention Plan

For any work which may impact active sanitary sewer pipes, whether new or existing, Developer shall prepare a Sewage Discharge Prevention Plan (SDPP), that shall describe Developer's procedures and work plan for such lines. The SDPP shall also describe the precautions that Developer shall take to prevent unplanned breakage or spills, and the procedure that Developer shall follow if breakage or a spill occurs.

Developer's method of work described in the SDPP shall ensure that any work done in or near any active sewer line is performed in a safe and controlled manner resulting in no accidental discharges. At a minimum, Developer's equipment and procedures shall be appropriate for the intended work and shall conform to Good Industry Practice.

The SDPP shall include information, as specified below, for all portions of the Project which involve the following work activities, and for any other element of Work which may involve contact with an active sanitary sewer line:

- A. Interrupt, divert, relocate, plug, or abandon a sewer line or service connection; or
- B. Brace, or tie into a sewer line or service connection.

Construction activities in the vicinity of active sanitary sewer lines or service connections shall also be included in the SDPP if any of the following conditions exist:

- A. Any work crossing beneath the pipe, at any angle, regardless of vertical separation;
- B. Any work crossing over the pipe, at any angle, within two feet of the top of pipe;
- C. Any work in the vicinity of a sewer manhole; or
- D. Work located parallel to the pipe within the following areas:
 - 1. For the area from the bottom of the pipe to two feet above the top of the pipe, any work within two feet horizontally of the pipe wall.
 - 2. For the area below the bottom of the pipe, any work located below an imaginary line beginning at the pipe springline and progressing downward at a slope of 1.5 feet vertically to 1.0 feet horizontally.

1 The following elements shall be addressed in the SDPP for every location where construction activity will
2 involve an active sanitary sewer line:

- 3 A. Describe the proposed work in general, including the reasons for the work, scope, objectives,
4 locations, dates, and estimated times the work will be conducted. Include plan sheets detailing
5 the proposed work and indicating the peak flow rates of active sewer lines, determined as
6 specified.
- 7 B. For all existing sanitary sewer pipes, determine whether the lines are active or abandoned, and
8 the peak flow rates of lines in service, as provided by the owner of the utility.
- 9 C. List the personnel (crew foreman, superintendent, and manager) that are proposed to perform
10 the work (include phone numbers).
- 11 D. Describe the work in step-by-step detail for each location, including excavation plans, shoring
12 plans, and how both the new and existing structures and utilities will be identified and protected.
- 13 E. Provide a detailed listing of any hardware, fittings, pipe plugs, flex couplings, tools, and materials
14 needed to accomplish the work, and note the status of these items (on-hand, to be fabricated,
15 on-order with expected delivery date, etc.). Include any manufacturer's specifications or
16 recommendations, especially for any pipe plugs, sewer line fittings, and patching materials.
- 17 F. List all major equipment to be used to perform the work. Include in this item any pumps that will
18 be used to perform the work and the rated capacity of the pumps at the anticipated suction head.
- 19 G. List all equipment to be used in the event of an unplanned release and specify how the
20 equipment will be used. The locations of standby pumps shall be specified in this item. The plan
21 shall indicate that all standby equipment to be used in the event of an unplanned discharge can
22 be delivered to the site and put into service within two hours of identification of any unplanned
23 flow.
- 24 H. List the safety equipment to be used and describe any unique safety procedures. Cite the
25 applicable OSHA standards covering the work.
- 26 I. Describe any contingency plans Developer will implement in the event of unplanned releases,
27 debris entering the line, and/or damage to existing facilities. List all personnel and
28 Subcontractors that will be responsible for responding to unplanned releases or damaged lines.
29 Provide qualifications for all such personnel and Subcontractors, including education, formal
30 training, and relevant experience.
- 31 J. Describe how the public will be protected during the work and include or cite any applicable
32 traffic control plans.
- 33 K. Describe the quality control procedures that will be used in the field.
- 34 L. Discuss how temporary plugs or flow control devices will be secured, monitored, and removed.

1 The SDPP shall be written and shall include any diagrams or sketches necessary for clarity. When
2 possible, diagrams and sketches shall be shown using the applicable Construction Drawings for the
3 Project.

4 Developer shall modify the SDPP as necessary throughout the Project to include any new or revised
5 information relevant to the items listed above. Developer shall resubmit the revised SDPP to ADOT for
6 approval in each case.

7 The SDPP must be approved at least 15 Business Days before any work in the vicinity of or involving an
8 active sewer line is to be done.

9 Approval of Developer's Sewage Discharge Prevention Plans, personnel, or construction methods and
10 operation shall not relieve Developer from its responsibility to safely perform the Work, nor from its liability
11 for damage resulting, either directly or indirectly, from its performance of the Work.

12 **107.15.03.03 Repairing Damaged Water and Sewer Lines**

13 When the operations of Developer result in damage to any utility line or service connection, the location
14 of which has been brought to Developer's attention, Developer shall assume full responsibility for such
15 damage.

16 Should an unplanned breakage occur in an active sewer line as a result of Developer's operations,
17 Developer shall immediately notify ADOT, and begin repairs to halt any flows and restore normal service,
18 in accordance with the procedures described in the approved SDPP. Developer shall also immediately
19 notify the affected utility company and ADEQ. Developer shall be responsible for repairing the damaged
20 pipe, restoring any interruptions in service, and cleaning up the affected areas within 24 hours of the
21 beginning of the spill.

22 Developer shall be responsible for all actions and costs to repair any breakage, in accordance with
23 requirements of the broken line's owner/operator, and to clean up the site per applicable Laws and
24 regulations, including those of the United States Environmental Protection Agency (USEPA), OSHA,
25 ADEQ, and all other agencies' specifications. Developer shall indemnify and reimburse ADOT for any
26 costs that ADOT incurs in connection with damage to water or sewer lines caused by Developer's
27 operations.

28 The foregoing shall not limit or restrict Developer's entitlement to relief under clause (g) of the definition
29 of Relief Event.

30 **107.15.04 Utility Coordination**

31 **107.15.04.01 Utility Coordination Plan**

32 Developer shall prepare a Utility Coordination Plan that includes the following information:

- 33 A. Description of the Utility Adjustment Coordinator's staff, their roles, and responsibilities;
- 34 B. Description of the procedures and schedule for contacting Utility Companies;
- 35 C. Description of the documentation of all Work with the Utility Companies;
- 36 D. Description of the process of coordinating Utility Design Work with Utility Companies;

- E. Description of the process of coordinating Utility Construction Work with Utility Companies;
- F. Description of the process to track Utility Design and Construction schedules by utility conflict;
- G. Description of the mitigation and escalation plan for any schedule slippage;
- H. Appendix:
 - 1. Utility coordination staff organizational chart;
 - 2. Utility contact list;
 - 3. Utility coordination flow chart;
 - 4. Utility coordination check list; and
 - 5. Utility design and construction schedule with CPM Activity, including predecessors, successors, and float for each utility owner and each conflict.
- I. Utility conflict matrix:
 - 1. Conflict;
 - 2. Proposed mitigation;
 - 3. Relocation/adjustment cost analysis;
 - 4. Utility owner approval;
 - 5. Conflict effect on schedule and critical path; and
 - 6. Relocation prior rights determination matrix.

Within 30 Business Days of NTP 1, and as a condition precedent to ADOT's issuance of NTP 2, Developer shall submit the Utility Coordination Plan for known conflicts to ADOT for review and approval. Developer shall update and resubmit the Utility Coordination Plan every 60 days as new conflicts are identified to ADOT for review and approval.

107.15.04.02 Utility Coordination Meetings and Progress Reports

Refer to Section 108.03.05 of the TPs for utility coordination meetings.

Developer shall submit a weekly progress report to ADOT documenting the most current utility contact information and status of all utility related coordination and work. The progress report shall include an updated Utility Conflict Matrix.

Developer shall maintain documentation of contact and discussions with utility companies and provide to ADOT copies of all correspondence between Developer's Utility Adjustment Coordinator, their staff, and any utility company within 10 Business Days of receiving it or sending it, as applicable.

Any delays resulting from Developer's failure to schedule and coordinate its work with the utilities are the responsibility of Developer.

107.15.04.03 ADOT-Provided Information

Information on existing utilities located within the Project Limits are shown on the as-built plans provided with the RIDs. The information may not show all existing utilities and/or the current state of the existing utilities. Developer shall also coordinate with the City of Phoenix, City of Tempe, City of Chandler, Town of Guadalupe, ADOT Central Construction District and Maintenance Permit Section to determine if any new utility installations have been permitted.

An existing Utility CAD file and inventory matrix was developed for the Project. The Utility inventory matrix, Utility CAD file, and any maps provided by the Utility Companies are included in the RIDs. Maps and plans provided by the City of Phoenix Water Services Department are not included in the RIDs. Developer shall secure the appropriate security clearance required to receive as-built information from the City of Phoenix.

Pothole information completed by ADOT is provided in the RIDs.

107.15.04.04 Procedures and Agreements

107.15.04.04.01 Prior Rights Determination

Utility Companies affected by the Project may claim that they have prior rights to real property that entitles them to compensation before ADOT and Developer may encroach or make use of such property. ADOT will approve or disapprove of any prior right claims. Preliminary prior rights determinations are included in TP Attachment 107-1.

Should any utility claim prior rights during the Work, Developer shall be required to gather the Prior Rights Documentation from the Utility and provide an initial determination to ADOT. The determination shall include at a minimum the following information:

- A. Date;
- B. Project Name;
- C. Project Number and TRACS Number;
- D. Utility Claiming Prior Rights;
- E. Description of the conflict and proposed relocation;
- F. Utility's basis of prior right claim (e.g., easement, utility agreement). Documentation shall be included as an attachment to Developer's initial determination;
- G. Developer shall verify that the Prior Rights Documentation submitted by the Utility represents the areas of the Project where the Utility relocations are anticipated;
- H. Exhibit depicting the plan view location of the existing utility, proposed improvements, conflict, ROW, and easement information; and

I. Signature page for ADOT and the Utility.

ADOT will make the final determination of whether a Utility Company has prior rights to a facility or section of facility. ADOT shall have 20 Business Days to make the final determination, commencing on the Day Developer submits a complete package containing its initial determination to ADOT.

If the prior rights determination package provided by Developer is incomplete, the package will be rejected and returned with comments to Developer for resubmittal. ADOT review time will start over for any resubmitted rejected submittal packages. Developer shall coordinate with the utility companies to continue to resolve the potential utility conflicts pending the prior rights determination.

107.15.04.04.02 Utility Agreements

Developer is responsible for preparing, negotiating, and entering into Utility Agreements with Utility Companies affected by Utility Adjustment Work. Developer is not required to enter into Utility Agreements with City of Tempe, Town of Guadalupe, and City of Chandler. ADOT will enter into Utility Agreements with SRP; Developer may be required to prepare, negotiate, and enter into agreements with SRP for services ancillary to the ADOT and SRP agreement as required by SRP. Developer shall refer to TP Attachment 107-2 for City of Phoenix Utility Agreement procedures and requirements. Developer shall provide ADOT originals, not copies, of the Utility Agreements. A sample ADOT Utility Agreement format is included in the RIDs.

Each Utility Agreement shall set forth all required terms and conditions for the subject Utility Adjustment Work, including:

- A. A clear description and specification of the scope of Utility Adjustment Work Developer is to perform, and the scope the Utility Company is to perform;
- B. The applicable Utility conflict map;
- C. A schedule for the Utility Adjustment Work, or procedures for preparing and implementing such schedule;
- D. The applicable Adjustment Standards and any terms and conditions regarding any Change in Adjustment Standards;
- E. If necessary, requirements and location for any Replacement Utility Property Interest;
- F. Provisions for payments, payment terms, controlling specifications, and work description;
- G. Security that Developer will provide to the Utility Company for reimbursement of the Utility Adjustment costs to which the Utility Company is entitled;
- H. Provisions for liability insurance that Developer shall provide for the Utility Company to protect the Utility Company in connection with Developer's performance of Utility Adjustment Work;
- I. Any Utility permits that may then exist with respect to the construction and relocation of the subject Utility;

J. Specific procedures for resolving scheduling, design, construction, and payment issues arising due to errors or omissions in information the Utility Company provides to Developer or other disputes between Developer and the Utility Company; and

K. Terms and provisions regarding Betterments, if any.

ADOT will not be a party to Utility Agreements between Developer and a Utility, except as identified herein. If a Utility Company has proper Prior Rights Documentation in connection with a Utility Adjustment, ADOT will execute a separate Utility Agreement between ADOT and the Utility for the sole purpose of indicating its consent to the Utility Company's prior rights.

107.15.04.04.03 Utility Clearance Letters

Developer shall prepare a Developer Utility Clearance Letter for each Release for Construction (RFC) package. Developer Utility Clearance Letters must include the following:

- A. Each Utility Company with facilities within the limits of the RFC package listed separately, showing the name of the Utility Company and contact information;
- B. For each of the Utility Company a description of each Utility within the RFC package and one of the following conditions identified:
 - 1. The Utility is not in conflict with construction if a Utility is present, but does not need to be the subject of a Utility Adjustment; or a Utility is present, and it needs to be avoided or protected in place;
 - 2. The Utility is in conflict and a Utility Adjustment is needed. The adjustment shall be identified as adjustment to be completed by Developer, or adjustment to be completed by the Utility Company. Adjustments shall include estimated completion date or number of working Days tied to another milestone;
- C. Statement of confirmation that all Utilities within the RFC package have been identified and all conflicts have been mitigated; and
- D. Signatures of certification by the Design Manager, Construction Manager and Utility Adjustment Coordinator.

At the same time as the RFC Submittal for each discipline, Developer shall submit the Developer Utility Clearance Letter(s), along with copies of correspondence from Utility Companies verifying the information contained in the letter is accurate or communications regarding the utilities included in the RFC package as available, to ADOT for review and approval.

Developer shall prepare Final Utility Clearance Closeout Letters for each Project Segment indicating that all needed Utility Adjustments have been completed and all Utility conflicts have been addressed. Within 10 Business Days of the completion of all Utility Adjustments within the applicable Project Segment, Developer shall submit a Final Utility Clearance Letter to ADOT for review and comment. The final Utility Clearance Letter shall include permit numbers for any ADOT issued permits related to utility adjustment work done within the Segment.

Prior to Substantial Completion, Developer shall prepare a Project Final Utility Clearance Closeout Letter. The Project Final Utility Clearance Closeout Letter shall list each utility company separately, showing:

A. The name of the company;

B. The nature of required adjustment, if any;

C. Date of completed relocation;

D. Record Drawings including x, y, and z coordinates (Final Design Documents Submittal if Record Drawings are not available);

E. Permit number(s); and

F. Project related abandonments.

107.15.04.04 SRP Owned Utilities

For Utilities owned by SRP, Developer shall coordinate design and construction activities for relocations of SRP facilities. Developer shall be paid for Utility Adjustment Work completed by SRP in accordance with Section 5.4.2.11 of the Agreement. Developer shall not receive extra compensation for preparation of the site due to SRP Utility Adjustment Work. Preparing the Site shall consist of all work necessary for SRP to access, remove and replace, relocate, install, and perform any other activity associated with SRP Utility Adjustment Work. Preparing the site shall include maintaining, relocating, protecting, and replacing ADOT drainage, lighting, signal, FMS, landscape, and irrigation systems. Preparing the Site shall also include traffic control for SRP Utility Adjustment Work.

Developer shall be responsible for abandoning and/or removing SRP facilities no longer in use. Developer shall abandon and remove SRP facilities in accordance with ADOT *Guidelines for Accommodating Utilities on Highway Right-of-Way*, except as modified in the Contract Documents. Developer shall not abandon or remove SRP facilities without prior acknowledgment from SRP.

Through coordination with ADOT, SRP design for the SRP-irrigation crossing west of 32nd Street may accommodate one SRP manhole within the outside westbound mainline shoulder of I-10. No other utility manholes shall be located within the roadway.

Developer shall install conduit for SRP-distribution facilities as shown in the concepts in the RIDs. The installation of the SRP-distribution facilities installed by Developer shall be in accordance with the SRP Underground Distribution Construction Standards Manual (<https://www.srpnet.com/menu/electricbiz/specs.aspx>) and as coordinated by SRP. Developer shall install ground rods and electrical markers at supply, transformer pad, cabinet, fuse switch, and pulling enclosure locations. Conduit under existing or proposed pavement shall be installed in a steel sleeve. Developer shall submit material certifications to SRP for review and approval 10 Days prior to procuring materials for SRP-distribution conduit installation.

Single phase 12kV SRP-distribution lines shall be housed within a 6-3-inch conduit configuration concrete encasement when outside of pavement and within a minimum 24-inch steel sleeve when under existing or proposed pavement.

Dual phase 12kV SRP-distribution lines shall be housed within a 12-3-inch conduit configuration concrete encasement when outside of pavement and within a minimum 42-inch steel sleeve when under existing or proposed pavement.

Developer shall coordinate with SRP-distribution Project Design Lead, Jason Hughes, (602) 236-0886, 10 Days prior to SRP-distribution Work to schedule SRP on-site inspections. ADOT will secure a TCE for SRP-distribution conduit work to be performed by Developer outside of Schematic ROW.

107.15.05 Design Requirements

107.15.05.01 General Requirements

It shall be the responsibility of Developer to identify all Utility conflicts and coordinate mitigations and/or relocations with the affected Utilities. Developer shall minimize impacts to all Utilities. Utility Adjustments or protection of Utilities within the Project ROW shall comply with the requirements of the ADOT *Guideline for Accommodating Utilities on Highway Right-of-Way*, except as modified in the Contract Documents.

Developer shall account for each Utility's design, relocation construction sequencing and durations in the Project Schedule. Developer is responsible for coordinating any work that may be necessary to resolve conflicts during construction.

Developer shall design all Utility Adjustments to city- or county-owned water and sanitary sewer, as needed, and shall obtain approval of the design from the appropriate Governmental Entities.

Prior to permit application, Developer shall obtain Utility Company approval of Utility Adjustment Plans prepared by Developer. Developer shall provide Utility Adjustment Plans approved by the Utility Company to ADOT as part of the Utility Report(s) and shall be processed for RFC as Design Documents. For utility design completed by the Utility Company, Developer shall review and approve such plans and confirm Utility Company plans do not conflict with the Work prior to submitting permit application.

107.15.05.02 Utility Identification

Developer shall verify the location of all Utilities within the Project Limits or otherwise affected by the Work. Utility Companies known to have facilities within the Project Limits include the following:

Table 107-2 Utility Contacts			
Company Name	Contact Person	Email	Phone Number
City of Phoenix	Jami Erickson	jami.erickson@phoenix.gov	(602) 261-8229
City of Chandler	Gina Ishida-Raybourn	gina.ishida-raybourn@chandleraz.gov	(480) 782-3584
City of Tempe	Mark Weber	mark_weber@tempe.gov	(480) 350-8526
Air Products	Kevin McKenzie	mckenzkj@airproducts.com	(480) 899-7000 ext. 25
Southwest Gas	Scott Suaso	scott.suaso@swgas.com	(480) 730-3843

Table 107-2 Utility Contacts			
Company Name	Contact Person	Email	Phone Number
Kinder Morgan	Steve Weatherhead	steve_weatherhead@kindermorgan.com	(520) 509-3265
Century Link	Andy Andrade	andrew.andrade@centurylink.com	(602) 630-5093
Terra Technologies (on behalf of Century Link)	Jason Jensen	jjensen@terratechllc.com	(801) 735-2464
Cox Communications	Frank Canales	frank.canales3@cox.com	(623) 328-3423
SRP Project Manager	Brad Hawn	brad.hawn@srpnet.com	(602) 332-2240
SRP Irrigation	Jorge Garcia	jorge.garcia@srpnet.com	(602) 236-4609
SRP Transmission	Curtis Chaney	curtis.chaney@srpnet.com	(602) 236-6383
SRP Distribution	Jason Hughes	jason.hughes@srpnet.com	(602) 236-0886
APS	Bobby Garza	baldemar.garza@aps.com	(602) 361-6840
AT&T Long Hall Communications	Joseph Forkert	joef@forkertengineering.com	(714) 963-7964
AT&T Local Networks Communications	Luke Jensen	lj505x@att.com	(480) 707-8581
Sprint	David Jeter	david.jeter@sprint.com	(602) 430-3615
MCI Verizon	Jesus Arrieta	jesus.arrieta@verizon.com	(480) 349-1350
Zayo	Matt Burke	matt.burke@zayo.com	(480) 257-7714
	Lee Stauber	lee.stauber@zayo.com	(602) 739-8813
ADOT	Scott Vollrath	svollrath@azdot.gov	(602) 568-3284
United Dairymen of Arizona	Richard Partin (Ex El Pipeline Services)	rpartin@exelpipe.com	(602) 376-8972

Table 107-2 Utility Contacts			
Company Name	Contact Person	Email	Phone Number
Level 3	Carlos Muniz	carlos.muniz@centurylink.com	(623) 215-5129

It is the responsibility of Developer to ensure that all Utilities within the Project Limits have been designated and included in the CAD base file(s). Developer will be responsible for potholes as necessary to confirm utility locations and conflicts. Developer shall perform up to 40 potholes as directed by SRP to aide in the design and relocation of their facilities in accordance with Section 5.4.2.10 of the Agreement. All Utility designation, including potholes, shall follow the American Society of Civil Engineers *Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data* (CI/ASCE 38-02). All pothole information shall be provided to ADOT within 30 Business Days of the pothole being performed.

Developer shall coordinate with Arizona 811 and ADOT will not be responsible for any delays or costs associated with Arizona 811 coordination.

107.15.05.03 Utility Report

Developer shall prepare Utility Reports for the Project that document the progress of the Utility coordination efforts. The Utility Report shall be sealed and signed by a registered Professional Engineer and shall contain a narrative detailing the various Utility conflicts and resolutions, the updated Utility matrix, and copies of all correspondence, including meeting minutes. The narrative shall include:

- A. Utility tracking matrix;
- B. CPM of utility relocations by location;
- C. A list of all Utility Companies within the Project Limits along with their contact person and contact information;
- D. Identify the quality of utility information shown on the final RFC Submittal in accordance with ASCE 38-02;
- E. A summary of the meetings held with each Utility Company including what was discussed and when, and what actions were taken to arrive at the selected mitigation measure;
- F. A list of pothole data requested and obtained;
- G. Anticipated Utility Adjustment costs, broken out by prior right/non-prior right;
- H. Utility Agreement status;
- I. ROW needed for relocations and acquisition status;
- J. A copy of all correspondence between Developer and each utility company;
- K. A list of permits issued for utility relocation Plans; and

L. Utility abandonment status (requests, approvals, locations, etc.).

Developer shall submit a Utility Report to ADOT for review and comment quarterly, at a minimum, or as directed by ADOT. Developer shall prepare and submit a Final Utility Report to ADOT for review and comment within 20 Business Days of Substantial Completion.

107.15.05.04 Utility Adjustments

Developer shall perform Utility Adjustments or ensure that the adjustments are made by the Utility Companies to accommodate the Project in accordance with Table 107-1, TP Attachment 107-2, TP Attachment 107-3, and the Contract Documents.

Developer shall coordinate access requirements of the Utility Companies. Developer shall provide for such access as may be requested by the Utilities and shall ensure that it is acceptable to ADOT. For Utilities that possess proper Prior Rights Documentation, Developer shall design and construct any replacement access roads that may be displaced by the proposed improvements.

107.15.05.05 Utility Service Connections

Developer shall provide new Utility service connections as required for the Project, including lighting, FMS, traffic signals, irrigation controllers, or other facilities in accordance with the Contract Documents. Developer shall also provide any temporary service connections as may be needed during construction. Developer shall coordinate with the appropriate Utility Companies and Governmental Entities to disconnect existing services that may be present and set up new or temporary services in accordance with the appropriate Utility Company's or Governmental Entity's requirements. Developer shall be responsible for the cost of all permits, utility service deposits and turn-off, turn-on service fees for all the utility services needed for the Project.

Developer shall prepare Utility Service Request Letters(s) to establish new services in accordance with the applicable Utility Company standards. At least 10 Business Days prior to planned submittal of a Utility Service Request Letter to the associated Utility Company, Developer shall submit Utility Service Request Letter(s) to ADOT. Utility Service Request Letters shall include the service address and information for the individual responsible for paying the utility bill. Developer shall obtain and comply with all permit requirements for all Utility service establishment and disconnections needed for the Project.

Developer shall remove any temporary Utility facilities no longer required prior to Substantial Completion. Developer shall furnish the necessary equipment and furnishings required by the Utility Companies, as applicable, at the point of source. This includes any and all necessary special trench, conduit and backfill, and fence enclosures or gates required by each Utility Company. If extensions of a Utility are required to provide the new service, Developer shall be responsible for the extension, including any land rights that may be needed.

107.15.05.06 Utility Plans

Utility Disposition Plans shall be prepared by Developer as separate Design Documents and submitted with preliminary, final and RFC roadway plan and profile sheets for ADOT review and approval. Utility Disposition Plans shall be updated per the Design Change requirements per Section 116.05.03 of the TPs, as utility and other design elements change.

Developer shall incorporate the utility location information provided by ADOT, the Utility Companies and obtained through Developer's own research into the Utility Disposition Construction Drawings and all Plans. Utility information shall be incorporated into Developer's utility CAD base file and shall indicate the

quality and reliability of existing Utility information. Vertical locations of underground Utilities shall be shown on all profiles, cross sections, and details in the Design Documents.

The Utility Disposition Plans shall include, at a minimum, the following:

A. Cover Sheet – Keymap depicting segment limits and table with contact information of existing utilities within the segment. Contact table shall include: utility company name; contact person name, email, and phone number.

B. 50 Scale Plan Sheets – Plan sheets shall include all existing and proposed Project features including utilities. All existing utilities shall be noted. Utility conflicts, new utilities, pothole information, relocations, and dispositions shall be noted. New, relocated, or abandoned utilities shall be noted as follows: Station, owner, size, material, installation, plan reference and permit number. See sample notes below:

1. Sta XXXX+XX New 30-inch RGRCP SRP Irrigation Line Installed by Others - See SRP Project No. XYZ; ADOT Permit No. 123

2. Sta XXXX+XX New 24-inch DIP City of Phoenix Waterline Installed by Developer – See RFC Package ABC; ADOT Permit No. 123

3. Sta XXXX+XX to Sta XXXX+XX Existing 6-inch Steel SWG Gas Line – Abandoned In Place; ADOT Permit No. 123

For all other construction Plans, Utility conflicts and relocations shall be noted on the construction Plans in accordance with Appendix 1 of the *ADOT Utility and Coordination Guide for Design Consultants*. The Preliminary Design Submittal shall adhere to Stage IV requirements of Appendix 1 of the *ADOT Utility and Coordination Guide for Design Consultants*. The Final Design Submittal shall adhere to the Stage V requirements sealing the utility information as shown in Appendix 1 of the *ADOT Utility and Coordination Guide for Design Consultants*.

107.15.05.07 ADOT Encroachment Permits

For all Developer designed and constructed Utility Adjustments, Developer shall coordinate with the Utility Companies and ADOT to secure, prior to commencing any construction within the Project ROW, an ADOT encroachment permit. The Utility Company must file the permit application. See the ADOT website (<http://azdot.gov/business/Permits/encroachment-permits>) for more information regarding encroachment permits.

An ADOT encroachment permit will be required for each Utility that will be installed, adjusted, or abandoned in the Project ROW. ADOT encroachment permit applications shall be submitted through ADOT's web-based project management information system for review and approval. Prior Rights information shall be submitted with each application.

Developer shall prepare and maintain a Utility Permit Matrix to include existing and new utilities that includes the following:

A. Utility Owner;

B. Location;

C. Disposition (e.g., new installation; adjustment; protect in place; abandonment);

D. Date of Permit Application;

E. Date of Permit Issuance; and

F. Date of Permit Expiration.

107.15.05.08 City Encroachment Permits

For all Developer designed and constructed Utility Adjustments that are constructed within the limits of ROW to be turned back to City or City ROW allowing construction through an IGA, Developer shall obtain a City encroachment permit prior to commencing any construction within the turn back ROW.

107.15.05.09 Utility Encasement

Developer shall encase Utilities in accordance with the ADOT *Guideline for Accommodating Utilities on Highway Rights-of-Way*, unless otherwise specified in the Contract Documents. Encasements shall extend 3 feet beyond edge of pavement where no shoulder treatment exists or 1 foot beyond back of curb, barrier, or wall footing.

Existing utility crossings that are to remain shall meet ADOT encasement requirements, shall be 3 feet below sub-grade of widened pavement and shall meet Utility Owner minimum clearance requirements. Existing gravity sewer lines without existing sleeves do not require new sleeves or sleeve extensions.

Utilities requiring encasement shall include water, sanitary sewer, non-ADOT irrigation, and other crossings as required by Utility Owner requirements. See Section 800 of the TPs for ADOT irrigation encasement requirements.

107.15.06 Construction Requirements

107.15.06.01 Standards

Developer shall perform all Utility Adjustment Work in accordance with the standards, manuals, and guidelines listed in Table 107-3, which are shown in no order of precedence; however, in the event of a conflict, the more stringent requirement shall prevail.

Table 107-3 Construction Standards		
No.	Agency	Name
1	ADOT	Guideline for Accommodating Utilities on Highway Rights-of-Way
2	ADOT	Encroachment Permit (http://azdot.gov/business/permits/encroachment-permits)
3	Varies	Utility Company Standards
4	ADOT	ADOT Utility and Coordination Guide for Design Consultants
5	ADOT	Standard Specifications for Road and Bridge Construction, 2008

107.15.06.02 Utility Adjustment Work by Developer

Developer shall perform the Utility Adjustment Work in accordance with the Contract Documents, the requirements of the applicable Utility Company, and the ADOT *Guideline for Accommodating Utilities on Highway Rights-of-Way*. Developer shall protect existing utilities not requiring relocation, removal, or

abandonment in accordance with the Utility Company and ADOT requirements. Developer shall actively protect all Utilities to remain in place and communicate its status to Subcontractors and Utility Companies; repair and replacement of any existing Utility that is damaged by Developer will be performed at no cost to ADOT or the Utility Company. All costs, including costs of the facility being out of service as a result of the damage, shall be the responsibility of Developer.

Developer shall perform all adjustments to city- or county-owned water, sanitary sewer, and storm drain facilities, and shall obtain approval of the Adjustments from the appropriate Governmental Entities.

107.15.06.02.01 Inspection

Developer acknowledges and agrees that each Utility Company, through its representative, has the right to inspect any work performed by Developer on its Utilities to ensure the location, alignment, and grade are in accordance with the approved Utility Plans and the Utility Company's requirements. Developer shall provide access to the Site to allow for the Utility Company's inspection. Developer shall leave the installation exposed for inspection by the Utility Company or expose the Utility or Utilities for inspection by the Utility Company if the installation is covered prior to the Utility Company's inspection and approval. Developer shall contact the respective Utility Company in advance to request an inspection of installed facilities.

107.15.06.02.02 Acceptance

Developer shall obtain a written acceptance of the Utility Adjustment Work, including Utility Record Drawings, from the Utility Company directed to ADOT. Developer shall request a Letter of Acceptance of the Utility Adjustment Work from the Utility Company after submittal of the Utility Record Drawings to the Utility Company. Within 10 Business Days of receipt, Developer shall submit the original Letter of Acceptance of the Utility Adjustment Work from the Utility Company to ADOT.

If the Utility Company is unwilling to provide a written acceptance, Developer shall prepare a Utility Work Acceptance Request that describes the Utility Adjustment Work and the request to the Utility Company to accept the Utility Adjustment Work. Developer shall submit a copy of the Utility Work Acceptance Request to ADOT as a notification that the Utility Work has been completed, but that the Utility Company is unwilling to provide a written acceptance. Developer shall schedule a meeting with the Utility Company and ADOT to resolve the matter. Notwithstanding Developer's submittal of a Utility Work Acceptance Request, if the Utility Company does not provide acceptance due to Developer's non-compliance with the Utility Company's requirements or the Contract Documents, Developer shall be responsible for correcting its work to obtain compliance, including the cost of performing additional design and construction work, without the right to an increase in the Contract Price, adjustment of a Completion Deadline or any other Claim.

107.15.06.02.03 Access Responsibilities During Construction

Developer shall take all appropriate measures to make certain that all Utilities remain fully operational during all phases of Construction Work, including coordinating with Utility Companies to develop a plan so Utility Companies may access their facilities for maintenance and repair. Developer shall construct any temporary access roads prior to disruption of the existing access roads.

107.15.06.02.04 Utility Record Drawings

Developer shall prepare Utility Record Drawings for each Utility Adjustment performed by Developer. Utility Record Drawings shall be submitted to ADOT and the Utility Company for review and approval within 60 Days of the Day on which each Utility Adjustment is substantially complete, whether or not the Utility Owner

has accepted the Utility Adjustment. If Developer makes any adjustments or changes to the Utility between submitting the Utility Record Drawings and acceptance of the Utility Adjustment by the Utility Owner, Developer shall update the Utility Record Drawings and resubmit to ADOT and the Utility Owner.

Developer shall prepare Utility Record Drawings in the format required by ADOT and each Utility Company, including City of Phoenix P-85 requirements. The Utility Record Drawings shall show the location of, and label as such, all abandoned Utilities. The Utility Record Drawings shall indicate the horizontal and vertical control of all facilities installed, with size and materials noted. Developer shall submit Utility Record Drawings to the associated Utility Company as required by the Utility Company. Developer shall incorporate the Utility Record Drawings into the Project Record Drawings.

All records with respect to Utility Adjustment Work shall comply with the record keeping and audit requirements of the Contract Documents.

107.15.06.03 Utility Adjustment Work by Utility Companies

Developer shall coordinate with Utility Companies to develop a plan so Utility Companies may access the Site to perform Utility Adjustments. Developer shall inspect all Utility Adjustment Work performed by the Utility Companies and/or their contractors and subcontractors within the Site to verify compliance with the Contract Documents. IQF shall inspect and approve the construction performed by each Utility Company to verify that the construction complies with the requirements of the Contract Documents and the approved Plans and permits for such construction. Developer shall request and receive, or alternatively create, Utility Record Drawings.

ADOT will allow the establishment of a utility corridor within ADOT ROW per Section 1.6 of the ADOT *Guideline for Accommodating Utilities on Highway Rights-of-Way*. Developer shall be responsible for coordinating the location of any new utility corridors to ensure that it does not conflict with the Project improvements and that future utility maintenance is accessed outside of ADOT access control.

Utility Record Drawings shall include horizontal and vertical control with size and materials noted for the Utility Adjustments performed by the Utility Companies. Developer shall provide a written Developer construction inspection approval letter to the Utility Company after Utility Record Drawings have been received from the Utility Company. Developer shall prepare a Utility Adjustment Package that includes Developer's construction inspection approval and Utility Record Drawings. Within 10 Business Days of sending the written Developer construction inspection approval letter to the Utility Company, Developer shall submit a Utility Adjustment Package to ADOT.

Developer shall immediately notify ADOT in writing upon discovering or learning that a Utility Company has performed Utility Adjustment Work that does not comply with the Contract Documents.

107.15.06.04 Utility Abandonment

Utility abandonment will be allowed in accordance with Chapter 5 of ADOT's *Guideline for Accommodating Utilities on Highway Rights-of-Way*.

For abandonment of any City of Phoenix, City of Tempe, or City of Chandler Utilities, Developer shall obtain written approval of the abandonment and method of abandonment from the owner prior to abandoning the utility.

Utility abandonments shall be documented by Developer as follows:

- A. Letter from the Utility Company to ADOT (or ROW owner) stating intent to abandon facilities within ROW;
- B. Developer letter stating that the abandonment is in accordance with the governing agency's policy for abandoning utilities within public ROW;
- C. Utility plan showing the location, limits, method of abandonment and ROW ownership; and
- D. ROW Owner and Utility signature block for approval.

107.15.06.05 Utility Removals

Developer shall be responsible for mitigating abandoned utilities under existing and proposed pavement. For utilities under existing pavement which are abandoned during the Project, Developer shall slurry fill pipes greater than 12 inches in diameter. Developer shall remove all abandoned utilities under proposed pavement. Developer shall remove all other abandoned utilities less than 12 inches in diameter not under existing or proposed pavement. Abandoned utilities 12 inches or greater not under existing or proposed pavement shall be identified by Developer and may be directed to be removed as an ADOT Directed Change. Developer shall clearly identify limits of utilities which were either slurry filled, abandoned, or removed on the Utility Disposition Plans.

107.15.06.06 Applications for Utility Permits

It is anticipated that, during the Work Utility Companies will apply to ADOT for utility permits and other agreements and approvals to install new utilities that would cross or longitudinally occupy the Project ROW, or to modify, upgrade, relocate or expand existing utilities within the Project ROW for reasons other than to accommodate the Project. Encroachment Permit Coordinator shall review and mitigate any conflicts and schedule impacts with the Utility Company or ADOT to allow for such permits to be granted. Such applications shall be governed by Section 5.4.9 of the Agreement.

107.15.07 Submittals

Table 107-4 reflects a nonexclusive list of Submittals identified in Section 107.15 of the TPs and is not intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 107-4 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Sewage Discharge Prevention Plan	3	0	1	At least 15 Business Days prior to any Work involving an active sanitary sewer line	107.15.03.02
Utility Coordination Plan	3	0	1	Within 30 Business Days of NTP 1	107.15.04.01

Table 107-4 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Developer Utility Clearance Letters	3	0	1	At the same time as the RFC Submittal for each discipline	107.15.04.04.03
Final Utility Clearance Closeout Letter(s)	3	0	1	Within 10 Business Days of the completion of all Utility Adjustments within the Project Segment	107.15.04.04.03
Project Final Utility Clearance Utility Letter	3	0	1	Prior to Substantial Completion	107.15.04.04.03
Potholes	5	0	1	Within 30 Days of performing pothole	107.15.05.02
Utility Report(s)	3	0	1	Submitted quarterly or as directed by ADOT.	107.15.05.03
Final Utility Report(s)	3	0	1	Within 20 Business Days of the completion of construction for the Project	107.15.05.03
Utility Service Request Letter(s)	5	0	1	At least 10 Business Days prior to submitting the Utility Service Request Letter to the associated Utility Company	107.15.05.05
Utility Work Acceptance Request	5	0	1	If the Utility Company is unwilling to provide a written approval	107.15.06.02.02
Letter of Acceptance	5	0	1	Within 10 Business Days of receipt	107.15.06.02.02
Utility Adjustment Package	5	0	1	Within 10 Business Days of receipt	107.15.06.03
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

1 107.20 Community Relations and Public Involvement Program

2 107.20.01 Purpose

3 The purpose of the Community Relations and Public Involvement Program (CRP) is to facilitate
 4 successful completion of the Project by actively sharing Project information and seeking and responding
 5 to input from Stakeholders defined in Table 107-5 throughout the design and construction of the Project.
 6 The CRP minimizes impacts of construction by detailing how Project public involvement staff will work
 7 closely with the Stakeholders to keep them apprised of the schedule for construction and progress
 8 achieved to ensure that their issues and concerns are addressed by Developer and ADOT.

The CRP is built on the FHWA-approved ADOT Public Involvement Plan, which is provided in the RIDs. The CRP incorporates requirements for compliance with Title VI, the Americans with Disabilities Act (ADA), Limited English Proficiency, and other federal regulations for Environmental Justice populations.

Developer shall coordinate with ADOT's Project Communications Team (PCT) to implement and execute a CRP that:

- A. Follows the guidelines and best practices delineated by the International Association of Public Participation (IAP2);
- B. Provides the Stakeholders with reasonable access to technical and policy information about the Project;
- C. Demonstrates Developer's consideration of and response to Stakeholders input obtained during the Work; and
- D. Solicits and considers the needs of those traditionally underserved by existing transportation systems to ensure that their involvement in decision-making helps prevent disproportionately high and adverse impacts upon such individuals and ensures that they receive a proportionate share of benefits of the Project. Traditionally underserved populations include, but are not limited to, low income and minority households, ADA populations and Native Americans.

For purposes of this Section 107.20 of the TPs, the Stakeholders shall be as follows:

Table 107-5 Project Stakeholders	
Stakeholder Definition	Example Entities
Businesses	Businesses and commercial enterprises located along the Project Limits. Other businesses, commercial enterprises, and nonprofit organizations in the vicinity of the Project Limits that are affected by the Project.
Governmental Entities	As defined in Exhibit 1 to the Agreement.
General Public	Members of the public within the area or who use the roadways within the Project Limits and roadways that are affected by the Project, including arterial streets and alternate highway routes.

107.20.02 Requirements of the Public Involvement Plan

To carry out its obligations in respect of the CRP, Developer shall prepare and implement a Project-specific Public Involvement Plan (PIP). In addition to meeting the requirements contained in the ADOT Public Involvement Plan and the requirements of Section 107.20.03 of the TPs, the PIP shall:

- A. Develop Stakeholder understanding of the Project;
- B. Provide opportunities for early and continuous engagement with Stakeholders;

- C. Develop and maintain accountability, credibility, and accessibility of ADOT and the Project team;
- D. Maximize potential for informed media coverage; and
- E. Keep the Stakeholders apprised of changing traffic conditions throughout construction.

Developer shall utilize and input information in the ADOT-provided Stakeholder Management System (SMS). ADOT will provide Developer three accounts/logins for the SMS with read/write access and 10 accounts/logins for the SMS with read-only access. In the instance that the SMS is not available due to unforeseen reasons, Developer shall maintain offline tracking until the SMS is available and populate information into the SMS when the SMS becomes available. Developer shall begin using SMS 90 Days within NTP 1.

107.20.03 Roles and Responsibilities

The following list provides Developer's responsibilities with respect to public involvement and the CRP, which is in addition to other such requirements in the Contract Documents:

- A. Developer shall prepare and submit for approval in ADOT's good faith discretion a PIP that complies with the requirements and responsibilities set forth in this Section 107.20.03 of the TPs.
- B. Developer shall meet with the PCT every six months to review the PIP and determine its effectiveness. Where Developer and the PCT determine that material changes to the PIP are required for effective implementation, Developer shall update and resubmit the PIP for approval in ADOT's good faith discretion.
- C. Developer shall prepare a multi-faceted, multi-lingual Reputation Management Plan if any employee, consultant, representative, or agent of Developer engages in any action that results in a negative impression of ADOT, its employees, or the Project and/or offends the public and/or Stakeholders during the course of the Project. The Reputation Management Plan shall identify strategies and tactics that Developer will utilize, including paid advertising, a press release, and other remediation tools, as well as the appropriate timeframe over which these strategies and tactics are to be employed. Developer shall include the Reputation Management Plan with the Project-specific PIP. ADOT may require, in its sole discretion, that Developer immediately remove the individual(s) involved in the action from the Project. All costs associated with the Reputation Management Plan are the responsibility of Developer and Developer shall not be entitled to an increase to the Contract Price, a Completion Deadline adjustment or any other Claim arising out of the preparation and implementation of a Reputation Management Plan. The implementation of the Reputation Management Plan may be determined at ADOT's Sole Discretion.
- D. Developer shall translate and provide interpretation for all materials and information that will be provided to the Stakeholders as needed or in compliance with the translation requirements including ADA and results of the Limited English Proficiency and Four-Factor Analyses on file with the ADOT Civil Rights Office. Without limiting the foregoing, Developer shall provide translations of the following: brochures, flyers, meeting/event signage, printed materials, explanations of diagrams or maps, and all materials available for attendees at any meetings.

Developer shall procure an individual who can provide interpretation at meetings and other functions intended to provide information about the Project to the public. Materials shall be in accordance with the ADOT Style Guide and the Project Design and Brand Guidelines provided in the RIDs and the AP Stylebook.

E. Developer shall develop a website for the Project (the "Developer Website"). Developer shall maintain the Developer Website on its own server, independent of ADOT's website. The Developer Website shall provide a portal to communicate Project information, including construction activities, Lane Closures, incidents governed by the Crisis Communications Plan, and other information about the Project. The Developer Website shall display photos and videos of the Project and provide for all content to be available in languages other than English via Google Translate. Developer shall submit the Developer Website URL to ADOT for review and approval in ADOT's good faith discretion. ADOT will secure and register domain names for the Developer Website so that the domains can point to the Developer Website on Developer's server. Any additional proposed domain names or URLs for the Developer Website shall be submitted for ADOT's review and approval. ADOT has provided a navigational "sliver", as found on other ADOT webpages, for Developer to incorporate into the Developer Website as specified in the RIDs. A mockup of the proposed Developer Website layout and content shall be submitted for ADOT's review and approval in ADOT's good faith discretion within 60 days of NTP 1 and any major redesign. The Developer Website must be available to the public 30 Days prior to NTP 2. The Developer Website shall not contain advertisements of any nature. The Developer Website shall contain a means of allowing users to submit information requests, complaints, and other inquiries about the Project. All Developer Website content must be approved by the PCT prior to upload.

F. Developer shall develop a mobile phone application ("App") for the Project. The App shall be developed and available for major mobile telephone devices, including iPhones and Androids. The App must be free of charge to users to download and use. The App shall provide real-time information about the Project, and must communicate Lane Closures, significant construction activities, collisions and incidents in the Project ROW, incidents identified in the Crisis Communication Plan, and other relevant information about the Project. Developer shall be responsible for maintenance of the App, including for updating information on the App. Developer shall provide software patches and other updates to the App as needed to maintain the App's functionality. The App shall be able to transmit "push" notifications that alert App users to new information on the App. The App must be available 30 Days prior to NTP 2. The App shall not contain advertisements of any nature. All App content must be approved prior to inclusion.

G. The PIP shall include a Crisis Communications Plan. The Crisis Communications Plan shall set forth how Developer will respond to a crisis that affects the Project, which includes emergencies and incidents within the Project ROW, a sudden, catastrophic event that materially impairs the ability to use the freeway, materially and adversely impacts construction activities, requires Lane Closures of an unusual or more frequent nature than normal; requires a full shutdown of the roadways within the Project Limits; or otherwise creates a health or safety hazard. The Crisis Communications Plan shall include Developer's plan to support ADOT's dissemination of information on an expedited basis, including via messaging systems to motorists, to the media, and through social media to make the public aware of the crisis within 30 minutes of the crisis

occurring. Developer shall similarly ensure that the Crisis Communications Plan reflects Developer's plan to ensure that the Developer Website and App are updated in these instances within 30 minutes of the crisis occurring. If the incident lasts more than 24 hours, Developer shall provide additional printed and electronic information.

H. The PIP shall include Developer's provision of a half-day public relations training for up to 40 people, comprised of Project staff (Developer and ADOT) whose responsibilities entail interfacing with the Stakeholders. The trainer must be IAP2 certified and material must reinforce the IAP2 Core Values and Code of Ethics. Developer shall hold the training for Key Personnel and the PCT within 30 Days of NTP 1, train the remaining staff prior to the commencement of NTP 2 and ensure any new Project staff members are trained prior to interfacing with Project Stakeholders.

I. Developer shall photograph and videograph construction activities as needed to convey the state of the Project in materials disseminated to the Stakeholders. Photos and videos must be of adequate quality to be printed and electronically streamed. Examples of activities to photograph and videograph include signage installation, major earthwork, bridge demolition and construction, paving, and other major milestones. At a minimum, Developer shall provide five photos and one (1 minute) video each week in a format that can be posted to the web. Developer shall produce 30 – 45 second Traffic Alert Videos with motion graphics to show detour routes in advance of Full Closures suitable for posting on the web. Video shall be appropriate for social media and website use, and shall be subject to approval in ADOT's good faith discretion.

J. Developer shall create a Public Information (PI) Kit. The PI Kit must include two table drapes with the Project logo, two 10 foot by 10 foot pop up tents, one 6 foot folding table, 4 brochure stands, Project shirts, and Project-branded giveaway items. Developer shall specify the contents and format of the PI Kit in the PIP, which shall be subject to approval by ADOT. Developer shall maintain PI Kit in good condition during the Work and replace items if worn or broken as directed by ADOT at Developer's expense. Developer PI team shall wear Project-branded clothing to all events. Project giveaways must be provided in adequate quantities to accommodate a minimum of 12 events per year beginning with the commencement of NTP 2.

K. Developer shall identify and maintain a list of community events, subject to ADOT's approval, (e.g., neighborhood/Homeowner's Association meetings, business organization events, community celebrations, etc.) that Developer will attend to promote the Project. Developer shall maintain a list of these events in the Project calendar in SMS. Developer shall coordinate logistics, contract for venues, develop and deliver printed materials for distribution during the meetings, develop a map to the venue, and hold preparation meetings for ADOT prior to the event. Developer shall submit an event plan for approval by PCT for each event 30 Days prior to the event start date. Each event plan shall include a description of the event and activities, staffing, materials/quantities and displays to be used. Developer shall publicize such meetings in advance. At such events, Developer's personnel shall wear Project branded clothing and be prepared to provide information about the Project that addresses concerns typical of the Stakeholders most likely to attend the function. Developer shall plan to attend a minimum 24 events per calendar year. Developer shall incorporate live, interactive polling platforms into at least half of the events to assess how the project is perceived and how outreach efforts are being received by the public. Within 5 Days of the end of the event Developer shall prepare a

summary report of the event that includes event attendance numbers, event attendee comments, photos of the booth, photos of interactions with the Stakeholders, and event logistical details including live, interactive polling results. Developer shall log the Event Summary into the SMS within 5 Days of the end of the event.

L. Developer shall maintain an up to date list of Special Events, as defined in Section 700.06.04.05.05 of the TPs, occurring in the Phoenix Metropolitan area, with specific focus on events occurring within the Local Jurisdictions and coordinate closures to accommodate the event traffic. Coordination shall include contacting event manager(s) to provide specific Project information relevant to event planning and execution, including potential alternate routes and parking. Developer shall document this exchange of information with external event staff in SMS. Developer staff shall review the list and update monthly.

M. Developer shall inform PCT of major changes in traffic control and Full Closures. Developer shall carry out the following to assist with community awareness and to avoid major congestion or other conflicts:

1. Developer shall draft construction alerts for all Lane and Shoulder Closures, Full Closures, and planned Utility disruptions. Developer shall ensure that all Project communications are consistent, use visuals to clearly explain concepts, and provide accurate and current information. Developer shall deliver alerts with graphics to the PCT for review and approval 5 Business Days prior to the Lane and Shoulder Closure and 15 Business Days prior to any Full Closure. Developer shall distribute alerts to affected Stakeholders via electronic distribution, including on the Developer Website and the App, and printed alerts via canvassing no less than 7 Days prior to the start of the Full Closure. Developer shall provide PCT an electronic version of alerts 7 Days prior to the start of the Full Closure for further dissemination. Developer shall provide graphics to the PCT for use in social media postings about the alerts.
2. Developer shall provide an outreach plan for maintenance of traffic phase changes on mainlines that includes a description of actions to be taken and materials to be used to provide notice to Stakeholders. The plan and supporting graphics must be provided to the PCT 30 Business Days prior to the start of the new construction phase. At a minimum, this information provided to Stakeholders shall include traffic control schemes, locations of construction, potential impacts on traffic, and the date/time for such implementation and duration.
3. Developer shall maintain a mobile phone line that serves as a Project hotline. The existing hotline currently in use by ADOT ((602) 501-5505) will be transferred, at Developer's cost, to become the mobile phone line. Developer shall monitor and respond to phone calls, text messages, and voicemail messages received, after receipt of approval of each response from the PCT. Pre-approved messages by the PCT may be utilized for routine responses by Developer. Developer shall escalate calls concerning critical issues and calls from news media and elected officials to ADOT. Developer shall assign appropriate staffing to answer hotline calls Monday through Friday during regular business hours, Saturday and Sunday during regular business hours during Full Closures and develop appropriate messages and response protocols for after-hours callers. Developer shall log all inquiries and responses in

1 SMS. Each Monday, Developer shall provide a weekly telephone hotline message including
2 the most current Project information. After approval, Developer shall record the message in
3 English and Spanish.

4 4. Developer shall maintain a Project e-mail account through which the Stakeholders can
5 submit inquiries and comments. Developer shall monitor the Project e-mail account, draft
6 responses for PCT approval, and respond to messages as provided in paragraph (8) below.
7 Developer shall log all messages and responses in SMS.

8 5. Developer shall monitor the information requests received via the Developer Website, draft
9 responses for PCT approval, and respond to messages as provided in paragraph (8) below.
10 Developer shall log all messages and responses in SMS.

11 6. Developer shall maintain a Project mailing address to receive mail. Developer shall monitor
12 incoming Project mail, draft responses to inquiries for PCT approval, and respond to mail
13 as provided in paragraph (8) below. Developer shall log all messages and responses in
14 SMS.

15 7. Each Tuesday, Developer shall provide (a) a weekly construction status report and (b) a
16 traffic report detailing upcoming impacts to traffic, as well as supporting graphics for both
17 (a) and (b). At a minimum, these reports (and each individual report) shall discuss traffic
18 control schemes, Lane and/or Ramp Closure locations, potential impacts on traffic, and the
19 date/time for such impacts.

20 8. Developer shall develop responses to Stakeholder inquiries or comments received verbally,
21 by email, through the Developer Website, or by postal mail within 24 hours of receipt.
22 Developer shall obtain PCT approval on responses before sending to the inquirer, shall send
23 the responses once approved, and shall document the response message, time, and
24 method in SMS. Pre-approved messages by the PCT may be utilized for routine responses
25 by Developer. Developer shall respond to incoming social media messages in the same
26 manner as media requests.

27 N. Developer shall hold construction briefings with Businesses whose access will be impacted a
28 minimum of 7 Days prior to the impact and as directed by ADOT. At the briefings, Developer
29 shall provide printed information packets to Businesses. Developer may brief each Business
30 individually or hold a forum to which all affected Businesses are invited for the briefing.

31 O. Developer shall communicate with Stakeholders within the identified specific noise sensitive
32 areas prior to any Work adjacent to such areas. Communication may be generic as it relates to
33 ongoing routing and planned construction methods and operations, but shall be specific for such
34 activities including pile driving, or demolition. Multiple communications may be required for each
35 area depending on new activities if not previously addressed. Communication approach and
36 schedule shall be outlined in the Construction Noise Assessment Memo per Section 119.03.05
37 of the TPs.

38 P. Developer shall prepare advertising material in radio, newspaper, and online formats for the
39 Project and submit to ADOT for approval.

- 1 Q. Developer shall not communicate or schedule meetings with elected officials or key stakeholders
2 identified in the SMS. Any requests shall be forwarded to ADOT within 2 hours of receipt.
- 3 R. Developer shall prepare draft monthly e-mails to Stakeholders that provide information about
4 the status of the Project and details about major construction activities planned to occur in the
5 upcoming months. In addition to the text, Developer shall insert maps and graphics into the draft
6 e-mail. Developer shall submit the draft e-mail to PCT by the 15th of each month, and ADOT
7 shall distribute the e-mail.
- 8 S. Developer shall have at least one member of its staff dedicated to the CRP reachable at all times
9 to support the identification of community relations issues and rapid resolution of conflicts, as
10 well as provide over the shoulder reviews of public notifications.
- 11 T. Within 30 Days of NTP 2, Developer shall draft a quarterly Project newsletter including photos
12 of activities, graphics, a schedule, and other Project information. Developer shall print the
13 newsletters for distribution at events and dissemination through canvassing. Developer shall
14 additionally make available a digital copy of the newsletter on the Developer Website.
- 15 U. Developer shall draft notification text and supporting visuals to be used for notification of
16 Emergencies and send to ADOT PCT for approval. Developer shall produce versions of this
17 notification in flyer or doorhanger format as requested by the PCT. Notification text and
18 production of materials shall occur as soon as practicable under the circumstances.
- 19 V. Developer shall provide the PCT access to Project planning, scheduling meetings and any
20 meetings associated with the implementation of traffic control changes.
- 21 W. ADOT's Public Information Officer (PIO) shall respond to all news media inquiries. Developer
22 shall provide Project information and support to the ADOT PIO for response to all news media
23 inquiries and events. Support may include providing water, safety escorts, lighting and providing
24 safe locations for media during live shots or on-site interviews. Developer shall forward any
25 media requests to the PCT with a copy to news@azdot.gov. Developer shall not communicate
26 with news media (with the exception of communications for the purpose of placing
27 advertisements) or elected officials without express, written approval by the PCT. Unauthorized
28 communication by Developer staff with any member of the media or elected officials may require
29 Developer to replace its employee with an alternate staff member possessing equivalent
30 experience.
- 31 X. Developer shall provide all content, graphics, photographs, and video to ADOT in a format that
32 can be used on websites and social media channels. Developer shall adapt such graphics,
33 photographs, and video to optimal size and resolution for use on various mediums.
- 34 Y. Developer shall accommodate requests for and provide no fewer than ten tours per calendar
35 year and coordinate necessary resources for such tours. Developer shall schedule tours on the
36 Project calendar in SMS, invite visitors, provide personal protective equipment (PPE), conduct
37 safety briefing for tour groups prior to departure, provide water, and arrange and execute on-
38 site vehicle escorts. Developer shall provide printed Project materials in packets for all attendees
39 of each tour. Developer shall document each tour in SMS. Developer shall immediately forward

1 to the PCT any tour requests involving news media, elected officials and Governmental Entities
2 and ADOT will address the request.

3 Z. Developer shall schedule and attend weekly communications update meetings with the PCT to
4 provide updates on communications activities and Stakeholder issues. Developer shall draft and
5 send to PCT a meeting agenda for review 24 hours prior to the meeting and will provide a
6 summary of the meeting discussion and list of action items within 48 hours after the meeting.
7 Developer shall upload the final meeting minutes to the SMS.

8 AA. Public Relations Manager shall attend ADOT Central District TSM Meetings and shall provide
9 information about the Project at such meetings.

10 BB. Public Relations Manager shall attend Project Specific Transportation System Management
11 Meetings and shall report on any public relations items as it relates to traffic control. The Public
12 Relations Manager shall report any necessary updates to the PCT

13 CC. At least 30 Days prior to the start of construction, Developer shall hold a virtual public information
14 meeting (Pre-Construction Kick Off meeting) during which Developer will introduce the
15 Stakeholders to the Project, describe anticipated phasing and, to the extent possible, share
16 information about planned closures, discuss methods that will be used to communicate traffic
17 issues and Lane and/or Ramp Closures and other planned impacts in the Project area; promote
18 the Developer Website and the App, answer questions about the Project, and provide project
19 resources. Developer shall provide renderings of the Project; and display maps and roll plots in
20 a virtual format. Developer shall provide a timeline of significant events and project completion.
21 Developer shall provide a moderator, all audio/visual equipment and services and a telephone
22 town hall function, and may provide other options for Stakeholders to listen or participate
23 including but not limited to a simultaneous radio broadcast of the meeting. Upon request,
24 Developer shall provide hard copies of all meeting materials by first class U.S. mail postmarked
25 within three days of the meeting date.

26 DD. Developer shall submit advertising material for the Pre-Construction Kick Off meeting in
27 accordance with Paragraph P above and, once approved, shall secure placement of at least
28 one print advertisement in the Newspaper of Record; at least one print advertisement in a
29 newspaper that serves the Spanish-speaking community in the region; and at least one print
30 advertisement in local newspapers serving the cities of Tempe and Chandler; the Ahwatukee
31 area of Phoenix; and the Town of Guadalupe. Developer shall place advertisements on
32 Facebook or Twitter geo-targeting a 5-mile radius around the Project area. Developer shall also
33 provide direct-mail or door-hanger notifications of the meeting to Stakeholders within a 1-mile
34 radius of the Project area. All advertising and public notice of the meeting shall begin two weeks
35 in advance of the meeting date. Developer shall plan to accommodate at least 500 people on
36 its virtual platform. Developer shall provide a complete meeting summary within two weeks of
37 the Pre-Construction Kick Off meeting date. Developer shall prepare a plan for this meeting and
38 submit such plan to ADOT 60 days prior to the meeting for approval.

39 EE. Developer shall follow all requirements of Temporary "Express Lanes" as stated in Section
40 700.06.03.12 of the TPs.

107.20.04 Reporting and Tracking

Developer shall document all Stakeholder-initiated communications, coordinate a response with the PCT, provide a record of response times to such communications, and conduct a review of actions taken in response. Developer shall respond to public comments and inquiries within 24 hours of receipt. Further, Developer shall conduct quarterly surveys of Stakeholders using the Construction Operations Survey described further below to determine overall satisfaction ratings with the Project, the effectiveness of the PIP, and community relations endeavors. The two tracking mechanisms are discussed in more detail below:

- A. Developer shall record all Stakeholder-initiated inquiries in SMS, including events and tours, online and print materials distributions, advertisements Stakeholder meetings, public meetings, presentations to groups, phone calls, text messages, emails, and letters, and trainings. Developer shall use the SMS system to provide a weekly report to ADOT outlining the number and nature of public-initiated inquiries and a summary of those inquiries.
- B. Developer shall draft a Construction Operations Survey and distribute it on a quarterly basis through the Developer Website, email as a fillable PDF and by handing out paper copies. The first Construction Operations Survey shall be distributed within 3 months after NTP 2 and continue until the first full quarter following Substantial Completion. The Construction Operations Survey shall measure Stakeholder satisfaction with the Project regarding: traffic control, dust control, noise control, access interference, encroachments to private property, advance warnings of potential construction impacts on daily routines, and the reliability of information originating from the Project. Developer must disseminate surveys in areas impacted by construction to be determined in conjunction with the PCT. Developer shall compile survey responses into a report and provide such report to PCT within three weeks of conducting surveys.

107.20.05 Submittals

Table 107-6 reflects a nonexclusive list of Submittals identified in Section 107.20 of the TPs and is not intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 107-6 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Public Involvement Plan	2	2	1	Within 90 Days of NTP 1.	107.20.03
Developer Website URL	2	0	1	Within 30 Days of NTP 1	107.20.03
Mockup of Website	2	0	1	During initial design of website and at each major redesign	107.20.03

Table 107-6 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Maintenance of Traffic Phase Change Outreach Plan	3	0	1	30 Days prior to Phase Change	107.20.03
Traffic Alert Videos	2	0	1	Three weeks prior to start of closure.	107.20.03
Event Plan	3	0	1	30 Days prior to the start of the event.	107.20.03
Event Summary Report	3	0	1	Within 5 Business Days of end of event.	107.20.03
Group Presentation Summary Report	3	0	1	Within 5 Business Days of presentation.	107.20.03
Special Event List	3	0	1	Within 30 Days of NTP 2.	107.20.03
Hotline Messages	3	0	1	5 Business Days prior to message recording.	107.20.03
Closure-Specific Outreach Plans	3	0	1	15 Days prior to start of closure.	107.20.03
List of Concurrent Projects	3	0	1	Within 30 Days of NTP 2.	107.20.03
Weekly Construction Status Reports	3	0	1	5 Business Days prior to the start of the week being reported.	107.20.03
Weekly Traffic Control Reports	3	0	1	5 Business Days prior to the start of the week being reported.	107.20.03
Project update flyers (lane closures, utility shutdowns, utility disruptions, hazardous conditions, security, and loss of access) and Emails	3	0	1	10 Business Days prior to the start of the impact.	107.20.03
Construction Operations Survey	4	0	1	Quarterly	107.20.03
Project Newsletter	3	0	1	Quarterly	107.20.03
Construction Operations Survey Report	4	0	1	Quarterly within two weeks of conducting survey	107.20.03

Table 107-6 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
Pre-Construction Kick Off Meeting Plan	3	0	1	60 days prior to the start of the event	107.20.03
Pre-Construction Kick Off Meeting Event Summary Report	3	0	1	Within two weeks of the meeting date	107.20.03
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

1 108 PROSECUTION AND PROGRESS

2 108.03 Meetings

3 Developer shall perform all Work in compliance with the requirements of this Section 108 of the TPs.
 4 Developer shall arrange and conduct Project meetings with ADOT and other parties as reflected in Table
 5 108-1 and the Contract Documents. Table 108-1 provides a nonexclusive list of meetings identified in
 6 this Section 108 of the TPs and is not intended to be an all-inclusive or exhaustive listing of meetings
 7 required by the Contract Documents.

Table 108-1 Meetings			
Description	Period (Design and Construction [D&C])	Frequency (or as approved by ADOT)	Section Reference
Partnering meetings	D&C	Article 21 of the Agreement	Article 21 of the Agreement
Progress meetings	D&C	Monthly	108.03.01
Pre-design coordination meetings	D	Once per discipline	108.03.02
Technical Work Group meetings (TWG)	D&C	As determined by Developer unless noted otherwise	108.03.03
Project Specific Traffic System Management Meeting	D&C	Monthly	108.03.04
Utility coordination meetings	D&C	Weekly	108.03.05
Third Party meetings	D&C	Section 108.03.06	108.03.06
Communications meetings	D&C	Weekly	107.20.03
Pre-construction coordination meetings	C	Prior to any Construction Work and once per activity	108.03.07
Construction activity meetings	C	Weekly	108.03.07

Table 108-1 Meetings			
Description	Period (Design and Construction [D&C])	Frequency (or as approved by ADOT)	Section Reference
Maintenance Coordination meetings	D&C	Monthly	108.03.08

Developer's responsibilities for meetings shall include scheduling all meetings, developing all meeting agendas, attending all meetings, and providing facilities and materials for all meetings required by the Contract Documents or as otherwise requested by ADOT. Not less than 3 Business Days prior to the associated meeting, Developer shall submit a Meeting Notice to ADOT. Developer shall invite ADOT and other attendees, as determined by ADOT, to all Project-related meetings. At least 24 hours prior to each meeting, Developer shall submit agendas to invitees. Meeting agendas shall include meeting topics, estimated topic duration, and a list of each action item and its status.

For all meetings relating to the Project at which Developer is required to attend or is an invitee (not just those meetings called by Developer or ADOT), Developer shall record meeting minutes. The meeting minutes shall include the date of the meeting, list of all attendees, issues considered by the participants, related responses or decisions for the issues, a list of action items, party(ies) responsible for completing each action item, assigned completion date, and any questions that pertain to the scope of Work and level of effort for the Work. Within 24-hours after the meeting, Developer shall submit the meeting minutes to ADOT for review and comment. ADOT will return comments within 48-hours. Developer shall incorporate ADOT's comments and prepare final meeting minutes. Within 5 Business Days of receipt of ADOT's comments, Developer shall submit final meeting minutes to ADOT. ADOT comments not incorporated shall be added as Agenda topics for the following meeting.

108.03.01 Progress Meeting

Developer shall be responsible for monthly progress meetings, or other meetings held at the request of ADOT, to review and discuss the status of the Project. In the meetings, the Parties will identify issues, cause for issues, responsible party, impacts, and potential solutions with the intent of finding the most effective solutions to problems through the following:

- A. Developer shall make available the Project Manager and appropriate personnel to participate in the monthly progress meetings; and
- B. Developer shall develop and record an action item list that specifies who is responsible for resolving existing or pending issues and the date by which the issue shall be resolved.

Developer shall present the Monthly Progress Schedule described in Section 108.04.02.07 of the TPs and the Monthly Progress Report described in Section 108.04.02.08 of the TPs at the Progress Meeting.

108.03.02 Pre-Design Coordination Meetings

Developer shall schedule a pre-design coordination meeting, per discipline, with ADOT to familiarize the designers and ADOT's review personnel with the design concepts, issues, status, and review procedures. Developer shall conduct the first pre-design coordination meeting within 10 Business Days prior to any Design Work.

108.03.03 Technical Work Group Meetings

Developer shall arrange and conduct Technical Work Group (TWG) meetings with ADOT to identify and resolve issues and concerns raised by ADOT or Developer. The purpose of these TWG meetings is to acquaint personnel with the details and features of the Work and to facilitate completion of the Project.

The TWG meetings may include Project visits at either Party's request. At a minimum, the Key Personnel assigned to perform the relevant type of Work involved, or his/her designee, shall attend. Developer shall invite ADOT, other relevant Governmental Entities' staff, and third-party staff.

The TWG meetings do not replace the review process described in Section 116 of the TPs.

Developer shall schedule and lead aesthetic and landscaping TWG meetings every other week unless otherwise directed by ADOT.

108.03.04 Project Specific Transportation System Management Meetings

Developer shall establish a Project Specific Transportation System Management meeting as noted in Section 700.06.02.02 of the TPs. Developer shall prepare a Project Specific Transportation System Management Invitees List that includes all parties invited to take part in the Project Specific Transportation System Management meeting. At least 15 Business Days prior to the first Project Specific Transportation System Management meeting, Developer shall submit a Project Specific Transportation System Management Invitees List to ADOT for review and comment.

Developer shall establish and convene the initial meeting of the Project Specific Transportation System Management meeting at least 30 Days prior to activities affecting traffic.

Developer shall schedule and chair the Project Specific Transportation System Management meetings once a month from the initial meeting to Substantial Completion. The meeting schedule and frequency may be adjusted upon the agreement of the Project Specific Transportation System Management invitees.

108.03.05 Utility Coordination Meetings

The Utility Adjustment Coordinator shall hold utility coordination meetings on a weekly basis or more often as needed, with ADOT and the Utility Companies to communicate with the Utility Companies, Developer's staff, and others to review designs and ensure that conflicts are being resolved throughout the duration of the design and construction of the Project.

The meeting schedule and frequency may be adjusted upon the agreement of the attendees of the Utility Coordination Meeting.

108.03.06 Third Party Meetings

Developer shall conduct meetings with Third Parties including Governmental Entities to coordinate the Work. Meetings shall be held to review designs, resolve conflicts, obtain approvals, or generally update progress of the Project.

Third Party Meetings may be held outside of the Collocated Office at the request and approval of the Third Party. Any requests of Developer for equipment or space needed to hold such meeting shall be coordinated with the Third Party prior to notification of the meeting to attendees. Developer shall be

responsible for material and equipment needed to conduct all Third Party Meetings. ADOT shall be in attendance of all design review and approval meetings.

108.03.07 Construction Coordination Meetings

Developer shall schedule a pre-construction coordination meeting with ADOT, IQF, and other necessary entities prior to any Construction Work and on any new construction activity identified in the Project Schedule, or as required elsewhere by the TPs, at least 10 Business Days prior to beginning construction, unless otherwise authorized in writing by ADOT.

Developer shall schedule and lead weekly construction activity meetings with ADOT, IQF and other necessary entities throughout Construction Work.

Developer shall discuss such details, construction schedule, early construction elements, the Safety Management Plan, and Environmental Management Plan at the pre-construction coordination and weekly construction activity meetings.

108.03.08 Maintenance Coordination Meetings

Developer shall schedule and lead monthly Maintenance Coordination Meetings with ADOT and Governmental Entities as Work occurs within or adjacent to other maintenance areas. The first Maintenance Coordination meeting shall occur at least 10 Business Days prior to NTP 2. The monthly Maintenance Coordination Meeting shall be led by the Maintenance Coordinator and include such topics of discussion as recurring maintenance issues, outstanding maintenance requests, delayed responses to maintenance activities, corrective actions to maintenance concerns, coordination, and clarification of maintenance requirements throughout the Project, and other topics relating to maintenance during construction. At the first Maintenance Coordination Meeting, the Maintenance Coordinator shall provide a contact list of individuals that shall be contacted if maintenance items are required after normal business hours. This contact list shall be updated as personnel changes.

108.03.09 Submittals

Table 108-2 reflects a nonexclusive list of Submittals identified in Section 108.03 of the TPs and is not intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 108-2 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Meeting Notice	5	0	1	A minimum of 3 Business Days prior to the associated meeting	108.03
Meeting Agendas	5	0	1	At least 24 hours prior to each meeting	108.03

Table 108-2 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
Meeting Minutes	3	0	1	Within 24 hours after the meeting	108.03
Final Meeting Minutes	3	0	1	Within 5 Business Days of receipt of ADOT's comments.	108.03
Project Specific Traffic System Management Meeting Invitees List	3	0	1	At least 15 Business Days prior to the first Project Specific Traffic System Management Meeting	108.03.04
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

108.04 Schedule Management

108.04.01 General Requirements

Developer shall perform all Work in compliance with the requirements of Section 108.04 of the TPs.

108.04.02 Administrative Requirements

108.04.02.01 Software Requirements

Developer shall prepare the Project Schedule using Oracle's Primavera P6.

108.04.02.02 Schedule Development

The Parties will use the Project Schedule for planning and monitoring the progress of the Work and to verify Draw Requests in accordance with Article 12 of the Agreement. The Project Schedule serves as the foundation for the Monthly Progress Schedule. Developer shall coordinate with Governmental Entities when developing and maintaining the Project Schedule and shall make provisions for adjacent projects and Governmental Entities' comments. Developer shall ensure that the Project Schedule reflects the following information:

- A. Activity Identification. Activities shall be assigned consistent descriptions, identification codes, and sort codes. Sort code schemes (a) are subject to ADOT's prior approval, (b) shall group activities using meaningful schemes defined by Developer and ADOT, (c) shall designate lead responsibility for each activity, and (d) clearly identify each Project Schedule Submittal. Resubmissions of Project Schedules shall use the same revision number as the original submission individually identified by a sequential appended letter (A, B, etc.), as an indication of a revised version;

- 1 B. Cost Allocation. Allocate price and commodity quantities throughout the Project activities in the
2 Project Schedule. Accurately reflect Developer's cost allocation for each Project activity. All
3 Work shall be represented by cost resource-loaded Project activities. Developer shall not
4 artificially inflate, imbalance, or front-load line items in the Project Schedules. The price of each
5 Project activity shall be all-inclusive and include all direct and indirect costs, overhead, risks,
6 and profit;
- 7 C. Milestones. Developer shall separately identify each Project milestone, conforming to the
8 scheduling requirements set forth in the Contract Documents;
- 9 D. Activity Information. Developer shall divide the Work into activities with appropriate logic ties to
10 show Developer's overall approach to the planning, scheduling, and execution of the Work.
11 Developer shall base duration and logical relationships of the Project activities (or summaries at
12 phase level) on the actual duration and relationships anticipated. Each activity shall have a
13 duration not exceeding 20 Business Days unless approved by ADOT;
- 14 E. Constraints. Developer shall not use calendar dates or constraints to logically begin or complete
15 any Project activity unless calendar dates are shown in the TPs or other relevant Contract
16 Documents. The Project Schedule shall not contain unspecified milestones, constraints, Float
17 suppression techniques, or use of Project activity durations, logic ties, and/or sequences
18 deemed unreasonable by ADOT. Any schedule showing an early completion date shall show
19 the time between the scheduled completion date(s) and the applicable Completion Deadline(s)
20 as Float;
- 21 F. Float.
- 22 1. Float is a jointly owned Project resource and shall comply with the requirements in Section
23 7.9.2 of the Agreement;
- 24 2. Developer shall not utilize (1) Float suppression techniques in the Schedule, including
25 interim dates imposed by Developer other than Project milestone(s), or (2) the inclusion of
26 activities or constraints in a path or chain leading to a Project milestone which are unrelated
27 to the Work as stated and specified in the Contract Documents, or (3) activity durations or
28 sequences deemed by ADOT to be unreasonable in whole or in part;
- 29 3. Preferential sequencing (i.e., whereby activities that could be performed concurrently and
30 are established in the Project Schedule as sequential simply to consume Float) and/or
31 indicating artificial activity durations (i.e., inflating activities in the schedule to consume
32 Float and influence the Critical Path) are unacceptable. Sequestering of Float is cause for
33 rejection of Developer's schedule Submittal. If Float sequestering is identified, Developer
34 shall revise the schedule appropriately;
- 35 4. Developer shall impose, code, and separately identify all time(s) and milestones in all
36 Monthly Progress Schedule Submittals in conformance with the milestone(s) and time(s)
37 set forth in the Contract Documents. Developer shall impose no other date restraints in the
38 Schedule, unless Developer provides an explanation of the basis for such date restraints
39 and such explanation is acceptable to ADOT; and

5. If Developer is delayed in performing the Work, Developer shall absorb any related delay, disruption, interference, hindrance, extension, or acceleration costs, however caused, except as otherwise provided in Articles 13 and 14 of the Agreement. Developer and ADOT may use Float to absorb Project delays, if any. Developer shall include a description of the cause of delay, the projected amount of Float to be used, and the revised Monthly Progress Schedule showing the use of the Float in the Monthly Progress Report. Developer shall work cooperatively with ADOT, other contractors, and third parties to identify and implement, to the maximum extent possible, no-cost measures to recover all schedule delays, regardless of the cause of the delays. One example of such measures is no-cost re-sequencing of Work activities.

G. Progress: Developer shall show actual progress and not calculated progress in the Monthly Progress Schedule. Developer shall incorporate logic changes and Work changes into the Monthly Project Schedule. Each Monthly Project Schedule Submittal shall clearly and individually define the progression of the Work within the applicable timeframe by using separate Project activities; and

H. Resources: Developer shall indicate any resources such as commodities, labor, or equipment quantities with the associated Project activity field. Developer shall base labor-loading of activities on total number of workers, not total number of crews, and shall assign applicable activities for major construction equipment to be used by Developer and Subcontractors in prosecuting Work. The quantity shall represent the estimated effort in-place for the Project activity field.

108.04.02.03 Schedule Submission Process

Developer shall use the schedule submittal process described in this Section 108.04.02.03 of the TPs for the preparation and submittal of all Project Schedules provided by Developer to ADOT for review and comment, unless otherwise specified in the Contract Documents. For each Project Schedule Submittal, Developer shall provide the following:

- A. Hard copies of the schedule on half-size (11 inches by 17 inches) color plot sheets;
- B. Electronic version of the schedule in both native (including activity data, logic, and coding) and PDF format on PC-compatible electronic media;
- C. Schedule Narrative in accordance with Section 108.04.02.04 of the TPs;
- D. Look-Ahead Schedule in accordance with Section 108.04.02.09 of the TPs;
- E. Recovery Schedule, as needed, in accordance with Section 108.04.02.10 of the TPs; and
- F. Time Impact Analysis, as needed, in accordance with Section 108.04.02.11 of the TPs.

The Project Schedule Submittal shall progress with the following steps:

- A. Developer shall submit Project Schedules for review and approval by ADOT;

1 B. ADOT will review the schedule and will return it with comments or no comments. ADOT will not
2 withhold payment in accordance with the requirements of Section 108.04 of the TPs if ADOT
3 fails to provide a response to the Project Schedule Submittal within the specified time;

4 C. Developer shall address all ADOT comments and revise the Project Schedule, as necessary;
5 and

6 D. Developer shall provide a revised schedule within 14 Days, if necessary.

7 ADOT's review of and comment on a Project Schedule does not do the following:

8 A. Imply or constitute approval of any particular construction methods or relieve Developer of its
9 responsibility to provide sufficient materials, equipment, and labor to complete the Project in
10 accordance with the Contract Documents;

11 B. Attest to the validity of assumptions, activities, relationships, sequences, resource allocations,
12 or any other aspect of the Project Schedule;

13 C. Imply Developer is entitled to any Supplemental Agreement extending the Completion Deadline
14 or adjusting the Contract Price; and

15 D. Relieve Developer from compliance with the requirements of the Contract Documents or result
16 in the approval of any Deviation, exception to or other variation from the Contract Documents.
17 Failure to include any element of Work required by the Contract Documents in the Project
18 Schedule does not release or relieve Developer from responsibility to perform such Work.

19 **108.04.02.04 Schedule Narrative**

20 With each Project Schedule Submittal, Developer shall prepare and submit a stand-alone Schedule
21 Narrative with sufficient detail to explain the basis of the submitted Project Schedule to ADOT. The
22 Schedule Narrative shall describe the activities, including how the activities interrelate. Developer shall
23 ensure that the Schedule Narrative includes the following information:

24 A. A list of the activities on each Critical Path and a comparison of early dates and late dates for
25 activities designating times;

26 B. Include Developer's site management plan (e.g., lay down, staging, traffic, and parking), the use
27 of construction equipment and resources, basis and assumptions for critical activity durations
28 and logic, compliance with temperature and weather related requirements, any shifts, non-
29 Business Days, and multiple calendars applied to the activities, the construction philosophy
30 supporting the approach to the Work outlined in the submitted Project Schedule, and the reasons
31 for the sequencing of Work, including a description of any limited resources, potential conflicts,
32 and other items that may affect the schedule and how they may be resolved;

33 C. Recap progress and days gained or lost versus the previous Progress Schedule; identify
34 problems and delays that have been experienced to date, the party responsible for the problems
35 or delays and Developer's plan to resolve the problems or bring the delayed activities back on
36 schedule; describe potential problems that may be encountered during the next period and the
37 proposed solutions (identify all potential problems and explain what action Developer feels

ADOT needs to take and the date by which the action needs to be taken to avoid the problem); describe changes in resources to be used on remaining Work; and identify delays, their extent, and causes. Each Schedule Narrative shall also itemize changes in activities and logic ties caused by each Supplemental Agreement, schedule recovery plans and grouping of related Developer initiated revisions;

D. The justification for any activity with a duration exceeding 20 Business Days;

E. The justification for any constraints used;

F. Developer's approach used to apply relationships between activities, including a list of activity relationships with lags and the justification for the use of each lag (e.g., all ties are based on physical relationships between Work activities [such as "rebar shall be placed before concrete is placed"] or relationships are used to show limited resources [such as "bridge two follows bridge one" because Developer has only one bridge crew]); and

G. Challenges that may arise associated with Critical Path activities.

108.04.02.05 Schedule Deliverable Requirements

Developer shall prepare and maintain the Project Schedule, which consists of the following:

A. Project Baseline Schedule;

B. Monthly Progress Schedule; and

C. Recovery Schedule.

Developer shall also prepare and maintain the following schedules:

A. Look-Ahead Schedule; and

B. As-Built Schedule.

108.04.02.06 Project Baseline Schedule

Developer shall use the Preliminary Project Baseline Schedule submitted with the Proposal as a foundation to prepare the Project Baseline Schedule. Developer shall detail CPM activities and logic ties in the Project Baseline Schedule as necessary to show Developer's Work sequencing and separately define all requisite ADOT tasks. For each activity in the Project Baseline Schedule, Developer shall provide the duration, in Days, required to perform the activity and the anticipated beginning and completion date of each activity.

The Project Baseline Schedule shall indicate the sequence of performing each activity and the logical dependencies and interrelationships among the activities. The Project Baseline Schedule shall include a listing of all Submittals required by the Contract Documents. Submittal activity durations shall include specific durations for reviews and/or concurrence of Developer's Submittals as set forth in the Contract Documents.

1 Prior to issuance of NTP 2, Developer shall submit a Project Baseline Schedule to ADOT for approval in
2 ADOT's good faith discretion. Developer shall use the Project Baseline Schedule as the basis for Monthly
3 Progress Schedule Submittals.

4 The completion/approval of the Project Baseline Schedule is a condition to issuance of NTP 2. Developer
5 shall use the Project Baseline Schedule to coordinate all activities on the Project, including those with
6 other entities, such as Subcontractors, vendors and suppliers, Utility Companies, Governmental Entities,
7 and ADOT. Developer shall develop the work breakdown structure (WBS) with clearly identifiable linkage
8 to Developer's activities and phases represented in the Project Baseline Schedule.

9 The Project Baseline Schedule shall clearly define the prosecution of the Work from issuance of NTP 1
10 to Final Acceptance by using the separate critical path method (CPM) activities for the following:

- 11 A. Design;
- 12 B. Project ROW activities (including TCEs), environmental commitments, and mitigation activities;
- 13 C. Construction;
- 14 D. Testing;
- 15 E. Permitting;
- 16 F. Submittal preparation, reviews, resubmissions, and concurrence;
- 17 G. Material and equipment deliveries;
- 18 H. Interfaces with other contractors, Utilities, etc.;
- 19 I. Final inspection;
- 20 J. Punch List;
- 21 K. Milestones including Substantial Completion, Landscape Establishment and Final Acceptance;
22 and
- 23 L. Training.

24 CPM activities shall include both design and construction activities for each Utility Company and each
25 conflict.

26 **108.04.02.07 Monthly Progress Schedule**

27 Developer shall prepare a Monthly Progress Schedule that updates the Project Baseline Schedule during
28 the Work, commencing after issuance of NTP 2, until the closing for Final Payment. The Monthly Progress
29 Schedule shall reflect progress up to the closing date, forecast finish for in-progress activities and re-
30 forecast early dates for activities planned in the next update period. The Monthly Progress Schedule shall
31 include the following:

- 32 A. Actual start and finish dates for completed activities;

1 B. Actual start dates, percentage complete, and remaining duration for activities in progress;

2 C. All proposed activities, logic, and restraint date revisions required to:

3 1. Implement changes in the Work;

4 2. Detail all impacts on preexisting activities, sequences, and restraint dates;

5 3. Reflect Developer's current approach for Work remaining;

6 4. Incorporate any delays that are being negotiated between ADOT and Developer; and

7 5. Reflect "or equal" or substitution proposals.

8 D. Planned start and finish dates for future activities; and

9 E. Progress for the current invoice submittal for Project activities.

10 If Work is performed out of sequence, Developer shall implement logic changes to allow the out-of-logic
11 sequence Work to proceed. Developer shall exclude any revisions for Developer's convenience when
12 reconciling an extension to a milestone. Developer shall document changes, which shall be highlighted
13 or identified, in any Monthly Progress Schedule. Concurrent with the Draw Request, Developer shall
14 submit the Monthly Progress Schedule to ADOT for approval in ADOT's good faith discretion, and for
15 discussion at the Progress Meeting, as set forth in Section 108.03.01 of the TPs and in Section 12.2.2 of
16 the Agreement. Once the Monthly Progress Schedule is accepted by ADOT, Developer shall use the
17 Monthly Progress Schedule as the basis for the next Monthly Progress Schedule. ADOT has no obligation
18 to approve payment of an invoice until ADOT receives an acceptable Monthly Progress Schedule and all
19 other conditions for approval have been satisfied.

20 **108.04.02.08 Monthly Progress Report**

21 Developer shall provide additional, separate, filtered reports of the Project activities and Work elements
22 based on the Monthly Progress Schedule with the Monthly Progress Report, including the following:

23 A. Description of coordination with Utility Companies and accomplishing Utility Work;

24 B. Bar chart schedule sorted by elements, indicating the physical status of all activities as of date
25 of the update;

26 C. Graphical report, which compares Developer's progress to planned progress by elements;

27 D. Design Document Submittals for the forthcoming period;

28 E. Tabular report listing all activities with 14 Days or less Float;

29 F. 60-Day look-ahead report identifying all required ADOT and Governmental Approvals;

30 G. 180-Day look-ahead bar chart schedule sorted by WBS and activity early start dates;

- H. Critical items graphical report for each Critical Path sorted by activity early start date, including major Work completion, long-term Closures of travel lanes beginning and ending, etc.;
- I. Time-scaled Critical Path network plot indicating the status of all activities as of the date of the update;
- J. Monthly expenditure projects and cash expenditure curves by WBS;
- K. Discussion of actions/corrections to be taken to achieve Project Baseline Schedule milestones; and
- L. Reporting of Noncompliance Events from the previous month.

At the same time as the monthly Progress Meetings, Developer shall submit the Monthly Progress Report to ADOT for approval in ADOT's good faith discretion.

108.04.02.09 Look-Ahead Schedule

The Look-Ahead Schedule is a computer-generated bar chart that shows the previous week's Work and the Work planned for the current and next 3 weeks. Developer shall base the Look-Ahead Schedule on the Project Schedule and provide a greater breakdown of the Project Schedule activities for the purpose of materials inspection and testing. The Look-Ahead Schedule shall clearly note and explain any departures from the Project Schedule. Developer shall reference the Project Schedule activity identification numbers and define subsequent specific daily operations for all Work activities scheduled to be performed during the 4-week period. Developer shall identify Work being performed by Disadvantaged Business Enterprise (DBE) firms as separate activities. At least 1 Day prior to the weekly construction activity meetings, Developer shall submit weekly Look-Ahead Schedules to ADOT.

108.04.02.10 Recovery Schedule

Unless otherwise directed in writing by ADOT, if the Monthly Progress Schedule indicates a late completion of the Work or if Critical Path items shown on the Monthly Progress Schedule Submittal slip by 28 or more Days beyond any milestone, Developer shall prepare a Recovery Schedule which demonstrates how Developer intends to reschedule those activities to regain compliance with the milestones and the Contract Documents. Whenever a Recovery Schedule is required, Developer shall provide the following information:

- A. Transmittal letter;
- B. Time-scaled network diagram;
- C. Electronic copy of the file used for the proposed Recovery Schedule; and
- D. Narrative describing any proposed changes to the Project Schedule, in detail, with justification for the changes, including the following:
 - 1. Changes to activity original durations;
 - 2. Changes to activity relationships and/or schedule logic;

3. Cause of schedule slippage and actions taken to recover schedule within the shortest reasonable time (e.g., hiring of additional labor, use of additional construction equipment, and expediting of deliveries);
4. Float consumption;
5. Identification of activities that have been added, deleted, or modified; and/or
6. Changes to the Project Schedule's Critical Path.

Within 10 Business Days of receipt of ADOT's written direction, when the Monthly Progress Schedule indicates a late completion of the Work, or when any Critical Path item slips by 28 Days or more, Developer shall submit the Recovery Schedule to ADOT. Developer shall not be required to prepare a Recovery Schedule if Developer requests and demonstrates, in writing, entitlement to extension of a Completion Deadline due to Relief Event Delay(s), and ADOT concurs that a Recovery Schedule is not required at that time. If ADOT disputes Developer's entitlement to a Completion Deadline adjustment, Developer shall, within 5 Business Days, submit a Recovery Schedule that does not include a Completion Deadline adjustment.

Within 5 Business Days after any rejection by ADOT of the Recovery Schedule, Developer shall resubmit a revised Recovery Schedule incorporating ADOT's comments. When ADOT accepts Developer's Recovery Schedule, Developer shall, within 5 Business Days after ADOT's acceptance, incorporate such schedule in the Project Schedule, deliver the same to ADOT, and proceed in accordance with the approved Recovery Schedule.

108.04.02.11 Time Impact Analysis

If Developer receives a Request for Change Proposal, submits a Change Request or submits a Relief Request asserting that an event, situation, or change affects a Critical Path of the Project Schedule as set forth in Section 13.1.3.1 of the Agreement, Developer shall prepare and submit with the response to the Request for Change Proposal, the Change Request or Relief Request a Time Impact Analysis showing the cumulative effect of the change on the completion or fixed milestone date. Developer shall also submit a Time Impact Analysis where otherwise provided in the Contract Documents. With each Time Impact Analysis, Developer shall include a written report, in a form satisfactory to ADOT, describing the Time Impact with the Time Impact Analysis. A revision to the Project Schedule associated with a time extension shall not modify the early- and late-start cost curves of the Project Schedule, except with respect to activities that have been affected by the event that justify the extension. Developer may reschedule activities not otherwise affected by the event to take advantage of additional Float available as the result of the time extension. Developer shall reflect any such rescheduling in the Project Schedule. Each Time Impact Analysis shall include a fragnet demonstrating the following information:

- A. How Developer proposes to incorporate any time extension provided for in a Supplemental Agreement;
- B. The impact to the Project Schedule;
- C. The sequence of new and/or existing activity revisions that are proposed to be added to the Project Schedule that is in effect when the change or delay is encountered; and
- D. The proposed method for incorporating the delay and its impact to the Project Schedule.

108.04.02.12 As-Built Schedule

Developer shall prepare an As-Built Schedule that includes actual start and actual finish dates for all activities. The As-Built Schedule, once accepted, serves as the final update of the Project Schedule. Developer shall include a written certification with the As-Built Schedule Submittal signed by the Project Manager in accordance with the following: "To the best of my knowledge, the enclosed final update of the Project Schedule reflects the actual start and completion dates of the activities for the Project contained herein." Submittal of the final update of the Project Schedule and the Project Manager's certification is a condition to Final Acceptance in accordance with Section 6.6.3.1 (d) of the Agreement. At least 20 Business Days prior to scheduled Final Acceptance, Developer shall submit the As-Built Schedule to ADOT.

108.04.03 Submittals

Table 108-3 reflects a nonexclusive list of Submittals identified in Section 108.04 of the TPs and is not intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 108-3 Nonexclusive Submittals List					
Submittals	Level of	Number of Copies		Submittal Schedule	Section Reference
	Review*	Hardcopies	Electronic		
Schedule Narrative	3	0	1	At each Project Schedule Submittal	108.04.02.04
Project Baseline Schedule	2	1	1	Prior to issuance of NTP 2	108.04.02.06
Monthly Progress Schedule	2	1	1	Concurrent with the Draw Request	108.04.02.07
Monthly Progress Report	2	1	1	At the monthly Progress Meeting	108.04.02.08
Look-Ahead Schedule	5	0	1	1 Day prior to the weekly construction activity meeting	108.04.02.09
Recovery Schedule	2	1	1	Within 10 Business Days of receipt of ADOT written direction, the Monthly Progress Report indicates late completion of Work, or when any Critical Path item slips by 28 Days or more	108.04.02.10

Table 108-3 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Time Impact Analysis	3	0	1	With each Relief Request, Change Request, response to Request for Change Proposal, or as otherwise required	108.04.02.11
As-Built Schedule	3	1	1	Within 20 Business Days prior to Final Acceptance	108.04.02.12
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

1 **110 SUBMITTALS PRIOR TO NOTICE TO PROCEED 2**

2 Developer shall perform all Work in compliance with the requirements of this Section 110 of the TPs.

3 Developer shall submit plans and other documents, respond to, and address all comments, and/or obtain
 4 approval of such plans and documents, prior to issuance of NTP 2 in accordance with Section 7.4 of the
 5 Agreement. Table 110-1 reflects a nonexclusive list of plans and documents that shall be submitted to
 6 and approved, in compliance with the Level of Review, by ADOT for issuance of NTP 2.

Table 110-1 NTP Submittals				
No.	Description	Level of Review*	Required Prior to NTP 2	Section Reference
1	Project Management Plan (PMP)	2	X	111
	• Project Administration	2	X	111.01
	• Quality Management Plan (QMP)	2	X	113.02
	○ Volume I – QMP General Requirements	2	X	113.02.01
	○ Volume II – Professional Services Quality Management Plan (PSQMP)	2	X	113.02.02
	○ Volume III – Construction Quality Management Plan (CQMP)	2	X	113.02.03

Table 110-1 NTP Submittals				
No.	Description	Level of Review*	Required Prior to NTP 2	Section Reference
	• Environmental Management Plan	2	X	119.02.03
	• Safety Management Plan	2	X	115.02.01
2	Network Administration Plan	3	X	112.03.02
3	Project Baseline Schedule	2	X	108.04.02.06
4	Segment Limits Map	2	X	116.03.02
5	Design Submittal Schedule	2	X	116.03.02
6	Basis of Design Report	3	X	100.03.02
7	Draft SWPPP	3	X	104.09.02
8	Transportation Management Plan (TMP)	4	X	700.06.02.03
9	Vehicle Project Logo	2	X	112.03.04
10	Utility Coordination Plan	3	X	107.15.04.01
11	Preliminary Plant Inventory	4	X	800.02.03
12	ITS Inventory	3	X	700.07.02.02
13	DBE Utilization Plan	2	X	Section 8.2.5 of the Agreement
14	Public Involvement Plan	2	X	107.20.03
15	OJT Utilization Plan	2	X	Section 8.3.3 of the Agreement
16	Existing Conditions Site Documentation	4	X	117.01
17	Noxious and Invasive Species Control Plan	4	X	800.02.05
18	Collocated Office Layout Plan	3	X	112.02.06
19	Visual Animation	3	X	116.02.05.03
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)				

Developer shall provide written notification to ADOT prior to performing any Work in the Project ROW once Developer ascertains that all requirements herein have been met for ADOT concurrence. ADOT is under no obligation to receive or review Submittals of Design Documents until approval of the Professional Services Quality Management Plan (PSQMP) in accordance with Section 113.02.02.01 of the TPs and until Developer has complied with the conditions in Section 7.5 of the Agreement.

111 PROJECT MANAGEMENT PLAN

Developer shall perform all Work in compliance with the requirements of this Section 111 of the TPs.

Developer shall establish and maintain an organization that effectively manages all elements of the Work. Developer shall define and guide the Project management effort through the Project Management Plan (PMP), which is a collection of several management plan elements. Developer shall ensure that the PMP

is an umbrella document that describes Developer's managerial approach, strategy, and quality procedures to design and build the Project in a way that achieves all requirements of the Contract Documents. Developer shall ensure that the PMP complies with Federal Highway Administration (FHWA) guidance for a project management plan for major projects. PMP elements are specified throughout the TPs. An acceptable structure of the PMP is outlined in Table 111-1. Developer may propose an alternative structure for the PMP, provided that the proposed alternative PMP outline and content comply with the requirements of the Contract Documents.

Table 111-1 Elements of the Project Management Plan		
PMP Chapter	PMP Chapter Title	Section Reference
1	Project Administration	111.01
2	Quality Management Plan	113.02
2A	A. Volume I – QMP General Requirements	113.02.01
2B	B. Volume II – Professional Services Quality Management Plan	113.02.02
2C	C. Volume III – Construction Quality Management Plan	113.02.03
3	Environmental Management Plan	119.02.03
4	Safety Management Plan	115.02.01

Developer shall prepare and submit the PMP, which shall be subject to approval in ADOT's good faith discretion, in accordance with the TPs. Developer shall ensure that all plans and components of the PMP remain valid and updated as appropriate throughout the Work. Developer shall update the PMP and/or affected components in the event of the following:

- A. The occurrence of any changes to the Key Personnel, Other Personnel, Quality Management Plan, Safety Management Plan, or Project administration policies and procedures;
- B. The occurrence of other changes necessitating revision to the PMP; or
- C. As otherwise directed by ADOT.

Within 10 Business Days after the occurrence of the change or direction triggering the need for the revisions to the PMP, Developer shall submit the revised PMP to ADOT, which shall be subject to approval in ADOT's good faith discretion. ADOT may audit and monitor the activities described in the PMP to assess Developer's performance. All commitments and requirements contained in the PMP shall be verifiable.

111.01 Project Administration

Developer shall prepare a Project Administration Chapter in the PMP that addresses the following:

- A. Organization: Include an organization diagram;
- B. Personnel: Establish Key Personnel and Other Personnel, and provide names, contact details, titles, and job roles. Include resumes for all Key Personnel and Other Personnel as identified in Sections 114.02 and 114.03 of the TPs;

- C. Responsiveness: Developer shall identify the priority list of Key Personnel in charge at any time during the Project effort. The identified person shall respond to ADOT management calls within 1 hour.
- D. Subcontractors: Discuss Developer's Subcontractor approval process;
- E. Schedule: Discuss schedule management procedures;
- F. PMP Updates: Include procedures for preparation of amendments and submission of amendments to any part of the PMP;
- G. Audit: Include procedures to facilitate review and for random audits by ADOT a minimum of every 6 months, auditing, and management review of Developer's own activities under the PMP, and auditing and management review of Subcontractors' activities and management procedures;
- H. Document Management: Include document management procedures in accordance with Section 111.02 of the TPs; and
- I. Site Documentation Plan: Discuss the process and procedures to prepare Existing Conditions Site Documentation and Site Documentation in accordance with Section 111.03 of the TPs.

Prior to issuance of NTP 2, Developer shall submit the Project Administration Chapter to ADOT for approval in ADOT's good faith discretion.

111.02 Document Management

Developer shall establish and maintain a web-based Electronic Document Management System (EDMS) to transfer, store, catalog, and retrieve all Project-related documents. Unless otherwise provided in the Contract Documents or directed by ADOT, Developer shall provide ADOT and ADOT's designated representatives access to the EDMS records throughout the Work. Developer shall provide the records to ADOT as a condition of Final Acceptance. All electronic information provided shall be text searchable and legible. The proposed EDMS is subject to review and comment by ADOT as part of the review and comment on the PMP. Developer shall prepare a Document Management Plan that:

- A. Describes Developer's document control system to store and record all documents, correspondence, design inputs, Plans, Standard Details, progress reports, technical reports, specifications, Contract Documents, Submittals, calculations, test results, inspection reports, Non-Conformance Reports, administrative documents, Deviations, and other documents generated under the Contract Documents. This includes all hardcopy and electronic records;
- B. Identifies how records are to be maintained and kept throughout the Work;
- C. Describes the methods by which all documents Developer issues or receives are to be logged, tracked, retrieved, and approved;
- D. Identifies how all documents are to be tracked using a unique document control number;

- E. Describes how Developer intends to submit all Submittals and other documentation required by the Contract Documents to ADOT's project management information system; and
- F. Describes how Developer intends to transfer all Project data to ADOT at Final Acceptance. Developer shall provide ADOT with EDMS procedures, software for accessing all documents generated under the Contract Documents, and access to Developer's document control database in accordance with the requirements of the Contract Documents and as deemed necessary by ADOT. Developer shall submit the Document Management Plan to ADOT as part of the Project Administration Chapter.

111.03 Site Documentation Plan

Developer shall submit the Site Documentation Plan to ADOT as part of the Project Administration Chapter. The Site Documentation Plan shall contain the policies, procedures, and staffing necessary to perform and provide both the Existing Condition Site Documentation and Site Documentation as required by Section 117 of the TPs.

111.04 Submittals

Table 111-2 reflects a nonexclusive list of Submittals identified in Section 111 of the TPs and is not intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 111-2 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Project Management Plans (PMP)	2	0	1	Prior to issuance of NTP 2	111
Revised PMP	2	0	1	Within 10 Business Days after the occurrence of the change or direction triggering the need for the revisions to the PMP	111
Document Management Plan	2	0	1	As part of the Project Administration Chapter	111.02
Site Documentation Plan	2	0	1	As part of the Project Administration Chapter	111.03

Table 111-2 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
*Levels of Review					
1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement)					
2. Good faith discretion approval (Section 3.1.3.2 of the Agreement)					
3. Reasonableness approval (Section 3.1.4.1 of the Agreement)					
4. Review and comment (Section 3.1.5 of the Agreement)					
5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

112 PROJECT AND FACILITIES MANAGEMENT

112.01 General Requirements

Developer shall perform all Work in compliance with the requirements of Section 112 of the TPs.

Developer shall maintain and post, in a conspicuous location(s) at the Site that is available to employees and applicants for employment, the current and updated versions of notices setting forth the provisions of the nondiscrimination requirements. Developer shall erect one or more bulletin boards, large enough to display posters and other information on the Site prior to construction. The location of the bulletin board(s) will be subject to the approval of ADOT and must be approved as a condition precedent to ADOT's issuance of NTP 2. Developer shall post, at a minimum, the following notices:

- A. The posters as shown on the ADOT Engineering and Construction Posters website (<https://azdot.gov/sites/default/files/media/2020/04/bulletin-board-jobsite.pdf>);
- B. The wage decision included in [TBD];
- C. The EEO Policy of Developer and Subcontractors with contracts greater than \$10,000;
- D. List of safety officers for Developer and major Subcontractors; and
- E. The Notice of Intent for Stormwater Discharges (EPA form 3510-618-98).

Developer shall post the following items at the collocated office:

- A. Name and telephone number of Developer's EEO policy enforcement officer;
- B. Emergency contact telephone numbers; and
- C. OSHA postings and other Project safety and security information, as identified in the Safety Management Plan. Additional office requirements for the Project are identified in other sections of the TPs.

Requirements for space and equipment in this Section 112 of the TPs is intended only to convey the requirements of the space reserved for ADOT's exclusive use. Developer shall determine facilities and equipment requirements for Developer's counterpart spaces.

1 **112.01.01 Standards**

2 Developer shall perform all Work in accordance with the standards, manuals, and guidelines listed
3 in Table 112-1.

Table 112-1 Standards and Stored Specifications		
No.	Agency	Title
1	NFPA	National Electrical Code
2	IEEE	National Electrical Safety Code (ANSI Standard C2)
3	ANSI/TIA/EIA	568-B - Commercial Building Telecommunication Cabling Standard
4	ANSI/TIA/EIA	569-D - Telecommunications Pathways and Spaces
5	ANSI/TIA/EIA	606-C - Administration Standard for Telecommunications Infrastructure
6	ANSI/TIA/EIA	607-C - Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises
7	BICSI	Telecommunications Distribution Methods Manual
8	BICSI	Network Design Reference Manual
9	BICSI	Telecommunications Cabling Installation Manual

4 **112.02 Collocated Office Requirements**

5 Developer shall provide and maintain in good operating condition and repair the Collocated Office and
6 other building space, including office space for ADOT, and all facilities, equipment, and parking for
7 vehicles necessary to design and construct the Project. The collocated office shall be fully functional and
8 compliant with all requirements in this section at least 14 Days prior to issuance of NTP 2. The ADOT
9 office space in the collocated office shall accommodate a staff size of approximately 75 people composed
10 of ADOT, ADOT representatives, and guests. Developer shall provide sufficient office space in
11 Developer's office in the collocated office for simultaneous occupancy by both design and construction
12 personnel.

13 **112.02.01 Location**

14 Except where noted elsewhere in the Contract Documents, Developer shall continue to be collocated
15 with ADOT until 90 Days after Substantial Completion to facilitate Project coordination and daily
16 communication. The definition of "collocate" is to occupy office spaces that are in the same building along
17 or adjacent to the Project and that are within 3 miles of the Project ROW. ADOT's facilities area shall be
18 a separate area than Developer's facilities area, unless otherwise specified in the Contract Documents.

19 **112.02.02 Office Facilities and Equipment**

20 Developer shall comply with the following for the ADOT facilities area:

- 21 A. General. Developer shall obtain all facility space, permits, licenses, and approvals, install and
22 pay for all utility services, and operate and maintain the facilities as part of the Work;
- 23 B. Code requirements. Developer shall comply with all applicable building and fire code
24 requirements;
- 25 C. Access and security. Developer shall provide a separate ADOT entrance(s)/exit(s) to and from
26 the building, secured with a multi-zone alarm with electronic door lock(s) plus a deadbolt lock(s).
27 The ADOT and Developer office facilities shall utilize separate alarm zones. Developer shall

provide security badge card access with locking doors running on time zone/holiday schedules for entry doors, as well as other designated areas (e.g., server room, document storage, and offices). Developer shall provide software for maintaining access to ADOT office spaces. Developer shall not access the ADOT office space without ADOT's prior authorization;

D. Lighting and electricity. Developer shall provide all interior spaces with overhead lighting complying with OSHA, building, and electrical and energy code requirements for similar office spaces (provide nominal 30-footcandles of light at 30 inches above finish floor). Developer shall provide each office space with at least four duplex receptacles, with minimum circuit capacity of 20 amperes;

E. Flooring. Developer shall provide carpeted flooring with non-static flooring in server room;

F. Window coverings. Developer shall provide blinds (no drapes) for all windows;

G. Power circuits. Developer shall provide dedicated electrical power circuits for copiers and a minimum of six duplex receptacles with three dedicated isolated ground 20-amp circuits terminating in National Electrical Manufacturers Association (NEMA) 5-20R receptacles and one dedicated isolated ground 30-amp circuit terminating in a NEMA 6-30R receptacle for the server room;

H. Network/electrical outlets. Developer shall provide each office and conference room with a minimum of two wall plates (comprising three RJ-45 jacks; two data and one voice if required in the space) per room, and one modular furniture plate (comprising three RJ-45 jacks; two data and one voice if required in the space) per cubicle, as well as outlets at all designated printer, facsimile, and copier locations and any and all shared areas (e.g., workroom, storage room). Developer shall install all data/voice outlets near power outlets. All data and voice cabling shall use Category 6 unshielded twisted pair (UTP) with plenum rating. Developer shall place a minimum of two duplex NEMA 5-15 or 5-20 outlets within six feet of each work surface;

I. Network/data network. Each of the data outlets shall provide a minimum of a 1000 megabits per second (Mbps) switched Ethernet connection. Developer shall connect all networked outlets to a managed Ethernet switch with the capability of each port being configured to a designated virtual local area network (VLAN) as determined by the network architecture. Developer shall provide patch cables long enough to safely reach from the data network outlets to the designated computer(s) and printer(s). Developer shall install all cable raceways and J hook cable supports in accordance with Building Industry Consulting Services International and National Electrical Code standards. Each location shall allow for ADOT-provided computer equipment to be installed and operated. Maximum length for horizontal cabling shall be 295 feet, with an additional 30 feet for patch cables. Patch cables from workstation jack to phone or computer shall be a minimum of 15 feet. As-built drawing of the network with floor plan, workstation jack numbers, and no hand-drawn red lines shall be provided in electronic format and minimum 24-inch by 24-inch hard copy in the server room;

J. Janitorial and trash services. Developer shall provide daily janitorial service (except Saturdays, Sundays, and holidays) and maintain trash containers and trash pickup service for the building and areas beyond the ADOT office space. Daily janitorial service shall include sweeping and

mopping floors, vacuuming of carpeted areas, cleaning restrooms and break rooms, emptying wastebaskets, weekly dusting, and replenishment of furnished toilet paper, paper towels and/or hand dryer, soap, and other restroom/kitchen supplies.;

K. Recycling services. Developer shall provide recycling receptacles for paper, cardboard, plastic bottles, and aluminum cans., including recycling pickup service for the ADOT office space;

L. Exterior maintenance. Developer shall maintain the exterior areas of office spaces, including access to parking areas and landscaping;

M. Accessibility and licensing. All facilities shall be in accordance with the access requirements of the *Americans with Disabilities Act (ADA) Accessibility Guidelines*, as amended (42 USC §§ 12101, et seq.) and the applicable building code(s). Developer shall obtain approval of the Collocated Office Layout Plans from all applicable Governmental Entities;

N. Restrooms, break room/kitchen, and entry space. Developer shall provide access to women's and men's restrooms, individual break room space, and building entry space; these spaces may be shared with Developer's office space/staff. All office space shall be accessible 24 hours a day, 7 days a week, including holidays. Developer shall provide ADOT with access to a common break room/kitchen with a 21 cubic foot refrigerator with freezer compartment, ice machine, sink with hot and cold running water, including waste disposer, and 2.0 cubic foot microwave oven on an individual circuit. Tables and chairs for 40 staff shall be provided. Developer shall provide two electric water coolers with hot and cold dispenser, with a minimum of 25 five-gallon bottles of purified water per week and water cups as needed. The break room/kitchen shall have a storage closet (minimum of 25 square feet) and cabinets with drawers and countertops. If restrooms are not directly accessible from a common building entry/lobby, Developer may provide separate restrooms for the ADOT office space. If it is necessary to locate a separate break room and/or restrooms within the ADOT office space, Developer shall increase the ADOT office space allocation to accommodate these spaces;

O. HVAC. Developer shall provide electrical, and heating, ventilation, and air-conditioning (HVAC) systems capable of maintaining temperatures between 65°F and 75°F in all spaces, 24 hours a day, 7 days a week, including holidays. The server room shall have dedicated air-conditioning/cooling system capable of maintaining temperatures between 70°F and 76°F and 20 to 60 percent relative humidity at all times;

P. Utilities. Developer shall obtain all permits and approvals and provide all installation, maintenance, and utility service costs throughout the Work;

Q. Emergency contacts. Developer shall provide a 24-hour emergency contact telephone number for Developer;

R. Emergency equipment. Developer shall provide emergency equipment, such as first aid kits and defibrillators. Developer shall provide fire extinguishers and smoke detectors in accordance with all Laws and as may be directed by the applicable Governmental Entity's fire marshal;

S. Insurance. Developer shall obtain and maintain insurance covering the collocated office in accordance with Exhibit 11 to the Agreement; and

- T. Disposal and removal. Developer shall dispose of and remove all collocated office facilities, including Developer's facilities, and provide any Site restoration Work needed to return the Site to the original condition, and as directed by ADOT.

112.02.03 Offices, Rooms, and Areas

Although actual spaces may vary, the following nominal size requirements apply for ADOT areas, offices, and rooms:

- A. General. Developer shall wire all offices, cubicles, conference rooms, and work areas for power, telephone, Wi-Fi, and network connectivity. Developer shall equip the reception area, offices, cubicles, and work areas with lighting, trash receptacles, desks, chairs, and multi-line telephones;

B. Offices:

1. Developer shall provide eight enclosed office rooms of 12 feet by 12 feet (144 square feet) each with walls extending full height to the ceiling. All offices shall have a desk, desk chair, small round meeting table with four chairs, two extra chairs for visitors, 4 foot by 8 foot wall mounted whiteboard with dry erase markers and eraser, a file cabinet, a 4 foot wide by 6 foot tall five-shelf book shelf, and individual lockable doors and keys. Five of the 144 square foot offices shall have telephones; and
2. Developer shall provide 15 enclosed office rooms of 10 feet by 10 feet (100 square feet) each with walls extending full height to the ceiling. All offices shall have a desk, desk chair, two extra chairs for visitors, 4 foot by 8 foot wall mounted whiteboard with dry erase markers and eraser, a file cabinet, a 4 foot wide by 6 foot tall five-shelf book shelf, and individual lockable doors and keys. Five of the 100 square foot offices shall have telephones;

Work surface area in all office rooms shall be a minimum of 8 linear feet and 30 inches in depth to allow for the installation of two monitors and still have room for spreading out books, reports, plans, or maps.

- C. Cubicles. Developer shall provide 55 total cubicle area spaces (nominally 80 square feet each). Each cubicle area shall have a desk chair and lockable storage with keys. Two of the cubicles shall have telephones. Four of the cubicles shall be located in a separate room that is adjacent to one of the 144 square foot office rooms. Work surface area in all cubicles shall be a minimum of 8 linear feet and 30 inches in depth to allow for the installation of two monitors and still have room for spreading out books, reports, plans or maps;

- D. Conference rooms. Developer shall provide the ADOT office space with three enclosed conference rooms with walls extending full height to the ceiling. All conference rooms shall have dimmable lighting. Developer shall provide an additional 10 chairs in each of the conference rooms in addition to the chairs required at the table. Each conference room shall be equipped with a 4 foot by 8 foot wall mounted whiteboard with dry erase markers and eraser. Developer shall not schedule meetings including TWG meetings or comment resolution meetings in the ADOT conference rooms without prior approval from ADOT.

1. One conference room shall be equipped with a table and chairs at the table to seat at least 24 people and accommodate at least 50 people,
 2. Two conference rooms shall be equipped with a table and chairs at the table to seat at least 12 people and accommodate at least 24 people each.
- E. Reception area. Developer shall provide an approximately 300 square foot total receptionist space with a waiting area with seating for at least four visitors, arranged with a reception area at a nominal 14 feet by 14 feet (196 square feet) and visitors' waiting area at a nominal 8 feet by 12 feet (96 square feet). Developer and ADOT will jointly determine other furniture. The reception area shall include a receptionist desk, desk chair and telephone switch board;
- F. Work room. Developer shall provide a work room (nominally 150 square feet) with 30-inch high wall mounted counters (15 lineal feet of counter-top space, 36 inches deep). Developer shall provide six additional six foot portable tables. Developer shall locate the workroom near the center of the ADOT office space;
- G. Storage and filing. Developer shall provide one lockable space for storage and filing, nominally 10 feet by 15 feet (150 square feet). Developer shall provide eight 5-drawer lateral filing cabinets;
- H. Server room. Developer shall provide one computer server room (100 square feet) that has limited and controlled access and is locked via security card access. The server room shall be accessible via a hallway entry not sharing any walls with the exterior of the building and shall have no windows, a non-static floor covering, and at least three dedicated isolated ground 20-amp power circuits and one dedicated isolated ground 30- amp circuit. Rack mount 10 outlet surge/power strips shall be provided per rack. Developer shall locate all patch panels (phone and data) within the designated server room. Floor-mounted 7 foot racks shall be bolted to the floor, and 12-inch rack to wall kits. A Panduit vertical and horizontal wire management system shall be included. Backboard shall consist of ¾-inch AC grade plywood backboard, fire rated with white paint and one square not painted to show the fire rating on the backboard. Developer shall maintain server room temperature with a dedicated air-conditioning/cooling system, as described above. Developer shall provide uninterruptable power supply (UPS) system in the server room capable of providing spike and brown out protection for all Developer and ADOT server room equipment;
- I. Kitchen/break room. Developer shall provide a kitchen/break room that is approximately 12 feet by 18 feet (216 square feet) and of such size so as to accommodate office-type appliances (refrigerator with freezer and microwave), sink, and kitchen cabinets and drawers. The kitchen/break room shall be of such size to accommodate seating for 40 people;
- J. Parking area. Developer shall provide a parking area for ADOT for at least 100 vehicles (85 staff/15 visitors). The parking area shall be reasonably level (all-weather surface and all-weather access). The parking area shall include an additional lockable fenced parking area to accommodate 25 ADOT vehicles. The fence shall be at least six feet high with three-strand barbed wire. All gates shall be 12 feet wide and lockable; and

- 1 K. Exterior lighting. Developer shall provide sufficient exterior security lighting that is automatically
2 activated at low light levels to maintain 2 footcandles of lighting within the building and parking
3 areas.

4 **112.02.04 Office Condition**

5 The ADOT office space shall be in good and serviceable condition, at least of the same quality as that of
6 Developer's counterpart office space and available for occupancy as specified in Section 112.02 of the
7 TPs. Developer and ADOT will participate in a facility condition survey prior to and at the completion of
8 occupancy. ADOT will return possession of Developer-provided ADOT office space to Developer in
9 essentially the same condition as when ADOT occupied the facilities, except for reasonable wear and
10 tear and except for alterations or loss or damage caused by any member of a Developer-Related Entity.

11 **112.02.05 Losses or Damage**

12 If ADOT office space in the collocated office, related facilities, or fixtures is destroyed, damaged, or stolen
13 then, except as provided below, Developer shall, at its cost and within 10 Business Days after the
14 occurrence of such Loss, repair the items to their original condition or replace them. However, in the case
15 of lost, damaged, or stolen office equipment (e.g., computers, facsimile machines, copy machines, and
16 printers), replacement shall occur within 2 Business Days. Notwithstanding the foregoing, however, if the
17 Loss occurs as a direct result of the willful misconduct of ADOT or its personnel or consultants and such
18 Loss is not covered by insurance actually carried, or deemed to be carried pursuant to Section 10.2.4 of
19 the Agreement, by Developer, then Developer shall repair or replace the affected items within the
20 timeframes specified herein, and ADOT will reimburse Developer for the actual reasonable documented
21 costs incurred to repair or replace, including the amount of any deductible.

22 **112.02.06 Collocated Office Layout Plan**

23 Developer shall prepare a Collocated Office Layout Plan that includes the layout of the offices, cubicles,
24 conference rooms, kitchen/break room, etc. Developer shall work collaboratively with ADOT in regards
25 to any options of layout and configuration that may be available in the development of the Collocated
26 Office Layout Plan. Within 20 Business Days of NTP 1, and as a condition precedent to issuance of NTP
27 2, Developer shall submit a Collocated Office Layout Plan to ADOT for review and comment. Developer
28 shall make the ADOT office space in the collocated office available for occupancy 14 Days prior to NTP
29 2.

30 **112.03 Computers and Equipment**

31 Developer shall provide network administration, operational support, and day-to-day management of the
32 collocated office networks and data systems. Developer shall provide a Project server that includes daily
33 reliable backups of Project data. All technology-related plans and procurements shall take into
34 consideration the information technology goals for maintaining a secure and reliable computing
35 infrastructure that complies with current and planned operations and business needs. The information
36 technology standards used in the collocated offices shall comply with Good Industry Practice.

37 **112.03.01 General Requirements**

38 Developer shall use:

- 39 A. Commercial off-the-shelf equipment when available;

1 B. New and suitable original equipment manufacturers (OEM) hardware components for the
2 purposes specified herein; and

3 C. Hardware of the OEM's current design and equipped with the current revisions, manuals, and
4 equipment updates at the time of issuance of NTP 1. Hardware shall comply with all applicable
5 quality control (QC) standards of the OEM.

6 Developer shall provide, install, and maintain the following for all ADOT workstations in the collocated
7 office, unless otherwise specified below:

8 A. Telephone. Developer shall provide touch-tone telephones with a unique direct-dial telephone
9 number for the 12 personal workstations identified in Section 112.02.03.B and 112.02.03.C of
10 the TPs and each conference room. Developer shall provide service and Developer shall provide
11 such service using voice over Internet protocol (VoIP) or analog means. Each telephone number
12 shall have voicemail, conference-call capability, call hold capabilities, and speaker telephone
13 capabilities for the telephones in enclosed offices/rooms;

14 B. File server. The file server solutions shall utilize an industry standard compliant operating system
15 compatible to ADOT server operating systems. At initial installation, the proposed system shall
16 operate at no more than 35 percent of capacity (for processor, memory, disk, and input/output
17 performance). The system shall continue processing without server failure should any one
18 component fail. A minimum of RAID 5 (disk striping with parity) and hot swap disks are required,
19 along with dual controllers/paths to the disk. The file server shall also have redundant
20 components such as power, fan, controllers, and network cards. The file server shall have
21 sufficient main memory, disk capacity, and processing capability to support the collocated office
22 electronic data storage needs and transmission of large numbers of electronic data files. The
23 file server hardware shall have expansion capabilities to comply with and support future
24 requirements as determined by ADOT. The file server shall initially have a warranty with a 5-
25 year next Business Day on-site service agreement and then an extended warranty for the
26 remainder of the projected life of the collocated office;

27 C. Internet. Developer shall provide ADOT with symmetrical business class Internet service with a
28 minimum of two public static IP addresses; 50Mbps in the collocated office;

29 D. Printer services. Developer shall provide the following printers with a maintenance contract to
30 include paper, toner, and next Business Day maintenance service at the collocated office:

- 31 1. Two high-speed Ethernet network color duplex printers capable of 11-inch by 17-inch output
32 with a print quality up to 600 by 600 dpi and at least one tray with a 500 sheet capacity with
33 operable finishing (staple, collate, hole punch). One printer shall be connected to the
34 network for ADOT use and one shall be connected to the Guest network;

35 E. Copier services. Developer shall provide maintain the following multifunction devices with a
36 maintenance contract to include paper, toner, and next Business Day service at the collocated
37 office:

- 38 1. Two high-speed Ethernet network color duplex multifunction devices capable of printing,
39 scanning, and copying 11-inch by 17-inch media with a print quality up to 1,200 x 1,200 dpi,

copy resolution of 600 x 600 dpi, and scan resolution up to 600 dpi and at least one tray with a 500 sheet capacity with operable finishing (staple, collate, hole punch). One device shall be connected to the network for ADOT use and one shall be for the guest network;

F. Wide area network (WAN). Developer shall provide a secure service gateway meeting ADOT specifications to establish an internet-based VPN connection back to ADOT systems;

G. IT equipment. Developer shall provide rack space, cooling, power, and cable management to allow for the installation and operation of additional network equipment supplied by ADOT. Developer shall provide a locking computer cabinet, a minimum of 42 rack units high, in a standard 19-inch equipment rack configuration, for each client party. Developer shall provide 120 VAC power for the additional network equipment with a minimum of four power outlets of style NEMA 5-20R for the client's equipment. Developer shall provide cable management systems to support running patch cabling from the floor cabling patch panels to each of the cabinets. Developer shall maintain a secure equipment room with controlled and restricted access for use in operating all the IT. The equipment room shall be climate controlled and capable of maintaining an ambient temperature range of 70°F to 76°F with a relative humidity between 20 and 60 percent at all times. Developer shall terminate all Category 6 UTP cable in data patch panels in the server room and any additional telecommunications room(s);

H. Wireless local area networks (WLAN). Utilizing the most current industry 802.11 standard, Developer shall provide a WLAN in the collocated office. Each WLAN shall provide a unique service set identification (SSID) and be protected using current WLAN best practices, with one WLAN for ADOT users and one for guest users;

I. Conference rooms. Developer shall provide an audio-visual solution to support the collocated office conference rooms. Developer shall provide video teleconferencing facilities and either a projector and screen or at least 90-inch monitor with video teleconferencing connections in each conference room. Developer shall provide a conference telephone for each conference room facility;

J. Disaster recovery. Developer shall prepare a Computer Disaster Recovery Plan to identify Project-specific core systems and processes and to determine acceptable levels of disruptive-to-Project operations. The Computer Disaster Recovery Plan shall outline the data backup scenario used to ensure proper backup of all Project data. 20 Business Days following the issuance of NTP 1, Developer shall submit the Computer Disaster Recovery Plan to ADOT; and

K. Non-disruptive operations. During normal business hours, network downtimes shall not be due to hardware or software system improvements and/or repairs. Developer shall provide a minimum of 1 Day's advance written notice to ADOT for all scheduled routine maintenance. In case emergency maintenance (i.e., equipment failure, virus detection, malware, etc.) cannot be scheduled during non-peak hours, Developer shall notify ADOT immediately. Developer shall, within 2 Days after any emergency maintenance, prepare and submit to ADOT an Action Report that includes an explanation of the root cause, the solution employed, and a prevention plan to prevent future re-occurrence of the cause of the emergency maintenance.

112.03.02 Network Administration Plan

Developer shall prepare a Network Administration Plan that describes all computer elements described in Section 112.03 of the TPs. Within 20 Business Days following issuance of NTP 1, and as a condition precedent to ADOT's issuance of NTP 2, Developer shall submit the Network Administration Plan to ADOT for review and comment.

112.03.03 Equipment Demobilization Plan

Developer shall prepare an Equipment Demobilization Plan that includes Developer's strategy for the methods and processes to discontinue the use of all computer and related equipment, and how Developer shall erase Project-sensitive information from the equipment. At least 30 Business Days prior to scheduled Substantial Completion, Developer shall submit the Equipment Demobilization Plan to ADOT for approval.

112.03.04 Project Vehicles

Project vehicles used by Developer shall comply with all vehicle registration, load restriction, and vehicle delineation requirements when used on roads open to the public. Developer shall establish adequate parking for Project staff personal vehicles as needed at the collocated office location. Developer may provide parking specific staging areas away from work activities within Project ROW that shall be directly accessible from public roads as approved by ADOT. Parking specific staging areas shall be constructed of a hard surface temporary asphalt pavement or millings and parking stalls defined with pavement markings. Parking specific staging areas shall be maintained through Substantial Completion as required for work activities.

Storage of construction vehicles and parking of personal vehicles belonging to Developer staff will not be permitted on public roadway, shoulders, or private parking lots without the owner's approval. Parking of personal vehicles belonging to Developer staff will not be permitted in any work zone.

Developer's light duty on-road vehicles that are on-site shall have the Vehicle Project Logo and Developer's name visibly displayed on both sides of the vehicle. As a condition precedent to ADOT's issuance of NTP 2, Developer shall prepare and submit a full-size sample Vehicle Project Logo that is to be affixed to all Developer's Project vehicles to ADOT for approval in ADOT's good faith discretion.

112.04 Construction Yards

Developer shall be responsible for obtaining all approvals, permits, and Governmental Approvals for obtaining locations for construction yards for the Project. Developer shall not locate construction yards adjacent to residential areas. See Section 5.5 of the Agreement for use of designated ADOT property.

112.05 Submittals

Table 112-2 reflects a nonexclusive list of Submittals identified in Section 112 of the TPs and is not intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 112-2 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
Collocated Office Layout Plan	3	0	1	Within 20 Business Days of NTP 1	112.02.06
Computer Disaster Recovery Plan	5	0	1	20 Business Days following the issuance of NTP 1	112.03.01
Action Report	5	0	1	No later than 2 Days of the emergency maintenance	112.03.01
Network Administration Plan	3	0	1	Within 20 Business Days following issuance of NTP 1	112.03.02
Equipment Demobilization Plan	4	0	1	30 Business Days prior to Substantial Completion	112.03.03
Vehicle Project Logo	2	0	1	Prior to NTP 2	112.03.04
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

113 QUALITY MANAGEMENT

113.01 General Requirements

Developer shall perform all Work in compliance with the requirements of Section 113 of the TPs and TP Attachment 113-1.

Developer shall be responsible for all Quality Control (QC) and Quality Acceptance (QA) as described in this section, as well as in the ADOT Quality Assurance Program – Projects Utilizing Contractor Performed Acceptance, refer to TP Attachment 113-1.

Developer shall utilize an Independent Quality Firm (IQF) to perform all QA.

113.02 Quality Management Plan

Developer shall prepare a comprehensive Quality Management Plan (QMP) that is consistent with and expands upon the preliminary QMP submitted with the Proposal.

Developer shall develop, implement, and update the QMP for the Work. The QMP shall be maintained current at all times.

The QMP shall consist of three volumes, as follows:

A. Volume 1: Quality Management Plan (QMP) General Requirements

1 B. Volume 2: Professional Services Quality Management Plan (PSQMP)

2 C. Volume 3: Construction Quality Management Plan (CQMP)

3 The QMP shall contain a complete detailed description of all the quality policies, procedures, processes,
4 and systems that Developer shall implement throughout its organization. The quality policies, procedures,
5 processes, systems, and objectives shall demonstrate Developer's senior management commitment to
6 the implementation and continuous improvement of the QMP and overarching quality practices and
7 principals.

8 The quality policies, procedures, processes, and systems shall ensure the Work complies with the
9 requirements of the Contract Documents and results in Quality Records that provide documented
10 evidence.

11 The quality policies, procedures, processes, and systems shall promote operational consistency,
12 encourage process ownership, promote thorough documentation, and allow for efficient audit by the IQF,
13 and audits by ADOT.

14 The QMP shall comply with International Organization for Standardization (ISO) 9001:2015 or most
15 current version in effect on the Setting Date, as updated by the International Organization for
16 Standardization. Quality terminology, unless defined or modified elsewhere in the Contract Documents,
17 has the meanings in ISO 9001. Terms used in ISO 9001 shall include the following meanings:

18 A. Organization: Developer's organization, including any Affiliates and Subcontractors;

19 B. Customers: the users of the roadways, ADOT, and stakeholders; and

20 C. Product: the Work.

21 Developer shall revise the QMP whenever either ADOT or its own quality management organization
22 detects quality policies, procedures, processes, systems, or objectives that produce Work that is not in
23 conformance with the Contract Documents, or Developer produces Work that does not meet the quality
24 levels identified in the QMP.

25 Developer shall prepare Results of Internal Audits that include the quality program audit findings and
26 documentation specified in the respective volumes of the QMP. Within 5 Business Days of their
27 completion, Developer shall submit all Results of Internal Audits to ADOT for review and comment.

28 **113.02.01 QMP General Requirements**

29 All quality objectives and the policies, procedures, processes, and systems that Developer shall
30 implement throughout its organization shall be listed as QMP General Requirements.

31 The QMP General Requirements shall include:

32 A. The organizational chart that identifies all quality management personnel, their roles, authorities,
33 and line reporting relationships;

34 B. Resumes for all quality management personnel, including information on certifications held.
35 Refer to Section 114 of the TPs;

- C. Description of the roles and responsibilities of all quality management personnel, and all those who have the authority to stop Work;
- D. Identification of both the QC and IQF: inspection, sampling and testing organizations, including information on the capability to provide the specific services required for the Work;
- E. Procedures for ensuring independence of all quality staff and procedures for assuring their authority to effect changes in the event of Developer's failure to comply with the Contract Documents; and
- F. The processes and procedures that define the interdisciplinary quality reviews, coordination, relationships, and interactions between the Professional Services Quality Management Plan (PSQMP), the Construction Quality Management Plan (CQMP), and QMP General Requirements.

The QMP General Requirements shall be submitted within 30 Days of NTP 1. The QMP General Requirements must be approved by ADOT in ADOT's good faith discretion prior to issuance of NTP 2.

113.02.02 Professional Services Quality Management Plan (PSQMP)

Developer shall prepare a PSQMP that describes Developer's policies, procedures, processes, and staffing to manage quality for Professional Services in accordance with the requirements of this Section 113.02.02 of the TPs. The PSQMP must be approved by ADOT in ADOT's good faith discretion prior to the submittal of a design package for ADOT review, or as a condition precedent to ADOT's issuance of NTP 2, whichever is earlier.

113.02.02.01 PSQMP General Requirements

The PSQMP shall address the following general requirements:

- A. Discuss the scope, Developer management support, and internal process for implementing and managing changes to the PSQMP;
- B. Discuss the structure, responsibilities, and hierarchy of the design quality organization;
- C. Discuss the requirements of the RFC process, including how document history will be reflected, and how documents will be distributed and tracked. A compiled RFC Submittal with the current version of approved Plans and specifications shall be maintained and electronically accessible by all Project personnel;
 - 1. Define internal procedures to assure that all documents ultimately released for construction have been subject to the appropriate checks and balances, regardless of their source or medium;
 - 2. Define the potential RFC Submittal sources and mediums, and define how the process may change as portions of the Project transition from design to construction including partial plans released for construction, Notice of Design Changes (NDC), and Field Design Changes (FDC);

- 1 3. Define how RFC Submittal status will be tracked and how documents will be made available
2 for use by ADOT, Developer-Related Entities, Governmental Entities, and Utility
3 Companies;
- 4 4. Define the procedures and documentation required for interdisciplinary reviews and
5 constructability reviews for all submittals including documentation of the issues and results
6 of the reviews; and
- 7 5. Define the procedure and documentation required by Developer to assure that all Submittals
8 are TP compliant.
- 9 D. Discuss methodology for assuring design consistency between multiple designers and design
10 firms, and for assuring compatibility between technical disciplines:
 - 11 1. Define the design quality control and quality assurance procedures that will apply to
12 Professional Services work products;
 - 13 2. Define procedures to assure that work products will be organized by discipline and sub-
14 discipline, as appropriate (such as engineering – roadway, structural, and utilities). These
15 procedures shall specify measures to ensure that appropriate quality requirements are
16 specified and included in the Professional Services work product; and
 - 17 3. Define measures that will control deviations from such requirements;
- 18 E. Discuss design production responsibilities, reviews, data control, data validation, and PSQMP
19 training:
 - 20 1. Define the specific quality control, quality assurance, and quality review procedures,
21 including all required forms and checklists, for preparing, and checking all Professional
22 Services work products;
- 23 F. Define the details of the design check process and discuss how, in addition to final Design
24 Documents, the process also applies to calculations, reports, Project special provisions, and
25 other material intended to support the final design including independent structural design
26 checks. Define how differences are resolved between the originator of the design and the
27 independent structural design checks. Developer shall clearly identify the designer and checker
28 on the face of all final Design Documents. Include specific procedures for checking the
29 Professional Services work product and identify any computer programs and methods being
30 used for such purposes. Include procedures for meeting documentation requirements of the
31 Contract Documents;
- 32 G. Discuss how design standardization and coordination will be achieved throughout the entire
33 Project across multiple Project Segments and within each design discipline. Define method for
34 coordinating Professional Services performed by different individuals or firms working in the
35 same area, in adjacent areas, or on related tasks to ensure that conflicts, omissions, or
36 misalignments do not occur between drawings or between the drawings and the specifications
37 or other applicable deliverables;

- H. Discuss how Developer's design quality organization will assure that constructability and maintenance considerations are incorporated into design reviews;
- I. Define how the design process will assure that any RFC Submittals clearly and completely define the acceptance criteria that will be utilized by IQF and Owner Verification forces during construction;
- J. Define how the design process will assure that the construction requirements defined in Section 116.05 of the TPs are incorporated;
- K. Discuss the design checking, back-checking, internal auditing, and independent review requirements for Professional Services. Provide procedures and schedules for the performance of audits of Developer's quality control procedures and quality assurance under the PSQMP. Provide a summary of the documentation that will comprise the Professional Services Quality Records, and the procedures to make such Quality Records immediately available to ADOT for review. Provide a summary of anticipated planned and random Professional Services audits, written procedures for the audits, and the procedures to make sure that Developer shall submit the Results of Internal Audits for Professional Services to ADOT for review and comment. Developer shall take follow-up action, including re-audit of deficient areas following corrective action;
- L. Discuss Developer post design services process, staff, authority, scope, documentation, and product review process. Define the interface between design and construction personnel and related processes. Define the role of the design team during construction; to include the RFI process and the Non-Conformance Report (NCR) process;
- M. Define the Nonconforming Work process. The process shall include a Non-Conformance Report (NCR). The NCR shall include the identification, classification, resolution, and documentation of Nonconforming Work. The NCR shall document the root cause of the issue and action plan to prevent future similar incidences. All proposed NCR resolutions require ADOT approval. No Work shall proceed on, or associated with, Nonconforming Work until the proposed resolution is approved by ADOT. All NCR resolutions shall be signed and sealed by the Engineer of Record prior to being submitted to ADOT for approval. The completion of the NCR process does not remove ADOT's right to Section 6.7 of the Agreement. Upon identification of Nonconforming Work, the IQF shall notify ADOT, including all available information. The IQF shall submit NCRs to ADOT for approval.
- N. Discuss the change process, including both NDC and FDC, how those performing Professional Services will address Directive Letters, the related document control interface, and the construction documentation interface. This discussion shall include defining how documents produced after the preliminary design phase will be subject to appropriate internal design checks, quality reviews, ADOT and Third Party approvals before being released for construction. This discussion shall also include measures to ensure any design changes are not made to constructed elements or identify partial removals if warranted;
- O. Discuss and define procedures to ensure the requirements of Section 107.20 of the TPs are timely, accurate and consistent throughout the Project. Define how information received by

design and construction staff will be verified and checked prior to being provided to Stakeholders. Discuss processes for the accurate input of information into SMS;

P. Comment Resolution Form;

Q. Define the mechanism in which ADOT shall access past versions of RFC plans following an NDC or FDC process; and

R. Discuss the responsibilities, activities, and source of information associated with the record drawing process.

S. Define the process for the review and approval of: construction submittals, shop drawings, and working drawings. Define which submittals and drawings are to be reviewed and approved by the EOR.

113.02.02.02 Personnel and Staffing

113.02.02.02.01 Personnel Performing Professional Services Quality Control

Developer shall ensure that the training and experience of personnel performing Professional Services quality control is commensurate with the scope, complexity, and nature of the Professional Services Work products to be reviewed. Qualifications shall include appropriate experience, certifications, training, and licensure. Quality control checkers shall be a registered Professional Engineer in the State with a minimum of 5 years experience in the Work being checked. Developer shall provide documentation acceptable to ADOT that all quality control checkers used on the Project meet the qualifications and experience requirements.

Independent structural design checks shall be completed in accordance with Section 600.03.08.02.01 of the TPs.

Developer personnel performing the quality control check of Professional Services Work products shall not be directly involved with the original development of the item, Element, Plan, or phase being checked.

The number of personnel performing Professional Services quality control shall reflect the volume of quality control activities necessary for the Work in progress.

113.02.02.02.02 Professional Services Quality Assurance Staff

Developer shall provide a quality assurance staff under the direction of the Professional Services Quality Manager (PSQM) to perform oversight and review of all Professional Services performed by any member of Developer.

The quality assurance staff shall have an understanding of the various aspects of Professional Services undertaken by Developer. The training and experience of the quality assurance staff shall be commensurate with the scope, complexity, and nature of the quality assurance to be performed. Qualifications shall include appropriate experience, certifications, and training.

The quality assurance staff shall not be directly involved with the original development or quality control of the item, element, or phase being checked.

1 The size of the Professional Services quality assurance staff shall reflect the volume of quality assurance
2 activities necessary for the Work in progress and Developer shall maintain such staff in accordance with
3 the approved PSQMP.

4 Developer shall update the Professional Services quality assurance staffing requirements as necessary
5 throughout the Work to reflect changes in the actual Project Schedule and specific Professional Services
6 elements. Developer shall ensure that adequate Professional Services quality assurance staff is available
7 and that PSQMP activities are undertaken in a manner consistent with the Project Schedule that enables
8 Developer to timely achieve the Substantial Completion deadline.

9 **113.02.03 Construction Quality Management Plan (CQMP)**

10 Developer shall prepare a CQMP that describes Developer's objectives, policies, procedures, processes,
11 systems, and staffing to manage construction quality in accordance with the Contract Documents. The
12 CQMP shall include the ITS Equipment and System Testing Plan as described in Section 700.07.04.02
13 of the TPs.

14 The CQMP shall assure that all construction quality requirements are explicitly defined, measurable, and
15 understood by all persons.

16 The CQMP shall be comprised of two distinct but interrelated sections; the Quality Control section and
17 the Quality Acceptance section.

18 The CQMP shall:

- 19 A. Define the CQMP development and updating process. The process shall clearly define the
20 authority and responsibility for the administration of the CQMP;
- 21 B. Discuss the structure, responsibilities, and hierarchy of the construction quality organization.
22 Discuss the roles and responsibilities of Developer management, quality control, and the IQF,
23 clearly defining the distinction between the various components of the quality program; and
- 24 C. Discuss the interface between Developer's quality activities, IQF's Quality Acceptance activities,
25 and ADOT's Owner Verification and independent assurance activities. Provide an organizational
26 chart which shows the relationship between Developer's production staff, QC, and QA.

27 The CQMP must be approved by ADOT in ADOT's good faith discretion prior to issuance of NTP 2.

28 **113.02.03.01 Quality Control (QC)**

29 QC shall consist of members of the production staff and members of the construction quality control staff.
30 The construction quality control staff shall be independent from the production staff and the IQF staff. QC
31 shall be led by the Construction Quality Manager (CQM).

32 **113.02.03.01.01 Production**

33 The CQMP shall:

- 34 A. Define the process to ensure that members of Developer's production staff are only constructing
35 and building from RFC Plans, approved Contract Documents, approved shop drawings,
36 approved mix designs, approved materials, etc.;

- B. Discuss the methods and procedures to be utilized by Developer to obtain active participation of the production workforce in QC operations to achieve a high quality Project;
- C. Developer shall define processes and procedures to ensure the production staff achieves compliance with the Contract Documents; and
- D. Define measures to ensure that purchased materials, equipment, and services conform to the Contract Documents, Governmental Approvals, applicable Laws, rules, and the Design Documents. These measures shall be consistent with Good Industry Practice and shall include provisions for source evaluation and selection, objective evidence of quality furnished by Subcontractors and suppliers, inspection at the manufacture or vendor source, and examination of products upon delivery.

113.02.03.01.02 Construction Quality Control

The CQMP shall:

- A. Define the construction quality control organization chart and staffing plan;
- B. Define the construction quality control workmanship inspection process;
- C. Define the usage of pre-activity meetings, including elements of work that will require a pre-activity meeting, attendees, and typical agendas;
- D. Define Developer's internal review and submittal process for the IQF's approval of all Portland cement concrete and asphaltic concrete mix designs;
- E. Define the process for scheduling hold point inspections. Hold points shall be unique inspection activities and shall be documented and recorded independently from other daily documentation. All parties involved in the hold point inspection shall be notified of the upcoming hold point inspection a minimum of 1 complete Business Day in advance;
- F. Define the quality control sampling and testing frequency; and
- G. Define the requirements for QC reports.

113.02.03.02 Acceptance

Acceptance shall consist of a QA and Owner Verification (OV).

QA policies, procedures, processes, and systems shall always accommodate OV activities.

113.02.03.02.01 Quality Acceptance

Developer shall utilize an IQF to perform all QA. The IQF shall inspect and accept all permanent Work, temporary Work, and third-party Work associated with the Project.

The CQMP shall define the IQF organization chart and staffing plan.

QA shall be led by the Construction Independent Quality Manager (CIQM). The size of the construction quality acceptance staff shall reflect the volume of quality acceptance activities necessary for the Work in progress and Developer shall maintain such staff size in accordance with the approved CQMP. The IQF staff shall perform quality acceptance, inspection, and testing services typically performed by ADOT on traditional projects, unless otherwise indicated in the TPs.

The IQF staffing plan shall (a) show the period of time that the quality acceptance staff members shall be present on the Site, and (b) state the required minimum knowledge, technical skills, and experience level of the personnel related to the various inspection functions, such as grading, drainage, paving, structures, electrical inspections, and traffic control that will occur on the Work. Developer shall identify the administrative/clerical support staff for management of records/documents pertinent to Quality Acceptance for the IQF activities.

The CQMP shall discuss procedures to ensure that the education, training, and certification of IQF personnel are achieved and maintained. Discuss procedures to make an electronic log available to ADOT that contains personnel certification status and expiration dates.

The IQF shall use rod and level survey equipment and not GPS methods when accepting survey tasks as defined in the Acceptance Survey Task List, Table 113-1.

Only RFC plans and other properly approved Contract Documents shall be used during the acceptance process. The CQMP shall list, and describe in detail, which documents will be used and how they will be used, during the acceptance process.

113.02.03.02.01.01 Workmanship

A key component of the Quality Acceptance program is the development and implementation of hold points. Hold points are a point in time when construction has proceeded to a stage at which representatives of Developer and the IQF shall evaluate the Work completed to date by inspecting the Work and reviewing any pertinent data to determine the acceptability of the Work. No additional Work shall take place past the hold point until Developer and the IQF agree that the Work up to that point is acceptable.

The CQMP shall:

A. Define the process for inspecting and checking Work, including how the hold point process will be implemented. Establish procedures and checklists for inspection of the Work based on the specifications and Contract Documents. These procedures will be established based on the ADOT Standard Specifications. Discuss what will be inspected, how it will be inspected, who will be involved in the inspection, and what acceptance criteria will apply. Define the manner in which OV will be accommodated during the inspection process;

B. Define the process for inspecting traffic control activities, including both MOT Plans and Traffic Control Plans, such as acceptance, monitoring, maintenance, and reporting.

Prior to any aspect of a MOT Plan being exposed to the traveling public, it shall be accepted in place by the IQF. Any field changes to MOT Plans shall be approved by the Maintenance of Traffic Manager prior to exposure to the traveling public. The MOT Manager is required to be present, in the field, in order to approve field changes. The approved field changes made by the

Maintenance of Traffic Manager do not require IQF approval; however, the changes are required to be documented by the IQF.

Prior to the beginning of any Work associated with, or covered by, a Traffic Control Plan, the IQF shall accept the in place traffic control elements from the Traffic Control Plan. Any field changes to Traffic Control Plans shall be approved by the Maintenance of Traffic Manager before any Work associated with the traffic control may begin. The MOT Manager is required to be present, in the field, in order to approve field changes. The approved field changes made by the Maintenance of Traffic Manager do not require IQF approval; however, the changes are required to be documented by the IQF;

- C. Define procedures for quality acceptance in the CQMP with respect to checking the accuracy and adequacy of construction stakes, lines, and grades established by Developer. The acceptance survey tasks and frequencies are defined in Table 113-1. Developer shall define which acceptance survey tasks shall be included as a hold point;
- D. Define the process for IQF accepting Work, meaning work that does not require a future hold point;
- E. Define how the IQF procedures will be used for documenting compliance or non-compliance for all items of Work;
- F. Define the process for the IQF exercising engineering judgement with regards to non-sampling and testing elements of Work. Discuss the format for documentation of the IQF's application of engineering judgment. At minimum, this shall include a unique identifying number for each instance, and a written document identifying the type and location of the Nonconforming Work, the circumstances and the engineering evaluation conclusions, and supporting documentation such as calculations or sketches, as appropriate;
- G. Define the process for IQF to execute the ADOT Construction Bulletins listed in TP Attachment 113-2;
- H. Define a hold point, and list all hold points;
- I. Define the process for advancing Work past a hold point;
- J. Define the process for addressing Nonconforming Work identified by ADOT; and
- K. Define the process for reviewing and approving Portland cement concrete and asphaltic concrete mix designs.

**Table 113-1
Acceptance Survey Task List**

ADOT Specification Section	ADOT Specification Work Item	Activity Description	Frequency
203 to 205		Accept survey staking:	N/A

Table 113-1 Acceptance Survey Task List			
ADOT Specification Section	ADOT Specification Work Item	Activity Description	Frequency
	Earthwork / Grade Roadway for Pavement	Accept Over Excavation	Cross section at all control points and every 500 feet
		Accept toe-of-slope, top of cut, cut ditch, hinge points, catch points	Cross section at all control points and every 500 feet
		Accept 90-degree angles	All control points and every 500 feet
		Accept slope stakes	All control points and every 500 feet
		Accept subgrade elevations	All control points and every 200 feet
301 to 305	Treated Subgrades, Subbases, and Bases	Accept treated Subgrade, Subbase, and Base elevations	All control points and every 200 feet
401	Portland Cement Concrete Pavement	Accept wiring staking	All control points and every 200 feet
501 to 507	Drainage Items	Accept staking	Pipe: 10% of all inverts staking; 10% of pipe midspan; All other drainage features: 10% of all layout staking
601	Concrete Structures: Bridges	Foundations: Accept all layout staking prior to work. Accept all top of foundation.	Accept all
		Abutments, transition caps, and piers: Accept top of abutments, piers, column, transition caps, caps	Accept every structure
		Bearing seats and pads: Accept top of bearing seats and top of bearing pads	Accept all
		Forms/soffit/falsework: verify edge of deck horizontal and vertical control. Accept offsets, grade, screeds from control.	Accept complete cross section every 50 feet
		Screed equipment steel rails	Accept screed equipment steel rails every 30 inches; accept all fill marks
		Accept approach and anchor slabs	Accept screed equipment steel rails every 30 inches; accept all fill marks

Table 113-1 Acceptance Survey Task List			
ADOT Specification Section	ADOT Specification Work Item	Activity Description	Frequency
603 and 609	Pilings & Drilled Shaft Foundations	Accept all layout staking prior to work. Accept all top of shaft & top of pile	Accept all
604	Steel Structures	Foundations: Accept all layout staking prior to work. Accept all top of foundation	Accept all
		Abutments, transition caps, and piers: Accept top of abutments, piers, column, transition caps, caps	Accept every structure
		Bearing seats & pads: Accept top of bearing seats and top of bearing pads	Accept all
		Forms/soffit/falsework: Accept edge of deck horizontal and vertical control. Accept offsets, grade, screeds from control	Accept complete cross section every 50 feet
		Screed equipment steel rails	Accept screed equipment steel rails every 30 inches; accept all fill marks
		Accept approach and anchor slabs	Accept screed equipment steel rails every 30 inches; accept all fill marks
606	Overhead Sign Structures	Foundations – Accept all layout staking prior to work. Accept all top of foundation	Accept all
801 to 804	Landscape Earthwork	Accept toe-of-slope, top of cut, cut ditch, hinge points, catch points	Cross section at all control points and every 500 feet
902 and 903	Fences	Accept staking	All control points and every 500 feet
905	Guardrail	Accept staking	All control points and every 500 feet
908	Curb & Gutter, Sidewalk, Driveway	Accept staking	All control points and every 500 feet
909	Survey Monuments	Accept placement of survey monuments	Accept all monuments
910	Concrete Barriers	Accept staking	All control points and 500 feet
911	Right-of-Way Markers	Accept placement	Accept all markers

Table 113-1 Acceptance Survey Task List			
ADOT Specification Section	ADOT Specification Work Item	Activity Description	Frequency
914	Walls & Miscellaneous Structures	Accept initial staking prior to work. Accept footings, face of wall locations, and top of wall elevations	All control points and every 50 feet
917	Embankment, Spillways, Embankment Down-Drains, Inlets and Outlets	Accept staking	Pipe: 10% of all inverts staking; 10% of pipe midspan; All other drainage features: 10% of all layout staking

113.02.03.02.01.02 Record Keeping, Documentation, and Audits

113.02.03.02.01.02.01 Documentation

The CQMP shall:

- A. Define the process for documenting the Work and the manner in which the objective evidence used to verify compliance with the specified requirements shall be made available to ADOT;
- B. Define the IQF process for documenting Developer daily Work activities;
- C. Provide a summary of the documentation that comprises the construction Quality Records, and define the procedures to submit Quality Records to ADOT for review within 24 hours after Work is performed;
- D. Discuss methods to assure that all activities undertaken by or on behalf of Developer affecting the quality of the Work are prescribed by documented instructions, procedures, mix designs, and appropriate drawings. Such instructions, procedures, mix designs, and drawings shall include quantitative and qualitative criteria to be used to determine compliance;
- E. Define and provide inspection documentation format for diaries and test reports; and
- F. Define the Nonconforming Work process. The process shall include a Non-Conformance Report (NCR). The NCR shall include the identification, classification, resolution, and documentation of Nonconforming Work. The NCR shall document the root cause of the issue and action plan to prevent future similar incidences. All proposed NCR resolutions require ADOT approval. No Work shall proceed on, or associated with, Nonconforming Work until the proposed resolution is approved by ADOT. All NCR resolutions shall be signed and sealed by the Engineer of Record prior to being submitted to ADOT for approval. The completion of the NCR process does not remove ADOT's right to Section 6.7 of the Agreement. Upon identification of Nonconforming Work, the IQF shall notify ADOT, including all available information. The IQF shall submit NCRs to ADOT for approval.

1 **113.02.03.02.01.02.02 Record Keeping**

2 The CQMP shall:

- 3 A. Define document control standards, the platform for data systems, document identification
4 standards, and processes for logging and distributing controlled documents. Discuss the
5 requirements and methods for controlling documents and discuss the document control system
6 accessibility by quality organization personnel;
- 7 B. Define where IQF Quality Records will be stored and the detailed organization and labeling
8 system that will be used;
- 9 C. Describe how Developer will prepare Quality Records which consist of all documentation and
10 other support material of any type, in any medium, which demonstrates compliance with the
11 requirements of Section 113 of the TPs;
- 12 D. Describe how Developer will load all Quality Records to the EDMS within one Business Day of
13 creation and notify ADOT of such Records creation to support the timely inspection, review, and
14 verification by ADOT. Quality Records shall be accessible at all times for inspection, review, and
15 verification by ADOT. Developer shall submit copies of Quality Records to ADOT within 24
16 hours. While available to ADOT via the EDMS, ADOT may request specific records at any time.
17 Requests may come in the form of meeting action items, e-mail correspondence to the IQF, or
18 formal correspondence. Developer shall provide such records as requested within 24 hours in
19 a means identified in the request;
- 20 E. Discuss the RFC process. Define the requirements related to the different types of construction
21 documents that can be used in the field for construction, and discuss the procedures and
22 processes in place to assure that only RFC Submittals are distributed for such use;
- 23 F. Define procedures for processing a Request for Information (RFI) to resolve discrepancies
24 and/or questions in the Plans and specifications. Any RFI that results in a design change must
25 be approved by Developer's Engineer of Record and followed by an NDC. Discuss the change
26 management and RFI Process as it relates to construction and the quality organization. Discuss
27 the interface between design and construction quality personnel and define the procedures that
28 will assure that change of any type is not implemented outside of the RFC process; and
- 29 G. Developer shall create and maintain IQF Quality Records including:
- 30 1. An electronic daily log of all inspections performed for Work operations in a format
31 acceptable to ADOT and shall be made available to ADOT at all times. The daily inspection
32 reports shall identify inspections conducted, results of inspections, location and nature of
33 defects found, causes for rejection, and remedial or corrective actions proposed or taken.
34 The responsible technician and supervisor shall sign the daily inspection reports. IQF shall
35 provide the results of the daily inspections to ADOT in an electronic format within 1 Business
36 Day after the work shift;
- 37 2. The IQF shall be responsible for establishing an electronic system for recording all material
38 test results and certifications. The responsible technician and his/her supervisor shall sign

the daily test reports. Developer shall provide the results of testing to ADOT within 24 hours of test completion;

3. The IQF's inspection and materials quality program shall deliver all inspection reports, laboratory, and field test results to ADOT in an electronic format acceptable to ADOT. This electronic reporting is intended to allow Developer and ADOT to make timely and accurate decisions on workmanship and material quality issues;

4. The IQF shall review and maintain all Certificates of Compliance or a Certificates of Analysis, as required, prior to the use of any materials or manufactured assemblies requiring such a certificate according to applicable ADOT *Materials Policy and Procedure Directives*. The certificates shall be made available to ADOT; and

5. The IQF or Developer shall provide specific requested information mentioned herein to ADOT within 24 hours. Information available to ADOT does not constitute satisfaction of a specific request for information of such records.

113.02.03.02.01.02.03 Audits

The CQMP shall:

- A. Define the IQF audit process;
- B. Define a comprehensive system of planned and random internal audits of the CQMP to determine adherence to and the effectiveness of the CQMP. IQF personnel unrelated to the Project shall perform the audits in accordance with the written procedures or checklists. Developer shall document, review, and act upon audit results. Developer shall take follow-up action, including re-audit of deficient areas following corrective action, where indicated; and
- C. Provide a summary of anticipated construction audit documentation to be submitted to ADOT, and the procedures to make sure all Results of Internal Audits for construction are submitted to ADOT within the timeline required in Section 113.03 of the TPs.

113.02.03.02.01.03 Materials Sampling and Testing

The CQMP shall:

- A. Describe the testing required to demonstrate compliance. The CQMP shall require that test results be documented and evaluated to ensure that test requirements have been satisfied. The CQMP shall also demonstrate how the IQF tracks its sampling and testing frequencies to ensure compliance with the Contract Documents and is in accordance with TP Attachment 113-1 and how that information will be transmitted to ADOT, in a manner acceptable to ADOT, at least daily;
- B. Define procedures for assessing compliance with the sampling and testing plan that include a process for tracking planned versus actual testing status. Define the nature and content of weekly reports that will be provided by Developer Quality Organization to show sampling and testing plan compliance, and discuss the manner in which non-compliance situations will be rectified, or otherwise justified;

- 1 C. Discuss how Developer accommodates inspections, sampling, and tests by third parties when
2 applicable;
- 3 D. Discuss the process by which the IQF may apply engineering judgment to substantiate the use
4 of material failing to meet the specification if the material still meets the intended purpose.
5 Developer shall incorporate the engineering judgment guiding principles from TP Attachment
6 113-1 into the CQMP and indicate how the IQF will comply with these guiding principles.
7 Developer may add additional guiding principles, as appropriate;
- 8 E. Discuss the format for documentation of the IQF's application of engineering judgment. At the
9 least, this shall include a unique identifying number for each instance, and a written document
10 identifying the type and location of the Nonconforming Work, the circumstances, and the
11 engineering evaluation conclusions, and any supporting documentation such as calculations or
12 sketches, as appropriate;
- 13 F. Address specific items, or components of items, that are planned to be accepted on the basis
14 of certification. Define how material certificates will be collected or received, how they will be
15 checked in the field by inspection, how they will be matched up and assigned to specific
16 quantities of received material, how they will be stored and organized to facilitate future audits,
17 what system will be used for tracking certificates, and who will be responsible for managing the
18 program;
- 19 G. Certificates shall be specifically identified as either a "Certificate of Compliance" or a "Certificate
20 of Analysis";
- 21 H. Define test data organization methodology. Identify the planned materials information database
22 structure and define the sample identification methodology that includes sample ID structure,
23 material type and usage codes, and location referencing standards. Material codes shall be
24 consistent with those identified in TP Attachment 113-1;
- 25 I. Indicate methodology to transmit test data to ADOT in an electronic format acceptable to ADOT;
- 26 J. Define the intended materials test summary reports and provide examples;
- 27 K. Define the materials information management software and end user computer devices that will
28 be utilized for collecting, organizing, processing, retrieving, and reporting test data. Discuss how
29 Developer will capture data and export information to ADOT in an electronic format acceptable
30 to ADOT;
- 31 L. Discuss the content and format of the sampling and testing requirements for all types of
32 materials that will be used on the Project. Material sampling and testing requirements shall be
33 consistent with those identified in TP Attachment 113-1;
- 34 M. Discuss methodology that will be used to assure that all collected samples and performed
35 material tests are reported with the proper material codes. Discuss internal quality control
36 methodology that will be used to check and assure data integrity;

- 1 N. Discuss procedures for reviewing and approving quality acceptance test results, categorizing
2 test results in a manner acceptable to ADOT, transmitting quality acceptance test results to
3 ADOT in a format acceptable to ADOT for use in fulfilling its statistical validation requirements,
4 and working collaboratively with ADOT to resolve statistical non-validation between IQF and
5 ADOT test results;
- 6 O. Discuss procedures for identification and control of materials, equipment, and elements of the
7 Work. These procedures shall be consistent with current industry standards to ensure that
8 identification of the item is maintained by appropriate means, either on the item or on records
9 traceable to the item, as necessary, throughout fabrication, erection, installation and use of the
10 item;
- 11 P. Define procedures to indicate, by the use of markings, such as stamps, tags, labels, routing
12 cards, or other suitable means, the status of inspections and tests performed upon individual
13 items of the Work;
- 14 Q. Define measures to ensure that tools, gauges, instruments, and other measuring and testing
15 devices used in activities affecting quality are properly maintained, controlled, calibrated,
16 certified, and adjusted at specified periods to maintain accuracy within industry standards;
- 17 R. Include procedures to control the handling, storage, shipping, cleaning, and preservation of
18 materials and equipment to prevent damage or deterioration;
- 19 S. Discuss procedures to ensure there is adequate quantity of material available for IQF sampling
20 and testing and ADOT Owner Verification sampling and testing; and
- 21 T. Discuss procedures to track and assure that personnel performing IQF Quality Acceptance
22 activities are evaluated randomly at least once a year by ADOT's Independent Assurance staff
23 for the sampling and testing they perform. Discuss procedures for reporting to ADOT which
24 individuals are due for evaluation.

25 **113.02.03.02.02 Owner Verification**

26 ADOT will perform Owner Verification.

27 **113.03 Submittals**

28 Table 113-2 reflects a nonexclusive list of Submittals identified in Section 113 of the TPs and is not
29 intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit
30 all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental
31 Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and
32 hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer
33 shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 113-2 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Quality Management Plan General Requirements	2	0	1	Within 30 Days of NTP 1 Prior to issuance of NTP 2	113.02.01
Quality Records	5	0	1	Upon request	113.02
Results of Internal Audits	4	0	1	Within 5 Business Days of their completion	113.02
Non-Conformance Reports (NCR)	3	0	1	Upon issuance and resolution of the non-conformance	113.02.03.02.01.02
Professional Services Quality Management Plan (PSQMP)	2	0	1	Prior to submittal of any design package for ADOT review or prior to NTP 2, whichever is earlier	113.02.02
Construction Quality Management Plan (CQMP)	2	0	1	Prior to issuance of NTP 2	113.02.03
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

1 114 HUMAN RESOURCES

2 114.01 General Requirements

3 Developer shall perform all Work in compliance with the requirements of Section 114 of the TPs.

4 Developer acknowledges and agrees as follows: All personnel performing Work on the Project shall have
 5 the experience, skill, and knowledge to safely and efficiently perform the Work assigned to them; all
 6 personnel performing Work on the Project shall also have appropriate required professional licenses and
 7 certifications; and such licenses and certifications shall be acquired prior to the individual starting work
 8 on the Project, except as otherwise noted below for Key Personnel. Developer shall ensure that all such
 9 personnel satisfy the applicable requirements set forth in this Section 114 of the TPs.

114.02 Key Personnel

The following provides a brief job description and requirements of the Key Personnel and other important personnel assigned to the Project. Exhibit 9 to the Agreement provides a full description of the qualifications required for each Key Personnel position. Developer acknowledges and agrees that all Key Personnel are required to be and shall ensure that they are Collocated as set forth below. The number of years of relevant experience listed for each Key Personnel position represented a target goal for evaluation purposes and is not a mandatory, minimum requirement for the position.

Replacement and/or staffing of all Key Personnel positions listed below shall follow the processes described in Section 8.6 of the Agreement.

All Key Personnel shall be actively engaged in the Project, for at least as much of the time required by Exhibit 9 to the Agreement. Developer shall appoint the Key Personnel for the Project as follows:

- A. Project Manager;
- B. Construction Manager;
- C. Design Manager;
- D. Maintenance of Traffic Manager;
- E. Quality Manager;
- F. Safety Manager;
- G. Public Relations Manager;
- H. Utility Adjustment Coordinator;
- I. Environmental Compliance Manager; and
- J. DBE/On-the-Job Training (OJT) Outreach and Compliance Manager.

114.02.01 Project Manager

The Project Manager is responsible for the overall design, construction, quality, and contract administration for the design and construction of the Project. This individual is required to be Collocated full time for the duration of the Project. The individual's relevant experience includes the following:

- A. 20 years on complex highway infrastructure projects;
- B. 10 years managing the design and construction of major urban freeway systems; and
- C. 5 years of major design-build project management of major urban freeway systems.

114.02.02 Construction Manager

The Construction Manager shall be assigned to the Project full time and shall be Collocated full time for the duration of the Project. The individual's relevant experience includes the following:

- A. 15 years on complex highway infrastructure projects;
- B. 10 years managing the construction of major urban freeway systems; and
- C. 5 years of major design-build construction management of major urban freeways.

114.02.03 Design Manager

The Design Manager is responsible for coordinating the individual design disciplines and is responsible for ensuring that the overall Project design is completed, and design criteria and requirements are met. This individual shall be assigned to the Project full time and shall be employed by the Lead Engineering Firm, and, in the Developer entity, under the direct supervision of the Project Manager. This individual shall be Collocated full-time while design is ongoing and until construction is at least 70% complete, whichever is later, and thereafter as needed. This individual is responsible for design quality management and shall be the Engineer of Record of the Project who has primary responsibility for design work under the Contract Documents. This individual must be a registered Professional Engineer in the State by the Effective Date. Relevant experience:

- A. 15 years on complex highway infrastructure projects;
- B. 10 years managing the design of major urban freeways; and
- C. 5 years of major design-build design management of major urban freeway systems.

114.02.04 Maintenance of Traffic Manager

This individual will be assigned to the Project full time and Collocated for the duration of the Project and will oversee MOT functions during construction. The individual will be responsible for evaluating Developer's sequencing, designs, traffic plans, staffing, safety, and other functions that relate to MOT during construction. This individual is responsible for the implementation of the Transportation Management Plan (TMP) per 23 C.F.R. § 630.1012. This individual must be at the Site or on-call during major construction work that requires the closing of one or more lanes of travel for more than four hours, with the exception of certain work that will occur during approved overnight hours. This individual must be a registered Professional Engineer in the State and a Professional Traffic Operations Engineer by the Effective Date. Relevant experience:

- A. 15 years on complex highway infrastructure projects;
- B. 10 years managing the design of MOT solutions; and
- C. 5 years of major design-build project experience.

114.02.05 Quality Manager

The Quality Manager is responsible for establishing and supervising Developer's QA/QC program for the design and construction of the Project. This individual shall work directly for Developer under the direct supervision of an executive officer above the level of, and under a line of authority independent of, the Project Manager. This individual shall be assigned to the Project full time and shall be Collocated for the duration of the Project. This individual must not be assigned any other duties or responsibilities on this Project or any other projects. This individual shall have the authority to stop design or construction Work

at any time and in the individual's, sole discretion. This individual must be a registered Professional Engineer in the State by the Effective Date. Relevant experience:

- A. 15 years on complex highway infrastructure projects;
- B. 5 years coordinating and managing quality programs on major freeway projects; and
- C. 5 years of major design-build construction management of major urban freeways.

114.02.06 Safety Manager

The Safety Manager is responsible for establishing and supervising Developer's safety program and coordinating the Transportation Management Plan (TMP) per 23 C.F.R. § 630.1012. This individual shall work directly for Developer and report directly to the Project Manager. This individual shall be assigned to the Project full time and is required to be Collocated during the construction phase of the Project. This individual shall be familiar with FHWA work zone safety regulations and OSHA and must have at least ten years of experience with roadway work zone safety. Relevant experience:

- A. 15 years on complex highway infrastructure projects;
- B. 5 years coordinating safety programs on major freeway projects; and
- C. 5 years of major design-build construction management of major urban freeways.

114.02.07 Public Relations Manager

The Public Relations Manager is responsible for supporting ADOT's effort to involve the community in the Project and shall oversee public communications, which entails notifying the public of such critical matters as traffic delays, detours, planned closures, construction progress, and other relevant information to keep the public fully apprised of how the Project impacts the community. This individual shall work directly for Developer and report to the Project Manager. This individual will be assigned to the Project full time and is required to be Collocated full time for the duration of the Project. The individual's relevant experience includes the following:

- A. 10 years working on community relations programs;
- B. 5 years coordinating public outreach programs on major urban freeway projects; and
- C. 5 years of community relations experience on major design-build construction projects along major urban freeways.

114.02.08 Utility Adjustment Coordinator

The Utility Adjustment Coordinator is responsible for coordinating the Utility Adjustment and relocation requirements for Developer and leading the efforts to resolve any utility conflicts that may arise during design and construction. This individual shall work directly for Developer and report to the Construction Manager. This individual is assigned to the Project full time and is required to be Collocated full time for the duration of the Project. The individual's relevant experience includes the following:

- A. 10 years on complex highway infrastructure projects;

- B. 5 years coordinating design and construction of utility adjustments and relocations for major urban freeway projects;

114.02.09 Environmental Compliance Manager

The Environmental Compliance Manager is responsible for coordinating the environmental permitting requirements for Developer and ensuring that issues are resolved before and during Construction Work. This individual shall work directly for Developer and report to the Construction Manager. This individual is assigned to the Project full time and is required to be Collocated for the duration of the Project. The individual's relevant experience includes the following:

- A. 10 years on complex highway infrastructure projects; and
- B. 5 years managing environmental compliance activities and permitting for major urban freeway project.

114.02.10 DBE/OJT Outreach and Compliance Manager

The DBE/OJT Outreach and Compliance Manager shall be assigned to the Project full time and shall coordinate with ADOT's General Engineering Consultant DBE/OJT Compliance Specialist, Project Federal Compliance Committee, and ADOT's Business Engagement & Compliance Office to help ensure Project goals are met. This individual shall be responsible for DBE/OJT, equal employment opportunity (EEO), and small business recruitment, outreach, management, monitoring, oversight, and reporting. The individual's relevant experience includes the following:

- A. Shall have strong knowledge and understanding of the federal DBE, OJT, and EEO program requirements; and
- B. 5 years of experience working with DBE, OJT, or EEO programs.

114.03 Other Personnel

Qualifications of certain staff termed Other Personnel are required to be reviewed and approved by ADOT prior to start of their corresponding item of the Work. Developer acknowledges and agrees that all Other Personnel are required to be and shall ensure that they are Collocated as set forth below. The number of years of relevant experience listed for each Other Personnel position represents a target goal and is not a mandatory, minimum requirement for the position. Resumes shall be not more than two pages for each Other Personnel. Requirements of individuals completing specific tasks not mentioned in this section shall also require ADOT approval as specified in that section. No less than 20 days before starting such work, Developer shall submit the person's resume and/or evidence of the required certifications to ADOT, and such individual shall be subject to ADOT's approval.

114.03.01 Professional Services Quality Manager

Developer shall designate a Professional Services Quality Manager (PSQM) for the Project. The PSQM shall report directly to the Quality Manager. Developer shall ensure that the PSQM is responsible for overall management of the PSQMP, including implementing and managing staff for design Quality Assurance/Quality Control functions. The PSQM shall be responsible for implementing quality planning, overseeing the Professional Services review, auditing, and coordinating with ADOT Professional Services oversight review. The PSQM shall be full time Collocated at the Project through the completion of the RFC'd Design Documents identified in Developer's Design Submittal Schedule and shall have no

other role, duties, or responsibilities on the Project. The PSQM and Construction Quality Manager (CQM) shall be different people.

The individual's relevant experience includes 10 years of experience in design quality management and/or Professional Services quality management of major urban freeway projects.

114.03.02 Construction Quality Manager

Developer shall designate a CQM for the Project. The CQM shall report directly to the Quality Manager and Developer shall ensure that the CQM is responsible for overall management of the CQMP. The CQM shall be responsible for implementing, monitoring, and adjusting the processes to make certain that acceptable quality is achieved and maintained and for implementing quality planning and coordinating with the IQF. The CQM shall be 100 percent committed to the Project and shall have no other role, duties, or responsibilities. The CQM shall be authorized to stop any Construction Work that does not comply with the standards, specifications, or criteria established for the Project. The PSQM and CQM shall be different people. The CQM's relevant experience includes 10 years of experience in the construction quality management of major urban freeway projects.

114.03.03 Construction Independent Quality Manager

Developer's IQF shall identify a collocated Construction Independent Quality Manager (CIQM) who shall be responsible for management of the quality acceptance aspects of the CQMP. The CIQM shall review, approve, authorize, examine, interpret, and confirm methods or procedures performed by Developer. The CIQM shall be responsible for overseeing the quality acceptance testing and inspection and coordinating with ADOT's oversight inspection and testing staff in accordance with the requirements of the Contract Documents.

The CIQM shall be a registered Professional Engineer in the State and shall be an employee of the IQF, with no responsibilities in connection with the production of the Work. The CIQM shall report jointly to ADOT and an executive officer above the level of, and under a line of authority independent of, the Project Manager. The CIQM shall not report to any person or party directly responsible for Design Work or Construction Work.

The CIQM shall be 100 percent committed to the Project while Construction Work is underway and shall have no other role, duties, or responsibilities. The CIQM shall be authorized to stop any Construction Work that does not comply with the standards, specifications, or criteria established for the Project. The PSQM and CIQM shall be different people.

114.03.04 Survey Manager

Developer shall designate a Survey Manager for the Project. The Survey Manager shall be the point of contact for all survey Work and shall be responsible for all survey Work, including directing and reviewing Subcontractor survey Work. The Survey Manager shall be familiar with ADOT procedures and standards pertaining to ROW, design, and construction surveying. The Survey Manager shall be a registered land surveyor in the State prior to commencing any survey work. The individual's relevant experience includes the following:

A. 10 years of experience with ROW, Design, and Construction surveys.

B. A minimum of 10 years of registration as a Land Surveyor.

114.03.05 Geotechnical Manager

Developer shall designate a Geotechnical Manager for the Project. The Geotechnical Manager shall be the point of contact for all geotechnical Work and shall be responsible for all geotechnical Work, including directing and reviewing Subcontractor geotechnical Work. The Geotechnical Manager shall be familiar with ADOT guidelines, procedures, and standards pertaining to geotechnical investigation, analysis, and design. The Geotechnical Manager shall be a registered Professional Engineer in the State prior to commencing work. The individual's relevant experience includes 15 years of experience in matters relating to geotechnical subsurface exploration, geotechnical site characterization, analysis, design, and construction of bridge foundations, retaining walls and noise barriers, drainage structures, roadway embankments and roadway pavements, and excavation and fill slopes in soil and rock.

114.03.06 Hazardous Materials Manager

Developer shall designate a Hazardous Materials Manager for the Project. The Hazardous Materials Manager shall provide expertise in the safe handling of Hazardous Materials required to perform the Work and those that may be discovered or impacted during the Work. The Hazardous Materials Manager shall schedule and/or conduct Hazardous Materials training for Developer's employees, verify all necessary certifications prior to and required for any handling of Hazardous Materials, and maintain records of all Incidents involving Hazardous Materials and notify the Environmental Compliance Manager, ADOT, and appropriate Governmental Entities in writing of any such Incidents.

The Hazardous Materials Manager shall be a qualified professional with 40-hour HAZWOPER certification. In addition, the Hazardous Material Manager shall have at least 5 years of experience in similar projects in developing remedial action plans or equivalent reports necessary and acceptable to the ADOT in Hazardous Material investigation, discovery, and remediation efforts of Hazardous Materials.

114.03.07 Erosion and Pollution Control Coordinator

Developer shall designate an Erosion and Pollution Control Coordinator (referred to elsewhere herein as Erosion Control Coordinator or ECC) for the Project. The ECC shall be responsible for finalizing the draft SWPPP from the preliminary information included with the Plans. The ECC shall be responsible for implementing, monitoring, and revising the approved SWPPP throughout the Work, for making the required inspections, and for implementing any other permit requirements stipulated in the Arizona Pollutant Discharge Elimination System (AZPDES) *General Permit*.

The ECC shall be capable of identifying existing and predictable effects of Developer's operations and shall have complete authority to direct Developer's personnel and equipment to implement the requirements described herein, including prompt placement of corrective measures to minimize or eliminate pollution and damage to downstream watercourses. The ECC shall also be familiar with procedures and practices identified in the SWPPP and shall ensure that emergency procedures are up to date and available at the Site.

The ECC shall at all times be aware of Developer's work activities, schedule, and effect of the Work on the environment, and shall, at any time, be accessible to direct Developer's personnel to replace or repair erosion control measures as necessary whether from construction, vandalism, or other causes. The ECC shall be Collocated full time. Developer shall provide ADOT with a phone number through which the ECC can be contacted at any time, 24 hours a day, 7 days a week, including holidays. The ECC shall be present at the jobsite within 24 hours of such call being placed.

The ECC shall also be aware of and comply with all requirements of the AZPDES *General Permit* to address discharges at the Site associated with Developer's activities other than construction, including staging areas, and other potential pollutant and material storage and borrow areas.

The ECC shall have successfully completed the mandatory two-day (16 hour) "Erosion Control Coordinator" training class provided by the Associated General Contractors (Arizona Chapter); telephone (602) 252-3926. No other training can be substituted. The ECC shall maintain the training class certification and shall not let it expire.

In addition, the ECC shall have documented experience equal to a minimum of 1 year from either of the following two categories:

- A. Experience in the development and implementation of SWPPPs, as specified in the AZPDES *General Permit*, or the National Pollutant Discharge Elimination System (NPDES) for highway construction projects. The ECC's experience shall demonstrate full-time responsibility for directly supervising construction personnel in the installation, monitoring, and maintenance of control measures; and
- B. Experience in stabilization of disturbed areas in environments similar to those on the Project. Experience in re-vegetation or restoration of disturbed areas. The ECC's experience shall demonstrate full-time responsibility for directly supervising personnel in stabilization of disturbed areas.

Developer's documentation shall provide details indicating the types of relevant experience and shall provide the number of months of each type of experience to be considered for approval.

In addition to the general ECC requirements, one of the following is required and shall be maintained for the duration of the Work.

- A. Registration in the State as a Landscape Architect, with a minimum of 1 year of experience in the fields of erosion control and sediment transport;
- B. Registration in the State as a Professional Engineer with a minimum of 1 year of experience in the fields of erosion control and sediment transport; and
- C. Certification by the EnviroCert International, Inc. as a Certified Professional in Erosion and Sediment Control.

To be considered for approval, Developer's documentation shall include a copy of the proposed ECC's certification or registration. Should the proposed ECC be a registered Landscape Architect or Professional Engineer in the State, Developer shall also provide documentation indicating the types of relevant experience, and the number of years of each type of experience to be considered for approval. Should the ECC be certified in accordance with item C above, Developer shall provide a copy of the wallet card supplied by EnviroCert International.

114.03.08 Hydraulics and Hydrology Engineer

Developer shall designate a Hydraulics and Hydrology Engineer for the Project. The Hydraulics and Hydrology Engineer shall report directly to the Design Manager. Developer shall ensure that the

Hydraulics and Hydrology Engineer is responsible for all matters regarding hydraulics for the Project. The Hydraulics and Hydrology Engineer shall be a registered or licensed professional engineer, comparable to an Arizona registration, in some state or foreign jurisdiction and shall be a registered Professional Engineer in the State prior to commencing any work. The individual's relevant experience includes 5 years of experience with hydraulics design for the projects on the Arizona State Highway System.

114.03.09 Landscape Architect

Developer shall designate a Landscape Architect for the Project. The Landscape Architect shall report directly to the Design Manager. The Landscape Architect shall be responsible for the landscaping and aesthetics for the Project and shall be familiar with ADOT construction plan preparation. The Landscape Architect shall be a registered or licensed landscape architect, comparable to an Arizona registration, in some state or foreign jurisdiction and shall be a registered Landscape Architect in the State prior to commencing work. The individual's relevant experience includes 5 years of experience in developing landscape and aesthetic plans.

114.03.10 Irrigation System Designer

Developer shall designate an Irrigation System Designer for the Project. The Irrigation System Designer shall report directly to the Landscape Architect. The Irrigation System Designer shall be responsible for the irrigation system design for the Project and shall be familiar with ADOT construction plan preparation. The Irrigation System Designer shall have a minimum of 5 years of experience designing on complex highway infrastructure projects using drip irrigation and have familiarity with reclaimed irrigation water design requirements and regulations.

114.03.11 ITS Design Manager

Developer shall designate an ITS Design Manager for the Project. The ITS Design Manager shall report directly to the Design Manager. Developer shall ensure that the ITS Design Manager is responsible for all matters regarding ITS elements for the Project. The ITS Design Manager shall be familiar with the overall functionality of the FMS, its field elements and their technologies, and the connectivity between the field elements and their users. The ITS Design Manager shall be a registered Professional Engineer in the State prior to commencing work. Registration shall be kept active throughout the duration of the Work. The individual's relevant experience includes a minimum of 10 years of experience in leading ITS design.

114.03.12 ITS Construction Manager

Developer shall designate an ITS Construction Manager for the Project. The ITS Construction Manager shall report directly to the Construction Manager. Developer shall ensure that the ITS Construction Manager is responsible for the construction, installation, and systems acceptance testing (SAT) for the entire ITS system. The ITS Construction Manager shall be familiar with the overall functionality of the ADOT FMS, ITS field elements and their technologies, and the connectivity between the field elements and their users. The individual's relevant experience includes the following:

- A. A minimum of 10 years of experience in leading ITS construction, installation, and SAT; and
- B. A minimum of 50 miles of previous fiber optic cable installation experience.

114.03.13 Maintenance Coordinator

Developer shall designate a Maintenance Coordinator for the Project. The Maintenance Coordinator shall be responsible for adhering to and administering the requirements of the Contract Documents as it relates to Developer Maintenance during the Project. The Maintenance Coordinator shall be responsible for having the ability to authorize and respond to unscheduled maintenance requirements as they occur. These requirements may occur 24 hours a day, 7 days a week as deemed necessary by the occurrence. The Maintenance Coordinator may designate other individuals to respond to after-hours maintenance requirements, however, it is the Maintenance Coordinator's responsibility to ensure all Maintenance requirements during construction are addressed in the allowable time frame.

114.03.14 Encroachment Permit Coordinator

Developer shall designate an Encroachment Permit Coordinator for the Project. The Encroachment Permit Coordinator is responsible for coordinating all encroachment permits needed to complete the Project Utility Adjustments. The Encroachment Permit Coordinator shall review plans and/or construction documents that may affect the Project, prepared by ADOT or third parties, for improvements in the Project area to be constructed by others. This position will report directly to the Utility Adjustment Coordinator.

The Encroachment Permit Coordinator shall coordinate with the Utility Companies and ADOT to secure, prior to commencing any construction within the Project ROW, an ADOT encroachment permit.

114.04 Submittals

Table 114-1 reflects a nonexclusive list of personnel identified in Section 114.03 of the TPs and is not intended to be an all-inclusive or exhaustive listing of all individuals. Developer shall determine and submit all qualifications as required by the Contract Documents, Governmental Approvals, and Governmental Entities. Unless otherwise indicated, Developer shall submit all qualifications in both electronic format and hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 114-1 Nonexclusive Submittals List					
Personnel	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Professional Services Quality Manager	3	0	1	Within 30 Days of NTP 1	114.03.01
Construction Quality Manager	3	0	1	Within 30 Days of NTP 1	114.03.02
Construction Independent Quality Manager	3	0	1	Within 30 Days of NTP 1	114.03.03
Survey Manager	3	0	1	Within 30 Days of NTP 1	114.03.04
Geotechnical Manager	3	0	1	Within 30 Days of NTP 1	114.03.05
Hazardous Materials Manager	3	0	1	Within 30 Days of NTP 1	114.03.06

Table 114-1 Nonexclusive Submittals List					
Personnel	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Erosion Control Coordinator	3	0	1	Within 30 Days of NTP 1	114.03.07
Hydraulics and Hydrology Engineer	3	0	1	Within 30 Days of NTP 1	114.03.08
Landscape Architect	3	0	1	Within 30 Days of NTP 1	114.03.09
Irrigation System Designer	3	0	1	Within 30 Days of NTP 1	114.03.10
ITS Design Manager	3	0	1	Within 30 Days of NTP 1	114.03.11
ITS Construction Manager	3	0	1	Within 30 Days of NTP 1	114.03.12
Maintenance Coordinator	3	0	1	Within 30 Days of NTP 1	114.03.13
Encroachment Permit Coordinator	3	0	1	Within 30 Days of NTP 1	114.03.14
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

1 115 SAFETY MANAGEMENT

2 115.01 General Requirements

3 Developer shall perform all Work in compliance with the requirements of Section 115 of the TPs.

4 Developer shall have sole responsibility for safety on the Site until Final Acceptance. Developer shall
 5 ensure that all Developer employees and Subcontractors comply with the Safety Management Plan,
 6 applicable Laws, and associated elements of Developer's injury and illness prevention program.

7 Developer shall comply with OSHA Regulations, including 29 C.F.R., Part 1926, and 29 C.F.R., Part
 8 1910, as well as all applicable standards of the USEPA, ADEQ, and the U.S. Mine Safety and Health
 9 Administration (MSHA).

10 115.02 Administrative Requirements

11 115.02.01 Safety Management Plan

12 Developer shall develop, implement, and maintain a comprehensive written Safety Management Plan
 13 that describes the policies, plans, training programs, Project controls and reporting, Incident response
 14 plans, and enforcement for the safety of personnel involved in the Project and the general public affected
 15 by the Project during the Work.

1 The Safety Management Plan shall be Project-specific and shall include Work to be performed by
2 Subcontractors. The Safety Management Plan shall include a hazard assessment describing the hazards
3 likely to be encountered on this Project and shall identify the sections of the plan that will be used to
4 manage those hazards.

5 Developer's Safety Management Plan shall at a minimum:

- 6 A. Be consistent with the Project insurance requirements;
- 7 B. Clearly establish the safety organization described in Section 115.02.01.01 of the TPs;
- 8 C. Describe the process of conducting safety orientation for all employees;
- 9 D. Describe Developer's alcohol and drug free workplace policy;
- 10 E. Describe employee training requirements;
- 11 F. Describe the process for conducting job hazard analysis;
- 12 G. Describe safety inspection procedures;
- 13 H. Describe procedures and policies for working in active traffic locations for work over traffic and
14 adjacent to traffic, protection of the public from falling debris; and, procedures for falsework
15 removal and shoring removal;
- 16 I. Describe Incident reporting procedures including near-miss Incidents;
- 17 J. Describe Developer's hazard communication program;
- 18 K. Describe Developer's management and auditing of the Safety Management Plan;
- 19 L. Describe personal protective equipment (PPE) requirements and policy;
- 20 M. Describe safety procedures for Developer's employees working around and handling Hazardous
21 Materials;
- 22 N. Describe the availability of first-aid, medical, and emergency equipment, and services at the
23 Site, including arrangements for emergency transportation;
- 24 O. Describe throughout the Safety Management Plan the coordination with the Project
25 Communication Team for each activity as applicable;
- 26 P. Describe security procedures to minimize unauthorized access to, theft, vandalism, and other
27 losses at the Site; and

28 Describe the process for reporting Work-Related Injuries and Illnesses to ADOT. Prior to issuance of
29 NTP 2, Developer shall submit the Safety Management Plan to ADOT for approval in ADOT's good faith
30 discretion.

115.02.01.01 Safety Organization

The Safety Management Plan shall clearly establish the specific chain of command and specify the lines of authority, responsibility, and communication with regard to safety compliance activities. The Safety Management Plan shall identify full-time dedicated safety professionals or managers covering all production shifts. The Safety Management Plan shall delineate administrative responsibilities for implementing the Project safety program. The Safety Management Plan shall describe the process of including representatives from Developer and all Subcontractors, as well as ADOT personnel working on the Project.

The Safety Management Plan shall specify which personnel have the authority to stop on-site activities when unanticipated and/or uncontrolled hazards are recognized and also specify those personnel with the authority to restart activities after the previously unrecognized hazards have been controlled. The Project Manager shall be responsible for the overall health and safety performance. The Safety Management Plan shall specifically define the safety responsibilities of each level of supervision.

115.02.01.02 Process of Employee Safety Orientation

The Safety Management Plan shall describe the safety orientation process, including the following:

- A. The extent and nature of the Project;
- B. Any hazards that can typically be expected during the Work that are specific to the job assignment;
- C. Conducting and using a job hazard analysis;
- D. Required Work practices, job conduct, hazard reporting and injury-reporting procedures;
- E. Acquainting the employee with special Work and safety requirements at the site; and
- F. Emergency response procedures.

115.02.01.03 Employee Training Requirements

Developer shall establish a safety training program that includes requirements for general and Project-specific training. All levels of Developer design and construction staff shall be trained.

Developer shall conduct, at a minimum, weekly safety meetings that are relevant to the specific types of Work at the Site, which comply with applicable Laws. Developer shall prepare documentation of meeting content and employee attendance.

115.02.01.04 Personal Protective Equipment Requirements and Policy

The Safety Management Plan shall define specific personal protective equipment (PPE) requirements for all employees for each task. At a minimum, Developer shall provide a consistent type of high-visibility safety vest (ANSI 107-2004 Class 2 daytime, Class 3 nighttime) to be worn by all personnel, as well as an ANSI-approved hard hat, safety glasses with side shields, and work boots, specific for the job being performed.

Developer shall ensure that all vendors and visitors wear hard hats, as well as other required PPE, while on the Site. Developer shall ensure that anyone not complying with these requirements does not enter

the Site or is required to leave the Site. Developer shall document all such Incidents. Developer's job hazard analysis shall include all required PPE for the specific task.

115.02.01.05 Alcohol and Drug Free Workplace Policy

Developer shall provide a policy for promoting a safe, alcohol-free, and drug-free workplace. The policy shall be consistent, fair, manageable, and subject to audit. The policy shall provide for disciplinary action or removal from the Project for a worker reporting for work under the influence of alcohol or a prohibited substance or in possession of a prohibited substance. It shall include the policy at the Site and any pre-job site and post-incident drug testing to satisfy Project insurance requirements.

115.02.01.06 Safety Inspection Procedures

The Safety Management Plan shall describe safety inspection procedures of Work areas, materials, and equipment to ensure compliance with the safety management program.

Developer shall schedule, conduct, and document safety inspections in all Work areas to identify and reduce physical and/or environmental hazards that could contribute to injuries or illnesses.

115.02.01.07 Emergency Procedures

Developer shall prepare an Emergency Action Plan for the Project that specifies the procedures for each identified potential Emergency, notification requirements, and training, and identify those individuals responsible for implementing the plan, if the plan is activated. The potential for an emergency exists at all construction areas and operational areas. The Emergency Action Plan shall identify the various response activities necessary to minimize the dangers and confusion associated with an emergency. The Emergency Action Plan shall address at a minimum: fire, explosions, chemical releases, Hazardous Materials, natural disasters, traffic crashes, contact with energized utilities, major injuries or fatalities, law enforcement activities, and civil disruptions. The Emergency Action Plan shall include coordination with the Project Communication Team and Crisis Communication Plan.

115.02.01.08 Incident Response Procedures

The Safety Management Plan shall include processes to investigate and report accidents and Incidents and to retain safety records. Developer shall develop a list of Project-specific requirements for documentation and reporting. Developer shall include the reporting of near-miss Incidents. Developer shall provide timely verbal notification and a written report to ADOT of all Incidents arising out of or in connection with the performance of the Work, whether on or adjacent to the Site, which cause death, personal injury, or property damage.

Developer shall verbally notify ADOT and Project Communications Team within 1 hour from time of occurrence of an Incident (or Developer's discovery of the occurrence thereof) causing public injury, and include date and time, location, brief description, extent of property damage, and extent of injuries. When such Incidents take place, Developer shall promptly initiate an investigation and notify appropriate individuals (ADOT, etc.).

Developer shall maintain a 24-hour-per-day, 7-day-per-week emergency contact telephone number with a responsible individual in charge, empowered to take any necessary actions on behalf of Developer.

115.02.01.09 Job Hazard Analysis and Communications

Developer shall provide policy and procedures for job hazard analysis and how that analysis is communicated to forepersons and workers as the day's work and tasks are outlined. On a daily basis, all employees involved with the task shall discuss the hazards anticipated, equipment needed to work safely, and PPE to be provided and worn. If the task changes from what was anticipated during the shift, the job hazard analysis shall be updated and each worker given the opportunity to review the updated document.

Developer shall give employees an opportunity to provide input regarding task steps, hazards identified, and appropriate control measures.

Developer shall document all job hazard analysis training.

115.02.01.10 Materials Safety Procedures and Communication Policy

Developer shall ensure that the Safety Management Plan describes safety procedures and communication policy for all workers working around and handling Hazardous Materials.

Developer shall provide employees with information and training regarding any Hazardous Materials to which they may be exposed. Additionally, Developer shall ensure that Hazardous Materials are not delivered, stored, or used at the Site, unless they are properly labeled, tagged, or marked and the safety data sheets are readily available at the work location. Additionally, Developer shall establish a location with a master set of safety data sheets.

115.02.01.11 Managing and Auditing of Safety Management

The Safety Management Plan shall describe the audit process for safety management. The Safety Management Plan shall describe frequency and scope of audit, how it is to be conducted, how the results are to be communicated, and how findings and corrective actions are to be tracked.

115.02.01.11.01 Safety Performance Analysis

Developer shall complete a detailed analysis of safety performance each quarter. Developer shall conduct the safety performance analysis to document that Developer and its Subcontractors are performing Work in a safe manner and in compliance with the Safety Management Plan and applicable Laws. The analysis shall define and measure specific proactive program elements designed to prevent Incidents, such as employee training and orientations, toolbox meetings, audits and inspections, individual supervisor safety performance evaluations, immediately dangerous to life and health interventions, etc. Developer shall document the measures to verify proactive efforts relative to safety performance results. Developer shall prepare a Safety Performance Analysis Report that includes the analysis and results as described in this Section 115.02.01.11.01 of the TPs. Each quarter by the 20th of the month after the quarter ends, Developer shall submit a Safety Performance Analysis Report to ADOT.

If the safety performance analysis reveals an error or deficiency, Developer shall take immediate measures to correct the observed error and immediately prepare a Safety Corrective Measure(s) that includes a description of all measures to correct the safety error or deficiency.

Developer shall immediately submit the Safety Corrective Measure(s) to ADOT.

115.02.01.11.02 Safety Results, Statistics and Reports

Developer shall prepare and submit reports per the following schedule:

- 1 A. Monthly Safety Report within 5 Business Days after the end of the month. Developer shall submit
2 the Monthly Safety Report to ADOT including:
- 3 1. Summary report for all OSHA recordable injuries, first aid cases, and reported near misses
4 including the date of Incident, type of injury, OSHA reporting classification and claim status
5 (open/closed);
- 6 2. Incident rate calculation for all OSHA recordable Incidents for the Project since inception
7 and OSHA recordable rate calculation for Incidents for the previous month. Incident rate
8 calculations shall include all Project Incidents, with a separate calculation for direct labor
9 such as self-perform work and management of the Project, and for each Subcontractor who
10 has an OSHA recordable incident on the Project. (Recordable Incidents x 200,000 /
11 Manhours);
- 12 3. Report detailing, corrective actions taken to prevent reoccurrence of similar Incidents for
13 Developer and all Subcontractors; and
- 14 4. Property damage and public liability Incidents occurring the in previous month including
15 date of Incident, description of Incident and corrective actions taken.
- 16 B. Quarterly Safety & Claims Report: In addition to the Safety Performance Analysis described in
17 Section 115.02.01.11.01 of the TPs, by the 20th of the month after the quarter ends, Developer
18 shall submit the Quarterly Safety & Claims Report to ADOT including:
- 19 C. Summary of all Incidents that occurred on the Project including: type of Incident, brief description
20 of the Incident, status of corrective actions plans;
- 21 D. Summary of all property or liability claims made against the Project including: date of loss, brief
22 description of the allegation, status of the claim, if the claim has been accepted, and the date
23 closed;
- 24 E. Summary of all claims tendered by the State including: State claim number, date of loss, brief
25 description of the allegation, status of the claim, if the claim has been accepted, and the date
26 closed; and
- 27 F. Summary of safety audits performed in the preceding quarter including: date of audit, description
28 of findings, status of corrective actions.

29 **115.02.01.12 Periodic Updates to Safety Management Plan**

30 Developer shall update the Safety Management Plan yearly to incorporate corrective action
31 recommendations and other minor clarifications. At a minimum, every year or as Work scope changes
32 the workplace environment, a major regulation change requirement occurs, or at the request of ADOT,
33 Developer shall review and update the Safety Management Plan for compliance with regulations, policies,
34 and procedures.

115.02.01.13 Site Security, Temporary Fencing, and Steel Plating

In conjunction with the Safety Management Plan, Developer shall submit a plan for site security to discourage unauthorized access to the Project or to specific hazard areas. The plan shall include providing 72-inch temporary chain link fencing, or ADOT approved equal, around all major structure construction areas (i.e., bridges, pump houses, drop structures, retaining walls, water ponds, etc.) and around any unattended excavation deeper than four feet, with slopes steeper than 1:2 (V:H). Temporary fencing shall completely enclose the referenced construction activity and shall be secured after normal working hours to prevent unauthorized access. Developer can take into consideration permanent ROW fencing in protecting work from unauthorized access if approved by ADOT. The plan shall describe the controls that will be implemented at each construction entrance such as gates, guards, or signs.

Developer shall limit open utility trenches to 50 feet in length, except for cast-in-place pipe installations during nonworking hours. Developer shall cover all open trenches where accessible to traffic with steel plates. Developer shall prepare an Open Trench Safety and Security Plan for all trenches greater than 50 feet in length that describes and details how Developer intends to construct the trench and to make it safe and secure for workers and the general public. At least 10 Business Days prior to excavating trenches greater than 50 feet in length, Developer shall submit the Open Trench Safety and Security Plan to ADOT for approval.

115.02.01.14 Audits/Inspections

ADOT reserves the right to perform audits and inspections to confirm that Developer is complying with health and safety rules and procedures. ADOT has the right to have a qualified representative perform audits and/or Inspections on a periodic basis.

115.02.01.15 Noncompliance with the Safety Program

ADOT, through ADOT designated personnel, has the authority to stop any activity that constitutes or is perceived to present a threat of imminent danger. If any conditions or activities may present an imminent danger that could result in serious injury, death, or extensive property damage, Developer shall stop the affected portion of the Work immediately and shall not recommence until the practices or conditions are corrected to the satisfaction of ADOT.

Developer shall have a disciplinary policy for workers who violate established safety rules and regulations. This includes immediate removal from the Project for serious violations, repeated violations, or the refusal to follow health and safety rules. Developer shall be solely responsible for all cost or schedule impacts, in the event the Project or any portion thereof is stopped or shut down by any Governmental Entity because of an unsafe condition.

115.03 Submittals

Table 115-1 reflects a nonexclusive list of Submittals identified in Section 115 of the TPs and is not intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 115-1 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Safety Management Plan	2	0	1	Prior to issuance of NTP 2	115.02.01
Safety Performance Analysis Report	5	0	1	Each quarter by the 20 th of the month after the quarter ends	115.02.01.11.01
Safety Corrective Measures, as needed	5	0	1	Immediately	115.02.01.11.01
Monthly Safety Report	5	0	1	Within 5 Business Days after the end of the month	115.02.01.11.02
Quarterly Safety & Claims Report	5	0	1	Each quarter by the 20 th of the month after the quarter ends	115.02.01.11.02
Open Trench Safety and Security Plan	3	0	1	At least 10 Business Days prior to excavating trenches greater than 50 feet in length	115.02.01.13
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

1 116 SUBMITTAL REVIEW

2 116.01 General Requirements

3 Developer shall perform all Work in compliance with the requirements of Section 116 of the TPs. Section
 4 116 of the TPs includes requirements related to Submittals and the Submittal review process for all
 5 Submittals required by the TPs. Developer shall be responsible for obtaining all required approvals from
 6 the applicable Governmental Entities and Utility Companies.

7 116.02 Administrative Requirements

8 116.02.01 General

9 Developer shall provide Submittal packages via the ADOT's web-based project management information
 10 system in accordance with the Contract Documents and the PMP along with all supporting information
 11 necessary for ADOT, Governmental Entities, and Utility Companies to conduct a review and to ensure
 12 that the design is progressing appropriately. Submittal packages shall include the following:

A. Administrative documents (PMP, other plans, etc.);

B. Design Documents; and

C. Construction Documents.

116.02.02 Submittal Format

Submittal packages shall have a unique alphanumeric identifier that remains with the package and identifies each Submittal stage (e.g., Preliminary Design Submittal, Final Design Submittal, Released for Construction (RFC) Submittal). The alphanumeric identifier shall remain constant and track the design package through the life of the Project.

Developer shall submit all Submittal documents in hardcopy and electronic format as specified in Table 116-1 unless otherwise specified in the Contract Documents.

Table 116-1 Submittal Format			
Submittal Stage/Deliverable	Hardcopy	Electronic	
		Native	PDF
Administrative Documents (e.g., PMP, Project Schedule)	X	X	X
Specifications, Technical Reports, Calculations, Modeling, Input, and Output Files, etc.		X	X
Preliminary Design Submittal		X	X
Final Design Submittal		X	X
RFC Submittal		X	X
Shop and Working Drawings	X		X
Request for Information			X
Design Changes			X
Record Drawings		X	X
Governmental Entity and Utility Company Submittals*			X
Note: * Developer shall determine the additional format requirements required by the applicable Governmental Entity and/or Utility Company.			

116.02.03 CAD Requirements

Developer shall prepare all drawings, Plans, and exhibits in accordance with the ADOT 2015 ADOT Drafting Guides for Use in Office and Field (Drafting Guide) and the CAD Requirements included on <https://azdot.gov/business/engineering-and-construction/traffic/cadd-standards-traffic-engineering> unless otherwise modified by the TPs to meet the requirements of applicable Governmental Entities or Utility Companies.

116.02.04 Media Format

Developer shall prepare all Plans on sheets 22 inches in height and 34 inches in length with 1-1/4-inch margins on the left and right sides, and 3/4-inch margins on the top and bottom, unless otherwise noted in the Contract Documents. A blank space, 4 inches wide by 3 inches high, shall be left inside the margin in the lower right corner. All Plans shall be made in such a manner that clear and legible copies can be made from them. Developer shall prepare half-size copies on standard 11-inch by 17-inch sheets. The

number of hardcopies indicated in the "Nonexclusive Submittals List" tables in the TPs for Plans indicates half-size copies. Developer shall prepare exhibits on 8.5-inch by 11-inch, 11-inch by 17-inch, 22-inch by 34-inch or 36-inch by 72-inch sized sheets.

All documents, reports, and calculations shall be prepared on 8.5-inch by 11-inch sheets, unless otherwise noted in the Contract Documents.

Roll plots may be used for specific deliverables as noted in the Contract Documents. Roll Plots shall not be used for RFC documents or Plans. Roll plots shall be 36 inches in height and 72 inches in length, with 1-1/4-inch margins on the left and right sides, and 3/4-inch margins on the top and bottom.

116.02.05 Electronic Format

Developer shall utilize or integrate with ADOT's web-based project management information system for electronic submittal of all data and documents to ADOT. If Developer chooses to integrate with ADOT's project management information system, Developer shall use data systems, standards, and procedures compatible with those employed by ADOT and implement any new operating practices required as a result of ADOT's amendments to any such systems, standards, and procedures. Web services application programming interface for real time integration using industry-standard protocols and event driven integrations triggered through structured workflows provide options to integrate with ADOT's project management information system. Developer shall obtain all software, licenses, training, and support to integrate or use ADOT's project management information system throughout the Work.

Developer shall use ADOT-provided electronic forms and process, where applicable. Developer shall submit, as identified in the Contract Documents, electronic submittals compatible with existing ADOT program systems and/or software. Systems and software currently being used by ADOT include the following:

- A. Microsoft Windows 10 (operating system);
- B. Google Office Suite with Gmail, Google Sheets, and Google Docs;
- C. Microsoft Word 2010;
- D. Microsoft Excel 2010;
- E. DocuSign for the Enterprise;
- F. Bentley's MicroStation V8i (2D and 3D files);
- G. Bentley's InRoads Suite SS2 (Existing Ground Model and design files) or newer; and
- H. Oracle Primavera P6.

Developer shall submit electronic files to ADOT as identified in the Contract Documents electronically through ADOT's project management information system. Developer shall include a transmittal letter that is electronically signed by Developer with all electronic submittals. Developer shall submit Plans in full-size (22 inches by 34 inches) PDFs.

116.02.05.01 Existing Ground Model

Developer shall create an integrated-model of the existing condition to create a digital terrain model (DTM) using Bentley's InRoads/Site/Survey Select CAD. The existing ground model shall include existing ground surface and subsurface elements (including the best available information for: drainage structures, Utilities, and bridge and wall foundations), features utilizing data from light detection and ranging (LiDAR), subsurface Utility evaluation, field surveys, and existing plans data collection including currently available LiDAR or other existing ground surface data (.dtm or .tin format). Developer shall verify the DTM for accuracy through field procedures of locating well-defined and random check points (not included in the creation of the DTM surface) systematically dispersed throughout the Site and compared to the DTM.

Developer shall comply with the requirements in the following manuals available from ADOT at <https://azdot.gov/business/engineering-and-construction/engineering-survey> in creating DTMs:

- A. Manual for Field Surveys;
- B. Location Survey P-codes for Bentley InRoads; and
- C. General Specifications for Photogrammetric Mapping.

Developer shall include the existing ground model in both DTM and LandXML format with the 3D Models.

116.02.05.02 InRoads Files (Design Files)

Developer shall prepare InRoads Design Files including alignment file in both *.alg and LandXML formats, storm drain data base in *.sdb format, and new design surfaces in *.dtm and LandXML format. Developer shall submit these files at the same time as Plan submittals.

116.02.05.03 Visual Animation

Developer shall prepare a Visual Animation to be used by ADOT for informational purposes. The Visual Animation shall provide an aerial view of a virtual model of the constructed Project and imagery of surrounding key features and geographic locations for reference. Visual Animations prepared by Developer shall be based on 3D Models and include proposed and existing to remain roadway features, drainage basins, bridges, walls, noise barriers, generalized locations of lights, and conceptual representation of aesthetic/landscape.

As a condition precedent to receiving NTP 2, Developer shall submit the Visual Animation of Developer's Schematic Design to ADOT for review and comment. The first Visual Animation shall include the complete extents of the Project Limits along I-10, US 60 and SR-143. Developer shall narrate a script describing the Work and features of the Design. The Visual Animation narrative shall also be translated into Spanish.

After NTP 2, an updated Visual Animation shall be submitted to ADOT every six months until Substantial Completion. Updates shall be coordinated with the Project Communications Team and may focus on specific elements of the Schematic Design such as the C-D road system, HOV Ramps, noise barriers, or other Project details. Developer is responsible for providing both English and Spanish narrative for each Visual Animation submittal.

116.03 Design Review Process

ADOT shall have the right to perform reviews of any Submittal or element of Work at any time throughout the Work.

Developer shall not be relieved of its responsibility for the satisfactory completion of the Work in accordance with the Contract Documents by ADOT's participation in design reviews. ADOT may require resubmittal of any Design Documents and/or Construction Documents, as it deems appropriate. ADOT will have the right to refuse and reject any Submittal that does not comply with the Contract Documents, including Quality Assurance/Quality Control requirements. If any Submittal is rejected, Developer shall notify all recipients to remove all copies from circulation. Developer shall redistribute the replacement Submittal to ADOT and other appropriate Governmental Entities, as authorized by ADOT.

ADOT will provide review comments to Developer numbered in a manner corresponding to the drawing or report page in question. Developer shall provide space after each comment for a brief response by Developer. Developer is advised that comments on the Submittals received from parties other than ADOT may not follow the above-described ADOT comment format. In addition, Developer may receive separate comment packages from each party that reviews a Submittal. With the PSQMP, Developer shall prepare and submit a Comment Resolution Form to ADOT. Developer shall compile all Submittal review comments on a Comment Resolution Form. The Comment Resolution Form is a living document in which Developer shall incorporate all comments and resulting resolutions for the Submittal package for the duration of the Submittal. Developer shall include previous Submittal comments, if applicable, and Comment Resolution Form(s) with each subsequent Submittal identified with an alphanumeric tracking number corresponding to the package submission in accordance with Section 116.02.02 of the TPs. With the subsequent Submittal, Developer shall prepare and submit written Review Comment Responses to ADOT.

Developer shall schedule a comment resolution meeting (CRM) to address unresolved comments. Developer may request ADOT to waive a CRM. ADOT may waive a CRM at its sole discretion. The purpose of the CRM is to discuss Developer's responses to review comments, determine which of the review comments Developer shall incorporate into the Work, and resolve the pending comments. More than one CRM per Submittal may be necessary to discuss all review comments provided to Developer. Within 5 Business Days of the CRM, Developer shall prepare and submit CRM notes to ADOT. The Project Manager, Design Manager, Engineer(s) of Record, and all Developer staff requested by ADOT shall attend the CRM.

The Parties will escalate review comments not resolved after the first complete CRM by making use of the Issue Resolution Ladder in Section 21.2.1 of the Agreement; provided that, if Developer contends that the comment review process (including informal use of the Issue Resolution Ladder) results in a Relief Event, Developer shall follow the process in Section 13.1 of the Agreement before a disagreement becomes a Dispute. Compliance with Section 13.1 of the Agreement shall be a condition precedent to a Dispute advancing to mediation under Section 21.2.3 of the Agreement, and failing resolution during mediation, to arbitration under Section 21.2.5 of the Agreement or litigation under Section 21.2.6 of the Agreement. If the Parties use the Issue Resolution Ladder informally as part of the comment resolution process, they may elect, with mutual consent, to waive a second use of the Issue Resolution Ladder after Developer has complied with Section 13.1 of the Agreement before advancing a Dispute (including a Dispute concerning whether a Relief Event has occurred) to mediation, and thereafter to arbitration or litigation, as applicable.

Developer shall address all Preliminary Design Submittal comments by the Final Design Submittal prior to submitting the RFC Submittal. Developer acknowledges and agrees that resubmittal of the Final

Design Documents, RFC packages, or other design Submittals may be required by ADOT. Developer shall resubmit the Final Design Documents as many times as necessary to obtain approval of the Final Design Documents. Developer shall not be entitled to an increase in the Contract Price, adjustment of a Completion Deadline, or any other Claim due to required resubmittals.

116.03.01 Over-the-Shoulder Reviews

Over-the-shoulder reviews are informal examinations by ADOT of Design Documents during the Project design process and are not considered formal reviews as specified in Section 116.04 of the TPs. Over-the-shoulder reviews are mainly intended to assess whether the requirements and design criteria of the Contract Documents are being followed and whether Professional Services Quality Management Plan (PSQMP) activities are being undertaken in accordance with the QMP.

The intent of these reviews is to check for concept, level of detail, design criteria, and patent flaws. Comments made by ADOT are considered nonbinding. An over-the-shoulder review shall not relieve Developer of its obligation to conform the Work to the requirements of the Contract Documents. These reviews are not intended to routinely include detailed calculation or drawing reviews, although ADOT will have the right to perform detailed reviews of any item at any time. If mutually agreed upon between the Parties for specific review items, the over-the-shoulder review may consist of an exchange of electronic files between Developer's designer and ADOT.

The QMP shall define the frequency, timing, content, and format of the over-the-shoulder reviews. Developer shall schedule over-the-shoulder reviews with ADOT during the development of each design package. The over-the-shoulder reviews are not critical activity points that restrict the progress of design. They are simply reviews of the design as it progresses and opportunities for ADOT to provide comments and feedback on the design.

If over-the-shoulder reviews are performed, ADOT will conduct them, as appropriate, in either Developer's office or at ADOT's offices or the Collocated Office, and in the presence of Developer's personnel with the intent to minimize disruption of ongoing Design Work. Formal assembly and submittal of drawings or other documents may not be required. The review may be of progress prints, computer images, draft documents, working calculations, draft specifications or reports, or other Design Documents.

ADOT will have no obligation to conduct over-the-shoulder reviews.

116.03.02 Segment Limits Map and Design Submittal Schedule

Developer shall prepare a Segment Limits Map and Design Submittal Schedule for the development, scheduling, and characterization of Developer's Design. The intent of the Segment Limits Map and Design Submittal Schedule is to enable ADOT to adequately plan its review resources.

Developer shall prepare a Segment Limits Map that identifies how Developer intends to divide the Project into design segments for the intent of submitting design Submittal packages to ADOT. ADOT will not accept or review a single design package for the entire Project. Developer may, with prior approval by ADOT, modify the Segment Limits Map as the design effort progresses. Segment Limits Map shall include stations and mileposts of:

A. Beginning of Project;

B. End of Project;

- C. Existing bridge crossings with Structures Identification Numbers;
- D. Proposed bridge crossings with Structures Identification Numbers;
- E. Construction segment delineation;
- F. Lead design firm delineation; and
- G. Other Project specific landmarks.

Developer shall prepare a Design Submittal Schedule that identifies all design Submittal packages up to and including RFC Submittal for each design segment Developer intends to submit to ADOT. The Design Submittal Schedule shall identify individual Submittal packages for each bridge and wall structure. Preceding elements such as reports required to be submitted prior to Plans shall be identified in the Design Submittal Schedule, as well as specification and shop drawings.

Within 20 Business Days of NTP 1, and as a condition precedent to ADOT's issuance of NTP 2, Developer shall submit the Segment Limits Map and Design Submittal Schedule to ADOT, subject to approval in ADOT's good faith discretion.

Developer shall incorporate in the Project Schedule the review periods for each Submittal package to be submitted as identified in the Design Submittal Schedule.

ADOT does not guarantee any specific review period for Governmental Entities and Utility Companies. The review period for each review to be performed by a Governmental Entity is established by the Governmental Entity, at its discretion, after a Submittal package has been provided to the Governmental Entity.

116.03.03 Submittal Review Periods

Developer shall coordinate with Governmental Entities and Utility Companies to determine those entities' submittal review requirements. Such reviews may include collaborative design review meetings with discipline specific staff at each Governmental Entity or Utility Company that are required to be held outside the Collocated Office as required by each Governmental Entity or Utility Company. Developer shall accommodate such review requirements to obtain approval. ADOT shall be present at all design reviews. Governmental Entity or Utility Company reviews may be concurrent with ADOT reviews.

Developer acknowledges and agrees that Submittals at all Submittal stages require the review period duration applicable for that category of Submittal as reflected in Table 116-2.

Developer shall coordinate with ADOT and FHWA to review changes from Schematic Design and information provided in the Change of Access Report to Developer's Schematic Design prior to the first Design Review Submittal. A TP-compliant design may require amendments and updates to the Change of Access Report. Developer shall be responsible for preparing information to modify and seal a revised Change of Access Report as required by ADOT and FHWA. Review and Approval by ADOT shall occur prior to FHWA review. If required, an approved Change of Access Report shall be required prior to NTP 2. Any delay caused by pursuing changes to the Change of Access Report or disapproval of proposed changes shall not entitle Developer to an increase in the Contract Price, adjustment of a Completion Deadline or any other Claim, or otherwise constitute a Relief Event.

- 1 Review times are applicable only for the submission of complete and comprehensive documents that are
- 2 deemed acceptable by ADOT for review.

Table 116-2 Submittal Review Periods		
Category	Submittal To	Review Period (Business Days)
Professional Services		
A	ADOT	10
B	ADOT (Design Variances)	20
C	ADOT (Design Exceptions and Change of Access)	20 ¹
D	Governmental Entities and Utility Companies	Varies ¹
Construction		
E	Design Changes	10 ¹
F	Record Drawings	20 ¹
Notes:		
1. Developer shall coordinate with Governmental Entities and Utility Companies to determine the entities' submittal requirements.		

- 3 A maximum of 10 Submittals can be submitted per technical discipline for review. Submittals shall include
- 4 Construction and Design documents. Technical Disciplines for the purpose of maximum review
- 5 Submittals include:
- 6 A. Land Surveying;
- 7 B. Geotechnical/Earthwork;
- 8 C. Pavement;
- 9 D. Environmental;
- 10 E. Public Information;
- 11 F. Utilities;
- 12 G. Roadway;
- 13 H. Drainage;
- 14 I. Aesthetics and Landscaping;
- 15 J. Structures;
- 16 K. Hydraulics;
- 17 L. Signing and Pavement Marking
- 18 M. Lighting or Signals;
- 19 N. Maintenance of Traffic or Traffic Control Plans; and
- 20 O. Intelligent Transportation System.

Developer acknowledges and agrees that no more than 10 Submittals per technical discipline in the aggregate may be pending for review by ADOT at any given time. Developer may request authorization from ADOT for the right to make Submittals in excess of the stipulated maximum number in accordance with Section 3.1.2.3 of the Agreement. Developer may make more than 10 Submittals per technical discipline for excess Submittals that are related to the early opening of I-10 eastbound south of Baseline Road.

116.04 Design Requirements

Developer shall prepare all Design Documents by, or under the supervision of, a registered Professional Engineer of the applicable discipline. All RFC packages and Final Design Documents shall be stamped, signed, and dated by the Engineer of Record.

Except as otherwise specified in the Contract Documents or approved by ADOT, Developer shall develop formal Submittals of Design Documents following the steps described in Section 116.04 of the TPs. The primary design Submittal package stages are:

- A. Geometric Drawing;
- B. Preliminary Design Submittal;
- C. Final Design Submittal; and
- D. RFC Submittal.

Notwithstanding the foregoing, Developer may request the right to propose to eliminate a design package step identified herein, as reflected by Developer's proposed Project Baseline Schedule. ADOT will have the right to withhold approval of such request in its sole discretion.

Developer shall coordinate with Governmental Entities and Utility Companies to determine those entities' submittal requirements and make appropriate Submittals, providing concurrent copies of any such submittals and respective correspondence to ADOT. Developer shall immediately notify ADOT of any additional Governmental Entity's requirements. Developer shall be responsible for all costs and schedule impacts for all Governmental Entities' requirements.

116.04.01 Plans

Developer shall prepare Plans that include design drawings specific for the Project that show the location, character, dimensions, and details of the Work to be performed and is prepared in accordance with the Contract Documents and Good Industry Practice. Developer shall ensure that all non-ADOT standard drawings/details are detailed on Plans. Standard Drawings and Details from ADOT, MAG, City of Phoenix, and City of Tempe may be used within Plans by reference and not recreated such that no alterations or modifications are required. Any modified standard drawing or detail shall be designed by Developer and included in the Plans. All Plans shall include the Project ROW and Temporary Construction Easements (TCE). Developer shall refer to Section 118 of the TPs for any requested changes to the Project ROW or TCEs.

Specific list of Construction Drawings required for each discipline is described in Sections 200, 300, 400, 500, 600, 700 and 800 of the TPs.

116.04.02 Geometric Drawing

Developer shall prepare a Geometric Drawing that includes the following:

- A. Typical cross sections of the various roadways;
- B. Plan view at a scale to show basic striping, topographic features, curve data, changes in alignment (i.e., begin of curve, end of curve, point on compound curve, angle points, etc.), dimensions, etc.;
- C. Profiles and superelevation diagrams that identify grades, vertical curves, changes in profile (i.e. begin vertical curve, end vertical curve, point of intersections, point of tangency, vertical curve lengths, grade breaks, etc.);
- D. Identification of pedestrian/bicycle facilities;
- E. Identification of structural and drainage facilities; and
- F. Identification of any Design Exceptions or Design Variances.

Prior to submittal of any other design package, Developer shall submit the Geometric Drawing to ADOT.

116.04.03 Preliminary Design Submittal

To supplement or augment Developer's design schematic included in the Proposal and when the design for a given element or segment is approximately 60 percent complete, Developer shall prepare and submit Design Documents to ADOT and all third-parties with elements of design within or adjacent to jurisdiction for review and comment. Developer is responsible for all cost and coordination efforts involved in third-party design submittals and reviews.

116.04.04 Final Design Submittal

When the design for a given element or area is approximately 95 percent complete, Developer shall prepare and submit a Final Design Submittal to ADOT and all third-parties with elements of design within or adjacent to jurisdiction for review and comment. Each Final Design Submittal shall include Plans, specifications, technical memorandums, reports, studies, calculations, and other pertinent data, as applicable. The Final Design Submittal shall also include a compiled list of quantities following ADOT item numbers for proposed new items within such Submittal. Removal and Maintenance of Traffic quantities are not required. The Final Design Submittal shall also include a Comment Resolution Form showing how the Final Design Submittal addresses the review comments generated during the previous Submittal reviews.

116.04.05 RFC Submittal

When the design for a given element or area is 100 percent complete and all previous comments have been addressed and appropriately incorporated, Developer shall prepare and submit the RFC Submittal to ADOT. The RFC Submittal shall include Plans, specifications, technical memorandums, reports, studies, calculations, and other pertinent data, as applicable with the RFC Submittal. The RFC Submittal shall also include a Comment Resolution Form showing how the RFC Submittal has addressed the review comments generated during previous submittal reviews by ADOT and all third-parties. The registered

Engineer of Record (by discipline) shall sign and seal the RFC Submittal prior to construction of the relevant Project component.

The RFC Submittal shall also include a compiled list of quantities following ADOT item numbers for proposed new items within such Submittal. Removal and Maintenance of Traffic quantities are not required. These quantities are not required to be signed nor sealed.

ADOT's review of any RFC package does not constitute approval of subsequent construction and does not relieve Developer of its responsibility to comply with the requirements of the Contract Documents. Developer shall ensure construction complies with the requirements of the Contract Documents, Laws, and Governmental Approvals. Developer shall bear the risk of any required modifications to the component construction due to subsequent design changes resulting from further design development.

116.05 Construction Requirements

116.05.01 Shop Drawings and Working Drawings

Developer shall prepare Shop Drawings and Working Drawings necessary to construct the Project. Shop Drawings and Working Drawings shall include drawings on 22-inch by 34-inch sized sheets, calculations, and certifications, description of the methods of construction proposed, and adequate definition and control of the Work. PSQM shall review and certify Shop Drawings and Working Drawings in accordance with approved CQMP. At least 10 Business Days prior to implementation, Developer shall submit Design Manager-approved Shop Drawings and Working Drawings to ADOT.

116.05.02 Request for Information (RFI)

Design issues or questions may arise in ongoing Work reflected in RFC packages. Developer may utilize the RFI process as a communication tool between design and construction. RFIs may be initiated by Developer or ADOT. Developer-initiated RFIs shall reflect the following: the general nature, Plan document, location, and description of the issue; Developer's proposed mitigation with supporting documentation of the issue; and the CQM's approval of such mitigation. ADOT will provide Developer an RFI for issues or questions identified by ADOT. ADOT will submit ADOT-initiated RFIs to Developer for incorporation into the RFI process. Developer shall submit RFIs to the Design Manager to obtain the proposed mitigation with supporting documentation. Developer's proposed mitigation shall be submitted to ADOT for approval prior to implementation.

RFIs pertaining to elements of work maintained, within or adjacent to Governmental Entity or Utility Company limits or appurtenances, must be approved by such Governmental Entity or Utility Company prior to submittal to ADOT.

The RFI process shall not be used to modify RFC Plans except for adding approved TCEs to the Plans. Any changes in design shall be in accordance with Section 116.05.03 of the TPs.

116.05.03 Design Changes

During Construction Work, adjustments to the design may be required to fit field conditions or because of an RFI. The Engineer of Record for the design at the time of the Design Change shall provide written approval for any Design Change that occurs during construction, or Design Changes that occur to Design Documents, unless otherwise specifically authorized in writing by ADOT. All Design Changes shall undergo the same QMP checks, reviews, and certifications and are subject to the same review process beginning at Final Design Submittal, as the original design. Design Changes shall include Plan sheets,

specifications, technical memorandums, reports, studies, calculations, and other data, as applicable per the deliverable content required by the level of the submittal.

Plan change documentation shall include confirmation that:

- A. The Design Change has been designed in accordance with the requirements of the Contract Documents, applicable Laws, and Governmental Approvals;
- B. The Design Change has been checked in accordance with Developer's PSQMP;
- C. The Design Change has been prepared consistently with other elements of the original design;
- D. The Design Change complies with the design certification requirements as set forth in the QMP; and
- E. ADOT comments are resolved.

Developer shall request and schedule an interim and final Design Review(s) for all Design Changes made to the Final Design and RFC Documents. Developer shall document all changes made through the Design Change process in the Record Drawings in accordance with Section 116.05.04 of the TPs.

116.05.04 Record Drawings

Developer shall prepare Record Drawings in accordance with the ADOT *Redline and As-Built Procedures and Guidelines* and the Contract Documents. The Construction Independent Quality Manager shall assume the role of Construction Administrator as it relates to the ADOT *Redline and As-Built Procedures and Guidelines* in review of the Record Drawings. As a condition of Final Acceptance in accordance with Section 6.6.3.1 of the Agreement, Developer shall submit Record Drawings as a composite set of Plans for the Project to ADOT for review and comment. The Design Manager or Engineer of Record shall professionally endorse (seal and sign) the Record Drawings. The Professional Services Quality Manager shall certify the Record Drawings comply with the QMP.

Developer shall prepare compiled list of as-built quantities following ADOT item numbers for newly constructed items as provided with each RFC Submittal. Developer shall also provide such information in a format acceptable as outlined in the ADOT Highway Feature Inventory System (FIS) Data Collector's Handbook as provided in the RIDs. ADOT will be responsible for entering the information into the FIS.

116.06 Submittals

Table 116-3 reflects a nonexclusive list of Submittals identified in Section 116 of the TPs and is not intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 116-3 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Visual Animation	3	0	1	Prior to NTP 2, followed by updates every 6 months for the through Substantial Completion.	116.02.05.03
Comment Resolution Form	5	0	1	With the PSQMP	116.03
Review Comment Responses	5	0	1	With the subsequent Submittal	116.03
CRM Notes	5	0	1	Within 5 Business Days of the CRM	116.03
Segment Limits Map	2	0	1	Within 20 Business Days of NTP 1	116.03.02
Design Submittal Schedule	2	0	1	Within 20 Business Days of NTP 1	116.03.02
Geometric Drawing	5	0	1	Prior to submittal of any other design package	116.04.02
Preliminary Design Submittal	3	0	1	When the design for a given element or segment is approximately 60 percent complete	116.04.03
Final Design Submittal	3	0	1	When the design for a given element or area is approximately 95 percent complete	116.04.04
RFC Submittal	3	0	1	When the design for a given element or area is 100 percent complete and all previous comments have been addressed and appropriately incorporated	116.04.05
Shop and Working Drawings	5	1	1	10 Business Days prior to implementation	116.05.01
RFI	4	0	1	Prior to implementation of the associated RFI Work	116.05.02

Table 116-3 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
Design Changes	4	0	1	Varies	116.05.03
Record Drawings	4	0	1	As a condition of Final Acceptance in accordance with Section 6.6.3.1 of the Agreement	116.05.04
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

1 117 DOCUMENTATION OF THE SITE

2 Developer shall perform all Work in compliance with the requirements of this Section 117 of the TPs.
3 Developer shall be responsible for the preservation of all public and private property and shall protect
4 carefully from disturbance or damage all land monuments and property marks.

5 Land monuments and property marks shall not be moved by Developer until directed by ADOT.

6 Existing fences, pole lines, signs, buildings, and structures that are to remain in place shall be protected
7 from injury or damage.

8 117.01 Existing Conditions Site Documentation

9 Developer shall prepare an Existing Conditions Site Documentation that identifies and documents the
10 existing conditions within and adjacent to the Project Limits. Developer shall investigate, videotape, and
11 photograph existing elements in the Project ROW that are planned to remain in place to determine its
12 condition, size, material, location, and other pertinent information. Developer shall videotape the interior
13 of all drainage facilities to remain within the Project ROW. The Existing Conditions Site Documentation
14 shall include adjacent roadways, drainage facilities including pump stations, channels, and flowing
15 waterways, fences, walls, houses, buildings, wells, sensitive habitats, landscaping and irrigation systems,
16 and areas where activities, whether permanent or temporary, will be performed by Developer.

17 Developer shall include in the Existing Conditions Site Documentation all facilities and Utilities that may
18 be impacted by the Work including downstream drainage facilities, adjacent roadway conditions, and
19 sensitive habitats. The videotape shall show details of the condition of all properties and structures,
20 pavement conditions of crossroads, and proposed and potential haul routes. Developer shall schedule
21 field meetings with ADOT to observe and participate in the Existing Conditions Site Documentation. If
22 Developer is unable to obtain site documentation of a specific element, including wetlands,
23 environmentally sensitive areas, or obstructed storm drains, such element shall be observed by ADOT
24 and ADOT concurrence of omission obtained prior to submission of the Existing Conditions Site
25 Documentation. Such determinations shall be documented and accompany the Existing Conditions Site
26 Documentation submittal. These requirements and this submittal do not supersede the requirements in
27 other sections of the Contract Documents that require specific inspections, assessments, and site
28 documentation.

Within 90 Business Days after issuance of NTP 1, and as a condition precedent to ADOT's issuance of NTP 2, Developer shall submit the Existing Conditions Site Documentation to ADOT for review and comment. The file structure and description of files shall be provided with this Submittal. The Existing Conditions Site Documentation may be stored on an external hard drive and delivered to ADOT at the same time as the transmittal of the submittal depending on the size of the files.

117.02 Site Documentation

Beginning within 10 Business Days of NTP 2, and every subsequent month through Substantial Completion, Developer shall provide photos, aerial photograph, and video of the Project Limits. Aerial photography and video shall be at consistent interval and spatial orientation from month to month.

In addition, Developer shall install a fixed view internet-based online interface camera (hereafter, "webcam") to collect at least one still photograph daily on a secure network connection. The Webcam shall focus on the major bridge construction along I-10 from 48th Street to Broadway Road. The webcam location shall not change throughout the duration of Work and photos shall be obtained at relatively the same time each Day. The Webcam shall be installed within the Project ROW unless otherwise approved by ADOT and the property owner. The Webcam shall not be integrated into the existing or proposed ITS improvements. Developer is responsible for the power consumption, power connection, communications to/from the Webcam, and physical and network maintenance as to deliver the daily images as requested herein. The naming convention for each daily photo file shall include the Day and date the photo was taken. Developer shall provide ADOT access to the online interface at all times.

Digital images shall be provided in JPEG or uncompressed TIFF format, produced by a digital camera with a minimum sensor size of 8.0 megapixels, and at an image resolution of not less than 1024 by 768 pixels.

117.03 Submittals

Table 117-1 reflects a nonexclusive list of Submittals identified in Section 117 of the TPs and is not intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 117-1 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies Hardcopies	Electronic	Submittal Schedule	Section Reference
Existing Conditions Site Documentation	4	0	1	90 Business Days after issuance of NTP 1	117.01
Site Documentation	4	0	1	Monthly	117.02
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

118 RIGHT-OF-WAY (ROW)

The Schematic ROW will be established by ADOT Right-of-Way Project No. 010 MA 149 F0072. The proposed Schematic ROW is shown in the existing and new ROW CAD files. Developer shall not access the Schematic ROW or any new easements until they are acquired by ADOT. Acquisition status is provided in TP Attachment 118-1.

Developer shall be responsible for establishing the existing ROW when new construction or construction activities are adjacent to the ROW. Project ROW limits shall be marked per Arizona Boundary Survey Minimum Standards. Developer shall coordinate this activity sufficiently in advance of any construction activities. See Section 118.04 of the TPs for Temporary Construction Easements (TCEs).

Additional permanent ROW acquired by Developer (Developer-Designated ROW) or TCEs acquired by Developer, shall be in accordance with Section 5.2 of the Agreement and this Section 118 of the TPs.

Developer is advised that all requirements of the Approved Environmental Document are based upon the environmental study area and the Section 106 Area of Potential Effect (APE) established by the Schematic Design, see TP Attachment 119-2 and Section 6.4.2 of the Agreement. These requirements are rigid and must be adhered to in the design and construction of this Project. Developer is responsible for any re-evaluation of the Approved Environmental Document, schedule implications, and costs related to Developer ROW acquisitions, unless otherwise provided for in the Agreement.

Innovations, proposed by Developer, requiring additional permanent ROW or TCEs that would require re-evaluation of the Approved Environmental Document may be cause for rejection of the innovations. Rejection of the innovations shall be at the sole discretion of ADOT.

118.01 General Requirements

Developer shall perform all acquisition of Developer ROW in compliance with the requirements of Section 118 of the TPs and Section 5.2 of the Agreement. Developer's acquisition of Developer ROW is subject to ADOT's approval in accordance with Section 5.2.2.1 of the Agreement.

118.02 Administrative Requirements

118.02.01 Standards

Developer shall perform all acquisition of Developer ROW in accordance with the Uniform Act and the standards, manuals, and guidelines listed in Table 118-1 which are shown in no order of precedence; however, in the event of a conflict, the more stringent requirement prevails, provided that nothing contained in the ADOT or State materials shall be interpreted to conflict with or supersede any provision of the Uniform Act that takes precedence.

Table 118-1 Standards		
No.	Agency	Name
1	ADOT	Right of Way Procedures Manual
2	State of Arizona	Arizona Boundary Survey Minimum Standards

Developer shall utilize the ADOT *Right of Way Procedures Manual* as a guideline, except to the extent it is inconsistent with the provisions of State or Federal Law or Section 118 of the TPs. All ADOT forms referenced in Section 118 of the TPs may be found in the ADOT *Right of Way Procedures Manual*.

118.02.02 Project ROW Status

Real property interests that have and shall be acquired to construct the Project as identified in the EA are identified in TP Attachment 118-1. TP Attachment 118-1 identifies which parcels ADOT will acquire and anticipated dates for access. ADOT has no obligation to provide Developer access for the parcels earlier than the dates set forth in TP Attachment 118-1. Developer shall restore any disturbed property within an easement to the condition at the time of occupancy by Developer, unless specifically noted in TP Attachment 118-1.

118.03 Developer ROW

ADOT will acquire the Schematic ROW and bear the cost thereof.

Any additional ROW outside the Schematic ROW, except for a Necessary Schematic ROW Change, shall be the responsibility of Developer, in accordance with Section 5.2 of the Agreement and the ADOT ROW acquisition process, the requirements of which are contained in the Uniform Act and the materials referenced in Table 118-1. Developer will be responsible for any further re-evaluation of the Approved Environmental Document and resulting schedule implications for any Developer ROW beyond those previously assessed in the Approved Environmental Document.

Developer shall clearly mark Project ROW limits in the field prior to construction and after the Developer ROW has been acquired. ROW limits shall be marked per Arizona Boundary Survey Minimum Standards.

118.04 Temporary Construction Easements (TCEs)

TCEs in the Schematic ROW are included with ADOT Right-of-Way Project No. 010 MA 149 F0072. These TCEs will be obtained by ADOT and the cost for these TCEs will be borne by ADOT.

Any additional TCEs outside the Schematic ROW shall be the responsibility of Developer and shall be acquired in accordance with Section 5.2 of the Agreement and the ADOT ROW acquisition process, the requirements of which are set forth in the Uniform Act and Table 118-1. Developer will be responsible for any further re-evaluation of the Approved Environmental Document and resulting schedule implications for any TCEs beyond those previously assessed in the Approved Environmental Document.

Developer shall clearly mark TCE limits in the field prior to construction and after the TCE has been acquired and no work, personnel or equipment shall be outside of these limits after the TCE has been acquired. TCE limits shall be marked per Arizona Boundary Survey Minimum Standards.

TCEs, including those acquired by Developer outside the Schematic ROW, shall be shown on all Plans. TCEs outside the Schematic ROW approved after RFC Plans shall be added to the Plans through the RFI or Design Change process.

118.05 Parcels with Special Consideration

Twin Buttes Cemetery: An Aerial Easement exists for the Twin Buttes Cemetery located east of I-10 between Broadway Road and Southern Avenue. Developer shall adhere to the easement requirements as documented in TP Attachment 118-2. Developer shall provide a debris containment system and plan in accordance with Section 600.04.12 of the TPs.

Existing fence shall not be removed until new fence is ready to be installed. Existing "Section 8" and "Section 8A" signs along the existing fence shall be surveyed prior to fence removal. Existing signs shall be removed and installed at the existing location on the new fence. No ground disturbance shall occur within 4 feet of the existing fence within the Aerial Easement other than fence removal/installation. See TP Attachment 118-2 for additional structure and aesthetic requirements near the Twin Buttes Cemetery located on the east side of I-10 south of Broadway Road.

ADOT Yard at Broadway Road and 48th Street (APN 12457002F): The Schematic Design shows impact to this parcel that requires the relocation of ADOT facilities. Developer shall modify the ADOT facilities per TP Attachment 118-3. Developer shall not modify the Limits of New Construction/Access Control line as shown in TP Attachment 118-3. Developer shall not impact the operations of the occupants of the parcel at any time without prior approval from ADOT. If Developer impacts the parcel, such that the parcel no longer provides adequate usage for ADOT facility and operations, as determined in ADOT's good faith discretion, Developer shall relocate the ADOT facility as required by ADOT at Developer's expense.

The ROW currently identified as owned by ADOT along the south side of Calle Guadalupe; east of Calle Bella Vista (in the residential backyard) is not available for any permanent or temporary improvements nor shall be accessed by Developer at any time. Refer to TP Attachment 118-4.

Northwest of Salt River Bridge (APN 122-24-002D): If Developer elects to use this parcel as permitted in Section 5.5 of the Agreement, Developer shall not mine or remove any materials from the property, including sand or gravel.

Maricopa Community College overflow parking lot: The existing overflow parking lot located in the north-east quadrant of the existing I-10 / SR 143 traffic interchange within ADOT ROW is available for Developer and Project use. The overflow parking site is considered within the ADOT ROW enclosed by existing fence. The lease with the tenant has been terminated effective May 31, 2020.

If Developer requires access or use of this site, Developer shall notify ADOT and the Maricopa Community College 30-Days prior to closure of the parking lot. Developer shall install temporary fence along the ADOT ROW to restrict access during construction or until permanent ROW fence can be installed.

If the Project improvements impact the existing overflow parking lot such that the existing access and circulation or number of existing parking spaces is reduced by more than half, Developer shall remove the parking lot surface, lighting system, install permanent ROW fence, landscape the area in accordance with Section 800 of the TPs, and modify the parking islands to restrict access to ADOT ROW.

If the ultimate Project improvements avoid the existing overflow parking or do not reduce the number of existing parking spaces by more than half and still provides access and circulation, Developer shall remove the portion of unusable parking lot surfaces (if any), remove lights impacted by the Work, modify the limits of the ROW fence as appropriate and return the parking lot surface lights and pavement markings in a condition equal to or better than prior to impacting the site.

The Developer shall coordinate with ADOT the responsibilities of the Developer and ADOT as identified in TP Attachment 118-1.

1 **118.06 Protected Features within ROW**

2 **118.06.01 Cell Towers**

3 Existing cell towers are located within the Project Limits at the locations shown in Table 118-2. Developer
4 shall adhere to the requirements noted.

Table 118-2 Cell Towers			
Location ¹	Description	Disposition	Developer Requirements
STA 8088+40, 705' Lt	Cellular One, Broadway and I-10 2180 W Broadway Frontage Road, Tempe, AZ 85281	To Remain	Protect in place, and provide new access path
STA 8082+60, 715' Rt	ADOT Yard, 2500 W Broadway Road, Tempe AZ 85282	To Remain	Protect in Place
STA 8363+61, 155' Rt	Northwest Corner Warner Road/I- 10, Verizon Pho Ikea Proposed, 5221 E Saguaro Circle, Phoenix, AZ 85044	To Remain	Protect in Place
STA 8421+41, 285' Rt	Northwest Corner Ray Road/I-10 Intersection, 5102 W Ray Road, Phoenix, AZ 85044	To Remain	Protect in Place
Notes: 1. Station Offset based on existing I-10 Median Centerline			

5 **118.06.02 Billboards**

6 The existing billboards located within the Project Limits at the locations shown in Table 118-3 are to
7 remain. Developer shall adhere to the requirements noted.

Table 118-3 Billboards ²			
Location ¹	Description	Disposition	Developer Requirements
STA 7995+43, 183' Lt	Southeast Corner of Probox by 36 th Street cul-de-sac, APN: 122-13-022B	To Remain	Protect in Place
STA 8001+27, 175' Lt	George Brazil, APN: 122-10-005D	To Remain	Protect in Place
Notes: 1. Station Offset based on existing I-10 Median Centerline 2. All other billboards not listed in this table are to be relocated per <u>TP Attachment 118-1</u>			

8 **118.06.03 Maricopa County Air Quality Monitoring Station**

9 The Maricopa County Air Quality Department operates an air quality monitoring station as part of their
10 mobile air monitoring program which measures criteria pollutants. The Diablo Station will be relocated to
11 a location on the east side of the 36th Street cul-de-sac on the south side of the I-10 (Existing I-10 Median
12 Centerline STA 8001+15, 155' Rt) which shall remain and be protected in place throughout the Work.
13 The air quality monitoring station will be in the clear zone of the Project improvements and shall be
14 protected by barrier. Developer shall provide rolled curb at the 36th Street cul-de-sac for maintenance

access along the south ROW. Access shall be maintained at all times. Electrical service to the monitoring station shall be protected in place. Developer shall coordinate construction activities within the vicinity of the air quality monitoring station with Maricopa County Air Quality Department.

118.07 Submittals

Table 118-4 reflects a nonexclusive list of Submittals identified in Section 118 of the TPs and is not intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 118-4 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
ROW CAD Files	5	0	1	Whenever the Project ROW or TCEs are updated	118.01
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

119 ENVIRONMENTAL

119.01 General Requirements

Developer shall perform all Work in compliance with the requirements of Section 119 of the TPs and to satisfy all functional needs of the Project, including environmental mitigation, monitoring, reporting, and protection, while complying with all applicable Environmental Laws and Governmental Approvals.

119.02 Administrative Requirements

119.02.01 Standards

Developer shall perform all Work in accordance with the standards, manuals, and guidelines listed in Table 119-1.

Table 119-1 Standards		
No.	Agency	Title
1	ADOT	I-10, I-17 (Split) to SR 202L (Santan) Draft Environmental Assessment (DEA)
2	ADOT	I-10, I-17 (Split) to SR 202L (Santan) Final Environmental Assessment – Errata Sheet (FEA)
3	ADOT	Noise Abatement Requirements dated May 2017

Table 119-1 Standards		
No.	Agency	Title
4	FHWA	FHWA's Statewide Section 106 Programmatic Agreement for Federal-Aid Projects, Attachment 6 (2016)
5	ADOT	ADOT's Standard Specifications for Road and Bridge Construction Section 104.08 (2008)
6	ADOT	Erosion and Pollution Control Manual for Highway Design and Construction (2012)
7	ADOT	ADOT's Clean Water Act Section 404/401 Guidance Manual
8	ADOT	ADOT's Temporary Traffic Control Design Guidelines
9	ADOT	SAF-6.01 Asbestos Management Policy
10	ADOT	ADOT's Roadside Vegetation Management Guidelines
11	ADOT	ADOT's Right of Way Procedures Manual
12	ADOT	ADOT's Public Involvement Plan

119.02.02 Environmental Management Program

Developer shall develop, operate, and maintain a comprehensive Environmental Management Program for the Work to establish the environmental requirements, approach, and procedures to be employed to protect the environment from Project impacts. The Environmental Management Program shall comply with all Environmental Approvals for the Project, and all applicable Law (including Environmental Law), Project Commitments, and Governmental Approvals issued thereunder, whether obtained by ADOT, a Utility Company, or Developer. The Environmental Management Program shall be submitted to ADOT and approved by ADOT prior to submittal of the Environmental Management Plan and first design submittal. The Environmental Management Program shall obligate Developer to follow the established protocols as well, Developer shall:

- A. Establish and implement environmental compliance measures taken during the performance of the Work to avoid and minimize impacts on the environment from the design and construction, activities of the Project;
- B. Effectively demonstrate in detail Developer's knowledge of all applicable Environmental Approvals, environmental Governmental Approvals, environmental issues, environmental commitments and constraints, and any applicable Environmental Laws;
- C. Provide concise, consistent environmental monitoring, documentation, and reporting activities throughout the Work, applicable to the environmental activities being performed;
- D. Describe the processes that are followed during the course of the Work to comply with those Environmental Approvals, environmental Governmental Approvals, environmental issues, environmental commitments, and Law, as well as the documentation required to verify and validate environmental compliance;

- 1 E. Describe the documentation required to verify and validate compliance of the Environmental
2 Management Program with all applicable Environmental Laws, Environmental Approvals,
3 environmental Governmental Approvals, and Contract Documents;
- 4 F. Establish a goal of zero environmental violations during the performance of all Work, and provide
5 detailed processes for rectifying such violations in an appropriate and timely way;
- 6 G. Provide design certifications with every Design Submittal or Design change indicating that an
7 environmental review of the design package has been completed and that the design does
8 not change any conditions of the original National Environmental Policy Act (NEPA) Approval or
9 any existing permit conditions;
- 10 H. Identify known or reasonably expected environmental constraints for review with each Design
11 Submittal or Design change;
- 12 I. Provide qualified staff for each of the environmental disciplines; and
- 13 J. Discuss sensitive environmental areas prior to the start of construction at the pre-construction
14 meeting and again at applicable pre-activity meetings.

15 **119.02.03 Environmental Management Plan**

16 Developer shall prepare an Environmental Management Plan (EMP) that describes Developer's
17 approach to implementing the environmental commitments. Developer shall incorporate all environmental
18 commitments into the Environmental Management Plan. A summary list of known environmental
19 mitigation commitments included in the FEA is provided in TP Attachment 119-1.

20 The EMP shall include, at a minimum, the following elements:

- 21 A. Developer's environmental personnel organizational chart and their training including the
22 Environmental Compliance Manager (ECM);
- 23 B. Developer's environmental commitments including all forthcoming permit conditions;
- 24 C. Environmental monitoring plan that indicates times, locations, and other primary monitoring
25 parameters;
- 26 D. Weekly environmental monitoring report content;
- 27 E. Monthly report content that combines the weekly report forms into a document that
28 summarizes the month's environmental monitoring activities;
- 29 F. Documentation confirming that Developer has provided each Subcontractor, including its agents
30 associated with the design and construction of the Project, with a copy of all permits and
31 training issued by Governmental Entities for the Project;
- 32 G. Environmental notification contact list;

- H. Pre-construction survey plan for sensitive species, including plants and nesting birds and burrowing owls.
- I. Schedule of EMP activities;
- J. Spill containment and countermeasure plan describing Developer's plans to prevent, contain, clean up, remove, dispose of, and mitigate all regulated material spills caused by Developer or its subcontractors and/or agents associated with the design and construction, of the Project. The spill containment and countermeasure plan shall be in accordance with the July 2002 United States Environmental Protection Agency (EPA) update. The spill containment and countermeasure plan shall include a notification list for containing and reporting;
- K. Plan for verifying that all personnel entering the Site have completed the Project-specific environmental awareness training;
- L. Hazardous Materials Management Plan, including procedures for discovery of unanticipated hazardous waste or contaminated materials;
- M. Unanticipated archaeological discovery plan;
- N. Noise analysis and mitigation plan;
- O. In the event any heavy ripping is planned for construction purposes, pre- and post-construction surveys for structures located within one-half mile of the area of heavy ripping;
- P. Air quality management plan;
- Q. Asbestos control management plan (demolition);
- R. Lead-based paint control management plan (demolition);
- S. Sedimentation and erosion control plan; and
- T. The environmental communications protocol specified in Section 119.02.03.01 of the TPs.

Prior to issuance of NTP 2, Developer shall submit the EMP to ADOT for approval in ADOT's good faith discretion. Developer shall not perform any Construction Work prior to ADOT's approval of the EMP. Developer shall review, revise, and update the EMP annually to reflect the Project's current state and to incorporate any changes attributable to revisions of State or Federal Laws or guidelines. Developer shall prepare interim EMP revisions, in the form of addenda, if revisions to the EMP are needed before the annual update.

119.02.03.01 Environmental Communications Protocol

The EMP shall provide for the development, documentation, and implementation of an environmental communications protocol (ECP). The ECP shall describe the process to be used for compliance and noncompliance reporting, unanticipated archaeological or hazardous material discoveries, personnel's roles, procedures for internal and external communications, and communications with ADOT. The ECP shall be consistent with Developer's Public Involvement Plan and the EMP. The ECP shall include organizational charts that identify Developer's ECM and other personnel who will be assisting the ECM

1 to ensure compliance with all permit conditions, performance standards, and environmental
2 commitments.

3 **119.02.03.01.01 Internal Communications**

4 For internal communications procedures, Developer shall ensure that the EMP:

- 5 A. Describes Developer's organizational hierarchy and identifies compliance roles and internal
6 reporting responsibilities;
- 7 B. Includes a clear discussion regarding which Key Personnel, in addition to the ECM, have the
8 authority to stop Work to prevent a violation from occurring; and
- 9 C. Describes the process for identifying and reacting to noncompliance events.

10 **119.02.03.01.02 External Communications**

11 For external communications procedures, Developer shall ensure that the EMP describes the
12 procedures that define how all external communications received by Developer shall be documented and
13 handled, including how ADOT will be involved. External communications may originate from Tribes,
14 Local Jurisdictions, regulatory agencies, and the public. Issues may range from public noise complaints
15 to violation notices from regulatory agencies. Where appropriate, this communication procedure shall
16 be consistent with the EMP. ADOT will remain the main point of contact (unless Developer is
17 otherwise directed by ADOT) with the public and for environmental and permit coordination with local
18 jurisdictions and regulatory agencies. ADOT will lead all communication related to cultural resources
19 and the Section 106 of the National Historic Preservation Act process. Developer shall be responsible
20 for external notification and reporting requirements associated with the permits Developer obtains and
21 for which Developer is listed as the permittee, including reporting protocols identified within Developer's
22 spill containment and countermeasure plan specified in Section 119.02.03 (J) of the TPs.

23 **119.02.03.01.03 Communications with ADOT**

24 For communications with ADOT, Developer shall ensure that the EMP:

- 25 A. Describes interactions between Developer and ADOT with regard to reporting noncompliance
26 issues;
- 27 B. Describes Developer's communication process and Key Personnel responsible for recognizing
28 when a design change and/or alternative construction technique may require a permit
29 modification or new approval; and
- 30 C. Describes Developer's strategy for managing design changes that may require permit
31 modifications or additional approvals.

32 **119.02.04 Environmental Monitoring Reports**

33 ECM must provide to ADOT an Environmental Monitoring Report (EMR) on a monthly basis that
34 documents Environmental Compliance monitoring. The EMR shall be organized into a single document
35 for each reporting period and further organized by resource type. For each resource, include the following
36 information:

1 A. Location of the area monitored (map, with stationing, addresses, or other reference);

2 B. Name of inspector or monitor;

3 C. Date(s) monitoring occurred;

4 D. Weather conditions;

5 E. Observations/conditions (typical details are listed below); and

6 F. Resolution of any and all violations or other problems encountered.

7 Conditions to be reported shall include:

8 A. Air and water quality standards compliance;

9 B. Any and all violations of applicable Governmental Approvals, Environmental Laws, or
10 commitments in the Environmental Documents;

11 C. Status of all Work in streams;

12 D. Any and all spills, either by third-parties or Developer;

13 E. Discharge of groundwater;

14 F. Discovery of migratory bird nest or raptor nest, whether active or not;

15 G. Discovery of any sick, dead, or injured migratory or raptor bird;

16 H. Discovery of potentially historic artifacts, human bones or remains, or non-human bones;

17 I. Agency field oversight, inspection, and coordination;

18 J. Status of impacts to cultural resources; and

19 K. Detection of Hazardous Substances and status of any Remediation Work.

20 **119.02.05 Project Environmental Commitment Requirements**

21 Developer shall comply with environmental mitigations, commitments, and requirements included in
22 the FEA and FONSI. The table provided in TP Attachment 119-1 includes the Project-specific
23 environmental mitigation measures associated with the FEA and FONSI and ADOT's standard
24 commitments. Environmental mitigation measures have been reviewed and approved by ADOT for the
25 construction of the Project. These mitigation measures are not subject to change without prior written
26 approval from ADOT. Developer shall be responsible for all environmental mitigation measures and
27 commitment requirements in TP Attachment 119-1, except those requirements that are specifically
28 identified as ADOT actions.

29 If, at any time, Developer is not in compliance with any applicable Laws, including any Environmental
30 Laws, and Governmental Approvals, ADOT may suspend the Work, in whole or in part, under Section

17.2.1 of the Agreement until such time that the errors, deficiencies, or noncompliant situations have been corrected. Any associated monetary fines and environmental restoration activities required to resolve violations are the responsibility of Developer.

119.02.06 Governmental Approvals

119.02.06.01 NEPA Approval

The Governmental Approvals that ADOT is responsible for acquiring (ADOT-provided approvals), and their status, are set forth in Table 119-2. The ADOT-provided approvals are based on the Schematic Design that is provided in the RIDs. Copies of ADOT-provided approvals that ADOT has already secured are provided in the RIDs.

Table 119-2 ADOT-Provided Approvals			
Governmental Entity	ADOT-Provided Approval	Status	Availability Date
ADOT	I-10, I-17 (Split) to SR 202L (Santan) Final Environmental Assessment – Errata Sheet and Finding of No Significant Impact (FONSI) (“NEPA Approval”)	Closed	4/27/2020

Developer acknowledges and agrees that changes to the Project ROW or the acquisition, use of or incorporation into the Project of Developer ROW may require re-evaluation, amendment, or supplement to the NEPA Approval as the Work progresses.

Developer shall identify any such changes and notify ADOT immediately. ADOT will determine whether an additional environmental study, re-evaluation, amendment, or modification is necessary.

Developer shall be responsible for all Work in connection with such re-evaluation, amendment, or supplement in accordance with Section 4.3 of the Agreement.

Developer may request ADOT’s assistance and cooperation in connection with re-evaluations, amendments, or supplements to the NEPA Approval in accordance with and subject to the requirements in Section 4.3.8 of the Agreement. Developer shall prepare a NEPA Approval Package that includes material in connection with the re-evaluations, amendments, or supplements to the NEPA Approval, including the application for amended approvals.

Developer shall submit the NEPA Approval Package to ADOT for review and approval by ADOT, at ADOT’s sole discretion.

Developer shall perform all obligations of the NEPA Approval except to the extent allocated to ADOT as identified in TP Attachment 119-1. Developer shall not perform Work outside of the NEPA-cleared areas.

Developer shall provide ADOT all documentation and perform analysis, as required, to ensure that ADOT can complete coordination and resolution of all environmental issues with affected interests and regulatory agencies. Developer shall document the resolution of issues for the correspondence file, including meeting minutes and memoranda, for the record. Developer shall document the permit requirements and contacts with the permitting agencies.

119.02.06.02 Governmental Approvals Applied for or Issued in ADOT's Name

Developer shall provide assistance for Governmental Approvals that must be formally submitted or issued in ADOT's name as it relates to environmental resources. In cases that require ADOT to act as the coordinating party for Governmental Approvals, Developer shall provide all required data to support, secure, or comply with the conditions of such Governmental Approvals. ADOT has undertaken certain preliminary work, including applications, exhibits, and correspondence concerning such Governmental Approvals, which are included in the RIDs. The following is a list of environmental Governmental Approvals that shall be applied for or issued in ADOT's name, including a description of the preliminary work that ADOT has performed to date and certain requirements to be performed by Developer with respect to such approvals:

- A. Section 404 of the Clean Water Act Permitting. Developer shall submit a complete design and information package in conformance with the 404 permit application requirements to ADOT for ADOT to coordinate with USACE for submittal of the Section 404 permit application;
- B. Section 401 of the Clean Water Act Certification. Developer shall submit a complete design and information package in conformance with the Section 401 application requirements to ADOT for ADOT to coordinate with ADEQ for certification under Section 401. Typical USACE application review periods are contained within the Operating Agreement between the FHWA, USACE, and ADOT; and
- C. Federal Aviation Administration (FAA) Notice of Proposed Construction or Alteration. Developer shall complete FAA Form 7460 and obtain an FAA Determination of No Hazard for any object that meets the requirement for construction or alteration requiring notice as specified in 14 CFR 77 (Code of Federal Regulations). Developer shall obtain FAA approval prior to any Construction Work within the FAA regulated area in accordance with Form 7460. As applicable, Developer shall modify proposed improvements and construction operations to comply with FAA height restrictions near airport facilities.

Table 119-3 includes a partial, non-exhaustive list of Environmental Approvals and other Governmental Approvals to be obtained or prepared by Developer. For Governmental Approvals that must be applied for or issued in ADOT's name, Developer shall prepare Governmental Approval package(s) that provide complete design information and include applications and all other required documentation. Developer shall submit the Governmental Approval package(s) to ADOT for approval in ADOT's good faith discretion.

Table 119-3 Non-Exclusive List of Environmental Approvals and other Governmental Approvals		
Permit or Approval	Governmental Entity	Responsible Party
AZPDES Stormwater Construction Activity General Permit (CGP)	ADEQ	Developer to obtain
CLOMR/LOMR	FEMA	Developer to prepare, ADOT to review, approve, and obtain
Pollutant discharge elimination system de minimis general permit	AZDPES	Developer to obtain
Section 404 of the Clean Water Act Regional General Permit (RGP) No. 96 with Concurrence Notification	USACE	Developer to prepare, ADOT to review, approve and obtain

Table 119-3 Non-Exclusive List of Environmental Approvals and other Governmental Approvals		
Permit or Approval	Governmental Entity	Responsible Party
Section 401 of the Clean Water Act Certification	USACE and ADEQ	Developer to obtain
Dust Control Permit	Maricopa County Air Quality Department	Developer to obtain
Federal Aviation Administration 7460 Determination of No Hazard	FAA	Developer to obtain

119.02.06.03 All Other Environmental Governmental Approvals

Developer shall obtain or prepare for ADOT to obtain all Governmental Approvals (including Environmental Approvals), with the sole exception being the NEPA Approval, to complete the Work. Prior to submittal to the Governmental Entity having jurisdiction, Developer shall submit any and all Applications for Governmental Approvals to ADOT.

119.03 Environmental Requirements

Developer shall comply with the environmental requirements contained in TP Attachment 119-1 during the Work. Developer shall not conduct or perform any ground-disturbing activities until the appropriate environmental clearance (i.e., cultural resources, hazardous materials, or biological evaluation) has been issued for the applicable area.

119.03.01 Environmentally Sensitive Areas

As part of the Environmental Management Program, Developer shall identify all environmentally sensitive areas and create a plan to protect environmentally sensitive areas. Environmentally sensitive areas include water and cultural resources as defined in the NEPA Approval, as well as those areas that may be identified during the permitting and preconstruction environmental survey(s) process. Developer shall map environmentally sensitive areas on all Design Documents and identify and address them in the EMP.

The Project is subject to inspections from the Governmental Entities. Developer shall allow access to and follow the instructions from any Governmental Entities pertaining to requirements for the protection or mitigation of impacts on environmentally sensitive areas.

119.03.01.01 Environmentally Sensitive Avoidance Areas

Developer shall identify the Environmentally Sensitive Avoidance Areas including any Traditional Cultural Properties and wetlands in the EMP. Developer shall fence the boundary of Environmentally Sensitive Avoidance Areas in accordance with Section 119.03.01.02 of the TPs. Developer shall ensure that all Construction Work or ground disturbing activities within the Environmentally Sensitive Avoidance Area Buffer is able to be monitored by ADOT or its designee. If the mainline is located within the airspace of the Environmentally Sensitive Avoidance Area, Developer shall ensure that it is aligned at the farthest extents of the Environmentally Sensitive Avoidance Area and is entirely outside of the Environmentally Sensitive Avoidance Area Protected Air Space. Developer shall not landscape Environmentally Sensitive Avoidance Areas.

119.03.01.02 Environmentally Sensitive Area Fencing

At the direction of ADOT, Developer shall protect environmentally sensitive areas by installing four-foot tall orange plastic barrier fencing with metal t-posts around all environmentally sensitive areas within the Project ROW, TCEs, Replacement Utility Property Interests, or Developer's Temporary Work Areas prior to any ground-disturbing activities. Developer shall notify ADOT a minimum of 14 Business Days prior to installing environmentally sensitive area fence to schedule coordination of fence installation. During Construction Work near these areas, Developer shall provide daily inspection of environmentally sensitive areas in accordance with the EMP, and immediately report any damage or impact to ADOT and the appropriate Governmental Entity. Developer shall coordinate with ADOT on such damage or impacts and provide potential on-site or off-site mitigation for such impacts, as required by permitting and Governmental Entities.

Developer shall remove fencing from environmentally sensitive areas prior to Final Acceptance. Developer shall notify ADOT a minimum of 14 Business Days prior to the removal of fencing around environmentally sensitive areas to schedule coordination of the fence removal.

119.03.02 Archaeological

Archaeological testing and recovery that is required within the environmentally cleared Project area will be performed by ADOT prior to construction. Archaeological monitoring shall be provided as coordinated by Developer at AZ U:9:48(ASM) for any construction activity within the limits of the site. Unstudied cultural resources, including human remains, could be contained within these locations, which approximate the original natural ground surface. Developer shall be responsible for any additional permitting, surveying, testing, or data recovery that might be necessary, in accordance with the *Section 106 Programmatic Agreement (Attachment VI)* included in the RIDs. Developer shall prepare and submit all Archaeological Documentation and Reporting to ADOT for review and comment. ADOT will be responsible for submitting any draft or final report to SHPO or other consulting Governmental Entities. Developer shall contact the ADOT Environmental Planning Historic Preservation Team ((602) 712-2343 or (602) 712-7767) at least 10 Business Days prior to the start of ground-disturbing activities to arrange for qualified personnel to monitor and be present during construction.

119.03.03 Cultural Resources

ADOT will fulfill the commitments made in the FEA and *Section 106 Programmatic Agreement* for the known cultural resources. The *Section 106 Programmatic Agreement* is included in the RIDs. This will include any required data recovery. ADOT will notify Developer of clearance of parcels with cultural resources in accordance with Section 118 of the TPs. If human remains or funerary objects are encountered during construction-related activity, Developer shall cease all further disturbances and activities within 300 feet of the human remains or funerary objects and notify ADOT. Developer shall manage unexpected cultural resources discoveries.

119.03.04 Hazardous Materials

Developer shall manage Hazardous Materials in accordance with TP Attachment 119-1. If suspected hazardous materials are encountered during construction-related activity, Developer shall cease all further disturbances and activities at that location and notify ADOT to make arrangements for assessment, treatment, and disposal of those materials. Developer shall comply with the protocols outlined in the EMP in the event of the discovery and substance disturbance of any materials containing lead-based paint and asbestos.

No pavement marking obliterations shall occur until the existing pavement markings are tested for lead based paint, and if present, a Lead-Based Paint Removal and Abatement Plan is approved by the ADOT Environmental Planning hazardous materials coordinator and implemented.

119.03.05 Noise

Noise mitigation structures (noise barriers) identified within the ADOT-approved Final Technical Noise Analysis and Mitigation Report are a commitment to the public and shall be provided regardless of Developer's design in terms of location, length, height, and elevation. Developer shall not reduce, eliminate, nor modify noise mitigation structures once shown in Public Involvement materials.

Developer shall use the ADOT-approved Final Technical Noise Analysis and Mitigation Report included in the RIDs for the minimum locations of noise mitigation structures. At the same time as the Preliminary Design Submittal of the roadway design, Developer shall submit a Developer updated Final Technical Noise Analysis and Mitigation Report based upon Developer's design to ADOT for approval in ADOT's good faith discretion. In accordance with Section 4a of the ADOT Noise Abatement Policy, Developer shall use a design year of 2040 for prediction of future noise levels. Developer shall use the MAG regional travel demand output provided. For vehicle mix, Developer shall assume that the heavy vehicle volume from the MAG model represents FHWA vehicle category classes 4 through 13, inclusive. Developer shall use hard soil settings for ground type characteristics in the traffic noise model.

Developer shall not complete equipment maintenance activities that generates noise impacts adjacent to residential areas between the hours of 10:00 PM and 6:00 AM.

Developer shall prepare a Construction Noise Assessment Memo for specific noise sensitive areas identified in the noise technical analysis that will include a description of the planned construction methods and operations, any basic measures that have been identified to reduce construction noise impacts, communication plan with Stakeholders within the identified specific noise sensitive per Section 107.20.03 of the TPs, and a process to address public comments during construction. Developer shall submit the Construction Noise Assessment Memo to ADOT for review and approval prior to Work adjacent to the identified specific noise sensitive areas.

119.03.06 Biological Resources

Developer shall adhere to the requirements of TP Attachment 119-1 for biological resources and preconstruction burrowing owl surveys by a qualified biologist.

Swallow mitigation shall be in accordance with the requirements of TP Attachment 119-1.

Prior to NTP 2, ADOT will have performed an initial nest removal and continuous monitoring of the area at I-10 under the Salt River Bridge. Developer is responsible for necessary exclusionary measures, removals, and monitoring as of NTP 2 in addition to any other requirements according to TP Attachment 119-1. ADOT makes no guarantee of the effectiveness of the initial nest removal or exclusionary measures prior to NTP 2.

119.03.07 Waters of the United States

Developer shall submit a complete design and information package in conformance with the Section 404 Permit application requirements to ADOT for ADOT to coordinate with USACE for submittal of the Section 404 Permit application. Developer shall be responsible for documenting compliance with all conditions of approved Section 404 Permit. Any deviation from the approved Section 404 Permit except as noted below or any noncompliance is Developer's responsibility. Developer shall make every effort not to:

- 1 A. Create new drainage ditches or channels that the USACE would consider jurisdictional; or
- 2 B. Increase Waters of the United States jurisdictional area.

3 ADOT will pay for and secure In-Lieu Fee Credits for the Work as described within these TPs prior to
4 NTP 2. ADOT's calculation includes 0.0018 credits for permanent improvements in the Salt River for the
5 Salt River bridge widening (piers per the F0072 Schematic Structures Roll Plots in the RIDs and shading).
6 No refunds nor reductions are available for these credits based on the Developer's design. If Developer
7 determines that additional credits are required based upon the Developer's design in accordance with
8 the requirements in the TPs, they shall immediately notify ADOT. ADOT will pay for and secure additional
9 In-Lieu Fee Credits based upon Developers design such that it meets the requirements of the TPs. ADOT
10 will not pay for nor secure additional In-Lieu Fee Credits for means and methods or permanent impacts
11 solely for temporary construction activities.

12 **119.03.08 Stormwater**

13 Developer shall:

- 14 A. Comply with the current Arizona Pollutant Discharge Elimination System (AZPDES)
15 Municipal Separate Storm Sewer System (MS4) permit;
- 16 B. Design and install post-construction controls in accordance with the recommendations
17 provided in the approved Post Construction BMP memo based on the ADOT *Post-Construction*
18 *Best Management Practices Manual for Water Quality* included in the RIDs and Section 500 of
19 the TPs; and
- 20 C. Coordinate with regulated MS4s within the Project regarding existing connections and comply
21 with the requirements of the regulated MS4s.

22 **119.03.09 City of Tempe Water Quality Stations**

23 Developer shall coordinate with City of Tempe in the removal and replacement of elements of the two
24 City of Tempe water quality monitoring stations "TD-01 & TD-03" located adjacent to local 48th Street and
25 the Tempe Drain. The point of contact for the City is Richard Dalton, Environmental Compliance
26 Supervisor, at (480) 350-2851 or richard.dalton@tempe.gov.

27 Developer shall schedule the Work such that samples of run-off can be taken once during the periods of
28 June to November and November to June in coordination and as approved by City of Tempe.

29 The City of Tempe shall remove existing equipment including cabinets and contents, rain gauges, solar
30 panels, flow sensors, suction lines, and associated protective conduit from the cabinet to the outfall.
31 Developer shall be responsible for removal of all remaining existing items including the pad, foundations,
32 and posts. Developer shall notify City of Tempe 10 Days prior to the scheduled removal of such Developer
33 responsible items to allow the City of Tempe to remove their items.

34 Developer shall coordinate with City of Tempe the locations of the two new water quality monitoring
35 stations. These locations shall have access from City of Tempe Local 48th Street east of SR 143.
36 Developer shall provide at each location a 6 foot wide by 6 foot long by 3 foot deep concrete cabinet
37 foundation, 3-inch diameter by 10 foot tall (exposed) aluminum post and foundation for rain gauge with
38 access port at the base, 6-inch diameter by 10 foot tall (exposed) aluminum post and foundation for solar

1 panel with access port at the base, two 3-inch conduit lines from the cabinet foundation to the outfall for
2 each water quality monitoring station for a maximum distance of 50 feet. City of Tempe will be responsible
3 for procuring and installing the cabinets and contents, solar panels, rain gauges, flow sensors, and
4 suction lines for each water quality monitoring station.

5 **119.03.10 Salt River Low Flow Channel**

6 City of Phoenix (Aviation Department) has a 404 Individual Permit (IP) associated with Sky Harbor; the
7 permit authorized the construction of a low-flow channel in the Salt River and to maintain it free of
8 vegetation in the area of the bridge. The low flow channel is maintained by the City of Phoenix for
9 emergency access and to avoid wildlife conflicts with air traffic; it is fed by the Tempe Drain and other
10 runoff sources. Developer shall avoid any impact to the Salt River low flow channel.

11 **119.04 Submittals**

12 Table 119-4 reflects a nonexclusive list of Submittals identified in Section 119 of TPs and is not intended
13 to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit all
14 Submittals as required by the Contract Documents, Governmental Approvals, and Governmental
15 Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic and
16 hardcopy format. At a minimum, and unless otherwise specified in the Contract Documents, Developer
17 shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 119-4 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
Environmental Management Program	4	1	1	Prior to first design submittal	119.02.02
Environmental Management Plan	2	1	1	Prior to issuance of NTP 2	119.02.03
Environmental Monitoring Reports	4	0	0	Monthly	119.02.04
NEPA Approval Package	1	0	1	As determined by Developer	119.02.06.01
Governmental Approval Package(s)	2	0	1	As determined by Developer	119.02.06.02
Applications for Governmental Approvals	5	0	1	Prior to submittal to the Governmental Entity having jurisdiction	119.02.06.03
Archaeological Documentation and Reporting	3	0	1	Prior to any ground disturbance	119.03.02
Construction Noise Assessment Memo(s)	3	0	1	Prior to Work adjacent to identified specific noise sensitive areas	119.03.05
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

1 **120 PROJECT SPECIAL PROVISIONS FOR CONSTRUCTION**

2 **120.01 General Requirements**

3 Developer shall prepare Project Special Provisions for construction in compliance with the requirements
 4 of Section 120 of the TPs.

5 **120.02 Administrative Requirements**

6 **120.02.01 Standards**

7 Developer shall perform all Work in accordance with the standards, manuals, and guidelines listed
 8 in Table 120-1.

Table 120-1 Construction Standards and Stored Specifications		
No.	Agency	Title
1	ADOT	Standard Specifications for Road and Bridge Construction, 2008

1 **120.03 Design Requirements**

2 **120.03.01 Project Special Provision for Construction Content Requirements**

3 The construction requirements described in the Contract Documents, ADOT Standard Specifications,
4 Stored Specifications and Item Specifications shall be adapted to the design provided by Developer.
5 References to “contractor” in the ADOT Standard Specifications, Stored Specifications and Item
6 Specifications shall be revised to read “Developer”. References to “engineer” in the ADOT Standard
7 Specifications, Stored Specifications and Item Specifications shall be revised to read “IQF” when referring
8 to acceptance and “ADOT” when referring to administration, with ADOT having the final determination of
9 how the term “engineer” is applied.

10 Developer shall include required ADOT Standard Specifications, Stored Specifications (TP Attachment
11 120-1) and Item Specifications in the Project Special Provisions for Construction based on Developer’s
12 actual design and the requirements of Governmental Entities and Utilities. References to “ADOT” in the
13 ADOT Standard Specifications, Stored Specifications, and Item Specifications shall be reviewed and
14 reference “IQF” or “Developer” as necessary.

15 Modifications from the construction requirements contained in the Project Special Provisions for
16 Construction shall be submitted for ADOT’s approval. Approved modifications shall be incorporated into
17 the compiled set of Project Special Provisions for Construction. TP requirements shall be incorporated
18 into the Project Special Provisions for Construction as necessary.

19 A Summary Index of applicable Standard Specifications and Stored Specifications is presented in TP
20 Attachment 120-1. The Stored Specifications can be downloaded from the ADOT Contracts and
21 Specifications web site. Item Specifications are provided by reference in TP Attachments and throughout
22 the TPs.

23 Notwithstanding that these Technical Provisions incorporate certain requirements in the ADOT Standard
24 Specifications and Stored Specifications, the Agreement and these Technical Provisions shall exclusively
25 govern the methods for measuring progress of the Work and the basis for payment therefor.

26 **120.03.02 Submittal Requirements**

27 The Project Special Provisions for Construction shall be submitted for Preliminary and Final review and
28 must reach RFC status prior to any construction activities. Developer may submit relevant sections
29 independently to correlate with construction activities or Design Submittals. Developer shall provide a
30 “Clean” and “Track Changes” version of all modifications made to the ADOT Standard Specifications,
31 Stored Specifications, or Item Specifications with each Submittal.

32 **120.04 Submittals**

33 Table 120-2 reflects a nonexclusive list of Submittals identified in Section 120 of the TPs and is not
34 intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit
35 all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental
36 Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and
37 hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer
38 shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 120-2 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Preliminary Project Special Provisions for Construction	3	0	1	With each Preliminary Design Submittal	120.03.02
Final Project Special Provisions for Construction	3	0	1	With each Final Design Submittal	120.03.02
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

End of Division

1

Division II, Grading

200 ROADWAY DESIGN

200.01 General Requirements

Developer shall perform all roadway Design Work in compliance with the requirements of Section 200 of the TPs.

200.02 Administrative Requirements

200.02.01 Standards

Developer shall perform all roadway Design Work in accordance with the standards, manuals, and guidelines listed in Table 200-1, which are shown in no order of precedence; however, in the event of a conflict, the more stringent requirement prevails.

Table 200-1 Design Standards		
No.	Agency	Title
1	ADOT	Design Exception and Design Variance Process Guide
2	ADOT	Roadway Design Guidelines
3	U.S. Access Board	Americans with Disabilities Act Accessibility Guidelines
4	U.S. Access Board	Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way
5	AASHTO	A Policy on Geometric Design of Highways and Streets, 2011
6	AASHTO	Roadside Design Guide
7	AASHTO	A Policy on Design Standards – Interstate System
8	ADOT	Construction Standard Drawings

200.03 Design Requirements

200.03.01 Access Control

Access control is defined for the existing conditions in the Project ROW plans. Existing access control limits shall be maintained where Developer does not modify existing ramp/crossroad intersections. At NTP 2, Developer shall install new or temporary access control fence when Work impacts existing access control fence. Developer shall also replace ADOT temporary access control fence for newly obtained parcels. Access control fence shall be 6 foot tall chain link.

Access control variances based on the Schematic Design have been identified in TP Attachment 200-3 and are subject to the provisions of Section 6.4.2 of the Agreement. The access control will be re-established by ADOT for 48th Street between 14th Street and University Drive and Diablo Way between Alameda Drive and Fairmont Drive per Section 506 of the ADOT *Roadway Design Guidelines*.

200.03.02 Design Criteria

Developer shall design the roadway in accordance with the design criteria shown in TP Attachment 200-1 and TP Attachment 200-2. All Design Work on the interstate system shall comply with the requirements in the AASHTO *A Policy on Design Standards – Interstate System*, unless otherwise noted in TP Attachment 200-3.

200.03.02.01 Sight Distance

Sight distance requirements for all roadways shall comply with Section 201 of the ADOT *Roadway Design Guidelines*.

Developer shall provide 2 times the stopping sight distance given in Figure 201.2 of the ADOT *Roadway Design Guidelines* on the mainline at lane drops, except for the I-10 WB HOV lane drop. The sight distance is measured from the center of the continuous approach lane to the center of the lane being dropped.

Developer shall provide 1.5 times the stopping sight distance given in Figure 201.2 of the ADOT *Roadway Design Guidelines* on the mainline at the approaches to ramp entrances and exits. The sight distance is measured from the center of the right-hand approach lane to the center of the right-hand ramp lane at the entrance and exit nose control points as shown in Figures 504.7 and 504.8A of the ADOT *Roadway Design Guidelines*. The locations listed in Table 200-2 are exempt from this requirement.

Table 200-2 Mainline Locations Exempt from Providing 1.5 Times Stopping Sight Distance Approaching Mainline Gores	
Roadway	Location
I-10 EB	EB C-D Entrance Ramp
	I-10/SR 143 DHOV Entrance Ramp
I-10 WB	32 nd Street WB Exit Ramp
	WB C-D Entrance Ramp
	I-10/SR 143 DHOV Exit Ramp
	Broadway Road WB Entrance Ramp
	US 60 WB Entrance Ramp
US 60 EB	Priest Drive EB Entrance Ramp
SR 143 NB	University Drive NB Entrance Ramp
SR 143 SB	University Drive SB Entrance Ramp

200.03.02.02 Superelevation

The superelevation axis of rotation for new roadways shall coincide with the horizontal alignment control line and the profile grade line per Section 202.2 of the ADOT *Roadway Design Guidelines*. When widening I-10, match existing superelevation transitions. Maximum superelevation rates for roadways are shown in TP Attachment 200-1. Superelevation transitions and rates shall comply with the requirements in Section 202.3 and Section 202.4 of the ADOT *Roadway Design Guidelines*. AASHTO Method 5 shall be used to distribute superelevation and side friction, except on crossroads with design speeds equal to or less than 45 mph, in which case AASHTO Method 2 superelevation rates may be used.

200.03.02.03 Horizontal Alignment

Horizontal alignment for all new roadways shall comply with the requirements in Section 203 of the ADOT *Roadway Design Guidelines*.

200.03.02.04 Vertical Alignment

New Mainline vertical alignment shall comply with the requirements in Section 204 of the ADOT *Roadway Design Guidelines*. Maximum allowable roadway grades shall be as shown in TP Attachment 200-1.

Broken back curves shall not be used. Broken back curves are defined as consecutive crest or sag curves that have a tangent length less than 150 feet between them.

200.03.02.05 Mainline Transitions and Tapers

When adding a lane, the approach transition shall have a taper rate of 25:1. The transition when dropping a lane shall have a taper rate of design speed to one. Except for HOV lanes, add lanes and drop lanes shall occur on the right.

Taper rates from narrow to wider shoulder widths in the direction of traffic shall be 15:1. When tapering from wider to narrower shoulder widths, the taper rate shall be design speed to one except as described in Section 200.03.02.07 of the TPs.

Mainline lane width transitions shall be at a rate of 65:1 or flatter. See TP Attachment 200-1 and TP Attachment 200-3 for approved locations.

Mainline shifts to accommodate the I-10/SR 143 Directional High Occupancy Vehicle (DHOV) movement shall be at a rate of 65:1 or flatter.

To accommodate the future I-10/I-17 DHOV movement, a portion of the Salt River bridge and the roadway to the northwest shall be overbuilt as part of this Project. Overbuilt roadway improvement shall begin at:

A. I-10 EB Sta 7914+70.10, 153' RT; and

B. I-10 WB Sta 7917+65.13, 153' Lt.

The roadway width shall transition at a rate of 65:1 as follows:

A. I-10 EB Sta 7925+46.60, 153' Rt to Sta 7938+46.60, 133' Rt; and

B. I-10 WB Sta 7925+46.60, 153' Lt to Sta 7938+46.60, 133' Lt.

200.03.02.06 Cross Section Elements

The standard cross slope for all new paved surfaces shall be 2 percent in a normal tangent section. The entire width of each roadway shall have a uniform cross slope. The cross slope of the shoulder shall match the cross slope of the adjacent lane, except at ramp gores.

Portions of the existing I-10 mainline outside shoulder have 4 percent cross slope. This pavement shall be removed and replaced with a full pavement section at 2 percent cross slope. Limits of existing 4 percent shoulder are shown in Table 200-3. Developer shall confirm limits and replace per surveyed limits with ADOT approval.

Table 200-3		
Location of Existing 4% Shoulder to Be Removed		
Roadway	Begin Station	End Station
I-10 EB	7932+83	7953+71
	7997+08	8056+10
I-10 WB	7934+00	7956+54
	7994+25	8056+43

1 A cross slope breakover will be allowed on eastbound I-10 at the 32nd Street Underpass to provide a 16
2 foot – 0 inch minimum vertical clearance over the entire width of the roadway including shoulders. The
3 vertical clearance shall include an allowance for a 1-inch AR-ACFC overlay. Existing pavement shall be
4 removed so that the allowable cross slope breakover and transition are located on an ultimate proposed
5 lane line with this Project. The cross slope of the widened pavement shall not be flatter than 4.10%. The
6 cross slope transition shall occur outside the limits of the bridge structure and meet ADOT *Roadway*
7 *Design Guidelines* superelevation runout criteria.

8 The existing 4 percent crown between HOV and General Purpose lanes on I-10 mainline can remain.

9 North of Baseline Road, mainline and ramp shoulder wedges shall be as shown Figure 302.1 of the
10 ADOT *Roadway Design Guidelines*. South of Baseline Road, mainline and ramp shoulder wedges shall
11 be a minimum of 8 foot wide and 6:1 max slope.

12 Mainline and ramp curbs shall comply with the requirements in Section 302.2 of the ADOT *Roadway*
13 *Design Guidelines*.

14 Crossroad improvements shall have curb and gutter. Curb and gutter shall be installed along the east
15 side of 48th Street, west of SR 143 per MAG Detail 220-1, Type A per City of Phoenix guidelines. The
16 improvements shall provide a continuous curb line between the existing curb and gutter and proposed
17 end treatment.

18 From back of gore to back of gore within the Elliot Road, Warner Road, and Ray Road service
19 interchanges, I-10 shoulder widenings of two feet or less may be accomplished by using 8-inch thick
20 ribbon curb, instead of the full pavement structural section(s) described in Section 400 of the TPs.

21 Location and type of AB shall be placed as shown in Figure 302.1 of the ADOT *Roadway Design*
22 *Guidelines*. The same type of AB for curb shall be placed under all barrier to the back of barrier.

23 Shoulder widths provided in TP Attachment 200-1 shall be the minimum continuous usable width of
24 paved shoulder. Spot reductions resulting in a minimum 10 foot mainline shoulder are allowed to
25 accommodate bridge piers, light foundations, and sign structures. Traffic shifts shall not be used to
26 provide required shoulder widths adjacent to barrier transitions for roadside obstacles/features/elements
27 such as median sign foundations.

28 Roadside recovery areas shall comply with the requirements in Section 303.2 of the ADOT *Roadway*
29 *Design Guidelines*. The largest recovery area width as shown in Table 303.2A shall be used for the
30 proposed roadway design speed.

31 A barn-roof roadway embankment approach shall not be used.

32 Side slopes shall comply with Figure 306.4B and Figure 504.4A of the ADOT *Roadway Design*
33 *Guidelines* except as modified and allowed in the TPs. Mainline fill slopes of 2:1 maximum are permitted
34 adjacent to roadway barrier between Baseline Road and Elliot Road and in accordance with Section
35 500.03.06.07 of the TPs.

36 Slope paving shall not be used as roadway cross sectional elements with the exception of along the
37 longitudinal axis of the bridges. New slope paving at bridges adjacent to existing slope paving shall match
38 existing material and color. The existing planter boxes along the north and south side of Southern Avenue
39 shall be protected in place.

Due to lack of weave distance, Developer shall not allow access between the University Drive ramps and SR 143 HOV lanes in both the northbound and southbound direction. Concrete Barrier shall be used to prevent these movements.

All existing pavement not utilized in the final roadway configuration of lanes and shoulders shall be removed.

200.03.02.07 Roadside Safety Devices

All barriers shall comply with the requirements of the National Cooperative Highway Research Program (NCHRP) *Report 350, Recommended Procedures for the Safety Performance Evaluation of Highway Features*, or the AASHTO *Manual for Assessing Safety Hardware (MASH)*. All end treatments shall be MASH compliant devices. Existing end treatments that do not comply with MASH criteria within the Project shall be replaced with new MASH compliant devices whether impacted by Developer's design or not.

New roadside safety devices shall be MASH compliant in accordance with the latest published agreement between AASHTO and FHWA as of the Setting Date.

Permanent roadway barriers shall be F-shape concrete barriers, exclusive of end treatments. All new barrier placements shall provide the shoulder widths and barrier offsets indicated in TP Attachment 200-1.

Barrier separating opposing traffic shall be a minimum of 42 inches in height. Existing glare screen on median barrier less than 42 inches in height shall be removed and the median barrier shall be extended to a minimum of 42 inches in height using reinforced concrete. Joints on the barrier shall be extended through the extension. The limits of existing glare screens to be removed shall begin at the western deck limit of the Salt River Bridge of I-10; and the southern deck limit of the Salt River Bridge of SR 143.

During construction of median barrier extension, Developer shall either:

- A. Only remove as much glare screen during daytime hours as can be replaced with barrier extension at the same time;
- B. Provide temporary barrier with glare screen; or
- C. Provide 50-foot separation between opposing traffic with no glare screen.

Median barrier shall be removed and replaced at the following locations based upon pre-project visual inspection. Final limits and locations shall be determined during design.

- A. I-10 Median Sta 8260+95 to Sta 8261+20; and
- B. I-10 Median Sta 8268+11 to Sta 8268+18.

Barrier on the outside of the roadway shall be a minimum of 32 inches in height. Barriers shall meet minimum test level TL-4 when placed against the top of retaining walls or protecting non-traversable slopes to the top of walls located within the clear zone.

South of Baseline Road, Developer shall protect existing roadside hazards that are within the required clear zone based on the new lane configuration or extend/replace the hazard outside the clear zone. Sand barrels shall not be used.

1 Barrier a minimum of 32 inches in height shall be used to separate the C-D roads from mainline I-10.

2 Barrier separating Broadway Road Westbound Exit Ramp and WB C-D from the Bell Butte shall meet
3 the requirements provided in Section 300.03.03.04 of the TPs.

4 Developer shall provide a median barrier opening at the I-10/SR 143 TI, west of Broadway Road, for DPS
5 patrol cars to access opposite bounds of mainline I-10 traffic. Barrier openings shall be minimum 12 foot
6 wide (24 foot offset from HOV lane, including 12 foot wide median shoulder) for DPS patrol cars to
7 maneuver into the median, turn around, and re-enter the opposite bound traffic, in the direction of travel,
8 through a minimum 12 foot wide (24 foot offset from HOV lane, including 12 foot wide median shoulder)
9 barrier opening. The barrier transition back to standard shoulder width shall be per the *AASHTO Roadside*
10 *Design Guide*. The median area used to turn around shall have maximum cross slope of 6:1 and maximum
11 longitudinal grade of 10 percent.

12 Signs and light poles located in the median as well as the barrier between two adjacent roadways
13 shall comply with the configuration shown in Figure 305.9 of the *ADOT Roadway Design Guidelines*.
14 The top of the median barrier shall have adequate width to place the pole anchor in lieu of notching
15 the barrier and placing the anchor at a location below the top of the barrier. If a sign structure shifts
16 horizontally, Developer shall replace the existing sign structure transition and foundation with barrier 42
17 inches in height.

18 Existing median light pole transitions with light pole base plate mounted at least 32 inches above the
19 adjacent PCCP roadway surface elevation can remain. The top of barrier shall transition to a minimum
20 of 42 inches in height at a 10:1 rate on each side of the minimum 32-inch foundations to remain. Existing
21 median barrier light poles mounted less than 32 inches above the adjacent roadway surface elevation
22 shall be removed and replaced with new median light poles, transitions, and foundations with barrier a
23 minimum of 42 inches in height. If light poles shift horizontally, Developer shall replace the existing light
24 pole transition and foundation with standard barrier a minimum of 42 inches in height. The existing three
25 light poles located on the I-10 / US 60 HOV Ramp bridge structure not meeting the 42-inch barrier
26 foundation height requirement may remain. See Section 700.01.03.05 of the TPs for additional lighting
27 criteria.

28 Existing median overhead sign foundations shall be removed to a depth at or below the lowest pavement
29 structural section adjacent to the foundation. Developer shall remove the existing transitions to the
30 overhead sign foundations and replace the median barrier with standard 42-inch barrier eliminating any
31 shoulder width variance.

32 Median barrier transitions at light poles, sign foundations, bridge piers, and back of gore crash
33 attenuators shall be in accordance with Figure 305.9 of the *ADOT Roadway Design Guidelines*.
34 Barrier height transitions shall be at the rate of 10:1. All other barrier transitions shall be per Section
35 200.03.02.05 of the TPs.

36 Approach ends of concrete barrier within the clear zone shall be shielded with MASH compliant
37 devices. Developer shall not bury the end of the barrier as an end treatment at the approach end.
38 Developer shall not solely taper the height of the barrier at the approach end with the exception of ramp
39 termini at cross roads.

40 Existing guardrail on all mainlines, system to system interchange ramps, and 32nd Street, 40th Street, 48th
41 Street and Broadway Road service interchange ramps shall be removed and replaced with 32-inch
42 concrete barrier and comply with the requirements in Section 305.8 of the *ADOT Roadway Design*
43 *Guidelines*.

Developer shall evaluate existing guardrail on service interchange ramps at Baseline Road, Elliot Road, Warner Road, and Ray Road against NCHRP *Report 350* and ADOT *Roadway Design Guidelines* Section 305.8 requirements. Existing guardrail found to not meet the requirements of the documents listed shall be replaced with 32-inch concrete barrier. New concrete barrier shall be extended through the non-compliant guardrail section and connect to other Project improvements such that there are not pieces of existing guardrail remaining between two new runs of concrete barrier.

Existing guardrail along the 32nd Street and 40th Street crossroads shall be removed. Developer shall design and construct Combination Pedestrian-Traffic Bridge Railing along the backside of sidewalk or 32-inch barrier adjacent to the roadway; and comply with the requirements in Section 305.8 of the ADOT *Roadway Design Guidelines*. Existing guardrail along local 48th Street, west of SR 143, shall remain. Existing end treatment shall be replaced with a MASH compliant end treatment.

Developer shall place compacted backfill and 3.5-inch Class B concrete cap with 0.5-inch expansion joint filler in areas between the back of barrier and barriers, walls, abutments, etc. that are less than ten feet in width, graded to drain. If Developer elects to place bridge piers in front of walls as a function of the structures design, the area between piers and walls shall be capped. Capped backfill shall be treated with pre-emergent.

When finished grade behind barrier is higher than the roadway finished grade at face of barrier, a minimum 2 foot wide by 6-inch deep section of 2-inch to 4-inch rock mulch shall be placed immediately behind backfilled barrier.

Developer shall slope pave per ADOT Bridge Group Structural Detail SD 2.04 from the back of gore to the end of the existing guardrail transition at the SR 143 SB Exit at University Drive.

Developer shall not use sand barrels in a permanent configuration. Existing sand barrels within the Project Limits shall be removed and replaced with roadside safety devices as described above.

At the western limits of the I-10 WB overbuild, Developer shall install new temporary concrete barrier to protect the blunt end of the permanent roadway barrier required for additional widening to accommodate the lane requirements of this Project. The new temporary concrete barrier shall not be pinned and shall flare per AASHTO *Roadside Design Guide* until outside clear zone, leaving at least 14 feet width for maintenance access between the end of new temporary concrete barrier and flared out permanent roadway barrier. Developer shall not use temporary concrete barrier in a permanent configuration at any other locations on the Project.

200.03.02.08 Collector-Distributor Roads

Developer shall design all C-D roads as interchange ramps and in accordance with TP Attachment 200-1 and ADOT *Roadway Design Guidelines*. C-D lane configuration shall be as described in Section 100.04 of the TPs. C-D roads shall not be stop-controlled.

200.03.02.09 Maintenance Access

Developer shall provide 100 scale Plans detailing a continuous 12 foot wide maintenance access path along both sides of the Freeway and throughout system to system interchanges. The maintenance access path shall be traversable by a light-duty truck (pickup) with a 12 foot long flat-bed trailer. The maintenance access shall be continuous except as listed in TP Attachment 200-4. Within 50 feet of drainage cleanout locations, maximum cross slope shall be 12:1. Otherwise, maximum cross slope shall

be 6:1. Maximum longitudinal grade shall be 10 percent. Maintenance access path shall provide access to existing and proposed drainage channels along the same side as access ramps to the channel bottom.

Maintenance access design requirements shall be coordinated with other permitted jurisdictions using the maintenance access. If another entity has different requirements than those listed in Section 200.03.02.09 of the TPs, the more stringent requirement governs.

Developer shall coordinate with ADOT and Utility Companies to determine locations of roll curb to be installed at crossroads within ADOT maintenance limits.

Developer shall not use C-D roads as the primary maintenance access path.

Developer shall design maintenance access to channels in accordance with Section 500.03.05.04 of the TPs.

Maintenance paths will be permitted to go through the drainage basins south of Baseline Road due to ROW constraints, as provided in Section 500 of the TPs.

200.03.02.10 Sidewalk

Except as required in Section 200.03.05 of the TPs, new sidewalk shall be a minimum of five feet in width; unless there is existing sidewalk greater than five feet in width that is being replaced or new sidewalk is connecting to. Developer shall replace in-kind the same width as the existing sidewalk greater than five feet.

200.03.02.11 ROW Fencing

Developer shall provide fencing at the ROW or along the control of access.

ROW fence shall be 8 foot tall chain link, Type 1, for limits of existing 8 foot tall ROW fence. Otherwise, ROW fence shall be 6 foot tall chain link, Type 1, in accordance with ADOT Standards. Developer shall provide double chain link gates as applicable to provide continuous maintenance access, utility access and easement access. Type 2 chain link fence shall be provided along Tempe Diablo Stadium parking lot and any other properties requiring barbed-wire per ROW agreements. Existing barbed wire fence shall be removed and replaced with chain link fence. Existing chain link fence meeting the current ADOT standard and in good condition that can be protected in place may remain. Existing chain link fence shall not be relocated, regardless of condition.

Approved locations for 4 foot tall chain link fence mounted on the top of barrier are listed in Table 200-4. Additional locations must to be approved by ADOT.

Table 200-4		
Location of Fence Mounted to Top of Barrier		
Roadway	Begin Station	End Station
I-10 WB	7996+47	8005+87

4 foot tall chain link fence shall be installed parallel to the inside of new and existing to remain service interchange ramps, beginning at the crossroad and extending 100 feet in the direction of the ramp gore.

1 The existing chain link fence paralleling the US 60/Priest Drive EB entrance ramp shall be protected in
2 place.

3 Developer shall replace existing barb wire fence with 6 foot tall chain link fence and gate along the east
4 ROW of I-10, south of Elliott Road adjacent to the "Tempe Autoplex" billboard.

5 Developer shall provide gates in both ends of the 10 foot by 10 foot box culvert crossing along the Knox
6 Road alignment at approximately existing I-10 Mainline Station 8396+75. The gates shall be lockable,
7 prevent pedestrian access, minimize debris build-up, and not impact the drainage functionality of the box
8 culvert.

9 **200.03.02.12 Temporary Roads**

10 Refer to Section 700.06.03.03 of the TPs for Temporary Roads.

11 **200.03.02.13 Traffic Interchanges and Crossroads**

12 Ramp-crossroad intersections shall comply with the requirements in Sections 403 and 505 of the ADOT
13 *Roadway Design Guidelines* and shall meet the desirable criteria.

14 Ramp-crossroad intersections shall be signalized with the exception of the 48th Street EB Exit from I-10.

15 Developer shall provide the number of lanes at all interchanges in accordance with Section 100.04.01 of
16 the TPs. Sight distances at new or reconstructed ramp-crossroad intersections shall comply with the
17 requirements in Section 408 of the ADOT *Roadway Design Guidelines* and permit for right turns on red
18 signals. The maximum grade for a ramp shall be 3 percent for 400 feet in advance of traffic signals with the
19 exception of the following locations: 32nd Street EB Exit Ramp, 40th Street EB and WB Exit Ramps, Baseline
20 Road WB Exit Ramp, Elliot Road WB Exit Ramp, Warner Road EB and WB Exit Ramps, Ray Road WB
21 Exit Ramp, and University Drive NB Exit Ramp. The existing maximum grades for the previously listed
22 ramps may remain when the desired grade is not met. Crossroads shall have raised medians with a
23 minimum width of six feet when pedestrian refuge is required and four feet when pedestrian refuge is not
24 required.

25 Ramps shall comply with the requirements in Section 504 of the ADOT *Roadway Design Guidelines*.

26 When ramp vertical curves cannot be designed as provided in Section 504 of the ADOT *Roadway Design*
27 *Guidelines*, K value, per AASHTO, shall be met.

28 All new and modified entrance and exit ramps, including DHOV, shall be parallel type. DHOV and auxiliary
29 lanes developed right before exiting a roadway (not continuing from an entrance ramp auxiliary lane) and
30 DHOV and auxiliary lanes to be dropped after joining another roadway shall be per Figures 504.7 and
31 504.8A of the ADOT *Roadway Design Guidelines*, except per Table 200-5 and except as follows:

- 32 A. SB DHOV exit lane from SB C-D shall be fully developed at a 25:1 rate, then carry at least 700
33 feet prior to separating from SB C-D;
- 34 B. SR 143/University Drive SB entrance ramp auxiliary lane only needs to be carried a minimum of
35 200 feet prior to dropping at a 50:1 rate; and
- 36 C. US 60/Priest Drive EB entrance ramp auxiliary lane only needs to be carried a minimum of 500
37 feet prior to dropping at a 40:1 rate.

Service interchange entrance ramps shall be two lanes and taper to a single lane at the entrance to the mainline in accordance with Figure 504.8B of the ADOT *Roadway Design Guidelines*.

South of Baseline Road, the following entrance ramps shall be widened to provide full-width lane and shoulder widths in accordance with Section 504.8 of the ADOT *Roadway Design Guidelines* and TP Attachment 200-1:

- A. Baseline Road EB Entrance Ramp;
- B. Elliot Road EB and WB Entrance Ramps;
- C. Warner Road EB and WB Entrance Ramps; and
- D. Ray Road EB and WB Entrance Ramps.

South of Baseline Road, the following exit ramps shall be widened to provide full-width lane and shoulder widths in accordance with Section 504.7 of the ADOT *Roadway Design Guidelines* and TP Attachment 200-1:

- A. Elliot Road EB and WB Exit Ramps;
- B. Warner Road EB and WB Exit Ramps; and
- C. Ray Road EB Exit Ramps.

South of Baseline Road, for service interchange ramps without existing curb and gutter, widenings of 2 feet wide or less may be accomplished using ribbon curb, instead of the full pavement structural section(s) described in Section 400 of the TPs.

Entrance or exit ramps on the left are not allowed with the exception of the following:

- A. HOV ramps;
- B. EB C-D ramp that enters the EB I-10 to EB US 60 ramp; and
- C. WB I-10 ramp that enters the WB C-D road on the left.

Gores shall be laid out per ADOT *Roadway Design Guidelines* Section 504.7 and 504.8, except as identified in Table 200-5. For gores listed in Table 200-5, the back of gore dimension may be reduced by running two roadway barriers together such that the offset from the main roadway face of barrier to the entering or exiting roadway face of barrier is no less than 2 feet. The resulting back of gore dimension will be measured from the main roadway barrier lip of gutter to the entering or exiting roadway barrier lip of gutter. The nose of gore dimension shall be no less than 4 feet, measured from the projected barrier lips of gutters and shall be no further than 200 feet from the back of gore, measured along the main roadway alignment. For all gores, the maximum breakover between gore and adjacent lane or shoulder pavement shall be 5 percent. Proposed nonstandard gores not listed in Table 200-5 require Developer justification and are subject to ADOT approval, in ADOT's sole discretion.

Table 200-5 Location of Non-Standard Gores	
Location Number	Location Description
1	From WB C-D to I-10 WB (Departure – Entrance Gore)
2	WB C-D to 40 th Street WB Exit (Approach – Exit Gore)
3	SR 143 Ramp SW to WB C-D (Departure – Entrance Gore)
4	SR 143 Ramp SW / 48 th Street SB (Approach – Exit Gore)
5	I-10 EB / Broadway Road EB Exit (Approach – Exit Gore)
6	SR 143 SB to EB C-D/HOV SE Ramp (Approach – Exit Gore)
7	HOV WN Ramp / WB C-D to SR 143 NB (Departure – Entrance Gore)
8	WB C-D to University NB Exit / WB C-D to SR 143 NB (Approach – Exit Gore)
9	I-10 WB / Broadway Road WB Entrance (Departure – Entrance Gore)
10	I-10 EB / HOV SE Ramp (Departure – Entrance Gore)
11	I-10 WB / HOV WN Ramp (Approach – Exit Gore)
12	EB C-D / Broadway Road EB Entrance Ramp (Departure – Entrance Gore)
13	EB C-D/EB C-D to US60 Ramp SE (Approach – Exit Gore)
14	WB C-D / WB US60 to WB C-D (Departure – Entrance Gore)
15	I-10 WB / WB C-D (US60 Ramp NE) (Approach – Exit Gore)
16	EB C-D to US60 Ramp SE / US60 Ramp SE (Departure – Entrance Gore)
17	SR 143 SB /SR 143 SB to 48 th Street SB (Approach – Exit Gore)
18	SR 143 NB /48 th Street NB to SR 143 NB (Departure – Entrance Gore)
19	48 th Street NB / WB C-D to University DR NB Exit (Departure – Entrance Gore)

For new and existing exit ramps with crash cushions at the back of gore, 1 foot wide by 7-inch long by 3/8-inch to 1/2-inch deep rumble strips spaced 1 foot on centers shall be installed in the shoulder 6 inches from the shoulder stripe for the entire length of the striped gore in advance of the crash cushion for both the mainline and ramp movements.

To prevent traffic from attempting to make an unsafe, unsigned alignment change, short circuits shall be avoided or, at a minimum, minimized in length. A short circuit is defined as the gap between two gores formed by three same-direction roadway movements merging and diverging from each other. Short circuits are measured from the back of entrance gore to the back of exit gore. The short circuit lengths shown in the Schematic Design shall not be increased and are subject to Section 6.4.2 of the Agreement. Additional Developer proposed short circuits not shown in the Schematic Design shall be a maximum of 100 feet and require ADOT approval.

200.03.02.14 Barrier Gates

Developer shall provide emergency access between the C-D roads and mainline through steel barrier gates placed at locations provided below. Temporary concrete barrier shall not be used as a barrier gate system. As no MASH compliant barrier gate system exists to address the situation as of the Setting Date, the barrier gate system shall meet NCHRP *Report 350* criteria for Test Level 3, at a minimum. Barrier gates shall provide a minimum 40-foot gap to allow emergency access and controlled evacuation from the mainline to C-D road and C-D road to mainline. The barrier gate system shall be manually operational and not rely on vehicles to operate.

Road geometry shall comply with the manufacturers' recommendations for installation locations of the barrier gate system. Developer shall meet with DPS and other Incident Management agencies prior to finalizing locations of barrier gate systems. Barrier gate systems shall be located:

J. Eastbound I-10 between Alameda Drive and US 60 – 2 barrier gate systems;

K. Eastbound I-10 between US 60 and Baseline Road – 1 barrier gate system;

L. Westbound I-10 between US 60 and Alameda Drive – 2 barrier gate systems; and

M. Westbound I-10 between 48th Street and 40th Street – 1 barrier gate system.

Developer shall provide a minimum of two training sessions for ADOT and emergency services staff in the use of the barrier gate system. Developer shall provide a minimum of two sets of tools per barrier gate location.

200.03.02.15 Special Access at US 60

Developer shall provide maintenance access for ADOT and SRP at the existing I-10 westbound to US 60 eastbound ramp location. Access shall be provided from the shoulder of the I-10 westbound C-D road over Type C-5.10, Type B curb for a minimum of 40 feet past the back of gore of the proposed I-10 westbound C-D road and US 60 eastbound. Maintenance access through the infield area shall be along a 20 foot wide decomposed granite surface material per Section 800 of the TPs with a longitudinal slope not to exceed 10:1 and a cross slope not to exceed 20:1. Developer shall provide a minimum of 50 feet of barrier along the I-10 westbound C-D road approaching and departing the SRP transmission pole. The minimum 100 feet of barrier shall be centered at the perpendicular intersection of the SRP transmission pole and the I-10 westbound C-D road centerline. This barrier may be extended at one or both ends to meet clear zone and length of need requirements for other obstructions in the clear zone. Developer shall accommodate maintenance vehicles to re-enter the I-10 westbound C-D road through an overbuilt shoulder. The overbuilt shoulder shall provide a 20 foot wide opening from the back of barrier or curb to the face of barrier or gutter flow line. The 20 foot wide opening shall taper to required C-D shoulder width at a taper rate of 20:1. The overbuilt shoulder and taper pavement shall be the same as the C-D road. Developer shall protect in place the existing barrier adjacent to the SRP Transmission poles along the I-10 westbound to US 60 eastbound ramp.

Developer shall provide access atop the eastern-most end of the Western Canal box culvert for SRP access to the existing trash rack. Access shall be across the top of the box with a maximum 20:1 cross slope with 30 foot wide access from the edge of the box to the closest back of barrier.

Developer shall provide maintenance access for SRP at the existing drainage basin adjacent to Wendler Drive, west of I-10. To supplement the requirements of the sidewalk as required in Section 200.03.04 of the TPs Developer shall provide a 30 foot rolled curb along Wendler Drive at the south side of the existing basin. Directly adjacent to the required 10 foot wide sidewalk, Developer shall provide 30 foot compacted decomposed granite per Section 800 of the TPs for maintenance access for SRP with longitudinal slopes not to exceed 10:1 and a cross slope not to exceed 20:1 to provide a total 40 foot set-up area. Fence shall be placed two feet from the edge of the 30 foot wide access to prevent access to the adjacent basin. Developer shall grade a setup area for SRP for 40 feet north and 50 feet west of the existing SRP transmission pole.

Concepts of these requirements are provided in the RIDs for information only.

200.03.03 Pedestrian Crossing, Equestrian Crossing, and Trail Connections

Developer shall provide pedestrian crossing structures at Alameda Drive, the Western Canal, and Guadalupe Road.

Design requirements of the pedestrian structures shall be as shown in Section 600.03.03 of the TPs.

Trail connections and pedestrian crossing structures shall meet *Americans with Disabilities Act Accessibility Guidelines* (ADAAG) requirements and provide the following connections listed in Table 200-6. The approaches to the Guadalupe Road bridge shall comply with the United States Department of Agriculture (USDA) *Equestrian Design Guidebook for Trails, Trailheads, and Campgrounds, December 2007* (Publication 0723-2816-MTDC).

Table 200-6 Pedestrian Crossing and Trail Connections Requirements			
Pedestrian/Trail Crossing	Minimum Clear Width	West Connection	East Connection
Alameda Drive (See <u>TP Attachment 600-5</u>)	14 feet	Southeast Corner of Alameda Drive and Diablo Way West of I-10	Northwest side of Alameda Drive Cul-de-sac East of I-10
Western Canal	10 feet	South Side Western Canal Service Road North of Hermosa Drive and Wendler Drive Intersection	Northwest Corner of Intersection of Arizona Mills Circle and Priest Drive Access Road
Guadalupe Road	10 feet	Northeast Corner of Intersection of Guadalupe Road and S. Pointe Parkway	Northwest Corner of Intersection of Guadalupe Road and Calle Sahuaro

200.03.04 Local Streets and Intersections

Developer modifications to curb, gutter, sidewalk and ADA ramps of local streets and intersections that will be turned back to the Local Jurisdictions shall be designed in accordance with the Local Jurisdiction's standards.

South Diablo Way (Fairmont Drive to Alameda Drive): Developer shall realign Diablo Way between Alameda Drive and Fairmont Drive reestablishing existing driveway access. South Diablo Way will be classified as a C-1 Collector and Industrial Street per City of Tempe Detail T-312 with respect to pavement structural section. Sidewalk shall not be required on either side of the roadway. Vertical curb and gutter per MAG Detail 220-1 Type 1 shall be installed along both sides of South Diablo Way. See TP Attachment 200-1.2 for additional design criteria.

Pedestrian Crossing at Western Canal: Developer shall provide a pedestrian crossing connection consisting of a 5 foot wide sidewalk beginning at the Western Canal north of Hermosa Drive, adjacent to Wendler Drive, to the southern end of the adjacent drainage basin. The sidewalk shall then transition to a 10 foot wide sidewalk heading east connecting to the Western Canal Crossing as well as connect to the existing sidewalk along Wendler Drive. A pedestrian crossing connection on the east side of I-10 consisting of a 14 foot wide sidewalk shall be provided adjacent to the existing Arizona Mills wrought iron fence beginning at the eastern ramp of the Western Canal crossing and ending at the Priest Drive Access Road.

1 *48th Street East and West of SR 143*: Modifications and realignments to local 48th Street east and west
2 of SR 143 shall be completed based upon Developer's Schematic Design. Developer shall provide equal
3 or better roadway widths and include curb and gutter with new improvements. Existing sidewalk impacted
4 the by the Work or not meeting ADA requirements shall be replaced.

5 *Diablo Way Cul-De-Sac*: Developer shall provide a 45 foot radius cul-de-sac at South Diablo Way, north
6 of Southern Avenue, per the City of Tempe Zoning & Development Code. Developer shall provide a
7 maximum 15 feet between the proposed C-D road retaining wall and the cul-de-sac as the minimum
8 width for ROW fence and maintenance purposes. Vertical curb and sidewalk will be placed on the north
9 side of the cul-de-sac. The existing guardrail along the south side of Diablo Way shall remain if not
10 impacted by the Work. New pavement for Diablo Way at this location will be classified as a C-1 Collector
11 and Industrial Street per City of Tempe Detail T-312 with respect to pavement structural section only.
12 Developer shall resurface the existing pavement to remain along Diablo Way with a 2-inch mill and fill to
13 the limits of Southern Ave.

14 **200.03.05 ADA Compliance**

15 New pedestrian facilities shall meet *Americans with Disabilities Act Accessibility Guidelines* (ADAAG)
16 requirements.

17 Existing pedestrian facilities (excluding pedestrian fence) directly impacted by the Work shall be retrofit to
18 meet ADAAG requirements.

19 At the I-10/32nd Street, I-10/40th Street, I-10/Broadway Road, and I-10/Warner Road service interchange
20 intersections the existing pedestrian facilities (excluding pedestrian fence to remain) shall be reconstructed
21 as needed to meet ADAAG requirements. Existing sidewalk ramps at the SR 143/University Drive service
22 interchange will be impacted by the Work. All sidewalk ramps within the quadrant of the service
23 interchange impacted by the Work shall meet ADAAG requirements regardless if directly impacted or not.
24 The quadrant of the interchange shall be defined by the intersection of the centerlines of the existing
25 crossroad and existing SR 143 mainline.

26 Developer shall reconstruct non-compliant ADA facilities including ramps and sidewalks along Southern
27 Avenue and Diablo Way, north of Southern Avenue, as needed to meet ADAAG requirements.

28 New sidewalk ramp width shall match adjacent sidewalk width as described in Section 200.03.02.10 of
29 the TPs.

30 With each Preliminary, Final, and RFC Roadway and Traffic Signal Submittal, Developer shall include an
31 ADA Asset Spreadsheet identifying all compliant existing or new pedestrian facilities including ADA
32 ramps, sidewalks, pedestrian bridges, pedestrian ramps, and push buttons modified or proposed new
33 and affected by the Project. A sample ADA Asset Spreadsheet is provided in TP Attachment 200-5.

34 **200.03.06 Design Exceptions and Design Variances**

35 The Schematic Design includes design elements that require Design Exceptions and Design Variances as
36 listed in TP Attachment 200-3. FHWA and ADOT have reviewed and approved Design Exceptions and
37 Design Variances based on the preliminary nature of the design and potential for design changes by
38 Developer. Developer shall prepare Design Exception requests for these design elements based on
39 Developer's design. Design Exceptions and Design Variances shown in the Schematic Design but not listed
40 in TP Attachment 200-3 shall be eliminated by Developer through refinements to the design. Interpretation
41 and use of the Schematic Design is subject to Section 6.4.2 of the Agreement.

Developer is discouraged from creating additional Design Exceptions or Design Variances. If Developer's design creates additional Design Exceptions or Design Variances, Developer shall demonstrate on a case-by-case basis that substantial benefits to the Project would result from the request.

For each Request for Design Exception or Request for Design Variance, Developer shall prepare all documentation in accordance with the ADOT *Design Exception and Design Variance Process Guide* in addition to FHWA revisions to AASHTO *Controlling Criteria*. At the same time as the Preliminary Design Submittal for the associated Work, Developer shall submit any Request(s) for Design Exception(s) or Request(s) for Design Variance(s) to ADOT for review and approval by ADOT, in ADOT's sole discretion. Developer is advised that ADOT may withhold approval of any such request(s) at its sole discretion and Developer shall schedule sufficient time for evaluation of all requests. Following review of any Request(s) for Design Exception(s), ADOT will submit the ADOT approved Request(s) for Design Exception(s) to FHWA for review and approval. All Design Exceptions must be reviewed by ADOT and reviewed and approved by ADOT and FHWA before Developer may incorporate them into the Project's design. Any delay caused by pursuing or obtaining additional Design Exceptions or Design Variances shall not entitle Developer to an increase in the Contract Price, adjustment of a Completion Deadline or any other Claim, or otherwise constitute a Relief Event.

Developer shall prepare a Design Exception and Design Variance Report that consolidates all Design Exceptions and Design Variances, all supporting documentation, and copies of the ADOT and FHWA approval letters. At the same time as the Final Design Submittal for the associated Work, Developer shall submit the Design Exception and Design Variance Report to ADOT.

200.03.07 Construction Drawings and Design Calculations

200.03.07.01 Construction Drawings

Developer shall prepare Construction Drawings in accordance with the ADOT *Standardized Dictionary of Work Tasks*. The Construction Drawings, at a minimum, shall include the following:

- A. Face Sheet and List of Standard Drawings;
- B. General Notes (available on the Roadway Design website: <https://azdot.gov/business/engineering-and-construction/computer-aided-design-and-drafting-cadd>);
- C. Design Sheet and Index;
- D. Typical Roadway and Detour Sections;
- E. Pavement Structural Sections;
- F. Summary Sheets;
- G. Special Details;
- H. Survey Control;
- I. Existing Conditions and Removal Sheets;
- J. Geometric Layout Sheets;

- 1 K. Geometric Data Sheets;
- 2 L. Detour Plan Sheets and Profile Sheets;
- 3 M. Roadway Plan Sheets and Profile Sheets;
- 4 N. Gore Staking Sheets;
- 5 O. Intersection Staking Sheets;
- 6 P. Sidewalk Ramp Staking Sheets;
- 7 Q. Pavement Joint Layout Sheets;
- 8 R. Fence Layout Sheets;
- 9 S. Maintenance Access Plan Sheets;
- 10 T. Retaining Wall and Noise Barrier Plans, Profiles, and Wall Selection Reports; and
- 11 U. Annotated Cross Sections.

12 **200.03.07.02 Design Calculations**

13 Developer shall prepare all necessary calculations to justify design elements in accordance with the
14 ADOT Design Manuals as denoted in Table 200-1. Electronic versions of calculations shall be submitted
15 with each submittal. The calculations, at a minimum, shall include the following:

- 16 A. Horizontal Stopping Sight Distance;
- 17 B. 1.5 times Sight Distance Approaching Ramp Gores;
- 18 C. 2.0 times Sight Distance Approaching Lane Drops;
- 19 D. Intersection Sight Distance;
- 20 E. Vertical Stopping Sight Distance;
- 21 F. Vertical Clearance;
- 22 G. Superelevation; and
- 23 H. Barrier Length of Need.

24 **200.04 Construction Requirements**

25 **200.04.01 Standards**

26 Developer shall perform all roadway Construction Work in accordance with the standards, manuals, and
27 guidelines listed in Table 200-7 which are shown in no order of precedence; however, in the event of a
28 conflict, the more stringent requirement prevails.

Table 200-7 Construction Standards		
No.	Agency	Title
1	ADOT	Standard Specifications for Road and Bridge Construction, 2008

1 **200.04.02 General Requirements**

2 Developer shall perform all roadway Construction Work in compliance with the requirements of Section
3 200.04 of the TPs.

4 **200.04.03 Construction Requirements**

5 Prior to installation, Developer shall submit barrier, end treatment, and crash cushion certifications to
6 confirm that the proposed barriers, barrier end treatments, and crash cushions comply with the
7 requirements of MASH or NCHRP *Report 350, Recommended Procedures for the Safety Performance*
8 *Evaluation of Highway Features*, as required by the RFC Plans to IQF for approval. Developer shall not
9 install barriers, barrier end treatments, or crash cushions prior to IQF approval of the certifications.

10 Prior to the last RFC Roadway or Traffic Signal plan Submittal, the Design Manager shall certify that all
11 designed pedestrian facilities identified on the ADA Asset Spreadsheet are ADAAG compliant. Prior to
12 Substantial Completion, the Construction Independent Quality Manager shall certify that all constructed
13 pedestrian facilities identified on the ADA Asset Spreadsheet were constructed per plan.

14 **200.05 Submittals**

15 Table 200-8 reflects a nonexclusive list of Submittals identified in Section 200 of the TPs and is not
16 intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and
17 submit all Submittals as required by the Contract Documents, Governmental Approvals, and
18 Governmental Entities. Unless otherwise indicated, Developer shall submit all Submittals in both
19 electronic format and hardcopy format. At a minimum and unless otherwise specified in the Contract
20 Documents, Developer shall submit the following to ADOT in the formats described in Section
21 116.02.02 of the TPs:

Table 200-8 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
ADA Asset Spreadsheet	4	0	1	With each Roadway and Traffic Signal Submittal	200.03.05
Certified ADA Asset Spreadsheet	4	0	1	Prior to Substantial Completion	200.04.03
Request(s) for Design Exception	1	0	1	At the same time as Preliminary Design Submittal for the associated Work	200.03.06
Request(s) for Design Variance	1	0	1	At the same time as Preliminary Design Submittal for the associated Work	200.03.06

Table 200-8 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Design Exception and Design Variance Report	4	0	1	At the same time as Final Design Submittal for the associated Work	200.03.06
Barrier, End Treatment, and Crash Cushion Certifications	4	0	1	Prior to installation	200.04.03
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

End of Division

1

Division III, Subgrade, Subbases, and Bases

300 GEOTECHNICAL

300.01 General Requirements

Developer shall perform all geotechnical Design Work in compliance with the requirements of Section 300 of the TPs.

300.02 Administrative Requirements

300.02.01 Standards

Developer shall perform all geotechnical Design Work in accordance with the standards, manuals, and guidelines listed in Table 300-1 which are shown in no order of precedence; however, in the event of a conflict, the more stringent requirement prevails.

Table 300-1 Design Standards		
No.	Agency	Title
1	AASHTO	LRFD (Load and Resistance Factor Design) Bridge Design Specifications, 2012, 6 th Edition
2	ADOT	ADOT Materials Preliminary Engineering and Design Manual (MPE&D), last revised 1992
3	FHWA	Geotechnical Engineering Circular No. 11, Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes, NHI Courses No. 132042 and 132043, Publication No. FHWA-NHI-10-025, Volumes I and II, 2009
4	FHWA	Geotechnical Engineering Circular No. 7, Soil Nail Walls, Report No. FHWA-IF-03-017, 2003
5	FHWA	Geotechnical Engineering Circular No.5, Evaluation of Soil and Rock Properties FHWA- NHI-16-072
6	ADOT	ADOT DS-1: Development of Drilled Shaft Axial Resistance Charts for Use by Bridge Engineers Based on Load and Resistance Factor Design (LRFD) Methodology, Memorandum, 2010
7	ADOT	ADOT DS-2: Interim Guidance – Design of Drilled Shafts in Gravels and Gravelly Soils Exhibiting Drained Behavior, Memorandum, 2010
8	ADOT	ADOT DS-3: Analysis of Drilled Shafts Subjected to Lateral Loads Based on Load and Resistance Factor (LRFD) Methodology, Memorandum, 2010
9	ADOT	ADOT SF-1: Development of Factored Bearing Resistance Chart by a Geotechnical Engineer for Use by a Bridge Engineer to Size Spread Footings on Soils Based on Service and Strength Limit States Based on Load and Resistance Factor Design (LRFD) Methodology, Memorandum, 2008 (Revision 1)
10	ADOT	ADOT SF-2: Limiting Eccentricity Criteria for Spread Footings based on Load and Resistance Factor Design (LRFD) Methodology, Memorandum, 2010

Table 300-1 Design Standards		
No.	Agency	Title
11	ADOT	ADOT SF-3: Resistance Factors for the Estimation of Factored Sliding and Bearing Resistance for Spread Footings of Gravity and Semi-gravity Walls based on Load and Resistance Factor Design (LRFD) Methodology, Memorandum, 2010
12	ADOT	ADOT Pavement Design Manual, September 29, 2017

300.02.02 Existing Geotechnical Information

Geotechnical reports prepared by ADOT and additional geotechnical information available from other sources are provided in the RIDs.

The geotechnical information provided does not meet the level of final investigations in accordance with the minimum requirements for investigations as contained in the MPE&D Manual and AASHTO (2012). It is expected that for Developer's Design, significantly more field and laboratory investigations will be required in accordance with MPE&D Manual, AASHTO (2012) and the Contract Documents. Developer shall perform geotechnical investigations to obtain data required and shall perform tests, analyses, and calculations to develop independent geotechnical recommendations for the Project to support Developer's design.

300.02.03 Software Requirements

Developer may use the software programs set forth below for geotechnical Work. In the event that Developer proposes to use any software other than that listed and as part of the Basis of Design Report in accordance with Section 100.03.02 of the TPs, Developer shall submit proposed Geotechnical Software (including input and output files for verification data) to ADOT for approval.

Acceptable Geotechnical Software for Design Work includes: ALLPILE, APILE, CBEAR, EMBANK, Shoring Suite, Driven, FoSSA, gINT, GSTABL, Geoslope, Goldnail, GRL WEAP, GROUP, LPILE Plus, MSEW 3.0, ReSSA, RetainPro, RockPack, RocFall Version 4.0 or 5.0, Roc Science Dips, Settle3D, Shaft 2012, Slide, Snail, SNAILZWin, TZPile, UNISETTLE, PCSTABL, XSTABL, CRSP Version 4.0 or 5.0 (CRSP 3D Version shall not be used), and Strain Wedge Model.

300.02.04 Equipment Requirements

Developer shall ensure that SPT hammers to be used for the geotechnical investigation have been tested for energy efficiency within the 12 months prior to use, with the energy efficiency ratio reported in the boring logs, drilling records and reports. Calibration records shall be provided by Developer at least 10 Days prior to drilling. Geotechnical data obtained using uncalibrated hammers shall be considered informational and shall not be used for Final Design.

300.03 Design Requirements

Developer shall conduct field explorations and subgrade testing necessary to design the Work in accordance with the requirements of the applicable standards listed in Section 300.02.01 of the TPs.

300.03.01 Subsurface Geotechnical Investigation by Developer

Developer shall perform subsurface geotechnical investigations, testing, research, and analysis as necessary to design the roadway, pavement, foundations, structures, embankments, excavation, slopes, and other facilities for the Project. Minimum exploration requirements are as follows:

Table 300-2 Minimum Exploration Requirements		
Feature	Minimum Boring Spacing	Minimum Boring Depth (feet)
Bridge (See Note)	Per AASHTO (2012) and MPE&D Manual	
Retaining Walls	Per AASHTO (2012) and MPE&D Manual	
Noise Barriers	1 per 500 LF	25 feet
Mainline and Ramp Pavement	Per AASHTO (2012) and MPE&D Manual	
Pavement (C-D Road)	Per MPE&D Manual	
Pavement (Crossroads and Local Streets)	Per Local Jurisdiction	
Cuts/Fills	Per MPE&D Manual	
Infiltration/Percolation Tests	Per <u>Section 500 of the TPs</u>	
Drainage facilities	As required by drainage Engineer of Record	
NOTE: Developer may use ADOT provided geotechnical data provided in the RIDs for the I-10 Salt River Bridge design that do not meet Minimum Boring Spacing requirements (horizontal variance). Vertical Boring Depth Requirements shall be per this Table 300-2. Use of this data is subject to <u>Section 13.4.6.5 of the Agreement</u> .		

Developer shall prepare and submit a Boring and Access Plan to ADOT that outlines the geotechnical investigation program. The Boring and Access Plan shall include a listing of exploration points with planned depths, sampling frequency and methods and include a site plan showing exploratory locations and routes planned to access the locations. Basic field exploration, sample handling, and laboratory testing procedures shall be outlined in the Boring Access Plan. All subsurface exploration locations shall include utility clearance certification by the Design Manager, Construction Manager and Utility Adjustment Coordinator, a minimum of 5 Days prior to drilling.

The geotechnical exploration program shall be conducted under either a separate geotechnical SWPPP for design or under the Project SWPPP in accordance with Section 104.09 of the TPs, ADOT encroachment permit(s), and/or other permits or entry agreements, as required. The geotechnical investigation shall not be performed until all environmental clearances are obtained as required. Developer shall contact Arizona 811 prior to any excavation activities.

ADOT shall be notified in advance of all field work associated with the geotechnical investigation for informational purposes, coordinating clearances, and to allow review and approval of any traffic control activities required to safely complete the field work as described in Section 700.06.04 of the TPs.

All geotechnical field investigation shall be compliant with Arizona Department of Water Resources (ADWR) drilling regulations. Developer shall employ field investigation measures that avoid groundwater contamination and pollutant discharge and shall perform all geotechnical investigation and associated mitigation and/or restoration in accordance with Section 119 of the TPs.

300.03.02 Geotechnical Engineering Reports

Developer shall prepare Preliminary and Final Geotechnical Engineering Reports documenting the conditions, and results of the geotechnical investigations and analyses, including assumptions. Developer shall coordinate with bridge designers to address potential impacts to existing bridge structures as required in Section 600.03.02.05 of the TPs. The Geotechnical Engineering Reports shall include a description of the geologic profile and geotechnical properties of the materials that will control performance of the facility for each of the Project features and shall include the following:

- A. Cover page, signed and sealed by the Engineer of Record;
- B. Description of the physical character of the site;
- C. Description of the geologic units and sequence underlying the site, including soil and rock types;
- D. Description of the groundwater conditions beneath the site;
- E. Description of the field investigations methods and laboratory testing used to characterize subsurface conditions. Field investigations shall include field logging techniques and personnel sampler penetration test results, hammer efficiency for each boring, soil sample recovery, in situ test results and rock recovery, rock quality designation and discontinuity orientation and spacing for all rock core, where applicable. Laboratory test results shall include classification and engineering properties for all major soil and rock strata in the Project study area;
- F. A discussion of the geological and geotechnical conditions and profile and results with reference to specific locations on the Project. Reference to applicable geologic hazards should be included;
- G. Geotechnical Recommendations for the following Project elements:
 1. Structures, including foundation type studies, capacities, lateral earth pressures, and related design parameters for bridges, culverts, retaining walls, noise barriers, sign supports and standards, and lighting standards;
 2. Roadway embankments, including material types and suitability, foundation and subgrade conditions and improvements, settlement impacts and remediation, and evaluation of borrow areas;
 3. Roadway excavations, including material types and suitability for use in embankments;

4. Temporary and permanent cut and fill slopes, including slope stability analyses for embankment fill slopes and cut slopes, rock cut slope designs, rockfall containment, and slope stabilization designs;
5. Impacts of compressible, hydro-collapsible, and/or expansive soils, if present, and proposed mitigations;
6. Stability analyses for temporary excavations and/or structures shall be performed, as appropriate, to demonstrate acceptable stability. Global and/or external stability for walls shall be conducted. Coordinate with wall designers/manufacturers, as necessary;
7. Scour and stream bank erosion protection;
8. Erosion abatement design for permanent cut and fill slopes;
9. Corrosion potential of soils on construction materials;
10. Impacts on, and from, groundwater, including necessary remedial actions;
11. Construction and inspection considerations;
12. Specification requirements and special provisions related to geotechnical recommendations;
13. Details and objectives of any instrumentation plan;
14. Suitability of materials (borrow, aggregates, riprap, etc.) that can be obtained from Project excavations, including source, quality, and availability; and
15. Recommendations for subgrade improvements for those locations not meeting the subgrade acceptance chart contained in TP Attachment 400-1.

H. Appendix, including the following:

1. Plan view locations of field sampling/testing (e.g., borings, test pits, test trenches, surface samples, geologic maps, and geophysical surveys);
2. Copies of the final boring logs and field/laboratory test data used for the analysis and design;
3. Other field test data (e.g., geophysical surveys, pressure meter tests, and infiltration/percolation tests);
4. Summary of laboratory testing methods and tabulated results;
5. Topsoil testing results;

6. Copies of geotechnical calculations used for analysis and design, background information, published verification or hand-calculated verification, and other pertinent data on computer programs or spreadsheets;
7. Copy of the SPT hammer(s) energy calibration;
8. Photographs of all rock cores and proper identification labels; and
9. Instrumentation Plan.

Coincident with the Preliminary Design Submittal of the associated design, Developer shall submit a Preliminary Geotechnical Engineering Report to ADOT. Additionally, coincident with the Final Design Submittal of the associated design, Developer shall submit a Final Geotechnical Engineering Report to ADOT. The Final Geotechnical Engineering Report shall be signed and sealed by the Engineer of Record.

Developer shall prepare Geotechnical Supplements to incorporate changes made during the development of the Work and shall incorporate any such Geotechnical Supplements into the Final Geotechnical Engineering Report(s). Developer shall submit Geotechnical Supplements to ADOT to support the Final Design Submittal.

Work required based on the Geotechnical Engineering Report(s), including overexcavation requirements, permanent casing, and subgrade improvement limits, shall be included in the Plans and submitted as details for ADOT review at the same time as a Roadway Submittal or as a standalone submittal.

Developer shall prepare an As-Built Geotechnical Engineering Report inclusive of all Final Geotechnical Engineering Reports and Geotechnical Supplements into one file/document. As part of the Record Drawings Submittal, Developer shall submit the As-Built Geotechnical Engineering Report to ADOT.

300.03.03 Geotechnical Analyses and Design

300.03.03.01 Shallow Foundations

Shallow foundations shall be designed and constructed in accordance with the AASHTO *LRFD Bridge Design Specifications* (2012) and applicable ADOT memoranda.

300.03.03.02 Deep Foundations

Deep foundations shall be designed and constructed in accordance with the AASHTO *LRFD Bridge Design Specifications* (2012) and applicable ADOT memoranda.

300.03.03.03 Retaining Walls

Retaining walls shall be designed and constructed in accordance with the AASHTO *LRFD Bridge Design Specifications* (2012), applicable ADOT memoranda, and the requirements of Section 600 of the TPs. Global stability of the retaining wall systems shall be performed to demonstrate acceptable stability in accordance with AASHTO.

300.03.03.04 Rock Cut Slopes

The Bell Butte existing slope shall not be modified. The resulting ditch between the existing rock face and new roadway shall be designed for rockfall containment. A narrowed (less than 12 foot wide) section of ditch is allowed only from existing Broadway Road WB exit ramp Sta 21+50 to Sta 22+50. To achieve

the required rockfall containment, the rockfall ditch design shall include a concrete barrier with minimum height of 32 inches and adequate height to contain the rockfall from all heights of the slope.

Embankment may be placed against the rock face but excavation of the rock slope at Bell Butte is prohibited. Surface treatment of the existing rock face at Bell Butte is prohibited.

Developer shall design new rock cut slopes as required by the Project geometry and shall demonstrate an adequate factor of safety for each slope design based on rock mass conditions, kinematic stability analysis and global slope stability analysis for the slopes in accordance with the Good Industry Practice and methods presented herein.

Developer shall design rockfall containment facilities and catchment features to prevent rockfall from intruding into the travel lanes. Developer shall perform computer simulation rockfall modeling for the design of all rock slope configurations. Version 4.0 or 5.0 of the CRSP, or Version 4.0 or 5.0 of the RocFall program shall be used for modeling purposes. Developer shall field verify the input parameters to the computer simulation rockfall modeling. Developer shall design rockfall containment facilities that are accessible and maintainable by heavy equipment, except for the limited reach along Broadway Road WB exit ramp as described herein. If the rockfall simulation model is utilized to establish the ditch geometry, it shall demonstrate that a minimum of 95 percent of the rockfall is contained in the ditch. A positive impervious barrier shall be incorporated into the rockfall containment feature to stop potential rollout of rockfall debris from the ditch into the paved shoulder and travel lanes.

300.03.03.05 Instrumentation

Developer shall prepare an Instrumentation Plan for all MSE Walls and embankments greater than 20 feet in height in accordance with the applicable standards listed in Section 300.02.01 of the TPs.

The Instrumentation Plan shall include proposed types of instruments, depths, installation details, manufacturers' information, and reporting. Monitoring points shall be spaced no further than 50 feet apart and shall be read at least weekly during the monitoring period. The monitoring shall begin once the wall reaches a height of 20 feet and shall continue until the wall settlement has stabilized for a minimum of one month. As part of the Preliminary Geotechnical Engineering Report(s), Developer shall submit the Instrumentation Plan to ADOT.

300.03.03.06 Tolerable Deformations

Developer shall design the Work in accordance with the following deformation criteria:

A. Highway bridge substructures:

1. Maximum total settlement of 1-inch after bridge superstructure has been constructed;
2. Maximum differential settlement of 0.75-inch after the bridge superstructure has been constructed;

B. Retaining walls and miscellaneous structures: Maximum total and differential settlements and lateral movements (including settlement and lateral movements attributable to stresses imposed by embankments) shall result in no distress to the structures and visual treatments of walls, including cracking and spalling of concrete, tilting of wall panels, and separation or crushing at joints; and

- C. Embankments and subgrade: Developer shall address settlement of embankment (total and differential settlements) so that the settlement will not negatively impact the functionalities and performance of facilities, immediately on top or adjacent to the embankment, and service life of these facilities in accordance with the Contract Documents.

300.03.03.07 Design and Construction Control R-Values

For any pavements not included in TP Attachment 400-1, Developer shall develop design and construction control R-values for pavement design in accordance with the Standards noted herein. The construction control R-value shall not be less than the design R-value.

300.04 Construction Requirements

300.04.01 Standards

Developer shall perform all geotechnical Construction Work in accordance with the standards, manuals, and guidelines listed in Table 300-3 which are shown in no order of precedence; however, in the event of a conflict, the more stringent requirement prevails.

Table 300-3 Construction Standards		
No.	Agency	Title
1	FHWA	Geotechnical Engineering Circular No. 10, Drilled Shafts: Construction Procedures and LRFD Design Methods
2	ADOT	Standard Specifications for Road and Bridge Construction, 2008

300.04.02 Foundations

Developer shall construct all foundations in accordance with the ADOT Standard Specifications.

300.04.02.01 Drilled Shaft Load Testing

If drilled shaft foundations load testing is performed, Developer shall perform such tests in accordance with the recommendations presented in FHWA *Geotechnical Engineering Circular No. 10, Drilled Shafts: Construction Procedures and LRFD Design Methods*. Developer shall perform the load tests on a sacrificial, non-production drilled shaft(s) and shall design such load tests to measure the nominal axial resistance of the test drilled shaft and load transfer characteristics of the shaft/soil profile. Both conventional (top-down) and bi-directional Osterberg Cell ("O Cell") drilled shaft load testing methods are allowed.

Developer shall prepare a Drilled Shaft Load Test Program that includes the following:

- A. Design Plans, specifications, and special provisions detailing the design and construction of the test drilled shaft(s), including test shaft materials, reinforcing cage, access tubes for integrity testing, estimated shaft capacities, test loads, loading/unloading increments and sequences, and instrumentation types and locations;
- B. Details and capacities of the loading frame and reaction shafts, or Osterberg cell assemblies;
- C. Test drilled shaft instrumentation plan, including details and calibration certificates of all test instrumentation proposed for monitoring of the test drilled shaft, such as sister bar strain gauges, linear vibrating wire displacement transducers, compression telltales, vibrating wire pressure

transducers, pressure gauges, data acquisition system and all associated software, and survey points and methods for monitoring the test drilled shaft;

D. Installation plan for the test drilled shaft and reaction shafts in accordance with the Drilled Shaft Installation Plan requirements in Section 300.04.02.02 of the TPs;

E. Drilled Shaft Load Test Report(s), which shall include the following items:

1. Description of the test drilled shaft details, construction, instrumentation, and test procedures;
2. Tables presenting all monitoring and Instrumentation data;
3. Plots of load versus displacement for each stage of the test;
4. Plots of load transfer along the length of the test drilled shaft determined from the strain gauge data for at least 10 applied load increments;
5. Summaries of mobilized unit side resistance along the length of the drilled shaft, and mobilized tip resistance;
6. Plots of creep displacement for each loading direction and increment; and
7. Plot of equivalent top-down load versus displacement curve for the test drilled shaft, developed from the load test data.

20 Business Days prior to performing the load test(s), Developer shall submit the Drilled Shaft Load Test Program to ADOT.

Subsequent to completion of the drilled shaft load test such that the test drilled shaft is no longer needed, Developer shall cut the test drilled shaft off at least five feet below final grade. Developer shall prepare a Drilled Shaft Load Test Report in accordance with the Drilled Shaft Load Test Program. Prior to construction of any production drilled shafts in the area(s) represented by the load test(s), Developer shall submit the Drilled Shaft Load Test Report to ADOT.

300.04.02.02 Drilled Shaft Installation Plan

Developer shall prepare a Drilled Shaft Installation Plan that includes the following information:

- A. List of proposed equipment to be used including cranes, drills, augers, bailing buckets, final cleaning equipment, desanding equipment, slurry pumps, sampling equipment, tremies or concrete pumps, casing, etc.;
- B. Details of overall construction operation sequence and the sequence of shaft construction in bents or groups;
- C. Details of shaft excavation methods, including equipment and procedures for checking the dimensions and alignment of each shaft excavation;

- 1 D. When slurry is required, details of the method proposed to mix, circulate and desand slurry, and
2 methods proposed;
- 3 E. Details of methods to clean the shaft excavation;
- 4 F. Details of reinforcement placement, including support and centralization methods, lifting
5 equipment, and staging location for tied steel reinforcement cages prior to placement;
- 6 G. Details of concrete placement, including concrete volumetric charts;
- 7 H. Details of casing dimensions, material, and splice details;
- 8 I. Details of concrete mix designs and mitigation of possible loss of slump during placement;
- 9 J. List of work experience for previous similar projects;
- 10 K. Other information shown on the Plans or requested by ADOT;
- 11 L. Emergency horizontal construction joint method if unforeseen stoppage of Work or interruption
12 in concrete delivery occurs; and
- 13 M. Details of any special access or setup requirements needed to position the drill equipment to
14 advance drilled shaft excavations.

15 Not less than 20 Business Days prior to drilled shaft construction, Developer shall submit the Drilled Shaft
16 Installation Plan to ADOT.

17 **300.04.02.03 Drilled Shaft QC/Integrity Testing**

18 Developer shall perform quality control testing and integrity testing of all constructed drilled shaft
19 foundations except for traffic related drilled shaft foundations as noted in Section 600.04.13.06 of the
20 TPs. Quality control testing and integrity testing shall include ultrasonic crosshole testing in accordance
21 with ASTM D6760 and geophysical logging (gamma logging) in accordance with ASTM D6274.

22 Developer shall perform drilled shaft testing no earlier than 48 hours after placement.

23 Developer shall prepare a Drilled Shaft Quality Control Report that presents the results of quality control
24 and integrity testing of drilled shaft foundations including IQF documentation of the construction. Not less
25 than 10 Business Days prior to construction of any structure on the associated drilled shaft foundations,
26 Developer shall submit the Drilled Shaft Quality Control Report to ADOT.

27 **300.04.03 MSE Walls**

28 Developer shall construct MSE walls in accordance with the FHWA *Geotechnical Engineering Circular No.*
29 *11, Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes*.

30 Developer shall determine placement tolerances for MSE wall facing elements that shall be included in
31 Developer's special provisions for MSE walls.

300.04.04 Soil Nail Walls

Developer shall Design and Construct soil nail walls in accordance with TP Attachment 600-4.

300.04.05 Slope Stability & Protection

Developer is responsible for slope stability throughout the Project, both within and adjacent to the Project ROW. If any slope instability develops during construction, Developer shall cease all Work in the immediate area within and around the unstable ground until the situation is fully assessed by the Geotechnical Manager. Developer shall implement temporary slope stabilization measures to ensure the safety of the public and Developer's personnel prior to returning to Work in the area of unstable ground.

All permanent slope stabilization measures shall meet the aesthetic treatment requirements of Section 800 of the TPs and comply with the minimum global slope stability safety factors in accordance with the *AASHTO LRFD Bridge Design Specifications*, the *FHWA Soil Slope and Embankment Design and Construction – Reference Manual* (FHWA-NHI-01-026, 2002) and the *FHWA Rock Slopes – Reference Manual* (FHWA-NHI-99-007, 1998).

300.04.06 Instrumentation Report(s)

Developer shall prepare an Instrumentation Report(s) containing the data and results of the monitoring of instrumentation of all geotechnical Work that requires monitoring as described in Section 300.03.03.05 of the TPs. The Instrumentation Report(s) shall include the following:

- A. The types, locations, and depths of installed instruments;
- B. Description of the reading procedures and frequencies;
- C. Updated summary plots of readings;
- D. A brief commentary that identifies all significant changes in the measured parameters since the previous Instrumentation Report;
- E. Probable causes of these changes; and
- F. Recommended mitigation action(s) as necessary.

Developer's data interpretation procedure shall include evaluation of the data to determine reading correctness and to detect changes requiring immediate action. Developer shall correlate instrument readings with other factors (cause and effect relationships) and evaluate the deviation of the readings from the predicted behavior. The Instrumentation Report shall also include a certification from the Geotechnical Manager confirming that the objectives of the Instrumentation Plan have been achieved and construction of the subject Work may proceed. In accordance with the requirements described in the Instrumentation Plan, Developer shall submit Instrumentation Report(s) to ADOT for approval. Within 3 Business Days of each recording, Developer shall submit all Instrumentation Data for each recording to ADOT.

300.05 Submittals

Table 300-4 reflects a nonexclusive list of Submittals identified in Section 300 of the TPs and is not intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental Entities. Unless otherwise indicated, Developer shall submit all Submittals both electronic and hardcopy

- 1 format. At a minimum and unless otherwise specified in the Contract Documents, Developer shall submit
- 2 the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 300-4 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Geotechnical Software	3	0	1	As part of the Basis of Design Report	300.02.03
SPT Hammer Calibration Records	3	0	1	Prior to execution of the geotechnical investigation	300.02.04
Boring and Access Plan	3	0	1	Prior to execution of the geotechnical investigation	300.03.01
Encroachment Permits for use on ADOT ROW, City Permits as required	3	0	1	Prior to execution of the geotechnical investigation	300.03.01
Preliminary Geotechnical Engineering Report	3	0	1	At the same time as Preliminary Design Submittal of the associated design	300.03.02
Final Geotechnical Engineering Report	3	0	1	At the same time as Final Design Submittal of the associated design	300.03.02
Geotechnical Supplement	3	0	1	At the same time as subsequent Submittal of the associated design	300.03.02
As-Built Geotechnical Engineering Report	3	1	1	As part of the Record Drawing Submittal	300.03.02
Instrumentation Plan	3	0	1	At the same time as Preliminary Geotechnical Engineering Report	300.03.03.05
Drilled Shaft Load Test Program	3	0	1	Within 20 Business Days prior to performing the load test(s)	300.04.02.01
Drilled Shaft Load Test Report	3	0	1	Prior to construction of any production drilled shafts in the area(s) represented by the load test(s)	300.04.02.01
Drilled Shaft Installation Plan	3	0	1	Not less than 20 Business Days prior to drilled shaft construction	300.04.02.02
Drilled Shaft Quality Control Report	3	0	1	Not less than 10 Business Days prior to construction of any structure on the associated drilled shaft foundations	300.04.02.03

Table 300-4 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Instrumentation Report(s)	3	0	1	In accordance with the requirements the Instrumentation Plan	300.04.06
Instrumentation Data	5	0	1	Within 3 Business Day of each recording	300.04.06
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

End of Division

1

Division IV, Surface Treatments and Pavements

400 PAVEMENT DESIGN

400.01 General Requirements

Developer shall perform all pavement Design Work in compliance with the requirements of Section 400 of the TPs. Pavement work for roadways and streets outside ADOT jurisdiction shall be performed in accordance with the requirements of the authority having jurisdiction.

Developer shall identify the necessary limits of Work on roadways and streets to meet the requirements of the Project. The localized limit of Work shall conform to the following:

- A. Widening or reconstruction of any portion of an asphaltic concrete roadway shall require that the entire roadway width be, at a minimum, resurfaced within the longitudinal limits of the widening or reconstruction to a depth of 2 inches. Removal and replacement of edge treatment shall not be considered reconstruction of asphaltic concrete roadway;
- B. Addition of sidewalks outside an existing roadway or curb and gutter replacement shall not require that the existing road be resurfaced;
- C. Developer shall resurface the entire width of a roadway after any portion of the roadway has been subject to obliteration of permanent or temporary pavement markings for a longitudinal distance of 50 feet beyond the last obliterated marking. Resurfacing shall include removal and replacement of AR-ACFC or removal and replacement of asphaltic concrete roadway to a depth of 2 inches. Where the full width of the roadway is separated by raised curb or barrier, the resurfacing shall be the full width of the direction of travel affected by stripe obliteration;
- D. Utility patching on roadways within 150 feet of the otherwise established paving or resurfacing limits shall require that the paving or resurfacing limits be extended to cover the Utility patching;
- E. All existing AR-ACFC in the Project Limits shall be removed within 365 Days of NTP 2 except for existing bridge decks with AR-ACFC that require AR-ACFC to be replaced at the completion of the Project. AR-ACFC may remain in place until the final AR-ACFC is to be installed adjacent to the existing bridge deck; and
- F. Within 90 Days of AR-ACFC removal, Developer shall prepare a Pavement Inventory and Recommended Repair Report documenting the identified existing PCCP condition and repair recommendations, including PCCP spall repairs, full depth slab repairs, and PCCP joint and crack repair, for the existing PCCP planned to remain within the Project Limits. Costs associated with the PCCP repairs will be paid for as an ADOT-Directed Change. For portions of the project receiving diamond grind, a supplementary report providing recommendations specifically for joint and crack repair shall be provided within 90 days after the diamond grinding is completed.

The limits of milling and resurfacing for roadways intersecting the Project shall extend beyond the curb return or to the limits of Construction Work required to tie into existing pavement, whichever is greater.

400.02 Administrative Requirements

400.02.01 Standards

Developer shall perform all pavement Design Work in accordance with the standards, manuals, and guidelines listed in Table 400-1 which are shown in no order of precedence; however, in the event of a conflict, the more stringent requirement prevails. Local Requirements apply where Work is within maintenance limits of the Local Jurisdictions.

Table 400-1 Design Standards		
No.	Agency	Title
1	AASHTO	Guide for Design of Pavement Structures, 1993 (I-GDPS-4) and 1998 Supplement
2	ADOT	Materials Preliminary Engineering and Design Manual (MPE&D), last revised 1992
3	ADOT	Pavement Design Standard Items
4	ADOT	Construction Standard Drawings
5	ADOT	ADOT Pavement Design Manual, September 29, 2017

400.03 Design Requirements

400.03.01 Pavement Design

A Pavement Design Summary (PDS) and Materials Design Report (MDR) have been prepared for ADOT roadways on this Project and are included in TP Attachment 400-1. These documents include minimum pavement structural sections and materials specifications that shall be used on the Project. Information regarding Temporary Pavement and Detour Pavement design shall be in accordance with the PDS and MDR. The pavement structural section layer thicknesses in the MDR shall not be reduced by Developer. Developer shall improve the existing subgrade when the top three feet of finished subgrade does not meet the Subgrade Acceptance Chart provided in the MDR.

For new, modified, repaired, or widened pavement maintained by Governmental Entities, Developer shall design and construct pavement per that Governmental Entity's current pavement design standards and guidelines at a minimum. For City of Phoenix, Developer shall reference TP Attachment 400-2. For City of Tempe, Developer shall refer to the *Tempe Supplement to the MAG Uniform Standard Details and Specifications for Public Works Construction*, Details T-303 thru T-306 for pavement criteria. Developer shall perform confirmation checks using the 2017 ADOT Methodology (based off AASHTO 1994) based on subgrade and traffic data. City of Tempe street classifications for pavement design include:

- A. Local 48th Street, East of SR 143: C-1;
- B. Broadway Road, from 48th Street to 52nd Street (excluding bridge structure): A-1;
- C. Frontage Road, from 52nd Street to east limit of construction: A-1;
- D. Alameda Drive, cul-de-sac east of I-10: C-1;
- E. Diablo Way, west of I-10 between Alameda Drive and Fairmont Drive: C-1; and
- F. South Diablo Way, north of Southern Avenue: C-1.

Developer shall provide microsurfacing to Southern Avenue within the limits of the Schematic ROW, excluding the existing concrete pavement. Microsurfacing shall be in accordance with TP Attachment 400-3.

Developer shall submit necessary calculations, memoranda, geotechnical information, reports and back-up information for review and approval with the Preliminary Design and Final Design Submittals.

Additional pavement requirements are as follows:

- A. Shoulders shall be constructed with the same pavement structural section thickness as is required for the adjacent lane (general purpose, C-D, auxiliary, ramp, or HOV as appropriate) by the PDS and MDR;
- B. Gores shall be constructed with the same structural section as the adjacent ramp;
- C. Crossroads shall have a minimum structural section equal to or greater than the existing crossroad pavement structural section, including both pavement and base material types and thicknesses;
- D. Developer shall anticipate the need for subgrade treatments or improvements consistent with those shown in the as-built drawings in the RIDs for adjacent sections. Additional subgrade treatments or improvements may be required depending on the outcome of Developer's geotechnical investigation; and
- E. New pavement for I-10 general purpose lanes and auxiliary lanes shall have load transfer dowels.

400.03.02 Related Pavement Materials Specifications

Unless otherwise specified herein, pavement materials shall comply with the requirements of the documents noted:

- A. ADOT Stored Specifications;
- B. ADOT Standard Specifications for Road and Bridge Construction; and
- C. ADOT Roadway Group Pavement Design Standard Items (refer to: <https://azdot.gov/business/engineering-and-construction/roadway-engineering/pavement-design>).

400.03.03 Asphaltic Rubber-Asphaltic Concrete Friction Course

Developer shall include an AR-ACFC overlay as specified below and in accordance with Section 414 of the ADOT Standard Specifications and Stored Specification 414ACFAR.

400.03.03.01 General Placement Limits & Requirements

The maximum vertical differential between top of AR-ACFC overlay and top of pavement section where the AR-ACFC overlay ends is 0.5 inches. Developer shall provide an AR-ACFC lateral overlay thickness transition over a minimum 1 foot horizontal distance where overlay ends and a longitudinal overlay thickness over a minimum of 20 foot horizontal distance where overlay ends.

1 Developer shall show the AR-ACFC limits on the Plans.

2 **400.03.03.02 Mainline I-10 and Mainline US 60**

3 AR-ACFC placement along mainline I-10 and mainline US 60 shall extend to the limits noted:

4 A. Low side shoulder – place AR-ACFC to two feet beyond the edge line/stripe; and

5 B. High side shoulder – place AR-ACFC to face of barrier or curb flowline.

6 **400.03.03.03 Bridges**

7 Existing AR-ACFC on the I-10 bridges over Salt River shall be removed and not replaced. See Table
8 400-2 for AR-ACFC requirements for other bridges.

9 **400.03.03.04 Service Interchange Ramps**

10 AR-ACFC placement along service interchange ramps east of the existing 40th Street centerline
11 shall extend onto the ramp 50 feet beyond the back of paved gore, from the face of barrier or curb on
12 the high side to 2 foot beyond the shoulder stripe on the low side.

13 Refer to Table 400-2 for additional information.

14 **400.03.03.05 System Interchange Ramps**

15 For existing US 60 system interchange ramps that connect to I-10, AR-ACFC placement shall extend the
16 entire length of the ramps and from the face of barrier or curb on the high side to 2 foot beyond the
17 shoulder stripe on the low side.

18 For new US 60 system interchange ramps, AR-ACFC placement shall extend onto the ramp 50 feet
19 beyond the back of mainline paved gores, from the face of barrier or curb on the high side to 2 foot
20 beyond the shoulder stripe on the low side.

21 Refer to Table 400-2 for additional information.

22 **400.03.03.06 Removal and Replacement Limits**

23 Developer shall remove and replace existing AR-ACFC without damaging the existing PCCP or bridge
24 joints. The existing AR-ACFC overlay shall be removed within the entire Project Limits including I-10, US
25 60 to existing Station 50+00 (or as dictated by replacement limit), full lengths of system interchange
26 ramps, and full lengths of service interchange ramps. AR-ACFC shall be replaced within the Project Limits
27 shown in Table 400-2. The AR-ACFC mill and overlay limits shall also be extended to repair or replace
28 impacts of traffic control.

Table 400-2 AR-ACFC Limits		
Location	Begin	End
EB I-10	Existing intersection of 40 th Street Centerline	I-10 Station 8445+00 (see note)

Table 400-2 AR-ACFC Limits		
Location	Begin	End
WB I-10	Existing intersection of 40 th Street Centerline	I-T0 Station 8445+00 (see note)
EB US 60	System Interchange with I-10	US 60 Station 50+00 (see note)
WB US 60	System Interchange with I-10	US 60 Station 50+00 (see note)
Service TI Ramps (I-10 and US 60) east of existing 40 th Street Centerline	Remove existing and replace 50 feet from back of ramp gore toward crossroad	
US 60 System TI Ramps Existing DHOV Ramp Existing WB US60 to EB I-10 Existing EB I-10 to EB US 60 New WB US60 to WB I-10	AR-ACFC placement shall extend the entire length of the ramps and from the face of barrier or curb on the high side to 2 foot beyond the shoulder stripe on the low side.	
US 60 System TI Ramps WB I-10 to EB US60 New WB US60 to WB C-D	AR-ACFC placement shall extend onto the ramp 50 feet beyond from the back of mainline paved gores, from the face of barrier or curb on the high side to 2 foot beyond the shoulder stripe on the low side. The bridges between these limits shall <u>not</u> have AR-ACFC replaced.	
Note: Begin/End locations are a minimum pending impacts of traffic control striping. Stations provided are from existing centerline stationing.		

Limits of existing I-10 mainline AR-ACFC that are removed and not replaced with new AR-ACFC shall be treated with a diamond grind as specified in the PDS and MDR. Ramps shall not be required to receive diamond grind application. The diamond grind shall extend the full width of the mainline pavement including shoulders. Shoulders with a vertical obstruction shall receive a diamond grind within 2 feet of the vertical obstruction. The limits of diamond grind shall be identified on the Plans.

400.03.04 Pavement Design Summary and Materials Design Report

Developer shall use the geotechnical information from its own geotechnical studies plus any supplemental information provided by ADOT, to generate an Preliminary and Final Pavement Design Summary (PDS) and Preliminary and Final Materials Design Report (MDR) for all pavement sections that result from Developer's proposed alignment changes that affect traffic volumes compared to the alignments shown in the Schematic Design, subject to Section 6.4.2 of the Agreement. Coordination with ADOT in developing recommendations is required. Developer's Final PDS and MDR must be approved prior to beginning construction of the applicable Project elements.

The Initial and Final PDS and MDR shall include the appropriate report sections noted in the ADOT *Pavement Design Manual*.

At the same time as the Preliminary Design Submittal of the pavement structural section Plans, Developer shall submit an Initial PDS and MDR to ADOT. At the same time as the Final Design Submittal of the pavement structural section Plans, Developer shall submit a Final PDS and MDR to ADOT.

400.03.05 Use of AC Miscellaneous Structural as AC Base

Developer shall use AC Miscellaneous Structural as AC Base. Material shall be in conformance with Stored Specification 409ACMS underneath PCCP at locations shown in the MDR.

400.03.06 Modification to Pavement Sections at DPS Turnaround

Developer may use a thinner pavement section as shown in the MDR for areas used for DPS Turnaround. Locations of modified pavement sections must be approved by ADOT.

400.03.07 Recycled Concrete Base

Developer may use aggregate subbase and aggregate base comprised of up to 100 percent salvaged materials. Developer shall ensure the salvaged materials is from Portland cement concrete produced by the crushing method, and in conformance to the gradation requirements and plasticity index. Developer shall ensure the gradation requirement and plasticity index are equal to unrecycled materials. The Developer shall ensure no additional risks are added to ADOT or third parties. Developer shall not use Recycled Concrete Base on Flexible/Asphaltic Concrete Pavement Sections.

400.04 Construction Requirements

400.04.01 Standards

Developer shall perform all pavement Construction Work in accordance with the standards, manuals, and guidelines listed in Table 400-3 which are shown in no order of precedence; however, in the event of a conflict, the more stringent requirement prevails. Local Requirements apply where Work is within maintenance limits of the Local Jurisdictions.

Table 400-3 Construction Standards		
No.	Agency	Title
1	ADOT	Construction Standard Drawings (C-standards)
2	ADOT	Standard Specifications for Road and Bridge Construction, 2008

400.04.02 Paving Plans

400.04.02.01 Asphaltic Concrete Pavement

Developer shall prepare construction Paving Plans for the Project. Each Paving Plan shall include the following:

- A. A detailed sequence and schedule of asphaltic concrete (AC) pavement placement operations, including the following:

1. Width of pavement to be placed;

2. Proposed equipment;
 3. Production rates;
 4. Working hours; and
 5. Asphalt concrete hauling;
- B. Placement and compaction methods;
- C. A detailed staking plan for subgrade controls, including offset requirements; and
- D. A Traffic Control Plan for pavement construction operations that includes provisions for the placement and maintenance of barriers required to protect the pavement from traffic.

400.04.02.02 Portland Cement Concrete Pavement

Developer shall prepare construction Paving Plans. Each Paving Plan shall include the following:

- A. A detailed sequence and schedule of PCCP placement operations, including the following:
1. Width of pavement to be placed;
 2. Proposed equipment;
 3. Production rates;
 4. Working hours;
 5. Concrete hauling;
 6. Placement methods; and
 7. Curing, sawing, and sealing methods;
- B. A detailed staking plan for subgrade controls, including offset requirements;
- C. Details of the layout of all longitudinal, transverse, weakened plane, and expansion joints, including joint sequence, dimensions, and locations of dowels and dowel baskets, which shall be in accordance with ADOT Construction Standard Drawings (C-standards); and
- D. A Traffic Control Plan for pavement construction operations that includes provisions for the placement and maintenance of barriers required to protect the pavement from traffic for a minimum of 7 Days after PCCP placement.

400.04.02.03 Paving Plans Submittal

Not less than 20 Business Days prior to paving, Developer shall submit each Paving Plan(s) to ADOT and IQF.

400.04.03 Pavement Subgrade Materials Requirements

Developer shall ensure and verify that the materials encountered or imported comply with the effective modulus of subgrade reaction (rigid pavement), resilient modulus (flexible pavement), or other design subgrade support value as evaluated in accordance with the ADOT *Pavement Design Guide* and utilized by Developer for the structural section design.

400.04.04 Asphaltic Concrete Pavement

Within ADOT maintenance limits, Developer shall construct AC pavement in accordance with the PDS and MDR.

400.04.05 Asphalt Rubber-Asphaltic Concrete Friction Course

ADOT will evaluate the AR-ACFC superficial treatment for smoothness for each 0.1 lane-mile increment in accordance with the provisions of *Arizona Test Method 829*. Developer shall request smoothness testing within 10 Business Days of placement of the AR-ACFC surface treatment on traffic lanes longer than 0.3 miles. Smoothness shall conform to the requirements of Section 415-7.06 of the ADOT Standard Specifications.

All new AR-ACFC shall have an international roughness index (IRI) less than or equal to 50 inches/mile. Developer shall remove full lane widths in any segment of AR-ACFC having an IRI greater than 50 inches/mile and replace with new AR-ACFC.

Upon completion of any necessary pavement replacement, Developer shall retest the 0.1 lane-mile increments containing replaced areas in accordance with the provisions of *Arizona Test Method 829*.

400.04.06 Portland Cement Concrete Pavement

If Developer constructs paving widths that are less than the full main roadway width, Developer shall locate new longitudinal construction joints outside of the wheel-path. Existing longitudinal construction joints may be located within the wheel-path or crossing the wheel-path. The wheel-path shall be defined as 1 foot either side of 3 feet from the nearest lane line or edge line (not within 2 to 4 feet and 8 to 10 feet of a 12 foot lane).

IQF shall evaluate PCCP thickness in accordance with Section 401-4.04 of the ADOT Standard Specifications and the Contract Documents. Developer shall ensure that the PCCP thickness and compressive strength complies with the material and construction requirements of Developer's pavement designs and the Contract Documents. Penalties shall be in accordance with Section 401-6 of the ADOT Standard Specifications.

All PCCP joints shall be sealed. A bituminous sealant shall be used for PCCP joints within limits of AR-ACFC placement. A silicone sealant shall be used for PCCP joints with no AR-ACFC placement.

IQF shall evaluate PCCP, whether it will be overlaid or not with AR-ACFC, for smoothness in accordance with *Arizona Test Method 801* and Section 401-4.02 of the ADOT Standard Specifications and the Contract Documents. The profile index of the new PCCP overlaid with AR-ACFC shall be a maximum of 7 inches/mile for every 0.1 lane mile section. New PCCP not overlaid with AR-ACFC shall be a maximum of 3 inches/mile for every 0.1 lane mile section.

IQF shall test the PCCP surface with a 10 foot long straightedge in accordance with Section 401-4.02 of the ADOT Standard Specifications and the Contract Documents. The pavement surface shall

not vary in any direction by more than 0.125 inches, except at longitudinal and transverse construction joints. The pavement surface shall not vary by more than 0.25 inches across any longitudinal or transverse construction joint.

Developer shall grind high areas or bumps not meeting the required pavement tolerances.

Upon completion of any necessary corrective actions, IQF shall retest repaired PCCP areas to verify that corrections have produced the required improvements. If surface texture is removed as a result of corrective actions, Developer shall groove PCCP.

Developer shall longitudinally tine all new PCCP roadway surfaces that will be exposed to traffic prior to an overlay with AR-ACFC in accordance with Section 401-3.04 (F) of the ADOT Standard Specifications and the Contract Documents. In areas where new PCCP is adjacent to existing pavement requiring diamond grind, Developer may utilize surface texturing method necessary to achieve a skid resistant surface as approved by ADOT.

400.04.07 Pavement Mix Designs

Developer shall prepare Pavement Mix Designs for the Project no less than 20 Business Days prior to paving.

Pavement Mix Designs are considered Shop Drawings and Working Drawings.

Developer shall submit Pavement Mix Designs, with the exception of AR-ACFC, to IQF for IQFs review and approval. Developer shall submit Pavement Mix Design for AR-ACFC to ADOT for ADOT's review and approval for AR-ACFC within ADOT's maintenance limits. Developer shall submit the Pavement Mix Designs for pavement within Governmental Entity maintenance limits for their review and approval.

ADOT will develop the AR-ACFC mix design based upon the requirements in the MDR.

400.05 Submittals

Table 400-4 reflects a nonexclusive list of Submittals identified in Section 400 of the TPs and is not intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 400-4 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Final Pavement Inventory and Recommended Repair Report	3	0	1	Within 90 Days of AR-ACFC removal	400.01

Table 400-4 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Initial PDS	3	0	1	At the same time as Preliminary Design Submittal of the pavement structural section Plans	400.03.04
Final PDS	3	1	1	At the same time as Final Design Submittal of the pavement structural section Plans	400.03.04
Initial MDR	3	0	1	At the same time as Preliminary Design Submittal of the pavement structural section Plans	400.03.04
Final MDR	3	1	1	At the same time as Final Design Submittal of the pavement structural section Plans	400.03.04
Paving Plans	3	0	1	Not less than 20 Business Days prior to paving	400.04.02
Pavement Mix Designs	3	0	1	Not less than 20 Business Days prior to paving	400.04.07
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

End of Division

Division V, Drainage Facilities

500 DRAINAGE DESIGN

500.01 General Requirements

Developer shall perform all drainage Work in compliance with the requirements of Section 500 of the TPs. Developer shall provide a drainage design that minimizes off-site impacts in accordance with Section 500 of the TPs.

500.02 Administrative Requirements

500.02.01 Standards

Developer shall perform all drainage Design Work in accordance with the standards, manuals, and guidelines listed in Table 500-1, which are shown in no order of precedence; however, in the event of a conflict, the more stringent requirement prevails.

Table 500-1 Design Standards		
No.	Agency	Title
1	ADOT	Roadway Design Guidelines, Chapter 600 (MAY 2012, REV APRIL 2014)
2	ADOT	Highway Drainage Design Manual, Hydraulics Final Report (January 2007)
3	ADOT	Highway Drainage Design Manual, Vol 2 Hydrology (2 nd Edition, 2014)
4	ADOT	Drainage Design Memorandums posted on ADOT Roadway Section Website
5	ADOT	Pipe Selection Guidelines and Procedure, February 1, 1996
6	FHWA	Hydraulic Design of Highway Culverts, Hydraulic Design Series No. 5 (3 rd Edition, 2012)
7	FHWA	Urban Drainage Design Manual, Hydraulic Engineering Circular No. 22 (3 rd Edition, Sep 2009, Rev Aug 2013)
8	FHWA	Culvert Inspection Manual (Final Report, July 1986)
9	NCHRP	Assessment and Rehabilitation of Existing Culverts (2002)
10	ADOT	Construction Standard Drawings

500.02.02 Data Collection

Developer shall collect all pertinent data associated with the Project including any historical analyses/studies, as-built plans, and drainage reports. Collection and documentation of data shall conform to the guidelines set forth in the ADOT *Highway Drainage Design Manual, Hydraulics Final Report (January 2007)*.

Developer shall create a Drainage inventory of all existing drainage facilities that are planned to remain based on the Existing Conditions Site Documentation per Section 117.01 of the TPs, within the Project Limits, including structures, culverts, ditches, and storm drains. All drainage facilities that are to remain shall be thoroughly cleaned prior to inspection and the existing condition assessment. Information required for the assessment shall include the condition, size, material, location, recommendation of cleaning or repair, videotape/photographs, and other pertinent information.

1 The inspection and assessment of the existing drainage facilities shall be conducted by an individual that
2 holds current National Association of Sewer Service Companies (NASSCO) Inspector Training
3 Certification (ITCP), Pipeline Assessment Certification (PACP), Manhole Assessment Certification
4 (MACP) and Lateral Assessment Certification (LACP). No less than 20 days before starting such work,
5 Developer shall submit the person's resume and/or evidence of the required certifications to ADOT, and
6 such individual shall be subject to ADOT's approval. Drainage facility inspection and recommended
7 repairs shall be in accordance with the corresponding Standards identified in Table 500-1. Developer
8 shall prepare and submit an Existing Drainage Facility Condition Memorandum within 120 Days of NTP
9 1 to summarize the initial inspections of storm drain facilities identifying conditions and clogged pipes.
10 Costs associated with the clog removals and repairs will be paid for as an ADOT-Directed Change.

11 **500.02.03 Third-Party Drainage Coordination**

12 Developer shall coordinate all drainage designs with all Governmental Entities and Utility Companies, as
13 applicable.

14 Drainage facilities within maintenance limits of Governmental Entities' jurisdictions shall be designed
15 according to the governing jurisdiction.

16 Developer shall coordinate with the administrator of the floodplain for each Local Jurisdiction as needed
17 throughout the Project Limits. If a FEMA map revision is found to be warranted for the Project by the
18 administrator of the floodplain, Developer shall prepare all necessary documentation and analyses that
19 are required to be submitted to the local Floodplain Administrators for approval. Additional information is
20 provided in Section 500.03.06 of the TPs.

21 **500.02.04 Software**

22 Developer shall use drainage software that is fully transferable with the software in use by ADOT. All
23 software shall comply with the manuals listed in Table 500-1. Software includes HEC-RAS, HEC-HMS,
24 StormCAD, Bentley InRoads Storm and Sanitary, HY8, and FHWA *Hydraulic Toolbox*. Other software
25 may be used with the prior approval of ADOT. Developer may use FLO-2D as outlined in Section
26 500.03.04 of the TPs with approval of ADOT.

27 Stormwater routing in association with the SR 143/Tempe Drain system, beginning north of Guadalupe
28 Road, and terminating east of the Salt River, may be conducted using the USEPA Storm Water
29 Management Model (SWMM) software.

30 **500.03 Design Requirements**

31 **500.03.01 General**

32 Developer shall design all elements of the drainage system(s) for the Project to provide a complete and
33 functional drainage system that complies with the requirements in the Contract Documents. Developer
34 shall design all drainage improvements in a manner that accounts for all existing and proposed tributary
35 areas within and/or outside of the Project ROW as well as the current and future land uses. When design
36 discharges originate or terminate outside of the Project ROW, the more stringent of the Contract
37 Documents or the governing agency's drainage criteria shall be used.

38 When determining the parameters for design, Developer shall conduct thorough due diligence (i.e.,
39 reviewing approved zoning maps and land use maps) to estimate the existing and future land use
40 parameters. Developer shall assess the resulting discharges from the land use evaluations and design
41 drainage improvements giving priority to the discharges with greatest impact, while also complying with

the Local Jurisdiction design criteria. Developer's design shall not cause adverse backwater, excessive velocities and scour as specified in the manuals listed in Table 500-1, which may negatively affect traffic safety, embankment stability, adjacent property, natural drainage courses, drainage facilities, floodplain developments, upstream drainage systems, and the use of downstream receiving waters. The drainage improvements shall be designed such that post-Project flow discharges are at or below pre-Project flow discharges.

Where drainage patterns are changed from existing patterns, Developer shall obtain all permits, drainage easements, and ADOT and Governmental Approvals prior to construction of any drainage improvements. Any additional Developer ROW beyond what is shown in the Schematic ROW must be approved by ADOT and acquired by Developer in accordance with Section 5.2 of the Agreement and Section 118.03 of the TPs.

Developer shall not permit any increase in water surface elevation compared to the existing conditions upstream or downstream of the Project ROW. Modifications shall be made to new or existing drainage features to achieve no rise in water surface elevation outside the Project ROW or drainage easements due to the Project.

Existing conditions (discharge, velocity, or water surface elevation) at the outfalls to existing drainage conveyance features shall not increase from the existing conditions. Mitigation measures to offset any increase to the existing conditions shall be provided within the Project ROW. Developer shall demonstrate through the drainage report(s) that the proposed design meets the above requirements.

Runoff from roadway ditches shall not cause additional erosion, scour, or undermining to bridge abutments.

Developer shall provide erosion and scour mitigation at the I-10 EB and I-10 WB overbuild pavement transitions west of the I-10 Salt River Bridge.

500.03.02 Drainage Reports

Developer shall document all drainage designs within a drainage report. If the Project is broken into separate segments, Developer shall prepare separate drainage reports that coincide with each segment. Upon completion of the Project, Developer shall combine all segment drainage reports into a single Project wide report that shall be inclusive of all subsequent addenda or versions of the report.

Drainage report submittals shall be commensurate with the stage/level of each submittal of the segment drainage Plans. The final sealed report shall be included with the RFC submittal. As part of the Record Drawing submittal, Developer shall submit the combined Project Drainage Report to ADOT.

500.03.03 Storm Frequency and Design Discharge

500.03.03.01 Design Frequencies

Developer shall use the minimum design frequencies listed in Table 603.2A and Table 603.2B of the ADOT *Roadway Design Guidelines*.

Detention basins located within the ADOT ROW north of Guadalupe Road shall be designed to the 50-year 24-hour storm. South of Guadalupe, existing linear retention, and detention basins along I-10 which were sized as part of the NH-10-3(322) project, shall be modified to accommodate the 100-year 24-hour storm volume from the new impervious roadway surface improvement area. At no time, shall Developer increase runoff from the ADOT ROW. Developer shall document these design requirements compared to ADOT *Roadway Design Guidelines* in the drainage report(s).

1 **500.03.03.02 Stormwater Storage Basins within ADOT ROW**

2 For detention and retention basins within the Project ROW, basins shall be sized for the return frequency
3 as stated in Section 500.03.03.01 of the TPs. Developer must provide computed results showing no
4 runoff increase off the Project ROW.

5 **500.03.03.03 Allowable Spread**

6 Developer shall design drainage systems to limit ponding widths for the design frequency event in
7 accordance with Table 603.2C and Figure 603.2A of the ADOT *Roadway Design Guidelines*.

8 **500.03.04 Hydrology**

9 Developer shall determine design flows based on the following sources, listed in order of relative
10 importance:

11 A. Where highway facilities encroach on established or planned regulatory floodplains, the flood
12 frequency curve approved by FEMA for the site shall be the primary source of data for use in
13 design. In the absence of a FEMA flood frequency curve, runoff rates from drainage studies by
14 Governmental Entities shall be evaluated for use in establishing a design flood frequency curve.
15 Such studies shall be reviewed for appropriateness with regard to the needs of the facility being
16 designed. There may be instances where two hydrologic runoff values shall be used: (1) the
17 FEMA or other agency value, to evaluate the impacts of the ADOT system on the existing FEMA
18 floodplain/floodway; and (2) an ADOT value, to size the drainage facilities;

19 B. Rainfall-runoff models shall be used where stream runoff data are not available. For drainage
20 areas of 160 acres or less, the Rational Method, as defined in the ADOT *Roadway and Design*
21 *Guidelines*, may be used. For drainage areas greater than 160 acres, the Rational Method shall
22 not be used. Developer shall comply with the approved procedures and recommended
23 parameter values for the Rational Method and HEC-HMS/HEC-1 based on ADOT and Local
24 Jurisdiction requirements. Developer shall use the Green and Ampt method to estimate rainfall
25 losses. Developer shall use the S-curve or the Clark unit hydrograph to calculate the unit
26 hydrograph parameters.

27 The latest hydrology studies approved by Local Jurisdictions can be referenced for off-site
28 discharges. Developer must either concur with the ADMS and/or ADMP by statement, or submit
29 additional documentation addressing and substantiating any differences. This includes FLO-2D
30 studies such as *Tempe Area Drainage Master Study* (ADMS), *Hohokam Area Drainage Master*
31 *Plan* (ADMP), and *Ahwatukee Foothills ADMS/P*. Any update to the FLO-2D studies approved
32 by Local Jurisdictions shall be in accordance with ADOT *Highway Drainage Design Manual Vol*
33 *2 Hydrology* (2014). If FLO-2D is used for the offsite Hydrologic and Hydraulic analyses,
34 Developer shall use FLO-2D for the entire Project. At no time shall Developer be allowed to
35 selectively use FLO-2D in isolated locations; and

36 C. Detention basin routing may be used to mitigate storm drain increases in discharge from the
37 onsite drainage system in accordance with Section 500.03.03 of the TPs.

500.03.05 Drainage Improvements

Developer shall provide the drainage improvements in accordance with the subsections outlined below. All drainage appurtenances shall include rock mulch protection in accordance with TP Attachment 500-1. Drainage improvement aesthetic features shall comply with the requirements in Section 800 of the TPs.

500.03.05.01 Inlets

Developer shall provide stormwater drainage improvements such that no ponded water will be retained on Project ROW outside of a designated retention basin. Drainage improvements shall be designed to accommodate runoff from behind proposed retaining walls and barriers to convey side slope runoff to the wall into the proposed storm drain system and prevent stormwater from ponding or draining over the walls. All roadway inlets located within sag conditions shall include flanking inlets.

Developer shall design inlets in accordance with Section 606.2 of the ADOT *Roadway Design Guidelines* and the inlet capture ratios shall be in accordance with Table 606.2 of the ADOT *Roadway Design Guidelines*. All inlets shall comply with the standards and references in Table 500-1. Inlets on roadways that allow bicycle travel shall be bicycle-safe grates. When standard inlets must be modified due to other design constraints, Developer shall design such modified inlets with standard grates and Project loading criteria as approved by ADOT.

Developer shall design all off-roadway inlets (area inlet) within the roadway recovery area with 3 inches or less local depression. Developer shall account for a potential reduction of inflow capacity attributable to clogging using the capture ratios shown in the ADOT *Roadway Design Guidelines*. Developer shall place rock mulch around inlet apron in accordance with Erosion Control Details in TP Attachment 500-1.

500.03.05.02 Storm Drain System

Where physical site constraints preclude handling runoff with open channels, or as required by Section 500 of the TPs, Developer shall design enclosed storm drain systems to collect and convey runoff to appropriate outfall locations.

Developer shall prepare storm drain documentation encompassing all storm drain systems that contains, at a minimum, the following items:

- A. Drainage area maps for each storm drain inlet with pertinent data, such as boundaries of the drainage area, topographic contours, runoff coefficients, time of concentration, land use, design runoff coefficients, discharges, and ponding;
- B. Location and tabulation of all existing and proposed pipe and drainage structures, including size, class, or gauge; catch basin spacing; detailed structure designs; and any special designs;
- C. Specifications for the pipe bedding material and structural pipe backfill on all proposed pipes and pipe alternates; and
- D. Complete pipe profiles, including pipe size, type, and gradient; station offsets from the centerline of the roadway; length of pipe; class/gauge of pipe; and numbered drainage structures with elevations.

1 The maximum allowable hydraulic grade line elevation for the design frequency shall be in accordance
2 with Table 603.2B of the ADOT *Roadway Design Guidelines*. Hydraulic grade lines shall be shown on
3 pipe profiles included in the drainage report(s).

4 For existing storm drain system(s) that are to remain, Developer shall analyze the existing system(s) to
5 determine the hydraulic impact from the proposed roadway configuration and document the analyses in
6 the drainage report(s). All results that violate the hydraulic criteria contained within these TPs shall be
7 mitigated.

8 Manhole spacing shall be in accordance with Table 607.2 of the ADOT *Roadway Design Guidelines*.
9 ADOT manhole covers shall be identified as shown on the ADOT Construction Standard Drawing No. C-
10 18.10.

11 **500.03.05.03 Pipes**

12 Developer shall design storm drain pipes with a minimum velocity of 3 fps when flowing full. Developer
13 shall design all storm drains to sustain all loads using fill heights and D-loads for determining pipe
14 classifications.

15 Developer shall design pipes in accordance with the following requirements:

- 16 A. Lifespan for new and reconditioned pipes shall be in accordance with the ADOT *Pipe Selection*
17 *Guidelines and Procedures*;
- 18 B. If there is an increase in loading on an existing pipe, Developer shall evaluate the impact and
19 mitigate the additional loading;
- 20 C. Pipe inspections and repair recommendations shall be in accordance with FHWA *Culvert*
21 *Inspection Manual*:
 - 22 1. Existing storm drain pipes and pipe culverts that are identified to remain shall be inspected
23 in accordance with Section 500.02.02 of the TPs. Developer shall prepare an improvement
24 plan for all existing pipes that require rehabilitation and that are to remain. The improvement
25 plan shall be included in the existing drainage facility condition and repair
26 recommendations report. Repairs to the existing infrastructure shall be in accordance with
27 a Drainage inventory completed by Developer and submitted to ADOT, based on ADOT's
28 concurrence, as well as the manuals identified in Table 500-1. The costs associated with
29 the repairs of pipes/culverts shall include the Maintenance of Traffic required to facilitate
30 the repairs. Repairs to existing infrastructure shall be compensated as an ADOT-Directed
31 Change as long as the repaired element is used in the final configuration of the Project.
32 The existing condition report with improvement recommendations shall be submitted with
33 the Preliminary Submittal and include a digital copy of the inspection video. No
34 recommended repairs shall commence without prior approval by ADOT of the improvement
35 plan recommendations. Prior to Substantial Completion, Developer shall video record all
36 drainage appurtenances within the Project Limits and prepare a post project condition
37 report or memorandum with a digital copy of the post project video. ADOT will not accept
38 the drainage improvements if the post project condition reveals that Developer adversely
39 impacted the drainage infrastructure. All cost associated with reconditioning or replacement
40 for the post project condition shall be borne by Developer.

2. The existing City of Tempe 48th Street storm drain, 54-inch, 90-inch & 102-inch diameter pipe alignment located east of SR 143 and west of 48th Street, has been identified to be in conflict with the Schematic Design. The alignment runs along the east side of SR 143 beginning south of I-10 and outletting into the Tempe Drain east of SR 143. Changes to existing loading need to be evaluated in accordance with *AASHTO LRFD Bridge Design Specifications* based on the pipe class as indicated in the record drawings. If Developer's design increases loading on the existing pipe, Developer shall document the additional loading as acceptable. If increased loading exceeds the capacity of the pipes, Developer shall provide details to mitigate excess loading. Loading documentation and/or mitigation designs and calculations shall be signed and sealed by Developer and provided to ADOT and City of Tempe for review and approval prior to Work above or that would impact the storm drain.

D. Repairs to existing pipes shall comply with the standards and references provided in Table 500-1 and Section 500.02.02 of the TPs;

E. Pipe diameter: Minimum pipe diameter shall be 24 inches except for pipes serving a single inlet, in which case, an 18-inch minimum diameter is allowed in accordance with the Section 607.1 of the *ADOT Roadway Design Guidelines*. New pipe extensions of existing pipe may match the existing pipe diameter provided hydraulics criteria is met;

F. Pipe Material: New storm drain pipe used as an extension of an existing pipe shall match the existing material. New pipe material shall be in accordance with the *ADOT Pipe Selection Guidelines*. Use of HDPE shall be in accordance with Section 500.04.02.04 of the TPs. Developer shall include new pipe and pipe extension summary sheets in the Plans;

G. Developer shall use the Manning's "n" values in accordance with Table 607.4 of the *ADOT Roadway Design Guidelines*;

H. Pipe depth of cover: Depth of cover shall be 12 inches minimum (top of pipe [crown] to bottom of finished subgrade) in accordance with Section 611.3 of the *ADOT Roadway Design Guidelines*;

I. Through the Schematic Design effort, several storm drain pipes were identified to have potential conflicts with the roadway widening if the pipes are extended or remain in place. These pipes are summarized in Table 500-3. At these locations and other locations with pavement conflicts identified by Developer, Developer shall provide mitigation measures to protect the roadway pavement and pipe to meet the required service life; and

J. Developer shall provide outlet protection in accordance with the Chapter 600 of the *ADOT Roadway Design Guidelines* and the *ADOT Highway Drainage Design Manual, Hydraulics Final Report (January 2007)*, see Table 500-1. When outfall protection is required, Developer shall provide calculations to document the design.

Developer shall locate the proposed trunk line outside the roadway section, except as allowable per Table 500-2. For proposed locations identified in Table 500-2, the trunk line and associated manholes may be installed within the proposed mainline shoulder using cement-treated slurry backfill in accordance with Section 501-3.04 of the *ADOT Standard Specifications*. Existing trunk lines under existing or proposed

- 1 travel lanes shall be removed or abandoned. If trunk lines are abandoned, they shall be grout filled and
- 2 capped. Existing manholes located within proposed travel lanes shall be removed.

Table 500-2				
Trunk Line Locations Allowed Under Shoulder Pavement				
From I-10 Station, Offset	To I-10 Station, Offset	Diameter (in)	Pipe	Location
7972+25, Lt	7976+05, Lt	66	Existing	I-10 @ 32 nd Street
7976+05, Lt	7977+97, Lt	60	Existing	I-10 @ 32 nd Street
7977+97, Lt	7979+76, Lt	--	Proposed	I-10 @ 32 nd Street
7995+23, Lt	8005+97, Lt	--	Proposed	From I-10 @ 36 th Street
8013+39, Lt	8015+18, Lt	--	Proposed	40 th Street Ramp
8018+63, Lt	8029+63, Lt	--	Proposed	I-10 @ 40 th Street
8038+55, Lt	8043+31., Lt	--	Proposed	I-10
8062+65, Lt	8062+65, Lt	--	Proposed	48 th Street Ramp
8117+99, Lt	8120+66, Lt	60	Existing	I-10
8120+65, Lt	8122+11, Lt	--	Proposed	I-10
135+00, Rt (US 60 Ramp SE)	148+00, Rt (US 60 Ramp SE)	--	Proposed	US-60 Eastbound
10+21, Rt (SR 143)	10+64, Rt (SR 143)	90	Existing	Broadway
11+20, Rt (SR 143)	14+49, Rt (SR 143)	90	Existing	I-10 Eastbound
18+20, Rt (SR 143)	25+11, Rt (SR 143)	90	Existing	WB CD-SR 143NB
25+11, Rt (SR 143)	34+03, Rt (SR 143)	102	Existing	WB CD-Univ Ramp C
11+19, Rt (SR 143)	12+30, Rt (SR 143)	54	Existing	I-10 Eastbound
12+30, Rt (SR 143)	14+44, Rt (SR 143)	54	Existing	I-10
16+25, Rt (SR 143)	25+27, Rt (SR 143)	54	Existing	WB CD-SR 143NB

Table 500-3 Storm Drain Pipes/Culverts with Potential Pavement Conflicts			
Mainline Station	As-built Size	Mainline Station	As-built Size
8083+80	18-inch	8275+42	24-inch
8089+50	18-inch	8281+16	10 foot by 3 foot Box
8093+00	18-inch	8286+72	38-inch by 24-inch Elliptical
8267+95	24-inch	8292+82	6 foot by 3 foot Box
8271+60	24-inch	8301+20	36-inch
8274+08	30-inch	8306+32	6 foot by 3 foot Box

500.03.05.04 Channels and Ditches

Developer shall ensure that both channels and ditches have appropriate maintenance access. Developer shall provide maintenance access for channels and ditches greater than or equal to 500 feet in length. If ramps are required to facilitate access into the ditches or channels, the ramps shall have a 10 foot wide minimum bottom width. Maintenance access ramps shall be provided both upstream and downstream of hydraulic structures. Developer shall not locate access ramps closer than 100 feet from the nearest channel transition. Access ramps shall be located on the high side of the channel invert. Access ramps shall have a max slope of 10:1. Access ramps shall slope downward in the downstream direction. If access ramps are not placed as described herein, Developer shall provide justification with calculations to show there are no adverse impacts that will arise from placing the ramp in an upstream orientation.

Developer shall include all necessary erosion control measures, in accordance with Section 612 of the *ADOT Roadway Design Guidelines*, for the drainage channels and ditches, including flexible or rigid channel linings, to prevent scour and sedimentation.

Aggregate lined and unlined channels shall have a maximum side slope of 3:1 (H:V). Concrete-lined channels shall have a maximum side slope of 2:1 (H:V).

Freeboard for drainage channels shall be in accordance with Section 608.4 of the ADOT Roadway Design Guidelines.

500.03.05.04.01 Receiving Waters

Developer shall design for the probability of coincidental occurrences when evaluating the tail water hydraulics for all drainage facilities discharging to receiving waters.

500.03.05.04.02 Fiber-Reinforced Concrete for Channel Lining

The Developer may use macrosynthetic (polymer) fiber reinforcement in concrete for channel linings only. Developer shall comply with minimum reinforcement requirements of AASHTO, the Highway Design Drainage Manual Appendix 7-H, and all requirements in Section 500.03.05.04 of the TPs.

500.03.05.05 Stormwater Storage Facilities

Developer shall design stormwater storage facilities in accordance with ADOT design criteria, in addition to either the AZPDES regulations for water quality and rate control requirements or the Governmental Entity with jurisdiction, whichever is more stringent. All stormwater storage facilities calculations shall be included in the preliminary and final drainage report(s).

Underground storage (tanks or other facilities) shall not be used to mitigate increases in flow rate.

Stormwater storage facilities shall comply with the following requirements:

- A. Outflow discharges from the stormwater storage facilities shall not increase peak discharges downstream of the Project;
- B. When required per Section 800.03.02 of the TPs stormwater storage facilities shall be designed to accommodate vegetation on the upper 1/3 of the basin banks without impacting the available storage capacity required to meet the design requirements;
- C. Stormwater storage facilities shall not retain standing water longer than 36 hours after inflow ceases.
- D. Stormwater storage facilities shall have an emergency spillway in accordance with the *ADOT Roadway Design Guidelines* unless indicated in the ADOT Design Variances per TP Attachment 200-3.
- E. Proposed stormwater storage facilities with bottom width less than 40 feet wide shall be stabilized with minimum 1.25-inch minus granite mulch 2 inches deep to facilitate drive through capabilities. Developer shall provide justification for sizing of the stabilization material.
- F. Proposed stormwater storage facilities with bottom width greater than 40 feet wide shall be seeded per Section 800.03.03.05 of the TPs. Maintenance access ramps into and out of the stormwater storage facilities shall be stabilized with minimum 1.25-inch minus granite mulch 2 inches deep.
- G. A minimum of two Falling Head Percolation Tests are required per retention basin. The recommended testing frequency, based on the basin bottom area proposed for percolation, is listed in Table 500-4:

Table 500-4 Minimum Quantity of Percolation Tests Required	
Retention Basin Bottom Area, A (sf)	Minimum number of Tests Required
$A < 10,000$	2
$10,000 < A < 20,000$	3
$20,000 < A < 30,000$	4
$30,000 < A < 43,560$	5
$A > 43,560$	A minimum of 5. Additional percolation tests may be required if the soil borings indicate variation in soil texture within the proposed percolation area
The tests shall be distributed evenly throughout the retention basin using engineering judgment. For example, when 5 tests are required, the typical distribution assuming a square basin would be a test in each corner and one in the middle.	

Developer shall design the Project without jurisdictional dams. Jurisdictional dams are defined as an artificial barrier for the impounding or diversion of water either 25 feet or more in height above adjacent natural ground or having a storage capacity of more than 50 acre-feet.

500.03.05.06 Culverts

Developer shall analyze existing and proposed culverts, drainageways, and associated appurtenances affected, replaced, or created by the Project design for any localized flooding deficiencies.

Where the culvert design is influenced by upstream storage owned by a Governmental Entity for the purpose of stormwater storage, Developer shall incorporate the analysis of the storage into the design of the culvert. Developer shall analyze all water levels for backwater and design all culverts so that backwater does not increase above existing conditions that extend onto adjacent properties.

Developer shall ensure that culverts comply with the following requirements:

A. Culvert Design shall be in accordance with Section 600 of the ADOT *Roadway Design Guidelines*;

1. Hydraulic calculation: Culverts shall be designed for a minimum design storm in accordance with Table 603.2A of the ADOT *Roadway Design Guidelines* except where a greater storm is required by other considerations.

B. Culvert extensions shall use the same material and height as the existing culvert when hydraulics requirements allow;

C. Service Life for new and rehabilitated culverts shall be in accordance with Section 500.03.05.03 of the TPs;

D. Culvert Inspections and repairs shall be in accordance with Table 500-1 and Section 500.02.02 of the TPs;

E. Existing culverts that are to remain shall be assessed for condition prior to the commencement of Work in accordance with Sections 500.02.02 and 500.03.05.02 of the TPs. Findings shall be

documented in the existing condition and improvement report. The improvements will not be accepted until ADOT has approved the condition of the systems;

F. The minimum box culvert height for new culverts shall be in accordance to the *ADOT Roadway Design Guidelines*;

G. For the design flood, the headwater level shall be no higher than 3 inches below the outside edge pavement. The headwater depth to culvert height ratio shall not exceed 1.5;

H. The 100-year floodwater levels shall not increase the flood damage potential on areas outside of the Project ROW;

I. If the culvert is embedded below thalweg, the area of embedment shall not be included in the culvert capacity analysis. Embedded area shall be clearly identified on the Plans;

J. All culverts shall have end sections or headwalls;

K. Culverts with a span or diameter greater than or equal to 48 inches shall have concrete headwalls;

L. Concrete box culverts shall have inlet cut-off walls. Concrete box culverts shall have an outlet cut-off wall with a minimum 4 foot depth;

M. Culverts with a span or diameter 48 inches or greater shall have an apron with cut-off wall;

N. Concrete cut-off walls shall extend at least 2 feet below the ultimate bed elevation and a minimum of four feet below culvert inverts;

O. Cut-off walls, headwalls, partial headwalls, and aprons, when applicable, shall be attached to the culvert;

P. Developer shall provide outfall protection in accordance with Chapter 600 of the *ADOT Roadway Design Guidelines* and the *ADOT Highway Drainage Design Manual, Hydraulics Final Report*; and

Q. Through the Schematic Design effort, several culverts were identified to have potential conflicts with the roadway widening if the culverts are extended or remained in place. These culverts are summarized in Table 500-3. At these locations and other locations with pavement conflicts identified by Developer, Developer shall provide mitigation measures to protect the roadway pavement and culvert to meet the required service life.

Developer shall design bridge culverts subject to traffic loading in accordance with Section 600 of the TPs.

500.03.06 Additional Requirements

The additional requirements contained in Section 500.03.06 of the TPs are specific items pertaining to this Project and shall incorporate the standard criteria with the manuals listed in Table 500-1.

500.03.06.01 Onsite Drainage

Developer shall not increase flow rates leaving the Project Limits. The use of retention/detention facilities may be necessary to mitigate increases in runoff discharge resulting from the increase in pavement area. When retention basins are planned to be used, Developer shall use single or double ring infiltration tests to estimate infiltration rates at the designed bottom elevation of the basin.

500.03.06.02 FCDMC Guadalupe Flood Retarding Structure

Developer shall coordinate with FCDMC regarding the Guadalupe Flood Retarding Structure to preserve the stability of the dam located between the east side of the South Mountain Resort and I-10. FCDMC contact for this Project is: Jeffery Shelton, (602) 506-4486.

500.03.06.03 Tempe Drain

Limits of Work within this Section 500.03.06.03 of the TPs shall be between the outfall of the Tempe Drain at the Salt River at approximate existing I-10 Median Alignment station 7945+00 to approximate existing I-10 Median Alignment station 7980+00 where the existing concrete lining begins. The areas approximately 300 feet east and west of 32nd Street are maintained by Flood Control District of Maricopa County and within City of Tempe Right of Way. Access to this area shall be granted to Developer by the IGA between ADOT and the City of Tempe. All Design Documents shall be reviewed and approved by Flood Control District of Maricopa County and City of Tempe. Construction shall also be coordinated with these agencies.

Developer shall remove all trees and vegetation adjacent to and within the existing Tempe Drain channel. Trees in this area for removal are exempt from the Plant Inventory requirements of Section 800.02.03 of the TPs.

An Approved Jurisdictional Determination (provided in the RIDs) was issued by USACE in October 2020 which removes Tempe Drain from USACE's jurisdiction based on the new Navigable Waters Protection (2020) rule.

Developer shall concrete line the Tempe Drain channel. The concrete lined channel shall have a 40 foot bottom width and minimum depth of 6 feet with 2:1 side slopes. The dimensions required are consistent with that of the evaluation and calculations provided in the *Drainage Memo for Tempe Drain* Revised May 2020 as provided in the RIDs. ADOT has coordinated the work of this section based upon this memo with the five stakeholders to the December 19, 1977 IGA. The alignment of the channel shall not be modified. The inverts of the channel shall provide positive drainage from the existing upstream to downstream ends of the channel. Developer shall provide a minimum 12-foot wide maintenance access path along the top of the north and south banks. Two maintenance vehicle access ramps shall be provided between the outlet to the Salt River and 32nd Street into the bottom of the channel in accordance with Section 500.04 of the TPs. The maintenance vehicle access ramps shall be located near the limits of this section of the channel. Developer shall stamp or engrave the delineation between ADOT and City of Tempe Right of Way. ADOT and City of Tempe limits shall be stamped or engraved on the appropriate side of the delineation.

In accordance with the memorandum *ADOT's Improvements to the Tempe Drain for the Phoenix-Casa Grande Highway (I-10) I-17 (Split) to SR 202L Project*, dated May 29, 2020, the required improvement to the Tempe Drain channel will increase hydraulic capacity. Developer may utilize a maximum of two-thirds additional capacity created by the concrete lining provided the increase has no adverse impact to adjacent and upstream properties. Developer shall provide a standalone drainage memorandum similar to that of the *Drainage Memo for Tempe Drain* Revised May 2020 for the Developer's design. The Developer's memorandum shall include total capacity created by the concrete lining, capacity used by the Project, and available capacity at the completion of the Project. Scour mitigation measures shall be

provided for any increase to scour potential at the Salt River. The 100-year event that includes any increase to the current ADOT discharge per the December 19, 1977 IGA shall be used as a check storm within the Tempe Drain to confirm there are no adverse impacts upstream of 32nd Street resulting in back water and that the channel hydraulics meet the design standards in Table 500-1.

500.03.06.04 Calle Guadalupe

Developer shall design a drainage system that will capture the runoff that drains to the south side of Calle Guadalupe at Calle Bella Vista and the area between Calle Bella Vista and Calle Maravilla. The proposed system shall discharge to the existing system that currently outfalls to the northwest corner of Calle Sahuaro and Calle Guadalupe. Design criteria shall be in accordance with ADOT and Maricopa Association of Governments requirements. All effort shall be made to minimize the impact to the residences adjacent to and south of the Project ROW. Restrictions to parcels shall be in accordance with Section 118.05 of the TPs.

500.03.06.05 Ray Road TI

Developer shall not increase runoff leaving the Project ROW. All increased runoff generated from the additional pavement area shall be retained or attenuated to pre-Project levels before exiting the Project ROW. Developer shall include documentation in the drainage report(s) that the post Project hydrologic results do not exceed or match the pre-Project hydrologic results. Developer shall modify the invert of the equipment pass located under the exit ramp from eastbound I-10 to Ray Road to eliminate the existing nuisance ponding without adversely impacting the clearance requirements or other appurtenances within the equipment pass.

500.03.06.06 Pump Stations

Developer shall not increase the flows to existing pump stations. All increased runoff in the Project ROW shall not be directed towards the existing pump stations.

500.03.06.07 Baseline Road to Ray Road Pavement Drainage

Barrier shall be used along the I-10 widened section in three locations:

A. STA 8231+00 to STA 8235+25, LT:

Developer shall install barrier and embankment slope to mitigate fill encroaching into the existing ditch that parallels I-10.

B. STA 8230+75 to STA 8247+75, RT and STA 8263+00 to STA 8281+25, RT:

Developer shall install barrier and embankment slope to mitigate fill encroaching into the existing detention/retention basins. Through these areas, appropriate catch basins and conveyance facilities shall be used to capture the pavement drainage area and convey it to the appropriate basin. Developer shall ensure that the basins receive the same contributing area that would contribute to the basins in an open or uncurbed section.

For these locations, Developer shall finish embankment slopes steeper than 3:1 to mitigate rilling and erosion.

500.03.06.08 Floodplain Encroachment

Developer shall coordinate with the Local Jurisdictions when the Project encroaches in the jurisdiction floodplain. See Section 500.03.08.03 of the TPs for specific information regarding FEMA floodplains.

500.03.07 Temporary Drainage

Refer to Section 700.06.03.06 of the TPs for temporary drainage design and management.

500.03.08 Bridge Hydraulics

500.03.08.01 General Requirements

Developer shall perform all hydraulic Design Work in compliance with the Manuals listed in Table 500-1 and Section 500.03.08 of the TPs.

500.03.08.02 Administrative Requirements

500.03.08.02.01 Standards

Developer shall perform all drainage Design Work in accordance with the standards, manuals, and guidelines listed in Tables 500-1 and 500-5, which are shown in no order of precedence; however, in the event of a conflict, the more stringent requirement prevails.

Table 500-5 Design Standards		
No.	Agency	Title
1	ADOT	Bridge Hydraulics Guidelines (Current Version)
2	FHWA	HEC-18 Evaluating Scour at Bridges (5 th Edition, 2012)
3	FHWA	HEC-23 Bridge Scour and Stream Instability Countermeasures Experience, Selection, and Design Guidance (3 rd Edition, 2009)

500.03.08.02.02 Data Collection

Developer shall collect all data in accordance with Section 500.02.02 of the TPs.

500.03.08.02.03 Coordination with Third Parties

Developer shall coordinate all hydraulics and water resource designs and obtain all applicable approvals from all affected Governmental Entities and Utility Companies.

500.03.08.03 Design Requirements

500.03.08.03.01 General

Developer shall determine if hydraulic structures and appurtenances are defined as a bridge in accordance with ADOT *Bridge Hydraulics Guidelines*, and if so, shall follow such guidelines. The aesthetics for hydraulics structures shall be in accordance with Section 800 of the TPs.

500.03.08.03.02 Discharge Rates

Developer shall collect the available hydrological studies and determine discharge rates in accordance with ADOT *Bridge Hydraulics Guidelines*. Design discharge rates shall be confirmed with the applicable governing Governmental Entity prior to use.

500.03.08.03.03 Design Frequency

The freeway that is part of the Project is designated as Class I route based on drainage frequency classification by ADOT. Storm frequency and hydraulic requirements within the Effective FEMA Special Flood Hazard Zone shall be in accordance with the C.F.R. for the National Flood Insurance Program: 44 C.F.R. Parts 60, 65, 23 C.F.R. Part 650, and Executive Order (EO) 11988.

500.03.08.03.04 FEMA Regulatory Water Courses & Floodplains

Developer shall evaluate and coordinate all impacts to FEMA floodplains with the local Floodplain Administrators.

Developer shall evaluate water surface elevations within the regulatory 100-year FEMA effective floodplain and floodway to ensure any change in water surface elevation profile due to the hydraulic structure(s) or encroachment is mitigated and coordinated with the local Floodplain Administrator. Water surface elevation increases within the floodplain shall be limited to the designated regulatory floodway elevation. For any increase of the water surface elevation of the 100-year flood within a FEMA effective floodplain, Developer shall analyze impacts to adjacent properties and coordinate with local Floodplain Administrator to ensure that the Project's design is consistent with the intent, standards and criteria set by the National Flood Insurance Program. If the Governmental Entity with jurisdiction determines that a revision request to the Floodplain Insurance Rate Map is warranted, Developer shall coordinate with the local Floodplain Administrator to prepare and submit revisions/documents and secure approval from FEMA, including the Conditional Letter of Map Revision (CLOMR) and/or Letter of Map Revision (LOMR), as required by the local Floodplain Administrator.

Local Floodplain Administrator contact information is listed in Table 500-6.

Table 500-6			
Local Floodplain Administrator Contacts			
Jurisdiction	Contact	Phone Number	Email
City of Phoenix	Elise Moore	(602) 262-4960	elise.moore@phoenix.gov
City of Tempe	Gregg Kent	(480) 350-2738	gregg_kent@tempe.gov

If FEMA floodplain impacts are identified in areas of the Project other than the City of Phoenix or City of Tempe, Developer shall identify and coordinate the impacts with the appropriate local Floodplain Administrator. The following jurisdictions have provided process requirements as follows:

City of Phoenix

- A. Prepare hydraulics models and document the results in a Technical Support Data Notebook (TSDN), in accordance with Arizona State Standard SS1;
- B. Submit all digital data and the TSDN to both City of Phoenix and the Flood Control District of Maricopa County (FCDMC), concurrently, for review and approval;
- C. Upon final approval from City of Phoenix and FCDMC, Developer shall submit final documents to City of Phoenix for processing and submittal to FEMA; and
- D. Developer shall be responsible for all costs associated with reviews of the FEMA submittal, including the FEMA review and any necessary public advertising.

City of Tempe

- A. Prepare hydraulics models and document the results in a TSDN, in accordance with Arizona State Standard SS1;
- B. Submit all digital data and the TSDN to City of Tempe for review and approval; and

C. Upon final approval from City of Tempe, Developer shall submit final documents to COT for processing and submittal to FEMA.

D. Developer shall be responsible for all costs associated with reviews of the FEMA submittal, including the FEMA review and any necessary public advertising.

As an example, a typical time frame to obtain Local Jurisdiction and FEMA approval could be as follows:

A. CLOMR (11-14 months assuming two rounds of FEMA review):

1. Engineer prepares CLOMR package including getting a “no effect” determination for ESA compliance (2-4 months);
2. COP/COT review package (1 month);
3. Engineer to address comments and resubmit to COP/COT (1 month);
4. Engineer/COP submit to FEMA for first review (3 months);
5. Engineer to address FEMA comments and resubmit (1 month); and
6. FEMA to approve CLOMR (3 months);

B. LOMR (12-16 months):

1. Engineer to prepare LOMR package with as-built info and public notification (3-5 months);
2. COP/COT review package (1 month);
3. Engineer to address comments and resubmit to COP/COT (1-2 months);
4. Engineer/COP submit to FEMA for first review (3 months);
5. Engineer to address FEMA comments and resubmit (1-2 months); and
6. FEMA to approve CLOMR (3 months).

500.03.08.03.05 Hydraulic Analysis

Developer shall evaluate water surface elevations in the waterway for existing and proposed conditions for sizing of bridge waterway openings. The hydraulic analysis and design shall account for the presence of any additional existing control structures that may affect the hydraulic performance and design of a structure. Developer shall identify and mitigate all negative hydraulic impacts caused by the Project.

The hydraulic analysis of bridge crossings at Effective FEMA Special Flood Hazard Zone shall adhere to those mandates as outlined by the applicable Governmental Entity and federal mandates as contained within C.F.R. for the National Flood Insurance Program: 44 C.F.R. Parts 59, 60, 65, and 70.

Developer shall use HEC-RAS Water Surface Profile Program (the most current version as of the Setting Date) to perform hydraulic analyses at bridge crossings, including culvert structures that meet bridge definitions, for both existing and proposed conditions.

Developer shall perform a preliminary assessment of possible drainage (hydrology and hydraulics) effects on public and private properties adjacent to the Project ROW. If existing hydrologic studies are used, validity of assumptions and accuracy of the results of such studies shall be verified by Developer.

500.03.08.03.06 Scour Analysis

Bridge foundations shall be designed to withstand the effects of scour, as estimated using the methods described in FHWA's HEC-18 and HEC-23 publications and ADOT's *Hydraulic Manual and Bridge Hydraulics Guidelines*, unless otherwise authorized in writing by ADOT. The scour types for analysis shall include long-term scour, general / contraction scour, local scour (pier scour / abutment scour), and scour associated with potential lateral movement. The recommendations from these publications shall be the basis for the design of bridge foundations and for the design of scour countermeasures of waterway bridges.

Deep foundations (piles and drilled shafts) shall not rely on lateral support from soil within the estimated scour depth. If the pile or the drilled shaft is embedded into a rock formation, Developer shall confirm that the rock is not subject to erosion, and if it is, Developer shall design measures to provide lateral support for the structure.

All bridges shall account for debris loading in accordance with ADOT standards and HEC-18 methodologies. The debris shall be assumed to extend 2 feet on each side of the pier and have a depth of 12 feet from the water surface elevation for pier scour estimation.

All piers and abutment foundations shall be evaluated for superflood conditions, in accordance with Section 600.03.01.12 of the TPs, and shall be designed to be stable for the 500-year scour. Revetment at abutments shall be designed in accordance with the procedures in HEC-23. Alternatives to random revetment for bridge abutments in urban areas or those frequently used by pedestrians is not allowed, unless authorized in writing by ADOT.

Developer shall evaluate the scour effects of any gravel mining operations within 1 mile upstream and 2 miles downstream of the bridges. Potential head or tail cutting shall be assessed and mitigated if the head or tail cutting threatens the stability of the bridge. TP Attachment 500-2 shows the mining operations in the Project vicinity. No permits are available from the City of Phoenix or FCDMC. These mining operations should be considered as perpetual and "Grandfathered-In" regarding permit renewal. The design and scour assessment shall be conducted using Developer topographic data of the conditions no older than 6-months prior to the Preliminary submittal of the bridge hydraulics and scour design. Developer topographic data shall be certified and dated by the Survey Manager. Construction of scour mitigation of the existing bridges, if required shall be an ADOT-Directed Change.

500.03.08.03.07 Bridge Deck Drainage

Runoff from Bridge decks shall be conveyed off the bridge, unless otherwise specified in the Contract Documents and shall comply with Section 500 of the TPs. The roadway drainage system shall intercept 100 percent of the pavement runoff prior to entering onto the bridge deck. Developer shall ensure that all stormwater flowing toward any bridge is intercepted upstream from the approach or anchor slab. These drains, or temporary drains, are to be constructed at time of bridge deck placement to prevent erosion.

Deck drains shall be spaced to comply with the design spread criteria in Section 500.03.03 of the TPs. Deck drainage outfalls shall be designed and constructed so as to avoid corrosion of bridge structural members, erosion of embankments, and splashing of moving traffic and sidewalk areas below the bridge. The drainage system shall intercept pavement drainage at both ends of bridges.

Deck drain piping system shall be used when direct discharge to below is not permitted.

Developer shall ensure that deck drains conform to the following requirements:

A. Bridge deck drainage downspouts at piers shall have outfall erosion protection; and

B. Bridge deck drains shall be in conformance with the guidelines included in FHWA's HEC-21.

Developer shall incorporate deck drainage appurtenances in the structural design of the bridge. "Through-drains" (holes in the deck) or slot openings in the structural barrier are not allowed except for the Salt River Bridge on I-10. Any deck drains or inlets must discharge into pipes and/or downspouts except for the Salt River Bridge on I-10. ADOT Standard B-19.10 6-inch pipe drains shall not be used and slot opening parapet drains shall not be used. Bridge deck drainage inlets shall be installed along the gutter line of the low side bridge concrete barrier.

Deck drains per ADOT Standard B-19.10 or approved equivalent may be used along the Salt River Bridge on I-10. If used, these deck drains shall not be placed within the limits of the Rio Salado Pathway and established existing maintenance paths within the limits of the bridge.

The bridge deck drainage inlet type and size shall be consistent with catch basin inlets used previously on other ADOT bridges. Bridge deck drainage inlets shall have removable grating for maintenance. The bridge deck drainage pipe shall have clean-outs or alternative access for maintenance. Pipe material shall be galvanized steel pipe with welded joints. Drainage pipe shall be concealed and/or encased to the maximum extent practicable. All pipes shall be concealed and encased within the substructure; except the actual discharge outlet, which shall have a 6-inch projection to prevent drip staining.

Longitudinal pipe shall not be exposed on the exterior "outboard" side of exterior elements of the bridge and shall be hidden from view inboard of the exterior web of cast-in-place concrete structures or inboard of the exterior girder of precast concrete structures. Transverse pipe at the deck cantilever overhang shall be encased in reinforced concrete using deck thickening (haunches), or an exterior feature (blister/rib), or both. Flexible joints and air gaps, if necessary, shall be designed for movement compatibility and consistency with bridge contraction, deflection, and expansion – in the longitudinal, transverse, and vertical directions. A summary of requirements is as follows:

A. Superstructure – Longitudinal pipe shall not be exposed on the exterior "outboard" side of exterior elements of the bridge framing plan. i.e., longitudinal pipe shall be hidden from view inboard of the exterior web of cast-in-place concrete structures or inboard of the exterior girder of precast concrete structures;

B. Superstructure – Transverse pipe at the deck cantilever overhang shall be encased in reinforced concrete via deck thickening (haunches), or an exterior feature (blister/rib), or both; and

C. Substructure – All pipes shall be concealed and encased within the substructure; except the actual discharge outlet, which shall have 6-inch projection to prevent drip staining.

500.03.08.03.08 Bridge Hydraulics Report

Developer shall prepare an initial Bridge Hydraulics Report for each bridge over a waterway in accordance with the ADOT *Bridge Hydraulics Guidelines*. The initial Bridge Hydraulics Report shall include, at a minimum, the following:

A. A comparison of water surface elevations at each bridge waterway opening between the existing condition and the proposed condition;

- B. All electronic HEC-RAS files;
- C. Concurrences from all applicable Governmental Entities that the design does not affect the effective floodplain in the final Bridge Hydraulics Report or describe actions required to address changes in water surface elevation of the effective floodplain to meet National Flood Insurance Program requirements;
- D. A discussion regarding whether or not the constraints from FEMA studies and/or the impact of the Project to the existing drainage patterns is significant enough to alter concentration of flow patterns to existing structures; and
- E. Scour estimation and documentation that the bridge is designed to withstand 500-year scour.

At the same time as the Preliminary Design Submittal for each bridge, Developer shall submit a preliminary Bridge Hydraulics Report to ADOT. At the same time as the Final Design Submittal for each bridge, Developer shall address ADOT comments on the Initial Bridge Hydraulics Report in a final Bridge Hydraulics Report and shall submit the Final Bridge Hydraulics Report to ADOT for review and comment.

500.03.09 Construction Drawings and Design Calculations

500.03.09.01 Bridge Plans

Developer shall incorporate hydraulic data into the Bridge Plans. At a minimum, the elevation view on the Bridge Plans shall also clearly indicate the following:

- A. The design discharge value, the water surface elevation, and the channel cross section;
- B. The 100-year design discharge elevations of the Effective FEMA Special Flood Hazard Zone;
- C. The super flood discharge (either 500-year discharge or overtopping discharge); and
- D. Design scour depth shall be depicted on the bridge elevation.

500.03.09.02 Construction Drawings

Developer shall coordinate any drainage facilities that are classified as structures through ADOT prior to the Preliminary Drainage Design Submittal.

Developer shall prepare Construction Drawings in accordance with the ADOT *Standardized Dictionary of Work Tasks*. The Construction Drawings, at a minimum, shall include the following:

- A. New Pipe Summary;
- B. Pipe Extension Summary;
- C. New RCBC Summary;
- D. RCBC Extension Summary;
- E. Drainage Special Details;

- F. Drainage Plan;
- G. Drainage Grading Plan;
- H. Channel Detail (Plan & Profile);
- I. Culvert Detail (Plan & Profile); and
- J. Storm Drain Profile.

500.03.09.03 Design Calculations

Developer shall prepare all necessary calculations to justify design elements in accordance with the ADOT Design Manuals contained in Table 500-1. Electronic versions of calculations shall be submitted with each Submittal.

500.04 Construction Requirements

500.04.01 Standards

Developer shall perform all drainage Construction Work in accordance with the standards, manuals, and guidelines listed in Table 500-7, which are shown in no order of precedence; however, in the event of a conflict, the more stringent requirement prevails.

Table 500-7 Construction Standards		
No.	Agency	Title
1	ADOT	Standard Specifications for Road and Bridge Construction, 2008

500.04.02 General Requirements

Developer shall perform all drainage Construction Work in compliance with the requirements of Section 500.04 of the TPs.

If necessary, all work occurring within a floodplain requires a floodplain use permit from the governing jurisdiction.

500.04.02.01 Magnetic Detection

Refer to Section 104.15 of the TPs for Magnetic Detection for Underground Facilities.

500.04.02.02 Concrete Channel Lining Requirements

500.04.02.02.01 Description

The work under this section shall consist of constructing the concrete channel lining.

500.04.02.02.02 Materials

Concrete shall be Class S ($f'_c = 3000$ psi) and shall conform to the requirements of Section 1006 of the ADOT Standard Specifications. Reinforcing steel shall be Grade 60 and shall conform to the requirements of Sections 605 and 1003 of the ADOT Standard Specifications.

Materials furnished for expansion joint filler and joint seals shall conform to the requirements of Section 1011 of the ADOT Standard Specifications.

Geocomposite drain material shall conform to the requirements of Subsections 1014-1 and 1014-6 of the ADOT Standard Specifications.

PVC weep hole pipes shall have a minimum diameter of 4 inches and be Schedule 40 or thicker.

500.04.02.02.03 Construction Requirements

Concrete channel lining shall be cast in place, constructed, and cured in accordance with the Plans and the requirements of Section 601 and 1006 of the ADOT Standard Specifications. All exposed surfaces shall be given a Class I finish in accordance with Subsection 601-3.05 and curing shall be in accordance with Subsection 1006-6 of the ADOT Standard Specifications.

The surfaces on which the channel lining is to be placed shall be finely graded to the lines and grades required. The surface shall be thoroughly compacted to 95 percent of the maximum density and shall be uniformly moistened so that water will not be drawn from the freshly placed concrete.

500.04.02.03 Pipe Plug (Masonry)

500.04.02.03.01 Description

Developer shall construct a brick masonry pipe plug at the location shown on the Plans.

500.04.02.03.02 Materials

Brick shall conform to the requirement of AASHTO M 91.

Materials furnished for Portland cement concrete (PCC) shall conform to the requirements of Section 1006 of the ADOT Standard Specifications for Class B concrete.

Mortar shall conform to the requirements of Section 503-2.03 of the ADOT Standard Specifications.

500.04.02.03.03 Construction Requirements

500.04.02.03.03.01 Bricklaying

The amount of wetting will depend on the rate of absorption of the brick at the time of laying. When being laid, the brick shall have suction sufficient to hold the mortar and to remove the excess water from grout and shall be sufficiently damp so that the mortar will remain plastic enough to permit the brick to be leveled and plumbed after being laid without breaking the mortar bond.

All bed and head joints shall be solidly filled with mortar at the time of laying. The thickness of mortar joints shall be uniformly 0.5 inches.

Face bricks shown to be laid in stack bond shall have the center lines of vertical joints plumb and the brick laid equidistant from the center line with not more than 0.125-inch variation in the width of these joints. The brick in each separate stack shall not vary more than 0.125 inches in length, but the separate stacks may vary in width of stacks.

When mortar has slightly stiffened, solidly fill with mortar all interstices between bricks and between bricks and other materials. Jointing and tooling shall be done before mortar has stiffened.

500.04.02.03.03.02 Curing

Finished masonry shall not be wetted, except when exposed to extreme hot weather or hot wind, and then only by using a nozzle-regulated fog spray sufficient only to dampen the face but not of such quantity to cause water to flow down over the masonry in accordance with Section 401-3 of the ADOT Standard Specifications.

500.04.02.04 Corrugate High-Density Polyethylene Plastic Pipe (CHDPEPP)

500.04.02.04.01 Description

Developer shall furnish CHDPEPP and all other materials required for the installation, excavation, furnishing, placing, and compacting of backfill material, all in accordance with the requirements of the TPs.

All contiguous pipe shall be of the same kind and material. Special sections, fittings, elbows, branch connections, tapered inlets, connectors, coupling, and other such items shall be of the same material and coating as the pipe to which they are attached unless otherwise stated in the TPs. The only exception is that the use of metal/galvanized end sections is allowed if HDPE pipe is used at the outlet.

500.04.02.04.02 Materials

CHDPEPP (18-inch to 60-inch diameter) shall meet AASHTO M294-15 Type S (full circular cross section, with an outer corrugated pipe wall and a smooth inner liner) including rubber gaskets at joints. CHDPEPP shall have a 75-year design service life with Manning n value of 0.012 and have a minimum cell classification of 435400 C in accordance with ASTM 3550. Resin shall not contain less than 2 percent carbon black UV stabilizer.

Developer shall submit manufacturer Certificate of Compliance for all CHDPEPP material placed.

500.04.02.04.03 Construction Requirements

500.04.02.04.03.01 Preparation of Foundations, Trenches, and Embankments

Where rock, hardpan, or other unyielding material is encountered, such material shall be removed below the vertical limits. The depth to be removed shall be at least 12 inches. The over-excavated area shall be backfilled with pipe zone material and compacted in layers not exceeding 6 inches in depth.

When a firm foundation is not encountered at the bottom of the vertical limits due to soft, spongy, or other unstable soil, such unstable soil shall be removed for a width of at least the horizontal outside dimension of the pipe on each side of the pipe and to a depth of 12 inches. The unstable soil removed shall be replaced with pipe zone material and compacted in 6-inch lifts.

A trench condition is defined as a trench that has vertical slopes to a point at least one foot above the top of the pipe. Install CHDPEPP in trench condition in natural ground or in embankment.

Minimum trench width for CHDPEPP, in accordance with AASHTO *LRFD* Section 30, shall not be less than 1.5 times the pipe outside diameter plus 12 inches.

Parallel pipes installed in the same trench shall have a minimum spacing of 12 inches for diameters 24-inch and less; and for pipe 30-inch diameter and over, the minimum spacing is one half the ID (of the largest diameter pipe).

Depth of cover shall meet the following requirements:

- A. CHDPEPP 18-inch diameter shall have a minimum cover depth of 1 foot (between finished subgrade elevation and top of pipe) and a maximum cover depth of 24 feet (between finished subgrade elevation and top of pipe).
- B. CHDPEPP 24-inch to 48-inch diameter shall have a minimum cover depth of 1 foot (between finished subgrade elevation and top of pipe) and a maximum cover depth of 18 feet (between finished subgrade elevation and top of pipe).
- C. CHDPEPP 54-inch to 60-inch diameter shall have a minimum cover depth of 2 feet (between finished subgrade elevation and top of pipe) and a maximum cover depth of 18 feet (between finished subgrade elevation and top of pipe).

Minimum temporary cover of all CHDPEPP increases to 3 feet (from top of pipe to subgrade surface elevation) for construction traffic over 30 tons of gross vehicle weight crossing the pipe.

500.04.02.04.03.02 Bedding & Backfill Material

Bedding and backfill material used within the pipe zone (material placed 6 inches below pipe to 12 inches above pipe) shall be aggregate pipe zone material, (per ASTM D2321-14) Class II (Clean, coarse grained soils, SW, SP, GW, or GP at 6-inch depth minimum); or Class I (Crushed angular rock at 4-inch depth minimum) or 1-sack cement slurry.

Bedding and backfill material shall have the aggregate gradation set forth in Table 500-8:

Table 500-8 Backfill Material Specifications	
Sieve Size	Percent Passing
1-1/2 inch	100
No. 4	25-70
No. 200	0-12
Plasticity index < 8 (AASHTO T 90)	

Aggregate for cement-treated slurry pipe zone material, prior to the addition of cement and water, shall conform to the requirements for aggregate pipe zone material. One sack of cement shall be added to each cubic yard of aggregate. Cement-treated slurry shall be thoroughly mixed and shall have a slump of 8 to 11 inches.

All trash, forms, sheeting, bracing, and loose rock or loose earth shall be removed from the area into which pipe zone material is to be placed.

A minimum 6-inch layer of aggregate pipe zone material shall be placed between the bottom of the trench and the bottom of the pipe. The remaining pipe zone from the bottom of the pipe to 12 inches above the pipe shall be backfilled with aggregate pipe zone material or cement-treated slurry.

1 Bedding and backfill material shall be placed in a manner which will prevent distortion, damage to, or
2 displacement of the pipe from its intended location, and provide adequate support to prevent floating.
3 Voids or loose soils that are found to occur due to improper placement or compaction of pipe zone
4 materials will result in rejection of that portion of the pipe installation.

5 Pipe zone material shall be placed in uniform horizontal layers not exceeding 8 inches in depth before
6 compaction. Aggregate pipe zone material cannot be compacted by jetting or placed as an aggregate
7 slurry. Ponding for compaction of pipe zone material shall not be permitted in any case.

8 Cement-treated slurry material shall be placed in a uniform manner that will prevent voids in, or
9 segregation of the bedding material, and will not float or shift the culvert or pipe. Cement-treated slurry
10 pipe backfill placement above spring-line shall not commence within 24 hours of the placement of the
11 underlying cement-treated bedding material below spring-line. Cement-treated pipe backfill shall be
12 placed in a uniform manner that will prevent voids in or segregation of the backfill to an elevation one foot
13 above the top of the pipe. No backfilling above the cement-treated slurry pipe backfill shall be commenced
14 until 24 hours after the cement-treated slurry has been placed.

15 Compaction of pipe zone material shall be performed without damage to the pipe and surrounding in-
16 place material. Special care shall be taken in placing, shaping, and compacting all bedding material under
17 haunches of pipe to prevent moving the pipe or raising it from its bedding.

18 Aggregate pipe zone material shall be compacted to at least 95 percent of the maximum density
19 determined in accordance with the requirements of the applicable test methods of the *ADOT Materials*
20 *Testing Manual*. No density tests will be required in the cement-treated slurry pipe zone material.

21 **500.04.02.04.03.03 Installation**

22 Pipe shall be handled carefully. Proper facilities shall be provided for handling and lowering the sections
23 of pipe. Pipe shall be installed in close conformity with the lines, grades and dimensions shown on the
24 Plans. Tracer wire for all underground facilities shall be installed in conformance with Section 104 of the
25 TPs.

26 Corrugated high density polyethylene plastic pipe shall be assembled and installed in accordance with
27 the manufacturer's instructions.

28 Water resistant joints are required for storm drains, culverts, or other drainage pipes. Watertight joints
29 shall be provided for siphon and irrigation pipe installations. Watertight and water-resistant joints shall be
30 joined together using an integral bell and spigot joint that meets the 10.8 psi watertight requirement of
31 ASTM D3212. Vertical installations of CHDPEPP is not permitted.

32 Bell or groove ends, and outside circumferential laps shall be placed facing upstream. To prevent damage
33 and to ensure that proper line and pipe grade are maintained throughout the backfilling operation, special
34 care shall be taken in the handling and installation of corrugated high-density polyethylene plastic pipe
35 and fittings.

36 When a shoring/trench box is necessary for installation of CHDPEPP, the bottom of shoring/trench box
37 shall not be lower than the top of pipe or more than 24 inches above the bottom of trench; if shoring/trench
38 box is below the top of pipe, a sub-trench is required.

39 When end sections are called for on the Plans, metal safety end sections shall be used. The embankment
40 slope shall be warped to match the end sections. For a skewed pipe installation, the toe of the

1 embankment slope shall be warped to match the toe of the skewed metal safety end section to provide
2 effective drainage.

3 CHDPEPP pipe installed within an MSE wall reinforcement zone will be detailed in MSE shop drawings
4 by Developer. CHDPEPP may not be placed within the foundation zone of walls or structural foundations.

5 **500.04.02.04.03.04 Trench Backfilling and Compacting**

6 Trench backfill material shall be placed above pipe zone bedding and backfill material to top of trench
7 shall meet embankment specified in Section 300 of the ADOT Standard Specifications.

8 Trench backfill material shall not contain organic material, rubbish, debris, and other deleterious material
9 and shall not contain solid material that exceeds 8 inches in greatest dimension and shall be soil selected
10 from excavation or from a source selected by Developer.

11 As an alternate, trench backfill may conform to the material requirements listed for bedding material for
12 aggregate pipe zone material or cement-treated slurry material.

13 All trash, forms, sheeting, bracing, and loose rock or loose earth shall be removed from the areas to be
14 backfilled before backfill material is placed.

15 Trench backfill shall be placed from one foot above the top of the pipe to the elevation at which base or
16 surfacing materials are to be placed or to the top of the trench.

17 Trench backfill mixed as a standard cement treated slurry shall be placed in uniform horizontal layers not
18 exceeding four feet in depth.

19 Backfill material shall be compacted to at least 95 percent of the maximum density determined in
20 accordance with the requirements of the ADOT *Materials Testing Manual*.

21 Cement-treated slurry bedding material used for trench backfill shall meet the requirements listed above
22 for pipe backfill up to the elevation that it is placed.

23 **500.04.02.04.03.05 Inspection & Testing**

24 Visual inspection shall be performed by the IQF on all CHDPEPP for line and grade, joint gaps and
25 misalignments, cracks, deformation, damage, and debris. Visual inspection shall be 30 Days after
26 placement of all pipe zone material or prior to placement of Pavement Section (whichever is first); but no
27 sooner than 7 Days after pipe zone material installation.

28 The maximum allowable vertical deflection is 5 percent, in accordance with AASHTO M294, using the
29 Certified Mean Diameter (CMD) provided by the pipe manufacturer. If any deflection is noted during the
30 visual inspection, the pipe shall be secondarily tested by mandrel. A minimum of 10 percent of CHDPEPP
31 less than 10 feet depth to subgrade shall be inspected with a mandrel, and all CHDPEPP with fill depths
32 greater than 10 feet to subgrade shall be inspected with a mandrel. The IQF shall notify ADOT of any
33 deflection during the visual and mandrel inspection.

34 Based on the results of secondary testing, IQF or ADOT may request a remedy for pipes with deflections
35 between 5 percent of CMD and 7 percent of CMD or may direct Developer to remove and replace the
36 pipe. Remedy options may include excavating the affected portion of the pipe run and reconstructing the
37 pipe, or removing and replacing the affected portion to the nearest pipe joint or drainage structure. For
38 pipe deflections greater than 7.0 percent of CMD, Developer shall remove and replace the affected length

of pipe to the nearest pipe joint or drainage structure. Use of mechanical re-rounding technology on installed pipe shall not be accepted as a remediation technique under any circumstance.

500.05 Submittals

Table 500-9 reflects a nonexclusive list of Submittals in Section 500 of the TPs and is not intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 500-9 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Existing Drainage Facility Condition Memorandum	4	0	1	Within 120 Days of NTP 1	500.02.02
Preliminary Drainage Report(s)	4	0	1	At the same time as Preliminary Design Submittal for the associated drainage improvements	500.03.02
Final Existing Drainage Facility Condition and Repair Report	3	0	1	At the same time as Final Design Submittal for the associated drainage improvements	500.03.02
Final Drainage Report(s)	3	0	1	At the same time as Final Design Submittal for the associated drainage improvements	500.03.02
Project Drainage Report	4	0	1	As part of the Record Drawing Submittal	500.03.02
Initial Bridge Hydraulics Report(s)	4	0	1	At the same time as the Preliminary Design Submittal for each bridge	500.03.08
Final Bridge Hydraulics Report(s)	4	0	1	At the same time as the Final Design Submittal for each bridge	500.03.08
CLOMR	3	0	1	With RFC	500.03.08.03.04
LOMR	3	0	1	After construction is completed and accepted in the watercourse	500.03.08.03.04

**Table 500-9
Nonexclusive Submittals List**

Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
*Levels of Review					
1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement)					
2. Good faith discretion approval (Section 3.1.3.2 of the Agreement)					
3. Reasonableness approval (Section 3.1.4.1 of the Agreement)					
4. Review and comment (Section 3.1.5 of the Agreement)					
5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

End of Division

1

Division VI, Structures

600 Structural Design

600.01 General Requirements

Developer shall perform all structures Design Work and Construction Work in compliance with the requirements of Section 600 of the TPs.

600.02 Administrative Requirements

600.02.01 Standards

Developer shall perform the structures Design Work in accordance with the standards, manuals, and guidelines listed in Table 600-1, which are shown in no order of precedence; however, in the event of a conflict, the more stringent requirement prevails.

Table 600-1 Design Standards		
No.	Agency	Title
1	AASHTO	LRFD Bridge Design Specifications, 8th Edition
2	AASHTO	LRFD Bridge Design Specifications, 6th Edition – Foundations
3	NCHRP	Report 276 – Thermal Effects in Concrete Bridge Superstructures
4	AASHTO	Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 6th Edition
5	AASHTO	Manual on Subsurface Investigations, 1st Edition
6	AASHTO/AWS	D1.5 Bridge Welding Code: Current
7	AASHTO	Guide Design Specifications for Bridge Temporary Works, 2nd Edition
8	AASHTO	Manual for Bridge Evaluation, 3rd Edition
9	AASHTO	Guide Specifications for Design and Construction of Segmental Concrete Bridges, 2nd Edition
10	AASHTO	LRFD Guide Specifications for the Design of Pedestrian Bridges, 2nd Edition
11	AASHTO	Manual for Assessing Safety Hardware (MASH), 2nd Edition
12	AWS	American Welding Society (AWS) 1.1 Welding Code: Current
13	ADOT	Bridge Load Rating Guidelines: Current
14	SRP	Design Guidelines and Specifications for Bridge Crossings of Salt River Project (SRP) Canals, Salt River Project Water Shareholder Operations
15	FHWA	FHWA-NHI-10-024 Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Volume 1
16	FHWA	FHWA-NHI-10-025 Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Volume 2
17	FHWA	FHWA-NHI-14-007 Geotechnical Engineering Circular 007: Soil Nail Walls Reference Manual
18	FHWA	FHWA-IF-99-015 Geotechnical Engineering Circular 004: Ground Anchors and Anchored Systems
19	ADOT	AASHTO Load and Resistance Factor Design Policy for Bridge Substructures: Geotechnical Design Policy (SF-1 through SF-3 and DS-1 through DS-3)
20	ADOT	Bridge Group Standard Details

600.03 Design Requirements

Structures design aesthetic features shall comply with the requirements in Section 800 of the TPs.

600.03.01 Roadway Bridges

Developer shall design all new roadway bridges in accordance with the AASHTO *LRFD Bridge Design Specifications*. Developer shall design bridges for a 75-year design life as defined by AASHTO *LRFD Bridge Design Specifications*.

600.03.01.01 Geometry

All fill and cut slopes along the longitudinal axis of bridges with spill through abutments shall not be steeper than 2:1 (H:V). Slopes steeper than 3:1 shall have concrete slope paving with exposed aggregate surface. Details of slope paving shall be in accordance with ADOT Standard Detail SD 2.04. Slope paving shall not be used as roadway cross sectional elements except for along the longitudinal axis of the bridges.

Vertical clearances shall be in accordance with TP Attachment 200-1. Vertical clearance is defined as the least vertical distance between the soffit and load carrying member of the bridge and the roadway below including the shoulders.

600.03.01.02 Foundations

Foundations for bridges shall be shallow (spread) foundations, driven piles, or drilled shafts. Transitions from drilled shafts to columns shall occur below finished grade. Shallow (spread) footings shall not be used in locations where potential for scour is present. The Geotechnical Design of foundations shall be designed using AASHTO *LRFD Bridge Design Specifications, 6th Edition Foundations* and the ADOT *AASHTO Load and Resistance Factor Design Policy (LRFD) for Bridge Superstructures: Geotechnical Design Policy*. Structural Design of foundations shall be designed using the AASHTO *LRFD Bridge Design Specifications, 8th Edition*.

Existing structures and utilities shall be protected during installation of driven piles if used. Vibrations shall be monitored, and a monitoring plan shall be submitted to ADOT for review and approval prior to starting any pile driving operations.

600.03.01.03 Loads

Developer shall design bridges for the following loading:

- A. Dead load. A reserve superimposed dead load of 25 psf shall be included in the design of all bridge elements to provide for a future deck overlay; and
- B. Live load. All new vehicular structures shall be designed for AASHTO HL-93 vehicular live loading. Bridges proposed to carry construction overload vehicles shall be designed per Section 16 of the ADOT *Bridge Group Design Guidelines*. Overload vehicles are defined as any vehicle that exceeds the Legal Truck loads as specified in the AASHTO *Manual for Bridge Evaluation*.

600.03.01.04 Uplift

Developer shall proportion bridge spans to prevent uplift at supports for all AASHTO *LRFD Bridge Design Specifications* limit states, except for the extreme event limit state.

1 **600.03.01.05 Compressive Strength and Stress Limits for Concrete**

2 Normal weight non-prestressed concrete shall have a minimum 28-Day compressive strength (f'_c), at 28
3 Days, as shown in Table 600-2.

Table 600-2 Minimum Concrete Strength	
Components	f'_c (ksi)
Decks (except barriers)	4.5
Bridge concrete barriers, approach slabs, and protective pavement systems	4.0
Substructures (abutments, piers, foundation, and drilled shafts)	3.5
All other class 'S' concrete	3.0

4 Normal weight precast, prestressed concrete members shall have a maximum 28-Day compressive
5 strength (f'_c) of 9,000 psi. The initial compressive strength at release (f'_{ci}) is at the discretion of Developer.

6 Normal weight cast-in-place post-tensioned box girder bridges shall have a maximum 28-Day
7 compressive strength (f'_c) of 6,000 psi. The initial compressive strength at release (f'_{ci}) is at the discretion
8 of Developer.

9 Maximum stress limits for prestressed concrete are as shown in Table 600-3.

Table 600-3 Stress Limits for Prestressed Concrete						
		Before Time- Dependent Losses	After Losses			
			DC + Prestress	Service Limit I	Service Limit III	0.5(DW +DC + Prestress) + (LL + IM)
Compression (ksi)		0.6f'ci	0.45f'c	0.6øw f'c	N/A	0.4f'c
Tension (ksi)	Any region of a prestressed component in which prestressing causes compressive stresses and service load effects cause tensile stresses	N/A	0 for post- tensioned boxes N/A for precast prestressed members	N/A	0.0948√f'c (For post- tensioned structures built on falsework, this value shall be zero. No tension shall be allowed)	N/A
	Other Regions	0.0948√f'ci ≤ 0.2 ksi	N/A	N/A	N/A	N/A

10 **600.03.01.06 Structural Concepts and Design**

11 Developer shall satisfy the following criteria for structure types and components:

- 12 A. Cable stayed bridge types shall not be used;
- 13 B. External pre-stressing or post-tensioning shall not be used;

- C. A minimum of three girders shall be used to provide redundant load path structures, except in bridge widenings when the deck is mechanically connected to the existing bridge deck to develop full shear and moment transfer;
- D. Fracture critical members shall not be used. Fracture Critical Members are defined in Articles 4.2.3.4 and 4.3.7.2 of the *AASHTO Manual for Bridge Evaluation*. Precast, prestressed beams and girders that do not provide a redundant load path are also considered fracture critical;
- E. The use of the approximate analysis methods for curved bridges in Article 4.6.2.2.4 of the *AASHTO LRFD Bridge Design Specifications* is not allowed. Curved bridges are defined in Article 4.6.1.2 of the *AASHTO LRFD Bridge Design Specifications*;
- F. The use of the V-load method for curved steel I-girders or the M/R method for curved steel box girders is not allowed;
- G. Proposed structure concepts shall have been accepted for general use by other transportation authorities. For proposed structure types not commonly used by ADOT, Developer shall demonstrate that the proposed structure concepts will not require more inspection and/or maintenance than structure types and components that are traditionally used by ADOT;
- H. For post-tensioned structures, Developer shall adjust the design, as necessary, to ensure that creep and shrinkage parameters are properly incorporated in the design of the superstructure. Deck closure pours shall not be placed until a minimum of 60 Days after post-tensioning activities to allow for the majority of creep and shrinkage to occur unless a shorter duration is demonstrated as acceptable through calculations based on concrete mixes that have undergone creep testing per ASTM C512 for use in calculations;
- I. Developer shall design exterior girders to meet or exceed the load capacity of the interior girders to allow for future widenings;
- J. Post-tensioning shall be designed and constructed with corrosion protection for the strands, consisting of grout filled galvanized or non-metallic ducts. No experimental ducts shall be used;
- K. Prestressing steel shall have a minimum center-to-center spacing of 2 inches. The use of bundled pretensioning strands is not allowed; and
- L. For structural steel systems using self-weathering steel, Developer shall address the potential for staining of adjacent items. A system or process for containing or mitigating staining of adjacent areas shall be submitted for approval in ADOT's good faith discretion.

600.03.01.07 Bridge Barriers

Bridge barriers shall be concrete and shall comply with the *AASHTO Manual for Assessing Safety Hardware (MASH)*, current edition, and the *AASHTO LRFD Bridge Design Specifications* requirements designed to meet MASH 16 requirements for Test Level 4, unless otherwise specified in the Contract Documents. Bridge barriers shall have a minimum 1-inch cover over reinforcing steel to rustication.

Bridge barrier for system-to-system traffic interchanges shall be designed to meet MASH 16 requirements for Test Level 5. System-to-system traffic interchanges are considered mainline to mainline directional ramps. System-to-system traffic interchanges are defined for this section as the following:

- A. Ramps between I-10 and SR-143;
- B. Ramps between I-10 and US 60;
- C. Ramps between US 60 and the C-D roads;
- D. Ramps between SR-143 and the C-D roads; and
- E. Ramps between I-10 and the C-D roads.

Except for median barriers cast on a continuous deck across both directions of traffic, bridge barriers shall not be slip formed.

Bridge barriers where pedestrian traffic is accommodated shall be combination pedestrian-traffic bridge railing complying with the AASHTO *Manual for Assessing Safety Hardware (MASH)*, *current edition*, and the AASHTO *LRFD Bridge Design Specifications* requirements designed to MASH 16 requirements for Test Level 4. Bridges where pedestrian traffic is accommodated on the bridge shall have pedestrian fencing. Fencing shall extend a minimum of 12 feet above the top of the traveled path. Aesthetic elements shall be placed on this fence as directed in Section 800 of the TPs.

For bridge barriers on bridges with sidewalk on only one side, bridge barriers shall provide a vertical pedestrian fence on the opposite side away from the sidewalk. This fencing shall extend a minimum of eight feet above the top of the finished roadway grade. Aesthetic elements shall not be placed on this fence.

Fencing on bridges shall be 0.5 inches - #13 standard expanded metal, flattened smooth with no sharp edges.

Fences shall be located and detailed to allow maintenance access to structure mounted signal poles, lighting poles and sign poles and to provide visibility for pole-mounted signal heads. Access shall be removeable or hinged and lockable.

Existing bridge barriers not mentioned herein may remain in place and are not required to be removed and replaced with MASH compliant barrier unless modifications to the barrier are required. If a section of the barrier is modified, the entire length of barrier on the structure shall be replaced with MASH compliant barriers. The addition or modification of a fence on top of an existing barrier is not considered a modification to the existing barrier. Removal of glare screens and increasing existing barrier height to 42 inches is not considered a modification to the existing barrier at I-10 Salt River Bridge. I-10 Salt River Bridge median barrier shall be extended to 42 inches from the higher of the two inside shoulder elevations. The entire top of barrier width is not required to be raised to 42 inches.

The entire length of the existing barrier on both sides of the structure crossing the Western Canal from westbound I-10 to eastbound US 60 shall be removed and replaced with MASH compliant bridge barriers.

600.03.01.08 Approach Slabs and Protective Pavement Systems

Developer shall provide a 15 foot minimum length reinforced concrete bridge approach slab at the ends of each new bridge. The bridge approach slabs shall extend the full width of the roadway. For concrete pavement, Developer shall provide a protective pavement system with separate joint systems to address bridge movement and pavement movement to prevent inducing loads on the bridge. Details of the approach slab and anchor slab system shall conform to ADOT *Bridge Group Standard Details*.

Barriers on approach slabs and protective pavement systems shall have a minimum 1-inch cover over reinforcing steel to rustication.

600.03.01.09 Bridge Deck

All structural deck slabs shall be concrete. Developer shall minimize the number of deck joints wherever possible. Deck joints shall be of a type commonly used in Arizona. Compression seals and strip seals shall conform to the ADOT Bridge Group Standard Drawings and as directed in Bridge Design Bulletin 2020-2. Asphaltic plugs, Aluminum, finger, or sliding plate bridge joints shall not be used. The bridge deck designs shall:

- A. Be controlled by Service Limit State I and Strength Limit State I;
- B. Be designed using an approximate elastic method;
- C. Allowable tensile stress in transverse deck reinforcing steel, f_s , shall be limited to 24 ksi for the Service Limit State;
- D. Dead load analysis shall be based on a strip method using the following simplified moment equation for both positive and negative moments:

$wS^2/10$ for deck slabs continuous over three spans or more

$wS^2/8$ for all other cases

where:

S = the effective span length specified in AASHTO LRFD Article 9.7.2.3

w = the uniformly distributed dead load of the slab system;

- E. Have a minimum clear cover for reinforcing steel in new deck slabs of 2.5 inches for top reinforcement and 1-inch for the bottom reinforcement for corrosion protection; and
- F. Provide a 0.5-inch concrete wearing surface in addition to the cover as specified in the AASHTO *LRFD Bridge Design Specifications*.

New bridge deck thicknesses shall be designed in 0.5-inch increments with the minimum thicknesses shown in Table 600-4. Effective span lengths greater than 13 feet are not allowed.

Table 600-4 Minimum Bridge Deck Thickness					
S (feet)	≤7	7< and ≤8.5	8.5< and ≤10	10< and ≤11.5	11.5< and ≤13
t (inches)	8.0	8.5	9.0	9.5	10.0

Where: S = the effective span length specified in the AASHTO *LRFD Bridge Design Specifications* Article 9.7.2.3
t = Minimum thickness of deck slab. t includes the 0.5-inch wearing surface

Sidewalks on bridges shall be in accordance with ADAAG requirements. The minimum width of useable sidewalk on bridges shall be six feet unless otherwise indicated in Section 200.03.02.10 of the TPs.

Stay-in-place deck forms may only be used for structures constructed over I-10, system interchange ramps, over the Tempe Drain, and over the Western Canal.

Partial-depth and full-depth concrete deck panels are acceptable on new bridges. Developer shall submit details of the proposed deck panel system for ADOT review and approval. The Construction Drawings shall include the following:

- A. Minimum, typical, and maximum panel widths, and lengths;
- B. Transverse and longitudinal keyway details;
- C. Shear pocket and shear connector details;
- D. Post-tensioning and Pre-tensioning details;
- E. Temporary shim details;
- F. Proposed method for compensating girder camber;
- G. Overhang details;
- H. Sidewalk, barrier, and parapet details;
- I. Grout specifications for keyways and shear pockets;
- J. Overlay details and specifications;
- K. A description of at least one previous project completed by Developer using the proposed panel details on a structure of similar type, size, and complexity, including contact information for the owner's representative; and
- L. Refer to Section 500.03.08.03 of the TPs for additional requirements for Bridge Deck Drainage.

600.03.01.10 Intermediate Diaphragms

Precast-prestressed I-girder bridges with spans over 40 feet shall be constructed with a 9-inch thick cast-in-place concrete diaphragm at the midspan of bridges unless as noted in Section 600.03.01.15 of the TPs. Special consideration for additional diaphragms shall be given to bridges with long spans. For bridge skew less than or equal to 20 degrees, the diaphragm shall be placed either parallel to the skew or

1 staggered and normal to the girder. For bridge skew greater than 20 degrees, the diaphragms shall be
2 staggered and placed normal to the girder. Steel intermediate diaphragms are not allowed for prestressed
3 I-girder bridges.

4 Post-tensioned box girder bridges shall be constructed with a 9-inch thick cast-in-place concrete
5 diaphragm at the midspan of the bridge. Special consideration for additional diaphragms shall be given
6 to box girders with large skews, curved boxes, and boxes over seven feet in depth. For bridge skew less
7 than or equal to 20 degrees, the diaphragm shall be placed either parallel to the skew or staggered and
8 normal to the girder. For bridge skew greater than 20 degrees, the diaphragms shall be staggered and
9 placed normal to the girder. All diaphragms shall be cast integral with the girder webs to add lateral
10 stability to the forming system.

11 Rolled beams and plate girders shall be provided with cross-frames or diaphragms at each support and
12 with intermediate cross-frames or diaphragms placed in all bays at intervals not to exceed 25 feet. Design
13 criteria and provisions for cross-frames or diaphragms shall conform to the AASHTO *LRFD Bridge Design*
14 *Specifications*. For bridge skew less than or equal to 20 degrees, the stiffener plates that also serve as
15 connection plates may be placed parallel to the skew or staggered and normal to the girder. For bridge
16 skew greater than 20 degrees, the stiffener plates that also serve as connection plates shall be staggered
17 and placed normal to the girder. Transverse intermediate stiffeners that are not connection plates shall
18 be placed normal to the web.

19 Other structure types shall utilize intermediate diaphragms in accordance with the applicable design
20 code. Due to the absence of requirements within AASHTO LRFD-8 for the design of intermediate
21 diaphragms for concrete I-girder bridges, the basis of design shall include:

- 22 A. Analyze the ability of concrete I-girders to resist wind loads using AASHTO LRFD-8 Article 4.6.2.7
23 – Lateral Wind Load Distribution in Girder Bridge Systems using Load Path 3, which assumes no
24 wind bracing (i.e., no intermediate diaphragms);
- 25 B. If stresses are acceptable, proceed with installation of proposed diaphragm details without further
26 analysis or modification; and
- 27 C. Precast girders shall be fabricated with threaded inserts on fascia girders and sleeves on interior
28 girders to accommodate rolled steel sections or tendons that will hold the diaphragms. The steel
29 intermediate diaphragms shall consist of a steel wide flange section of varying size depending on
30 girder height. Steel diaphragms will be allowed on the bridges provided that the Developer
31 designs them in accordance with AASHTO Section 4.6.3.3.4 and other applicable sections of
32 AASHTO. Precast Concrete and Concrete-Encased Steel diaphragms are not permitted.

33 **600.03.01.11 Utilities**

34 No utilities will be allowed on bridge structures except as allowed in this section. Conduits shall be limited
35 to those needed for ITS, traffic signals, and overhead/underdeck lighting. Shared or separate conduits for
36 local agencies may be provided with approval from ADOT. Conduits shall be encased in bridge barrier or
37 sidewalk or shall otherwise be placed between girders such that conduit and support elements, including
38 hanger, are not exposed from the exterior “outboard” side of exterior elements of the bridge framing.

600.03.01.12 Bridge Hydraulics and Scour

Bridges over waterways shall be designed for stream loading and scour as required in Section 500.03.08.03.05 through 500.03.08.03.08 of the TPs. The bridge shall be evaluated for all applicable load combinations required by the AASHTO *LRFD Bridge Design Specifications*. The bridge shall also be evaluated for superflood conditions which is defined as the lesser of the 500-year flood event discharge Q500 or the flood event causing overtopping of the roadway or bridge deck. For this case, all bank protection and approach embankments are assumed to have failed. Abutments and piers shall be designed to withstand the Load Combination of $1.0DC + 1.0DW + 1.0WA + 0.5WS$ under full scour. This load combination is considered an Extreme Event limit state.

For the design flood, in accordance with Section 500.03 of the TPs, proposed and/or existing bank protection shall be investigated for failure under the design event. If the bank protection is not designed for the appropriate design flood, impacts to the abutments shall be considered and mitigation measures provided if necessary. As an alternative, the abutments may be evaluated for the event scour assuming failure of existing bank protection. Existing piers shall also be evaluated against scour at the design flood. If existing piers are not deep enough for event scour, mitigation measures shall be provided as an ADOT-Directed Change.

600.03.01.13 Requirements Near Twin Buttes Cemetery

Decorative fencing shall be placed along the historic right-of-way shown in Exhibit B of TP Attachment 118-2. A minimum 4 foot wide maintenance access area is required between the fence and the structure supporting the C-D roads under the bridge. 10 foot wide gates shall be provided at each end to prevent access by trespassers. The layout of the fence shall generally conform to Exhibit B of TP Attachment 118-2 with reasonable adjustments allowed to conform to the geometry of the structure built at this location. A minimum of 230 feet of decorative fence shall be provided. Fence and gate locations may be adjusted as necessary to meet this requirement subject to ADOT approval. The 4 foot wide maintenance access is not subject to the 4 foot ground disturbing limitation per Section 118.05 of the TPs. Longitudinal joints between the structure and adjacent roadway shall be located outside the normal travel way unless otherwise approved by ADOT.

The decorative fencing shall be of a material and type shown in Exhibit B of TP Attachment 118-2. Fence shall be a minimum of 8 foot tall and consist of curved or angled square hollow steel pickets. Fence shall be powder coated. Any areas damaged during installation shall be repaired. Gates shall match the decorative fencing in material and type. Main support elements of the gates may be modified as needed to provide support of the gate system. Gates shall be able to be operated manually and locked.

The minimum vertical clearance measured from the soffit of the structure to the finished grade below shall be 8'-6".

The aesthetics of the exposed face of abutments, wing walls, and retaining walls underneath the bridge shall conform to the aesthetic details and requirements of Section 800 of the TPs. A Resolution Approving Aesthetic Design that matches these concepts, which replaces Exhibit C of TP Attachment 118-2, by Maricopa County Board of Supervisors agenda and item 108 attachments are provided in the RIDs.

Lighting shall be provided underneath the bridge. Lighting shall be located such that it may be maintained from the maintenance access area.

600.03.01.14 AR-ACFC on Bridges

AR-ACFC limits shall be in accordance with Section 400.03 of the TPs. For new bridges that are not overlaid with AR-ACFC, the AR-ACFC shall end at a joint closest to the ends of the bridges. The joint shall be installed with a 1 foot minimum width concrete header or slab on each side of the joint and placed to the top of the AR-ACFC to provide a smooth transition between the AR-ACFC and the concrete surface. Steel bars welded to joint angles to retain AR-ACFC shall not be used.

When AR-ACFC is removed from bridges and not replaced as part of this Project, Developer shall modify the existing deck joints as needed to remove any bars or attachments previously added to the joint to retain AR-ACFC.

When AR-ACFC is removed from bridges and replaced as part of this Project, no modifications to the existing joints are required.

New deck joints in widened bridges shall match the existing deck joint per Section 600.03.02.02 of the TPs. The top of joint shall match the top of adjacent concrete surfaces.

600.03.01.15 Steel Intermediate Diaphragms

The Developer may use steel intermediate diaphragms for precast-prestressed I-girders with spans over 40 feet and follow requirements stated in Section 600.03.01.10 of the TPs. Steel Intermediate Diaphragms shall be only allowed on the following structures that cross over I-10:

- A. Bridge 20 – I-10 southbound 48th Street underpass;
- B. Bridge 30 – I-10 northbound 48th Street underpass;
- C. Bridge 40 – I-10 SR143 to eastbound collector-distributor road underpass;
- D. Bridge 50 – I-10 SR143 direct high-occupancy vehicle underpass; and
- E. Bridge 60 – I-10 Broadway Road underpass.

600.03.02 Additional Requirements at Bridge Widenings

600.03.02.01 Geometry

Final vertical clearances shall meet the requirements defined in Section 600.03.01.01 of the TPs, except that vertical clearance may be reduced to not less than the existing vertical clearance over the travel lanes of roadways.

Slope paving for widened bridges and existing bridges impacted by construction shall match existing material and color.

Approach slabs and anchor slabs shall line up with the existing bridge slabs where practical. Any deviations in approach/anchor slab placement must be approved by ADOT.

600.03.02.02 Bridge Deck

Partial-depth and Full-depth precast concrete deck panels are not allowed on bridge widenings. A penetrating crack sealer – Methacrylate shall be applied to existing decks where existing overlay is

removed by milling. Work shall be completed prior to placing new overlays, where required. For design and construction requirements refer to TP Attachment 600-1.

A minimum deck thickness less than what is required by Table 600-4 may be used to match the existing deck thickness when effective length of the new deck, as defined in *AASHTO LRFD Bridge Design Specification* 9.7.2.3, is equal to or less than the effective length of the existing deck. For larger effective lengths, the minimum deck thickness required by Table 600-4 applies. Deck overhangs shall meet the deck thickness requirements shown in the barrier details.

Expansion joints at bridge widenings shall match existing expansion joints in location, type, and opening. The soundness of concrete at all existing bridge expansion joints shall be inspected near the encased steel headers, with a representative of ADOT in attendance. Developer shall inspect the joints for voids by sounding the angle with a hammer. All voids within the inspected limits shall be repaired by Developer by epoxy injection. Developer shall request ADOT attendance 7 days prior to the existing bridge expansion joint soundness inspection.

Expansion joint repairs in areas required for installation of new expansion joints in the widenings and within five feet of the widened sections are included in the cost of the new expansion joints for the widened sections. If required, repairs outside these limits will be paid for as ADOT-Directed Change.

The condition of the gland at the existing bridge expansion joints shall be inspected with a representative of ADOT in attendance. Developer shall inspect the deck joint glands for damage and movement. If the deck joint gland is damaged or sunken, Developer shall replace the entire gland in the existing bridge. If replacement of the existing gland is required, the deck joint gland shall be installed as one continuous piece through the existing and widened sections of the bridge. If there is no damage, the deck joint gland between the widened section and the existing bridge shall be sealed or fused to the existing gland per the manufacturer's direction. The cost of the gland for the deck joint in the widenings is included in the cost of the new expansion joint for the widened sections. If required, the cost of replacement outside the widened sections will be paid for as ADOT-Directed Change. Developer shall request ADOT attendance 7 days prior to the existing bridge expansion joint gland inspection.

Refer to Section 500 of the TPs for additional requirements for Bridge Deck Drainage.

600.03.02.03 Intermediate Diaphragms

Precast-prestressed I-girder bridges at bridge widenings shall be constructed with cast-in-place concrete diaphragms located to match existing diaphragms. Steel intermediate diaphragms are not allowed.

600.03.02.04 Bearings

Bridge widening bearings shall match the existing bridge configuration and details, unless otherwise approved by ADOT. Developer's design shall account for expansion or contraction in the lateral as well as the longitudinal directions.

The condition of the existing bearings shall be inspected with a representative of ADOT in attendance. Bearings that are damaged shall be evaluated and a repair plan developed for review and approval by ADOT. Expansion bearings where debris is preventing movement shall be cleaned. If ADOT requires the repair and cleaning of existing bearings, such direction shall be an ADOT-Directed Change.

600.03.02.05 Existing Structure Modification Report

An Existing Structure Modification Report shall be prepared for each bridge widening. The reports shall be sealed and signed by a registered Professional Engineer in the State and shall be submitted for review and approval prior to beginning construction of foundations that may impact the existing bridge foundations. Impacts to existing foundations include the following:

- A. Proposed drilled shafts will be placed near an existing drilled shaft such that the spacing between the two is reduced below three diameters based on the average diameter of the proposed and existing drilled shaft;
- B. Proposed drilled shafts will be placed within the influence zone of existing spread footings. The influence area is defined as the frustum bounded by a 45-degree line starting at each corner of the spread footing to a depth equal to the longest horizontal dimension of the foundation;
- C. Proposed spread footings will be placed next to an existing drilled shaft such that the spread footing imparts a lateral squeeze and/or downdrag force to the existing drilled shaft;
- D. Proposed spread footings will be placed next to an existing spread footing such that increased vertical loading causes additional settlement to the existing structure; and
- E. A proposed substructure is rigidly attached to an existing substructure causing a redistribution and/or increase to foundation elements in the existing substructure.

The Existing Structure Modification Report contents shall include the following:

- A. An analysis of the as-built existing bridge foundations, including the affected frame within the bridge, if required. If there is no impact to the existing frame, the report shall state there is no impact along with a description of the engineering judgement and/or analysis used to determine no impact;
- B. An analysis and assessment of the maximum allowable settlement of the existing bridge, or affected frame within the bridge, caused by impacts to its foundation. The maximum allowable settlement will be that which causes any portion of the existing structure to reach a maximum permissible stress as specified in the *AASHTO LRFD Bridge Design Specifications*, as modified by these TPs;
- C. A detailed procedure that will be employed to monitor and preclude/control/recover deflection of the existing superstructure throughout the bridge widening construction, beginning 30 Days prior to commencement of construction, and ending no earlier than 120 Days after completion of the superstructure construction. Monitoring is required at foundations impacted by construction and at existing nearby foundations subject to disruption of the footing influence area;
- D. For existing spread footing foundations, the procedure shall outline the steps to be taken to avoid disruption of the influence area below the foundations of structures located near construction activities;
- E. In cases where construction encroachment on the influence area is unavoidable, the report shall identify countermeasures and safeguards to protect the integrity of the existing foundations

against settlement, lateral movement, and loss of capacity. The procedure shall identify all temporary and permanent materials, products, equipment, instrumentation, and processes to be used. The procedure shall prescribe the sequence and estimated duration of installation, utilization, and removal of such items;

F. Analysis, design, and preliminary drawings of the proposed structure foundations;

G. Drawing(s) clearly illustrating the construction sequence and schematic load transfer and deflection control from the existing foundation to the new foundation modification; and

H. A detailed list of the phases or steps, if any, and their estimated durations during which closure of the existing bridge to vehicular traffic is necessary.

600.03.02.06 Additional Considerations

Developer shall ensure that creep and shrinkage parameters are properly incorporated into the design of the superstructure with consideration given to the existing structure. Guidance for creep and shrinkage can be found in the AASHTO *LRFD Bridge Design Specifications*, NCHRP *Report 496*, and the FHWA *Post-Tensioned Box Girder Design Manual*. Deck Closure pours shall be placed no less than 60 Days after tensioning activities.

600.03.02.07 Additional Requirements at the Salt River Bridge (Structure No. 02003)

The existing grade break at the exterior edges of the Salt River Bridge shall be reconstructed to provide a 2 percent constant cross slope at the exterior of the bridge.

600.03.02.08 Additional Requirements at the Guadalupe Bridge (Structure No. 02725)

Guadalupe Bridge shall be widened to the north to accommodate a multi-use path on the north side of Guadalupe Road that will include equestrian use. Design and construction of this path shall comply with the United States Department of Agriculture (USDA) *Equestrian Design Guidebook for Trails, Trailheads, and Campgrounds, December 2007* (Publication 0723-2816-MTDC). Minimum horizontal clearance, vertical clearance, and railing height shall be as shown in the Schematic Design, subject to Section 6.4.2 of the Agreement, for this bridge as shown in the RIDs.

Existing bridge barrier along the south side of the Guadalupe Bridge may remain. Developer shall remove the existing fence atop the barrier and replace with vertical pedestrian fence extending a minimum of eight feet above the top of the finished roadway grade.

There is an existing pier immediately south of the existing bridge originally intended for a future pedestrian bridge. The painted lean concrete portion of this pier shall be removed and extended to match to the top of the existing adjacent vertical barrier.

600.03.02.09 Required Bridge Repairs and Modifications

Developer shall carry out such repairs and modifications to existing bridges required by TP Attachment 600-2 and TP Attachment 600-3.

600.03.02.10 Additional Requirements at the SR 143 Tempe Drain Bridge (Structure No. 01801)

If the existing bridge is to be kept as part of this Project, Developer shall remove the existing AC overlay on the bridge and replace it with a new concrete topping slab. Existing condition and location of shear

connections and transverse post-tensioning shall be considered in the design of the new concrete topping slab. The concrete topping slab shall be designed to provide shear transfer between boxes to prevent reflective cracking. Longitudinal construction joints in the concrete topping slab on the existing structure are not allowed unless approved by ADOT. Final locations of approved construction joints are preferred in locations within the shoulder or outside normal wheel paths. The requirements of Table 600-4 do not apply for topping slabs on adjacent box beams.

600.03.03 Pedestrian Bridges

Developer shall design pedestrian bridges in accordance with AASHTO *LRFD Guide Specifications for the Design of Pedestrian Bridges*. The minimum vertical clearance along the pathway of the bridge shall be 10'-0" and the minimum horizontal clearance along the bridge shall be 10'-0". Vertical clearances between the pedestrian bridge and the roadway below shall be in accordance with TP Attachment 200-1.

Pedestrian bridges shall have pedestrian fencing when over roadways or when adjacent to and within 25 feet of the travel lanes or where grade difference from the pedestrian ramp and the adjacent pedestrian ramp or finished ground line below is greater than eight feet. This requirement applies to the bridge crossing the roadway and approaches at each end of the bridge. Fencing on bridges shall be 0.5 inches - #13 standard expanded metal, flattened smooth, with no sharp edges. Fencing shall extend a minimum of 12 feet above the top of the traveled path. Full fence enclosures are not allowed. Enclosures are defined as a panel or system above the walkway that would provide continuous level support in a manner to allow camping or resting. Cross frames and intermittent aesthetic elements will be allowed, as approved by ADOT. Access to areas not intended for pedestrian use shall be prevented with fencing, barriers, or other means.

Requirements for Local Jurisdiction access and emergency response shall be coordinated with the maintaining agency.

Aesthetic design shall be designed in accordance with the standards and guidelines of the maintaining agency, as approved by ADOT. See Section 100.05.03 of the TPs for additional information.

Alameda and Western Canal Pedestrian Bridge superstructures shall be a steel truss bridge when crossing I-10, ramps, and C-D roads and shall be supported on concrete substructures. The truss design shall include an additional 100 pounds per foot for aesthetic elements, including any aesthetic lighting features. This load shall be considered a component dead load.

For the Alameda Pedestrian Bridge, the location, layout and general features shall be as shown in the Schematic Design in the RIDs, subject to Section 6.4.2 of the Agreement, and TP Attachment 600-5, including approach ramp geometry, location, and type. Approach spans may be either cast-in-place or precast concrete.

For the Western Canal Pedestrian Bridge, alternative geometry may be used with approval of ADOT and the City of Tempe. Approaches may be built-up fill sections with walls or concrete end spans.

600.03.04 Retaining Walls and Wingwalls

Developer shall design retaining walls in accordance with the applicable standards provided in Section 600.02 of the TPs.

1 **600.03.04.01 Geometry**

2 Retaining wall layout shall address slope maintenance above and below the wall and provide return into
3 the retained fill or cut at retaining wall ends where possible.

4 Final tolerances shall be 0.5 inches in 10 feet, level and plumb. Footings shall be level. Batter walls during
5 construction to balance lateral deflection due to permanent loads. Negative batter, defined as the top of
6 wall rotated towards the outside exposed face of wall, is not allowed.

7 **600.03.04.02 Drainage**

8 Developer's design shall account for surface and subsurface drainage. Developer shall provide a system
9 to intercept or prevent surface water from entering behind walls. Surface water shall be captured and
10 redirected behind walls. Conveyance of surface water over the top of walls is not allowed.

11 **600.03.04.03 Barriers and Pedestrian/Barricade Railing**

12 Developer shall provide 42-inch tall pedestrian or barricade railing on top of existing and new retaining
13 walls of 48 inches in height or greater, except when protected by barrier against the top of the retaining
14 wall. Pedestrian railing shall be designed per the AASHTO *LRFD Bridge Design Specifications* and shall
15 be located at locations where it is reasonable that pedestrians will have access to the area. Barricade
16 railing shall be designed per the AASHTO *LRFD Bridge Design Specifications* except that rail spacing
17 may be increased to 1'-9" maximum (two-rail system). Barricade railing may only be placed when
18 reasonable access to pedestrians will not occur. Fencing may be substituted for railing if fencing is
19 shown to meet the loading requirements of AASHTO. Locations of fencing replacing railing must be
20 approved by ADOT.

21 MASH compliant concrete barriers along the tops of wingwalls and retaining walls shall be supported on
22 a footing independent from the adjacent wall. Approach slabs and anchor slabs may be employed as
23 independent footings. These barriers shall not be slip formed. Barriers integral with walls are not allowed,
24 except for combination barrier / toe-down walls that utilize a cast-in-place wall extending below the barrier
25 foundation without the use of a secondary foundation. These toe-down walls shall be limited to a
26 maximum height of six feet measured along the exposed face from the top of barrier foundation to the
27 bottom of the toe-down wall. The bottom of the wall shall have a minimum of 18 inches cover for a
28 maximum exposed surface of 4.5 feet measured from the top of barrier foundation to finished grade.

29 The maximum slope for finish grading adjacent to retaining walls and noise barriers shall be three
30 horizontal to one vertical. A minimum 4 foot bench shall be graded at the face of wall for maintenance
31 access activities.

32 **600.03.04.04 Wall Types**

33 Wall types identified in the Wall Concept Report shall be used.

34 **600.03.04.05 Cast-in-Place Walls on Spread Footings**

35 Cantilever concrete retaining walls may be used in accordance with ADOT Bridge Group Standard
36 Drawing Structure Detail Drawing SD 7.01. If such Standard Drawing is unmodified, structural
37 calculations are not required per Section 600.03.07 of the TPs. The spacing of construction and
38 expansion joints shall account for short and long-term longitudinal differential settlements.

Developer may provide specially designed cast-in-place (CIP) walls. Specially designed CIP walls shall be designed and constructed in accordance with the AASHTO *LRFD Bridge Design Specifications* and the ADOT *AASHTO Load and Resistance Factor Design (LRFD) Policy for Bridge Substructures: Geotechnical Design Policy*. Geotechnical design shall be in accordance with Section 300 of the TPs.

600.03.04.06 Cast-in-Place Walls on Drilled Shafts

CIP walls on drilled shafts shall be designed and constructed in accordance with the AASHTO *LRFD Bridge Design Specifications* and the ADOT *AASHTO Load and Resistance Factor Design Policy for Bridge Substructures: Geotechnical Design Policy*. Geotechnical design shall be in accordance with Section 300 of the TPs.

600.03.04.07 Anchored Walls

Anchored walls design and construction shall use FHWA-IF-99-015 *Geotechnical Engineering Circular 004: Ground Anchors and Anchored Systems*. Anchors shall use Class A Protection and shall be encapsulated with plastic sheathing. Proof load tests for anchors shall be provided in accordance with the above FHWA guidelines. Calculations and drawing details shall be signed and sealed by a registered Professional Engineer in the State.

The use of anchored walls is limited to supporting existing embankment and at bridge widenings. Anchored walls shall not be used to support embankment under new bridges.

600.03.04.08 Mechanically Stabilized Earth (MSE) Walls

Design and construction of MSE wall systems shall be accordance with FHWA-NHI-10-024 *Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Volume 1* and FHWA-NHI-10-025 *Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Volume 2*. Calculations and drawing details shall be signed and sealed by a registered Professional Engineer in the State.

Mechanically stabilized earth (MSE) walls shall not be used to support abutment spread footing foundations on the Project. Drilled shaft foundation and driven pile foundations may be placed within the MSE wall reinforced zone. Foundation loads from the structure shall be properly incorporated into the MSE wall design in accordance with the FHWA design manuals.

Barriers adjacent to MSE walls shall be supported independently from the wall coping. Top of coping shall match top of barrier footing.

Developer shall design and construct MSE walls for the Project in accordance with TP Attachment 600-6.

600.03.04.09 Soil Nail Walls

Soil nail wall design and construction shall use FHWA-NHI-14-007 *Geotechnical Engineering Circular 007: Soil Nail Walls Reference Manual*. Anchors shall use Class A Protection and shall be encapsulated with plastic sheathing. Proof load tests for nails shall be provided in accordance with the FHWA guidelines specified in this section. Calculations and drawing details shall be signed and sealed by a registered Professional Engineer in the State.

For design and construction requirements refer to TP Attachment 600-4.

The use of soil nail walls is limited to supporting existing embankment and at bridge widenings. Soil nail walls shall not be used to support embankment under new bridges.

600.03.04.10 Post and Panel Walls

Post and panel walls shall be designed in accordance with the *AASHTO LRFD Bridge Design Specifications*. Geotechnical design shall be in accordance with Section 300 of the TPs.

600.03.04.11 Walls in Close Proximity to other Structures

Developer shall consider the impact to walls of nearby structures. Loading due to earth surcharge (vertical and horizontal) from adjacent structures shall be included in the design of walls when structures are in considered in the influence area of the wall. Global stability and compound stability shall also be evaluated.

600.03.05 Noise Barriers

Developer shall design noise barriers at the locations determined by Developer and in accordance with Section 119 of the TPs.

Noise barriers shall be designed in accordance with the *ADOT Noise Abatement Regulations (2017 NAR)* and the *AASHTO LRFD Bridge Design Specifications*. Noise barriers located on roadways shall be designed to withstand a minimum unfactored wind pressure of 18.0 psf for walls 12 feet tall or less and 25.0 psf for walls taller than 12 feet at the Strength Limit State. Noise barriers located on bridges shall be designed to withstand an unfactored minimum wind pressure of 50 psf using the Strength Limit State. Noise barriers on bridges shall be designed assuming a Wind Exposure Category C. All noise barriers less than 18 feet of exposed height shall be designed for an exposed height of 20 feet to allow for future wall height extensions. Walls more than 18 feet of exposed height shall be designed for an exposed height of 25 feet to allow for future wall height extensions. Noise barriers shall not be supported on top of barrier for any condition.

Roadway noise barriers shall be either concrete or masonry. New noise barriers that connect into existing noise barriers or overlap existing noise barriers shall match the existing noise barrier type.

Noise barriers shall be designed for vehicular collision forces where appropriate and as determined by AASHTO. Noise barriers located on bridges and adjacent to traffic hazards, private property, or travel ways shall be designed to prevent catastrophic failure due to vehicular collision forces and shall limit the risk of falling debris resulting from vehicle impact. Noise barriers on the bridges shall be placed behind bridge barrier. Vehicular collision forces do not need to be considered when noise barriers are adjacent to landscaped areas where failure due to vehicular collision does not result in adjacent property damage or debris impact to travel ways.

Noise barriers to be placed on bridge structures shall utilize lightweight materials not to exceed 15 psf. Lightweight materials for noise barriers shall only be used on bridge structures. Bridge decks shall be designed and detailed to support a noise barrier design height of 20 feet to allow for future wall height extensions. Noise barriers shall be designed to prevent catastrophic failure, considered as panels falling onto vehicles or property below the bridge.

Fire hose access holes shall be provided at noise barriers located adjacent to residential areas. Covers shall be placed on each of the fire hose access holes. Developer shall coordinate with the fire departments in the Local Jurisdictions for specific locations and obtain approval from ADOT for the locations and cover type.

Noise barriers shall be designed level and plumb. The use of steps at top of wall shall be in conformance with the Aesthetics Requirements of Section 800 of the TPs. The design of noise barriers shall provide for adequate surface drainage. Special wall design may be required to pass 50-year off-site drainage through noise barrier openings. Developer shall provide for long-term maintenance access of noise barriers.

Masonry walls, where used, shall be designed to prevent water seepage into the wall system and prevent efflorescence. A cap block shall be installed at the top of all masonry walls.

New noise barriers south of Baseline Road east of I-10 mainline shall be located at the ROW. New noise barriers south of Baseline Road west of I-10 mainline shall be located adjacent to I-10 EB shoulder with appropriate roadside barrier.

600.03.06 Sign Structures, Lighting Structures, CCTV Structures and Drainage Structures

Developer shall design sign structures, lighting structures, CCTV structures, DMS structures and drainage structures in accordance with the applicable standards in Table 600-1. Wind speed shall not be interpolated from the maps located in the design specifications. The greatest wind speed contour adjacent to the Project shall be used for design. Structures maintained by local agencies shall be designed per the local agency regulations and standards.

600.03.06.01 Sign Structures

See Section 700.01.03.03 of the TPs for additional requirements.

A minimum vertical clearance of 18'-6" shall be provided for all new sign structures, including shoulders and gutters. Minimum vertical clearance is measured to the lowest sign, attachment, or component of the sign structure.

Sign structures placed above mainline roads shall use the ADOT Bridge Group Structure Detail Drawings. For conditions where sign panel height, area or structure geometry exceed the limits shown in these details, the sign structure shall be designed in a manner similar to these details. Significant deviations from the structural concept shall require approval by ADOT.

Drilled shafts shall be used to support overhead and cantilever sign structures. Where signs are located on a retaining wall, only cast-in-place type retaining walls or pedestals may be used to support them. Where signs are located on bridge elements, connections shall be incorporated into the bridge design. Installation of anchors into prestressed or post tensioned elements after fabrication is not allowed.

If the sign foundation extends more than two feet above adjacent finished grade, it shall be constructed as a formed element. Round forms will not be allowed. The formed element shall be incorporated into the aesthetics of the adjacent structures.

Signs supported directly on bridge precast elements shall be incorporated into the precast construction. Drilling into pretensioned or post tensioned structures is not allowed.

For existing sign support structures on existing superstructures that are to be removed, bolts remaining in the existing superstructures shall be ground and patched in accordance with Section 601-3.05 (B): Class I Finish of the ADOT Standard Specifications.

DMS structures shall be designed by Developer in accordance with AASHTO: *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 6th Edition*, and Sections 700.07.03.02.02 and 700.07.04.04.01.02 of the TPs.

600.03.06.02 Lighting Structures and CCTV Structures

Poles shall be constructed of material conforming to ASTM A595, Grade A or ASTM A572, Grade 55 or better. Drilled shafts shall be used to support lighting structures and CCTV structures. Where light poles are located on a retaining wall, only cast-in-place type retaining walls or pedestals may be used to support them. Where light poles are located on bridge elements, connections shall be incorporated into the bridge design. Installation of anchors into prestressed or post tensioned elements after fabrication is not allowed.

CCTV poles shall be designed for a minimum effective wind area of two square feet for CCTV & Assembly and shall be designed for a 1-inch maximum deflection at the top of the pole under a 30 mile per hour non-gust wind speed.

600.03.06.03 Drainage Structure Railing

Developer shall provide 42-inch tall railing on top of existing and new concrete structures, outlets, and wing walls of 48 inches in height or greater. Refer to Section 600.03.04.03 of the TPs for railing requirements.

600.03.06.04 Special Requirements at Western Canal

In accordance with the recommendations in the *Western Canal Strengthening Memo and Addenda* in the RIDs, Developer may place a maximum six feet of fill, measured from top of box to the top of finished grade, on top of and within the influence zone of the existing Western Canal box culvert. Developer shall provide signed and sealed calculations to SRP that the design does not exceed the ADOT recommendations. Any construction activity within the SRP ROW or within the influence zone of the existing Western Canal box culvert shall be coordinated and approved by SRP, including obtaining any necessary license agreements.

Developer shall coordinate with SRP regarding any maintenance requirements as a result of proposed construction activities or new construction adjacent to the existing reinforced concrete box structure in accordance with Section 200.03.02.15 of the TPs.

Structures within SRP ROW shall be designed in accordance with the more stringent of the AASHTO *LRFD Bridge Design Specifications* or the *SRP Bridge Design Guidelines*, in either case the most recent version as of the Setting Date.

The existing SRP Equipment Underpass north of the Ramp N-E Bridge shall be modified and extended. Extension of this structure shall be completed as to not reduce the existing horizontal or vertical clearances. Entrance and exit grades shall not exceed the existing condition. Modification and extension of this structure shall be coordinated and approved by SRP. Restrictions and closures of this equipment crossing shall be coordinated and approved by SRP.

600.03.06.05 Special Requirements at Tempe Drain (SR 143)

Improvement adjacent to and over the existing Tempe Drain channel at SR 143 shall not reduce the existing vertical clearance or the horizontal offset of the existing bridge structure of SR 143 and 48th Street over the Tempe Drain channel. Vertical clearance for this requirement mentioned herein shall be defined as the distances between the bridge soffit and the top of existing channel lining. New abutments shall not

be located closer to the existing channel than the existing abutments. New structure elements shall not apply additional surcharge pressure to the existing channel lining. Developer shall coordinate with SRP and Maricopa County Flood Control District in regard to the design and construction of elements adjacent to and over the Tempe Drain channel and include any Plans for review and approval, including any necessary license agreements. These requirement apply to all bridge widenings and new bridges constructed across the Tempe Drain.

600.03.07 Use of ADOT Standard Details

ADOT Standard Details are acceptable if the design and construction criteria as stated on the Standard Drawings are applicable and where the ADOT Standard Details are unmodified. No calculations will be required for ADOT Standard Details used. ADOT Bridge Group Standard Details for barriers may be considered acceptable under this section if modified for aesthetics with the following restrictions:

- A. The 1 foot by 1 ½-inch thick band at the top of the barrier may be eliminated; and
- B. The rustication shall extend outwards from the back of barrier and shall be limited to 2 inches in depth.

Modifications for reasons not dictated by Section 800 of the TPs shall not be allowed.

600.03.08 Construction Drawings and Design Calculations

600.03.08.01 Construction Drawings

Developer shall coordinate structure names and structure numbers through ADOT for each bridge by the Preliminary Design Submittal.

Developer shall prepare Construction Drawings in accordance with the ADOT *Standardized Dictionary of Work Tasks*. Construction Drawings shall be submitted separately for individual bridges. The Construction Drawings, at a minimum, shall include the following:

- A. General plan, including plan, elevation, and typical section;
- B. General notes, including bridge load rating;
- C. Foundation sheets;
- D. Drilled shaft details (if appropriate);
- E. Abutment plans, elevations, sections, and details;
- F. Wing wall elevations, sections, and details (if appropriate);
- G. Pier plans, elevations, sections, and details (if appropriate);
- H. Slope protection (if appropriate);
- I. Superstructure plan and section;
- J. Girder framing plan (if appropriate);

- K. Girder details (if appropriate);
- L. Prestressing details (if appropriate);
- M. Diaphragm details (if appropriate);
- N. Bearings details;
- O. Deck joint details;
- P. Screed elevations;
- Q. Foundation data sheets;
- R. Special details (if applicable); and
- S. Pile records (if applicable).

Construction Drawings shall reflect earthwork requirements as identified in the Geotechnical Engineering Report(s) and meet the requirements of Section 300.03.02 of the TPs.

Screed elevations and foundation data sheets shall be part of the Plans but may be submitted unpopulated for Preliminary, Final, and RFC submittals. Screed elevations shall be provided to IQF and ADOT for review prior to construction of the deck and shall be considered as a Working Drawing. Screed elevation and foundation data sheets shall be completed and submitted as part of the Record Drawings as required in Section 116.05.04 of the TPs.

600.03.08.02 Design Calculations

600.03.08.02.01 Structure Calculations

Developer shall prepare a Structure Calculations Report for each structure that includes a table of contents, all structure calculations, references to computer programs in the calculations, and computer documentation that includes name of program, vendor, version, and release date. The Structure Calculations Report shall be bound and all pages shall be numbered. Developer shall submit the Structure Calculations Report concurrent with the Final Design Submittal.

Independent design checks will be required on complex structures and on structures with a low level of redundancy. These structure types include, but are not limited to, straddle bents of any length and bridge structures with spans of over 250 feet. Independent checks shall include independent design calculations and a review of the applicable structural details and shall be performed by a registered Professional Engineer in the State with at least 10 years of relevant experience and who was not involved in the original design of the specific structure being reviewed.

600.03.08.02.02 Bridge Load Rating

Developer shall load rate all NBI qualified bridges carrying vehicular traffic, including culverts that qualify as bridges, and prepare a Load Rating Report(s) in accordance with the AASHTO *Manual for Bridge Evaluation* and the ADOT *Bridge Load Rating Guidelines*. References to CONSPAN in the ADOT *Bridge Load Rating Guidelines* are intended to reference LEAP Bridge Concrete software. The minimum length of structures required to be load rated and the loading requirements shall be in

accordance with the AASHTO *Manual for Bridge Evaluation*. This requirement applies to structures designed and constructed using ADOT Standard Details that meet the definition of a bridge as described herein. Load rating shall be completed using the Load Resistance Factor Rating (LRFR) method using HL-93 live loading. This requirement applies to all new bridges and bridges that are widened.

The minimum operating load rating factor for all new vehicular bridges shall be 2.0 for concrete structures and 1.8 for steel structures. This requirement does not apply to reinforced concrete box culvert structures that qualify as a bridge.

For bridge widenings, the minimum operating load rating factor shall be the operating load rating of the existing bridge or 1.5, whichever is greater. If the operating load rating of the existing bridge is greater than 2.0, then the minimum operating load rating factor shall be 2.0. Coordination and approval from ADOT Bridge Group will be required in instances where these provisions cannot be met. Table 600-5 provides Inventory and Operating Load Ratings for bridge widenings that are part of the Work and identified in the Schematic Design, subject to Section 6.4.2 of the Agreement. Values provided shall be considered informational. Developer is responsible for developing an independent load rating for all bridge widenings. Significant differences from the values shown in Table 600-5 shall be brought to the attention of ADOT to determine the controlling rating value to be used for the widening. This requirement does not apply to reinforced concrete box culvert structures that qualify as a bridge.

Table 600-5 Existing Bridge Load Ratings					
Bridge Name	Structure Number	Load Factor Rating (LFR)		Load and Resistance Factor Rating (LRFR)	
		Inventory Rating	Operating Rating	Inventory Rating	Operating Rating
I-10 Salt River Bridge OP	02003	1.21	3.06	1.00	2.03
SR 143 Tempe Drain #2	01801	1.43	2.39	1.78	2.30
US-60 Priest Drive OP EB	02350	1.28	3.02	1.00	1.96
Ramp NE over Western Canal	02367	1.40	2.82	1.60	2.60
Guadalupe Road UP	02725	1.17	3.65	1.00	2.30
Broadway Road TI UP	01211	1.01	1.70	0.68	0.87
University Drive TI OP	02005	1.11	2.69	> 1.00	> 2.00

Developer shall submit a Preliminary Load Rating Report(s) and load rating calculations to ADOT for review and comment concurrent with the construction drawing Preliminary Design Submittal. Developer shall submit a final sealed Load Rating Report(s) to ADOT for review and comment concurrent with the construction drawing Final Design Submittal.

600.04 Construction Requirements

600.04.01 Standards

Developer shall perform the structures Construction Work in accordance with the standards, manuals, and guidelines listed in Table 600-6, which are shown in no order of precedence; however, in the event of a conflict, the more stringent requirement prevails.

Table 600-6 Construction Standards		
No.	Agency	Title
1	ADOT	Standard Specifications for Road and Bridge Construction, 2008
2	AASHTO	LRFD Bridge Construction Specifications, 4th Edition
3	AASHTO	Guide Design Specifications for Bridge Temporary Works, 2 nd Edition
4	AASHTO	Construction Handbook for Bridge Temporary Works
5	FHWA	FHWA-NHI-10-024 Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Volume 1
6	FHWA	FHWA-NHI-10-025 Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Volume 2
7	FHWA	FHWA-NHI-14-007 Geotechnical Engineering Circular 007: Soil Nail Walls Reference Manual
8	AASHTO	Guide Specifications for Design and Construction of Segmental Concrete Bridges, 2nd Edition

600.04.02 Bridge Material Properties

Concrete shall be ASTM C150 Type II, Type III, or Type V cement for cast-in-place concrete, precast concrete, and miscellaneous concrete. Structural concrete shall be ADOT Class S with minimum strengths as specified on the construction documents. For concrete, Developer shall use accepted mix designs, which have shown a history of satisfactory performance and minimal life-cycle costs. Mix designs shall be submitted to ADOT for approval in accordance with Section 1006 of the ADOT Standard Specifications.

All reinforcing steel shall be per ASTM A615 Grade 60 or ASTM A706, weldable. Reinforcing steel shall be sized in U.S. customary units. Provide minimum concrete cover in accordance with the AASHTO *LRFD Bridge Design Specifications* with the following modification: Minimum cover for concrete exposed to weather shall not be less than 2 inches unless otherwise specified. Deck top reinforcing shall have a concrete cover of 2.5 inches minimum.

Structural steel shall conform to the requirements specified in AASHTO *LRFD* Table 6.4.1-1, with the selection based on strength, serviceability, and overall economy. All structural steels shall be ASTM A709 Grade 50 or 50W (AASHTO M270 Grade 50 or 50W). Special shapes requiring different material types shall be clearly identified on the construction drawings and shall reference an AASHTO or ASTM standard.

ASTM A709 Grade 36 (AASHTO M270 Grade 36) steel may be used for miscellaneous applications, such as, anchor bolts, expansion joints, rods etc. All miscellaneous steel hardware exposed to weathering action shall be galvanized.

600.04.03 Concrete Structures

Developer shall ensure that concrete pours are not conducted over live traffic. This includes, but is not limited to, straddle bents, concrete decks, and bridge barrier.

Developer shall saw longitudinal grooves on bridge decks, approaches, and concrete pavement protective systems that are not overlaid with AR-ACFC in accordance with the ADOT Standard Specifications and Stored Specification 601CONC.

600.04.04 Reinforcement Fabrication

Lap splices or mechanical connectors shall be used for all reinforcing steel splices and connections. Welding of reinforcing steel to replace the requirements of a lap splice is not allowed.

600.04.05 Construction Requirements for Noise Barriers

Final tolerances shall be 0.25 inches in 10 feet.

For construction that impacts existing noise barriers, Developer shall use a 6 foot high temporary chain link security fence with privacy/visual shade screen/mesh to secure the area prior to removal of the existing noise barrier and construction of the new noise barrier. The temporary fencing shall be maintained by Developer. Developer is responsible for coordinating access with the property owner and shall take all necessary measures to protect existing utilities, existing improvements, landscaping, and irrigation. Developer shall phase activities to minimize the duration between when an existing noise barrier is removed, and new noise barrier is constructed.

600.04.06 Construction Requirements for Sign Structures

Sign structures shall be galvanized.

600.04.07 Construction Requirements for Drilled Shafts

Developer shall follow the construction requirements for drilled shafts in accordance with the ADOT Standard Specifications and Stored Specification 609DRSFD.

600.04.08 Structure Shop Drawings and Working Drawings

Shop Drawings and Working Drawings, which include drawings for falsework, shoring, soldier piles, cofferdams, temporary bridges, and other major temporary support structures, shall be signed and sealed by a registered Professional Engineer in the State.

Developer shall prepare MSE Wall Drawings that include the design and construction requirements of the MSE wall. MSE Wall Drawings are considered Shop Drawings and Working Drawings. Developer shall submit MSE Wall Drawings to ADOT for review and comment prior to implementation.

The following Shop Drawings and Working Drawings, if applicable, shall become part of the Record Drawings structure drawings:

- A. Post-tensioning details;
- B. Expansion joint details;
- C. Proprietary bearing details;
- D. Proprietary retaining wall details;
- E. Proprietary noise barrier wall details;
- F. Precast and stay-in-place deck panels;
- G. Precast girder; and

H. Other Shop Drawing and Working Drawings for atypical structures as specified in the Contract Documents.

600.04.09 Falsework, Forms, and Shoring

Developer shall design and construct falsework, forms, and shoring in accordance with the following:

- A. ADOT Standard Specifications;
- B. AASHTO Guide Design Specifications for Bridge Temporary Works;
- C. AASHTO Construction Handbook for Bridge Temporary Works; and
- D. AASHTO LRFD Bridge Construction Specifications.

Developer shall prepare Falsework Drawings that comply with the design and construction requirements of the falsework and forms. Falsework Drawings are considered Shop Drawings and Working Drawings. Developer shall submit Falsework Drawings to ADOT prior to implementation.

All falsework shall maintain a minimum of 16 feet of vertical clearance to the roadway below.

Developer shall prepare Shoring Drawings that comply with the design and construction requirements of the shoring. Shoring Drawings are considered Shop Drawings and Working Drawings. Developer shall submit Shoring Drawings to ADOT prior to implementation.

600.04.10 Load Rating Report

Developer shall prepare an As-Built Load Rating Report(s) based on as-built condition in accordance with the AASHTO *Manual for Bridge Evaluation* and shall include both inventory and operating ratings of the "as-built" structures. At the same time as the Record Drawing Submittal, Developer shall submit the As-Built Load Rating Report(s) to ADOT for review and comment.

600.04.11 Removal of Existing Bridges

Prior to the demolition of any bridge, Developer shall submit a comprehensive Removal Plan for the existing structure for approval. The Removal Plan shall include the following:

- A. Evaluation reports documenting asbestos and lead testing of the bridge;
- B. Proposed sequencing of the bridge demolition. Sequencing shall consider loading of elements during all phases of demolition to ensure that the structure is stable. Developer shall provide structural calculations showing the stability of the structures if requested by ADOT;
- C. Steps, equipment, and duration of demolition for the sequence proposed;
- D. Qualifications of the demolition contractor demonstrating prior experience of bridge demolition using similar techniques (a minimum of two projects);
- E. Environmental and safety measures to satisfy Federal, State, and Local requirements for the removal and disposal of solid waste and/or hazardous material as applicable;

1 F. Disposal of steel members painted with lead-based paint shall be in accordance with Section
2 119.03.04 of the TPs;

3 G. If a portion of the existing structure is to temporarily remain and will remain in an area above or
4 near traffic, Developer shall provide an analysis showing that the remaining portion of the
5 structure is stable, and that failure will not occur. This Developer shall include the anticipated time
6 the portion of structure will remain in place before final demolition. A debris containment system
7 in accordance with Section 600.04.12 of the TPs shall be provided for any portion of the existing
8 structure that extends above traffic.

9 Developer shall take the necessary measures during the bridge demolition to prevent the contamination
10 of the earthwork, roadway, and landscaping areas underneath and around the bridge. Developer is
11 responsible for ensuring that all Federal, State, and Local standards, regulations, and requirements have
12 been met and shall bear the responsibility for any non-compliance with these standards, regulations, and
13 requirements.

14 Holes, cavities, and depressions resulting from the removal of structures shall be backfilled and
15 compacted to a density of not less than 95 percent of the maximum density as determined in accordance
16 with the requirements of the applicable test methods of the ADOT *Material Testing Manual*.

17 Approval of this plan is required prior to any demolition of the existing bridges.

18 **600.04.12 Debris Containment Systems**

19 Developer shall provide a Debris Containment System for sections of removed structures that will remain
20 in place over traffic and for demolition and work over the Twin Buttes Cemetery aerial easement, SRP
21 Western Canal open channel, SRP equipment crossing and the Tempe Drain. The Debris Containment
22 System shall be of a type and size suitable to contain all debris anticipated during the work. A Debris
23 Containment System Plan shall be submitted for approval prior to work requiring the Debris Containment
24 System and shall include the following:

25 A. A description of the Debris Containment System;

26 B. Maximum loading on the Debris Containment System;

27 C. Details for the support system designed to resist loads, including analysis of existing structure for
28 any proposed support attached to existing structure;

29 D. Sequence of installation and removal of the Debris Containment System, including patching of
30 existing structure; and

31 E. Duration of proposed use and frequency of inspection for removal of debris.

32 Developer shall meet, coordinate and document the existing site condition of the facility being spanned
33 prior to the work over such facility.

34 Developer shall remove debris in a reasonable time or as directed by ADOT while the Debris Containment
35 System is in use. Developer shall immediately notify ADOT if any debris falls outside the Debris
36 Containment System and shall make immediate efforts to safely remove the debris.

1 The Debris Containment System Plan shall be reviewed and approved by SRP prior to work requiring
2 the Debris Containment System.

3 The requirements in this section do not waive the requirements in Section 600.04.03 of the TPs.

4 **600.04.13 Other Requirements**

5 **600.04.13.01 Removal of Bridges**

6 Except as otherwise stated in these Technical Provisions, piling, piers, abutments, footings, and
7 pedestals shall be removed to at least one foot below ground line or five feet below finished subgrade
8 elevation, whichever is lower. Explosives shall not be used in bridge removal operations unless approved
9 by ADOT.

10 **600.04.13.02 Separation Geotextile Fabric**

11 Traffic or construction equipment shall not be permitted on geotextile fabric. If traffic or construction
12 equipment is placed on fabric for emergency purposes, fabric shall be inspected for damage. Any
13 damaged fabric shall be replaced.

14 **600.04.13.03 Falsework**

15 Deflection of the falsework span due to the weight of concrete only shall not exceed 1/240 of the falsework
16 beam span irrespective of the fact that the deflection may be compensated for by camber strips.

17 For post-tensioned structures, the falsework deflections shall not produce stresses in the structure at any
18 time prior to post-tensioning greater than 0.8 times the modulus of rupture for plain concrete.

19 **600.04.13.04 Prestressing**

20 The stresses in the prestressing steel shall not exceed those specified in the AASHTO LRFD Bridge
21 Design Specifications.

22 **600.04.13.05 Welding of Reinforcement**

23 Tack welding of reinforcement will not be allowed unless approved by ADOT. Tack welding will only be
24 allowed when required by design. Tack welding for purposes of placement of reinforcement will not be
25 allowed. If tack welding of reinforcement is required, the reinforcement shall be deformed and shall
26 conform to the requirements of ASTM A706.

27 **600.04.13.06 Drilled Shaft Foundations**

28 Foundations of less than or equal to four feet in diameter and less than or equal to 28 feet in length
29 utilized in light pole and sign post foundations shall be exempt from the requirement to submit an
30 installation plan, perform integrity testing, conduct a drilled shaft preconstruction meeting, and construct
31 a confirmation shafting.

32 The contractor shall construct a confirmation shaft to determine the adequacy of the contractor's
33 equipment, materials, employees, and procedures for completion of the drilled shaft foundations in
34 accordance with the requirements of the plans, specifications, and installation plan. The confirmation
35 shaft shall be the first drilled shaft foundation to be developed. Developer will specify the location of the
36 confirmation shaft. The confirmation shaft holes shall be completed in the same manner as other
37 production shafts.

1 The maximum deviation from plumb shall be not more than 1.5 percent. The maximum permissible
2 variation of the design center axis for both the borehole and rebar cage at the top shall be 5 percent of
3 the shaft diameter, not to exceed 3 inches from its project plan location.

4 The inside diameter of the casing shall not be less than the specified size of the shaft. The outside
5 diameter of the shaft shall not exceed plan dimension by more than 6 inches unless use of telescoping
6 casing or surface casing is allowed by the installation plan.

7 Each drilled shaft foundation completed shall be inspected by means of a cross-hole sonic logging (CSL)
8 survey and a gamma gamma logging (GGL) survey.

9 **600.04.13.07 Cold Weather Concreting:**

10 Concrete operations shall not be scheduled when weather forecasts indicate a probability that ambient
11 temperatures will fall below 35°F during the placement or curing periods unless a Cold Weather
12 Concreting Plan has been previously approved by ADOT.

13 Concrete operations shall be immediately discontinued when a descending air temperature in the shade
14 and away from artificial heat falls below 40°F nor shall concrete operations be resumed until an ascending
15 air temperature in the shade and away from artificial heat reaches 35°F unless a Cold Weather
16 Concreting Plan has been previously approved by ADOT.

17 The Cold Weather Concreting Plan shall meet the requirements of the 1006-5.03 of the ADOT Standard
18 Specifications and requirements of Stored Specification 1006PCC and shall identify methods used to
19 meet these requirements, equipment to be used, and a remediation plan when internal temperatures of
20 the concrete drop below 35°F. Concrete temperatures shall be measured and continuously recorded
21 using temperature sensing devices during the entire curing period when a descending air temperature in
22 the shade and away from artificial heat falls below 40°F and shall continue until an ascending air
23 temperature in the shade and away from artificial heat reaches 35°F.

24 If the surface concrete temperature at any location in the structure falls below 35°F during the curing
25 period, Developer shall core the areas in question at the locations indicated by the monitoring. The
26 contractor shall submit the cores to a petrographer for examination in accordance with ASTM C 856.
27 Concrete damaged by frost, as determined by the petrographer, shall be removed and replaced.

28 The placing of concrete will not be permitted until all the necessary protection equipment and materials
29 are on hand at the site and in satisfactory working condition.

30 Concrete requiring cold weather protection shall have such protection removed at the end of the required
31 curing period in such a manner that will permit a gradual drop in the concrete temperatures.

32 **600.04.13.08 Cracks in Concrete Structures**

33 Concrete that exhibits severe cracking shall be evaluated by Developer and IQF. Severe cracking is
34 defined as cracks with a measured crack width of 0.017 inch. In instances where crack widths exceed
35 0.017 inch, Developer shall propose a remediation method to seal the crack and if required, the
36 surrounding concrete surface. When numerous cracks are identified in a finished deck surface,
37 Developer shall seal the deck with a penetrating crack sealer, methacrylate, after cracks have been
38 remediated.

1 **600.05 Submittals**

2 Table 600-7 reflects a nonexclusive list of Submittals identified in Section 600 of the TPs and is not
 3 intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit
 4 all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental
 5 Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and
 6 hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer
 7 shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 600-7 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Proprietary Wall Drawings	3	0	1	Not less than 10 Business Days prior to implementation	600.04.08
Falsework Drawings, Shoring Drawings, Shop Drawings, and Working Drawings	5	0	1	Not less than 10 Business Days prior to implementation	600.04.08, 600.04.09
Structure Calculations Report	3	0	1	Concurrent with the Final Design Submittal of a structure Plan	600.03.08
Independent Design Check Calculation Report (When Required)	3	0	1	Concurrent with the Final Design Submittal of a structure Plan	600.03.08
Initial Load Rating Report(s)	3	0	1	At the same time as the Preliminary Design Submittal of a bridge Plan	600.03.08
Final Load Rating Report(s)	3	0	1	At the same time as the Final Design Submittal of a bridge Plan	600.03.08
As-Built Load Rating Report(s)	3	0	1	At the same time as the Record Drawing Submittal	600.04.10
Vibration Monitoring Plan	3	0	1	30 Days prior to Work involving driving piles	600.03.01.02
Existing Structure Modification Report	3	0	1	At the same time as the Preliminary Design Submittal of a bridge Plan	600.03.02.05
Removal Plan	3	0	1	Prior to the demolition of any bridge	600.04.11

Table 600-7 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Debris Containment System Plan	3	0	1	Prior to any work on bridges of the Western Canal Open Channel, equipment crossing and Tempe Drain	600.04.12
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

End of Division

1

Division VII, Traffic Control Facilities

700 TRAFFIC DESIGN

700.01 Pavement Marking, Signing, Signals and Lighting

700.01.01 General Requirements

Developer shall perform all traffic Design Work in compliance with the requirements of Section 700.01 of the TPs.

700.01.02 Administrative Requirements

700.01.02.01 Standards

Developer shall perform all traffic Design Work in accordance with the relevant requirements of the standards, manuals, and guidelines listed in Table 700-1, which are shown in no order of precedence; however, in the event of a conflict, Local Requirements for the applicable Local Jurisdiction shall prevail. Otherwise, in the event of a conflict, the more stringent requirement prevails.

Table 700-1 Design Standards		
No.	Agency	Title
1	FHWA	Manual on Uniform Traffic Control Devices (MUTCD), 2009 with 2012 Revisions
2	ADOT	Arizona Supplement to the MUTCD, 2009 with revisions
3	U.S. Access Board	Americans with Disabilities Act Accessibility Guidelines
4	ADOT	Signing and Marking Standard Drawings
5	ADOT	Traffic Signals and Lighting Standard Drawings
6	ADOT	Arizona Manual of Approved Signs
7	ADOT	Standard Specifications for Road and Bridge Construction, 2008

700.01.02.02 Software

Developer shall use SignCAD to develop non-standard or specific sign format layouts.

Developer shall use AGI 32 for lighting analysis.

700.01.02.03 Existing Signs

Refer to Section 700.01.03.03 of the TPs.

700.01.02.04 Speed Regulations

Developer shall document the final design data, curves, and geometry that support the proposed posted speed limits along all study area roadways. This shall be submitted to ADOT for purposes of developing the speed regulation. ADOT will draft the official speed regulation, in accordance with ADOT *Traffic Engineering Guidelines and Processes* 223, taking into account the design data and real-world operation. The speed regulation will be finalized by ADOT.

1 **700.01.03 Design Requirements**

2 **700.01.03.01 General**

3 Developer shall design traffic improvements that require Utility service in accordance with Section 107.15
4 of the TPs. Developer shall utilize ADOT standards, manuals, and guidelines for all ADOT-owned
5 facilities.

6 **700.01.03.02 Pavement Markings**

7 Pavement marking layout shall comply with the ADOT *Signing and Marking Standard Drawings*.
8 Developer shall design a complete and functional pavement marking system for the Project that complies
9 with the following requirements:

- 10 A. Provides for the orderly and predictable movement of all traffic;
- 11 B. Provides guidance and warnings as needed to ensure the safe and informed operation of
12 individual elements of the traffic stream; and
- 13 C. Consistent with pavement markings on the ADOT transportation system in the Phoenix area.

14 Pavement markings for legends, symbols, in-lane pavement markings, system to system ramp edge lines,
15 lane skip striping, and gore marking shall be Preformed Type I pavement marking (durable tape) in
16 accordance with Section 704 of the ADOT Standard Specifications. All other final striping within ADOT
17 maintained limits shall be 90 mil (0.090-inch) thick ribbon extruded thermoplastic in accordance with Section
18 704 of the ADOT Standard Specifications.

19 New and existing PCCP and bridge decks that are not overlaid with AR-ACFC at the completion of the
20 Work shall have high durability type 1 high-contrast pavement marking tape applied in accordance with
21 Section 705 of the ADOT Standard Specifications. Crossroads and service interchange ramps are
22 exceptions and do not require high-contrast pavement marking tape. HOV white solid 12-inch stripe shall
23 include Type C raised pavement markers as shown in ADOT *Standard Drawing M-13*. Inside yellow edge
24 lines shall not include raised pavement markers as indicated in ADOT *Standard Drawing M-19*.

25 When transitioning from two HOV lanes to one on westbound I-10, the second HOV lane shall end with a
26 lane drop. An HOV lane shall not terminate by converting to a general-purpose lane.

27 Developer shall not use paint for final pavement markings on ADOT-maintained roadways.

28 Developer shall provide bridge and barrier markers in accordance with ADOT *Standard Drawings M-32*
29 *and M-33*.

30 Developer shall provide striping on service interchange ramps up to the crosswalk at the intersection,
31 including arrows and legends, which will require obliteration and re-striping on existing pavement that is
32 beyond the limits of new pavement construction.

33 Developer shall provide two sets of Type I in-lane route designation pavement markings in each system
34 ramp lane in advance of each system interchange at the following locations:

- 35 A. Eastbound I-10:
- 36 1. Approaching SR 143;

2. Approaching US 60 (mainline and C-D road); and
 3. Approaching SR 202L.
- B. Westbound I-10:
1. Approaching US 60 (mainline only);
 2. Approaching SR 143 (mainline and C-D road); and
 3. Approaching I-17.
- C. Southbound SR 143 approaching I-10.
- D. Westbound US 60 approaching I-10 (route markings not affected by Construction may remain and count towards required markings).

Developer shall provide Preformed Type I in-lane route designation pavement markings in all I-10 General Purpose lanes adjacent to the I-17 approach markings. High-contrast in-lane route designation markings shall be used if markings are placed on PCCP or Bridge Deck.

The in-lane route designation markings shall indicate the numerical route and the direction of the approaching interchange, "ONLY" legend as applicable for exclusive exit lane, and be placed far enough in advance of the interchange as to allow drivers to assume adequate lane positioning. The exact distance will vary depending on proposed geometry and signage. Developer shall coordinate with the ADOT Regional Traffic Engineer for guidance on exact placement.

Developer shall install wrong-way arrows on service interchange off-ramps in accordance with ADOT *Signing and Marking Standard Drawing M-12*.

Vertical delineators or tubular markers for purposes of permanent traffic control or to restrict vehicular movements shall not be installed anywhere within the Project Limits.

700.01.03.02.01 Raised/Reflective Pavement Markers

Reflective raised pavement markers shall be installed on the mainline, ramps, C-D roads, and frontage roads in accordance with ADOT *Signing and Marking Standard Drawings*.

700.01.03.02.02 Pavement Marking Plans

Developer shall prepare Construction Drawings in accordance with the ADOT *Standardized Dictionary of Work Tasks*. The Construction Drawings, at a minimum, shall include edge and lane line striping, stop lines, crosswalks, arrows, legends, gore areas, symbols, in-route designation markings and legends, raised pavement markers, object markers, delineation, or other required markings in accordance with applicable standards.

700.01.03.02.03 City of Phoenix Pavement Markings

Pavement marking shall comply with the City of Phoenix Design Guidelines and the City of Phoenix Paint Standard Details, included in TP Attachment 700-1. Developer shall provide lane and shoulder widths per TP Attachment 200-1 to establish roadway width. Developer shall coordinate and lead a meeting with the

City of Phoenix prior to Preliminary Plan Submittal to obtain final lane and shoulder widths. Lane and shoulder widths shall not change the combined width of the roadway per dimensions shown in TP Attachment 200-1. Developer is responsible for submitting pavement marking plans to the City of Phoenix for review and approval.

700.01.03.02.04 City of Tempe Pavement Markings

Pavement marking shall comply with the Maricopa County Department of Transportation's *Pavement Marking Manual*. Developer shall provide lane and shoulder widths per TP Attachment 200-1 to establish roadway width. Developer shall coordinate and lead a meeting with the City of Tempe prior to Preliminary Plan Submittal to obtain final lane and shoulder widths. Lane and shoulder widths shall not change the combined width of the roadway per dimensions shown in TP Attachment 200-1. Developer is responsible for submitting pavement marking plans to the City of Tempe for review and approval.

700.01.03.03 Signs

Signing layout shall comply with the ADOT *Signing and Marking Standard Drawings*. Developer shall design all components of the signing system for the Project to provide a complete and functional system that complies with the following requirements:

- A. During all phases of construction and until such time that the permanent signs are in place, Developer shall relocate existing signs or provide temporary signs;
- B. Remove and dispose of all conflicting signs and sign structures;
- C. All permanent signs, sign supports, and sign structures, shall be new; and
- D. Modification or relocation of existing signs or sign structures is not allowed.

Developer shall coordinate with ADOT Adopt-A-Highway Central District for the location and design of Adopt-A-Highway signs within the Project Limit.

Developer shall coordinate with Grand Canyon State Logo Signs, a program of ADOT, for the locations of specific service logo signs at each interchange and exit ramps. Developer shall provide locations for new logo sign installation to Grand Canyon State Logo Signs. Grand Canyon State Logo Signs is responsible for coordinating with ADOT for the fabrication and installation of the specific service logo signs.

Developer shall install interchange sequence signs as shown in the Sign Concept titled "F0072 Schematic Signing Roll Plots" as provided in the RIDs. When used, interchange sequence signs shall take the place of a required advance guide sign and shall list the next three available exits. The interchange sequence sign shall not take the place of an advance guide sign positioned over an auxiliary lane.

The signing system shall include HOV violation signs providing for a \$400 minimum fine. HOV lane time restrictions shall be included on all overhead HOV signage.

Existing signage for HOV exits from I-10 eastbound shall be replaced with, at a minimum, the same number of signs as exists as of the Setting Date, even if there are more signs posted than required per the MUTCD. Developer shall not reduce the number of signs in place for an HOV exit.

Non-overhead sign panels extending into the shoulder, such as median-mounted panels, shall be mounted with 12 feet minimum vertical clearance from the pavement surface.

All existing supplemental guide signs listing attractions or destinations, including educational locations, cities, and towns shall be replaced in kind. All guide signs listing the name of intersecting highways, roads, or cross streets shall be mounted overhead. The only guide signs permitted to be ground mounted are as follows:

A. Supplemental guide signs listing attractions or destinations other than intersecting roads or highways; and

B. Exit gore signs.

Developer shall obtain an FAA Determination of No Hazard, in accordance with Section 119.02.06.02 of the TPs, for any new sign panel or sign structure which meet the requirements for construction or alteration requiring notice in 14 CFR 77 (Code of Federal Regulations). Developer shall revise such design determined to exceed obstruction standards, and follow any requirements to install obstruction lighting, paint or other warning devices based on FAA response.

All warning signs for curves in which there is a Design Exception, as indicated in TP Attachment 200-3 or obtained by Developer, shall include advisory speed plaques. Advisory speed plaques shall not be ordered until the ultimate stripes are marked on the final roadway surface of such curves. Developer shall notify ADOT 10 Days prior to the ordering of advisory speed plaques to schedule a "Ball Bank" survey by ADOT. The "Ball Bank" survey shall supersede the signing plans, including any adjusted based upon the "Ball Bank" survey, as directed by ADOT. Adjustments to the Plans shall be in accordance with Section 116.05.03 of the TPs. The ADOT "Ball Bank" Crew may be reached at (602) 228-4932 for Adrian Sample, (602) 228-2508 for Dan Yalda, or (602) 228-0889 for John Livingston.

All signs shall comply with the Stored Specification 1007REFS for sign sheeting.

Developer shall provide wrong way signing in accordance with ADOT *Traffic Engineering Guidelines and Processes (TGP) 314*. Red retroreflective sheeting shall be placed facing wrong-way traffic on the sign posts from the bottom of the sign to near the top of the foundation or slip base. The angle of orientation of the post-mounted signs shall be jointly reviewed in the field by, and subject to the approval of, ADOT Regional Traffic Engineer, Developer, and the IQF.

All ground-mounted sign panels within the Project Limits shall be replaced with new sign panels, even if the sign is undisturbed by construction activities. Developer may not reuse any ground-mounted sign panels. Sign posts and foundations for ground-mounted signs may only be reused if undisturbed by construction activities and if the sign being mounted on the post is of the same size as the previously mounted sign(s). The limits of sign panel replacement on service interchange ramps extend to the crossroad crosswalk of that ramp. Any signs impacted by crossroad construction or modifications to access or destinations shall be new. All other crossroad sign panels may remain.

Developer may not reuse existing guide sign panels or overhead-mounted sign panels, with the following exceptions:

A. Guide signs approaching SR 202L that were installed with construction of the South Mountain Freeway, as shown in the Schematic in the RIDs; and

B. Arrow per lane guide signs on US 60 approaching I-10, as shown in the Schematic in the RIDs.

Developer shall remove all Arizona Centennial signs within the Project Limits. Upon removal, Arizona Centennial signs shall become the property of Developer.

To enforce ADOT access control limits, Developer shall provide signage to exclude bicycles from traveling on mainlines, C-D roads and ramps.

For the purposes of the signing and pavement marking design, the interchange of I-10 at SR 143 / 48th Street shall be considered a major interchange.

Mainline general purpose lanes and HOV Lanes not established as a parallel acceleration entrance ramp lane shall be signed with an overhead warning sign identifying the upcoming lane merge, including I-10 westbound HOV lane near the Salt River Bridge, I-10 westbound approaching 32nd Street and I-10 eastbound approaching Elliot Road.

700.01.03.03.01 Sign Panels

All sign panels shall be aluminum. Developer shall not use overlaid sign panels or overlaid plywood sign panels. All ground mounted sign supports used shall be in accordance with the ADOT *Signing and Marking Standard Drawings*. Developer shall not use U-channel posts for sign mountings.

700.01.03.03.02 Overhead Sign Structures

Refer to Section 600 of the TPs for structural requirements of overhead sign structures and foundations.

All mainline overhead sign structures shall be new. Ramp overhead sign structure impacted by the Work shall be new. Relocation of existing overhead sign structures shall not be allowed.

Minimum sign clearance for overhead signs shall be in accordance with TP Attachment 200-1 over the entire width of the pavement, including shoulders and gutters. The minimum sign clearance for signs mounted on bridge structures shall not be less than the bridge clearance requirements specified in the Contract Documents. The bottom of signs mounted on bridge structures shall be 6 inches above the soffit of the structure. Developer shall locate overhead sign structure foundations required in areas other than the mainline and ramps in such as manner as to provide a minimum of two feet of horizontal clearance from the face of vertical curb.

Overhead signs mounted adjacent to and on the same structure as other overhead signs shall all be aligned such that the bottoms of the signs are at the same height above the pavement. If the difference in height of adjacent signs is to be less than or equal to two feet, the smaller signs shall be increased in size to match the height of the adjacent taller signs.

All overhead signs, existing or proposed, with information that applies only to certain lanes below shall be mounted over those lanes. This includes HOV and Exit Only signs. Down arrows or upward angled exit only arrows shall be approximately centered over the lane they control.

New overhead sign structures shall be provided on northbound and southbound 40th street (except on the existing 40th Street bridge structure), southbound 48th Street north of Broadway Road, eastbound Broadway Road, and westbound Broadway Road west of 52nd Street. Existing overhead sign structures on westbound Broadway Road east of 52nd Street, eastbound and westbound University Drive may remain with new sign panels.

1 **700.01.03.03.03 Signing Plans**

2 Developer shall prepare a Signing Concept Plan roll plot showing all existing to remain and proposed
3 guide signs and DMSs for the Project. A Signing Concept workshop shall be held to present the
4 Preliminary Signing Concept Plan to ADOT and obtain input and guidance prior to the Preliminary Sign
5 Plan Submittal. An updated Signing Concept Plan shall be submitted by Developer to ADOT when there
6 are changes to the work that affect the guide signing or DMS.

7 Developer shall prepare Signing Plans, in conjunction with the Pavement Marking Plans, showing all
8 existing and proposed signs and DMSs for the Project, including signs designated for removal that are
9 outside the limits of sign replacement.

10 Developer shall prepare Construction Drawings in accordance with the ADOT *Standardized Dictionary*
11 *of Work Tasks*. The Construction Drawings, at a minimum, shall include the following:

12 A. Signing Plans showing the location of all proposed and existing to remain signs within the Project
13 Limits and proposed and removal of signs outside the Project Limits. Plans shall include signs
14 in relation to the roadway and other features, graphical representation of number of posts and
15 legend of sign, sign number and station of sign. Signing Plans shall also show proposed
16 locations for Grand Canyon State Logo signs and Adopt-A-Highway signs;

17 B. Signing summary sheets that include the plan sheet number, sign number, sign code, disposition
18 of sign, mounting height and offset, background color, legend, the size of the sign, type of sign,
19 foundation type and quantity, post length and quantity, slip base requirement, stringer and
20 overhead sign structure information and any additional remarks following the format of the
21 typical ADOT sign format;

22 C. Sign format Plan sheets for all signs that are specific and not included in the ADOT *Manual of*
23 *Approved Signs*. Developer shall develop sign formats using SignCAD and ADOT's current
24 policy for the formatting of guide signs;

25 D. Sign elevation sheets that show the sign position in relation to the travel lanes for all overhead
26 signs, spacing between brackets, the number of brackets used, the minimum vertical clearance,
27 and structure and foundation information; and

28 E. Sign mounting details for all overhead signs mounted on bridges, nonstandard sign structures
29 details, and nonstandard sign structure foundations details.

30 **700.01.03.03.04 City of Phoenix Signing**

31 Signing within City of Phoenix maintenance limits shall comply with ADOT requirements. Developer is
32 responsible for submitting signing plans to the City of Phoenix for review and approval.

33 **700.01.03.03.05 City of Tempe Signing**

34 Signing within City of Tempe maintenance limits shall comply with the Maricopa County Department of
35 Transportation's *Traffic Signing Manual*. Developer is responsible for submitting signing plans to the City of
36 Tempe for review and approval.

1 **700.01.03.04 Traffic Signal Systems**

2 Traffic signal layout shall comply with the ADOT *Traffic Signal and Lighting Standard Drawings*, MUTCD,
3 and the ADOT Arizona Supplement to the MUTCD. Developer shall design all components necessary to
4 provide a complete and functional traffic signal system that complies with the following requirements:

- 5 A. Developer shall modify, as appropriate, any existing traffic signals affected by Developer's
6 design. Traffic signal ADA facilities impacted by construction activities shall be replaced with
7 new features in accordance with Section 200.03.05 of the TPs;
- 8 B. Developer shall coordinate with the appropriate Governmental Entities for interconnection and
9 synchronization of traffic signal networks;
- 10 C. The traffic signal system shall:
- 11 1. Include phasing that has been reviewed and approved by the ADOT;
- 12 2. Provide communication between each ADOT-maintained traffic signal and the ADOT
13 Traffic Operations Center in accordance with Section 700.07 of the TPs;
- 14 3. Accommodate pedestrians as required by local, state, and federal regulations, and
15 Section 200.03.05 of the TPs for ADA Compliance;
- 16 4. Include vehicle detection in accordance with Section 700.01.03.04.01 of the TPs, closed
17 circuit television (CCTV) remote monitoring at each intersection in accordance with
18 Section 700.07 of the TPs, and communication links for signal coordination;
- 19 5. Provide at least the recommended minimum number of overhead-mounted primary
20 through signal faces for each intersection approach as specified in Table 4D-1 of the
21 MUTCD;
- 22 6. Provide temporary traffic signals at any location that currently has traffic signals and that
23 are removed for construction or locations that are required to facilitate maintenance of
24 traffic;
- 25 7. Provide a traffic signal uninterruptible power supply (UPS) for each new or modified
26 ADOT-maintained traffic signal that complies with the requirements in TP Attachment
27 700-3 to maintain eight full hours of operation of the traffic signals in the event of a power
28 outage;
- 29 8. Provide pedestrian pushbuttons for all pedestrian crossings at new or modified signalized
30 intersections in accordance with the MUTCD and the requirements of the maintaining
31 agency;
- 32 9. Provide signal head visors on all signal indications in accordance with ADOT *Traffic*
33 *Signals and Lighting Standard Drawing T.S. 8-4*; and
- 34 10. Provide egg crate-type visors on all pedestrian signal housings in accordance with ADOT
35 *Traffic Signals and Lighting Standard Drawing T.S 8-7*.

1 For ADOT-maintained traffic signals, Type Q and Type Q-2 signal heads shall only be used with ADOT
2 approval.

3 Any new traffic signal systems or modifications to existing signal systems shall follow the appropriate
4 design standards of the agency which will be maintaining the intersection. Current signal maintenance
5 responsibilities are as follows:

6 A. I-10 & 32nd Street: ADOT

7 B. I-10 & 40th Street: ADOT

8 C. I-10 & 48th Street / SR 143: ADOT

9 D. 48th Street & Broadway Road: City of Tempe

10 E. I-10 EB & Broadway Road: City of Tempe

11 F. I-10 WB / 52nd Street & Broadway Road: City of Tempe

12 G. I-10 & Baseline Road: City of Tempe

13 H. I-10 & Elliot Road: City of Tempe

14 I. I-10 & Warner Road: ADOT

15 J. I-10 & Ray Road: ADOT

16 K. I-10 & Chandler Boulevard: ADOT

17 L. SR 143 & University Drive: ADOT

18 M. US 60 & Priest Drive: City of Tempe

19 Traffic signals anticipated to be impacted by construction activities, which will require modification,
20 removal, or reconstruction, include:

21 A. I-10 & 40th Street:

22 1. Remove the existing traffic signal infrastructure and install new traffic signal infrastructure
23 at the intersection of 40th Street and the I-10 eastbound ramps;

24 2. Existing traffic signal infrastructure at the intersection of 40th Street and the I-10
25 westbound ramps may remain in place if unimpacted by construction activities;

26 3. New vehicle detection shall be installed for all approaches of the interchange to include
27 the intersections with both the eastbound and westbound ramps of I-10; and

28 B. I-10 & 48th Street / SR 143:

29 1. Remove existing traffic signal system; and

C. I-10 EB & Broadway Road:

1. Remove existing traffic signal system and install a complete and new traffic signal system at the new intersection location in accordance with City of Tempe requirements; and

D. I-10 WB / 52nd Street & Broadway Road:

1. Remove existing traffic signal system and install a complete and new traffic signal system at the new intersection location in accordance with City of Tempe requirements; and

E. I-10 & Warner Road:

1. Remove and install new traffic signal equipment impacted by widening of I-10 westbound off-ramp to Warner Road.

Other traffic signal infrastructure may require ADA improvements per Section 200.03.05 of the TPs.

Removal of existing traffic signal systems and infrastructure includes removal of foundations, pull boxes, conductors, and conduit unless under existing pavement to remain.

Traffic signals that are impacted by Developer's design, which are not listed above shall be modified and/or reconstructed by Developer and subject to the approval of ADOT in its good faith discretion. Existing traffic signal poles that do not require relocating but require new push buttons may be retrofit with new push buttons. Any other modification to an existing traffic signal pole or relocation of pole shall require a new traffic signal pole.

Developer shall not regulate eastbound I-10 to northbound 48th Street / SR 143 traffic through an existing or proposed traffic signal or stop control; this movement shall be free-flow.

Refer to Section 700.06.03.08 of the TPs for Temporary Traffic Signal Systems.

700.01.03.04.01 Vehicle Detection

If new vehicle detection is required at an ADOT-maintained traffic signal as indicated in Section 700.01.03.04 of the TPs, the detection system may function as both traffic signal detection and wrong way driver detection provided requirements of both systems can be met. FLIR TrafiSense-2 with eight inverse direction zones, camera resolution QVA (336x256) with a frame rate of 30 FPS, long wave infrared (7-14 µm) type and compression of H.264, MPEG-4 and MJPEG (dual stream) shall be used.

Specific camera models shall comply with the manufacturer recommendations for correct focal length, lens angle, and distance of cable run with respect to Developer's proposed locations of the cameras and field of vision for detection.

700.01.03.04.02 Traffic Signal Plans

Developer shall prepare Construction Drawings in accordance with the ADOT *Standardized Dictionary of Work Tasks*. The Construction Drawings, at a minimum, shall include the following:

- A. Traffic signal notes;
- B. Existing and proposed traffic signal poles;

C. Existing and proposed traffic signal equipment;

D. Traffic signal details;

E. Signal phasing diagrams;

F. Pull box schedules;

G. Pole and equipment schedules; and

H. Conductor schedules.

Developer shall submit the ADA asset spreadsheet with each Traffic Signal submittal in accordance with Section 200.03.05 of the TPs.

Traffic Signal Plans shall follow the maintaining agency's requirements regarding CAD standards and sheet layout.

700.01.03.04.03 City of Phoenix Traffic Signal Systems

Traffic signal systems shall comply with the City of Phoenix Traffic Signal Standard Details, included in TP Attachment 700-1. City of Phoenix Traffic Signal and Traffic Signal Interconnect Specifications are included in TP Attachment 700-1. Developer shall submit Traffic Signal Plans to the City of Phoenix for review and approval.

700.01.03.04.04 City of Tempe Traffic Signal Systems

Traffic signal systems shall follow the Maricopa Association of Governments Uniform Standard Details and Specifications for Public Works Construction, the Tempe Supplement to the Maricopa Association of Governments Uniform Standard Details and Specifications for Public Works Construction, and the City of Tempe Engineering Design Criteria. City of Tempe Traffic Signal and Traffic Signal Interconnect Specifications are included in TP Attachment 700-2. All new traffic signal equipment shall be compatible to existing City of Tempe infrastructure. Developer shall submit Traffic Signal Plans to the City of Tempe for review and approval.

700.01.03.05 Lighting

Developer shall design a continuous Light Emitting Diode (LED) urban roadway lighting system in accordance with the requirements in the *AASHTO Roadway Lighting Design Guide*, the ADOT Standard Specifications, and the ADOT *Standard Drawings*. Developer shall upgrade all lighting to LED on I-10 (Papago Freeway) from 2,000 feet east of 24TH street to 1,500 feet south of Ray road, SR 143 from 3,300 feet north of University Drive to I-10, and US 60 from I-10 to Hardy Drive including ramps, as shown in the Schematic in the RIDs. All existing ADOT luminaires shall be replaced with LED luminaires, including underdeck lighting. The existing underdeck lighting on Southern Avenue and on Priest Drive shall be upgraded to LED fixtures. Existing lights on crossroads not affected by construction or directed here-in shall not be replaced with LED luminaires. Any existing luminaires with shielding installed shall have an equivalent shielding system installed on the new LED luminaire.

The lighting system shall provide illumination and uniformity levels in accordance with Section 700.01.03.05 of the TPs. Developer shall design ADOT-maintained street lighting along 48th Street north of the existing Broadway Road intersection. The existing light pole, foundation, and conduit within the

48th Street ADOT Yard property shall be removed. Proposed lighting of 48th Street shall not include new light poles within the ADOT Yard at Broadway Road and 48th Street. Any new or reconstructed local streets or cul-de-sacs shall have new roadway lighting installed following the Local Jurisdiction's standards.

LED lighting for ADOT facilities shall have a correlated color temperature of 3000 Kelvin. Lighting on arterials shall meet the color temperature requirements of the agency with jurisdiction.

Where opposing traffic shares a median barrier, roadway lighting shall be on a median lighting system that lights the freeway from the median edge line to the outside shoulder edge line in both directions. System interchanges shall have high mast poles as the primary support type. Service interchanges may have high mast poles and shall have supplemental lighting to attain lighting levels on all travelled lanes. The required level of maintained horizontal illuminance, measured in footcandles, on the mainline roadway and ramps shall be an average of 0.6 to 0.9 with an average to minimum uniformity ratio of 4:1. Developer shall not use a light loss factor greater than 0.8. Light levels for C-D roads shall meet the same requirement of the mainline roadway. On freeway ramps, roadway lighting shall light the ramp between the lane lines from the gore area to within 75 feet of the crossroad. The required level of maintained horizontal illuminance, measured in footcandles, on ADOT maintained crossroads shall be an average of 0.8 to 1.2 with an average to minimum uniformity ratio of 4:1.

Existing light poles along ramps shall meet the following requirements such that they meet the design criteria for lighting:

- A. Existing light poles on breakaway bases may remain;
- B. Existing light poles on standard bases ultimately protected by barrier or guardrail or outside of the clear zone may remain; and
- C. Existing light poles on slip-bases shall be removed and replaced with new light poles on new foundations and bases.

Developer shall design and construct an underdeck lighting system for all bridge crossings of the roadways and the pedestrian paths where light levels cannot be otherwise achieved. Underdeck lighting shall be provided beneath the structure over Twin Buttes Cemetery to obtain an average maintained illuminance level of 0.5 footcandles or higher with an average to minimum uniformity ratio of 3:1 under the structure.

Developer shall provide lighting for pedestrian bridges and pedestrian ramps with an average maintained illuminance level of 1.4 footcandles or higher. Lighting for new and modified sidewalks connecting existing facilities to new pedestrian ramps shall be designed in accordance with the standards of the Local Jurisdiction ultimately responsible for its maintenance.

Developer shall provide roadway and pedestrian path lighting along Guadalupe Road within the limits and corresponding requirements listed below:

- A. Guadalupe bridge within the limits of the I-10 bridge abutments (adhere to ADOT's requirements for light levels and power metering);
- B. Guadalupe Road from the western I-10 bridge abutment to the western limits of ADOT ROW (adhere to City of Phoenix lighting design requirements for spacing and luminaire type; Light

poles shall be ADOT-maintained; luminaires to be metered and maintained by the City of Phoenix);

- C. Guadalupe Road from the eastern I-10 bridge abutment to the eastern limits of ADOT ROW (adhere to ADOT's requirements for power metering; Pole spacing shall not exceed 250 feet).

Developer shall maintain consistent light levels within the Project ROW and minimize luminaire glares. In areas where existing luminaires have glare screens or shields, Developer shall include glare screens or shields in their analysis with new fixtures.

Developer shall prepare a Photometric Analysis Strip Map that displays all 0.2 iso-contours. The design shall keep light levels at the edge of the Project ROW less than 0.20 footcandles. Any 0.2 iso-contour that falls outside of the Project ROW, adjacent to neighboring residences, shall be redesigned for avoidance. If the lighting engineer determines that a specific area outside of residential areas cannot meet this requirement Developer shall bring that specific area to the attention of ADOT to determine the best option to properly light the roadway. As part of the Lighting Design Report, Developer shall submit the Photometric Analysis Strip Map to ADOT.

Developer shall perform load calculations and voltage drop calculations for each circuit. Developer shall not use more than a 3 percent voltage drop from the load center cabinet to the branch circuits to size conductors. The conductors from the load center to the point of service shall be sized using a 1 percent voltage drop. All new lighting load center cabinets shall be metered for a maximum of 480 volts.

Developer shall design the freeway lighting circuits in such a manner as to minimize the total loss of lighting to an area in the event of a circuit failure. At a minimum, the design shall include the following for new and existing lights:

- A. Median poles with two or more lights shall have a minimum of two circuits within each pole. Adjacent poles may be on the same circuit(s), but luminaire orientation shall be varied (staggered by $180^{\circ}\pm$) to minimize the effect of all luminaires in a circuit being on the same side of the barrier wall;
- B. High mast poles of 100 feet, 120 feet, and 150 feet, or any pole containing 4 or more luminaires, shall have a minimum of two circuits within each pole; and
- C. Light poles containing one luminaire each shall not have adjacent single poles on the same circuit unless there are special circumstances approved by ADOT.

Light poles shall comply with the requirements in the *ADOT Traffic Signals and Lighting Standard Drawings*. Developer shall design Project specific U69 poles, foundations, and barrier transitions for use at mainline median locations where existing U69 poles are to be removed. Project specific U69 pole shafts shall be 65 feet – 2 inches tall from bottom of base plate to top of pole, not including pipe tenon. All non-ADOT standard poles including Project specific U69 poles shall meet the requirements specified in Section 600 of the TPs. All new light poles shall be aluminum, except high mast poles and median barrier mounted Project specific U69 poles. All light poles with mounting height that exceeds 69 feet shall be equipped with lowering devices. Developer shall provide a permanent level maintenance pad of at least 15 feet in diameter for all high mast lighting. Level maintenance pad shall not exceed 2 percent cross slope, 3:1 embankment slopes and shall be constructed with 4-inch thick Class 2 AB. Developer shall provide a level maintenance platform of at least 15 feet in diameter where the roadway side slope

is steeper than 3:1 (H:V). The maintenance platform shall be designed including structural details, handrail details, include a light broom concrete finish for the pad surface, and match the aesthetic patterns for walls within the area of the platform for any exposed surface. Landscape blocks shall not be used. Grading details shall be provided to transition from typical cross section side slope to those required by the pad or platform detail.

Developer shall test all existing high mast lowering devices within 90 Days following NTP 1. If Developer determines that lowering devices require repair or replacement due to improper function, Developer shall advise ADOT, and ADOT may direct that Developer perform such repair or replacement. If such repair or replacement would not have otherwise been required in connection with Developer's design, such work may constitute an ADOT-Directed Change. All lowering devices shall be demonstrated to be fully functional before Final Acceptance.

Developer shall obtain an FAA Determination of No Hazard, in accordance with Section 119.02.06.02 of the TPs, for any new light poles which meet the requirements for construction or alteration requiring notice in 14 CFR 77 (Code of Federal Regulations). Developer shall revise any design determined to exceed obstruction standards and follow any requirements to install obstruction lighting, paint or other warning devices based on FAA response.

Developer shall provide a pull box at the intersection of each new foundation conduit and the mainline conduit that runs parallel with the freeway. All lighting pull boxes and lids shall be locking lid pull boxes (4B and 6B) per standard drawing TS 1-12. All lighting pull boxes and lids shall comply with ANSI/SCTE 77 requirements with a Tier 22 load requirement and shall be tamper-resistant.

Any nonstandard equipment and installations shall be reviewed and approved by ADOT. All conductors, conduit and pull boxes for new lighting shall be new, and conform to the owning agency standards. Developer is not required to add a new median pull box to existing median light poles to remain.

Developer shall prepare a Lighting Design Report that provides all necessary engineering data to support the conclusions arrived at by Developer for the roadway lighting design. The Lighting Design Report shall include equipment type, photometric analyses, layout, voltage drop calculations, load calculations, and conductor sizing information. The Lighting Design Report shall be sealed and signed by a registered Professional Engineer. At the same time as the Preliminary Design Submittal of the roadway lighting system, Developer shall submit the Lighting Design Report to ADOT.

No sign lighting fixtures may exist within the Project Limits. Any existing sign lighting fixtures shall be removed by Developer.

700.01.03.05.01 Power Metering Requirements

Developer shall design lighting power supplies to separately meter the following lighting systems. Power supplied for all elements to be owned by ADOT, including the following:

- A. Mainline lighting;
- B. Ramp lighting;
- C. Collector-Distributor road lighting;
- D. Underdeck lighting on all bridge crossings of ADOT facilities including the Twin Buttes Cemetery; and

E. Roadway and pedestrian path lighting on Guadalupe Road.

Developer shall design and coordinate lighting power supplies to power the following City of Phoenix lighting systems:

A. Street and crossroad lighting (unmetered);

B. Pedestrian path lighting (unmetered);

C. Pedestrian bridge lighting (metered); and

D. Underdeck lighting on all bridge crossings of city crossroads (metered).

Unmetered power supplies and associated work to power the lighting system shall be coordinated with local power utility company and the City of Phoenix for requirements and responsibilities of Developer.

Metered power supplies and associated work to power the lighting system shall be designed and constructed by Developer.

Developer shall design lighting power supplies to power City of Tempe lighting systems in accordance with City of Tempe requirements.

All existing flat rate ADOT lighting load centers shall be converted to metered service. The existing lighting load center cabinets being reused in place shall be inspected for correct voltage, adequate number of circuit breakers, serviceability, and cleaned and refurbished as necessary to provide service to the new lighting system. Developer shall inspect all existing electric service cabinets and replace any missing or damaged parts. All circuit and main circuit breakers shall be verified to be rated for at least 125 percent of the maximum expected current after all new and upgraded lighting and signal equipment is in place. Any inadequate circuit breakers shall be replaced along with wiring and any other incidental hardware needed to provide a complete electrical service meeting all code and standard drawing requirements.

700.01.03.05.02 Lighting Plans

Developer shall prepare Construction Drawings in accordance with the ADOT *Standardized Dictionary of Work Tasks*. The Construction Drawings, at a minimum, shall include all existing and new electrical features, all details, pole schedules, conductor schedules, notes, and special provisions.

The Plans shall include information regarding conduit used to intercept existing circuits to be used for new lighting and for new conduit crossing locations for median lighting. The lighting system Plans shall also include lighting summary sheets providing the location of the lighting poles and load centers, and the conductor summary.

Lighting Plans shall include maintenance unit (MU) numbers for all light poles, provided by the ADOT System Maintenance and Management group. See Section 700.01.04.05 of the TPs for further information on obtaining MU numbers.

700.01.03.05.03 City of Phoenix Lighting

Street lighting shall comply with the City of Phoenix Lighting Details and the City of Phoenix Streetlighting Layout Guidelines, included in TP Attachment 700-1. Developer is responsible for submitting lighting Plans to the City of Phoenix for review and approval.

All City of Phoenix lighting shall be un-metered, except as identified in Section 700.01.03.05.01 of the TPs, with a standard spacing of 200 feet. The luminaire manufacturer shall be General Electric:

A. Local Streets

1. LUMNARE 39W LED RWGR

- A. ERL1005A327AGRAYR: Luminaire, 39 Watt, 2700K, 4,700 Lumen, Roadway, LED, Terminal Board, 10KV Surge Protection, 90 Degree Cutoff, Gray, Multivolt 120/208/240/277 Driver, IES Type II Narrow, ANSIC136.41 7 Pin Twistlock Photo Control Receptacle

B. Collector Streets

1. LUMNARE 71W LED RWGR

- A. ERL1008C327AGRAY: Luminaire, 71 Watt, 2700K, 7,600 Lumen, Roadway, LED, Terminal Board, 10KV Surge Protection, 90 Degree Cutoff, Gray, Multivolt 120/208/240/277 Driver, IES Type III Narrow, ANSIC136.41 7 Pin Twistlock Photo Control Receptacle

C. Arterial Streets

1. LUMNARE 97W LED RWGR

- A. ERL1010C327AGRAY: Luminaire, 97 Watt, 2700K, 9,250 Lumen, Roadway, LED, Terminal Board, 10KV Surge Protection, 90 Degree Cutoff, Gray, Multivolt 120/208/240/277 Driver, IES Type III Narrow, ANSIC136.41 7 Pin Twistlock Photo Control Receptacle

Modifications to existing roads maintained by the City of Phoenix shall include new lighting design.

700.01.03.05.04 City of Tempe Lighting

Street lighting shall comply with the City of Tempe *Design Criteria* and City of Tempe *Supplement to the Maricopa Association of Governments Uniform Standard Details and Specifications for Public Works Construction*. All new lighting equipment shall be compatible with existing City of Tempe infrastructure. The luminaire manufacturer shall be General Electric with model number EALS 03 0 H3 AW 7 40 N A C1 DKBZ LRV and EALS 03 0 K3 AW 7 40 N A C1 DKBZ LRV. Developer is responsible for submitting lighting Plans to the City of Tempe for review and approval.

Developer shall design City of Tempe lighting along Broadway Road from 48th Street to the limits of Construction, Diablo Way (north of Southern Ave), Diablo Way (between Alameda Drive and Fairmont Drive) and 48th Street (between 14th Street and north of Medtronic Way).

700.01.04 Construction Requirements

700.01.04.01 Standards

Developer shall perform all traffic Construction Work in accordance with the relevant requirements of the standards, manuals, and guidelines listed in Table 700-2, which are shown in no order of precedence; however, in the event of a conflict, Local Requirements for the applicable Local Jurisdiction shall prevail. Otherwise, in the event of a conflict, the more stringent requirement prevails.

Table 700-2 Construction Standards		
No.	Agency	Title
1	FHWA	Manual on Uniform Traffic Control Devices (MUTCD), 2009 with 2012 Revisions
2	ADOT	Arizona Supplement to the MUTCD, 2009 with revisions
3	ADOT	Signing and Marking Standard Drawings
4	ADOT	Traffic Signals and Lighting Standard Drawings
5	ADOT	Arizona Manual of Approved Signs
6	ADOT	Standard Specifications for Road and Bridge Construction, 2008

700.01.04.02 Pavement Marking

Pavement marking shall comply with the FHWA *Manual on Uniform Traffic Control Devices (MUTCD)* and the ADOT *Arizona Supplement to the MUTCD*. Pavement markings shall not be placed on the final pavement surface course unless it is the final pavement marking at its final location.

Developer shall re-stripe routes utilized by construction vehicles in which pavement markings were damaged or prematurely deteriorated due to the construction activity at the discretion of ADOT.

There shall be a 30-Day striping establishment period for all permanent pavement markings placed on new AR-ACFC. During this period, only temporary pavement markings shall be placed in the permanent locations. After the 30-Day striping establishment period is finished, the permanent pavement markings shall be placed in the permanent locations.

700.01.04.03 Signs

Developer shall remove all sign lighting fixtures, exposed conduit, and wiring to the nearest pull box serving the structure. Developer shall remove all hardware from bridge fascia in the instance a bridge fascia mounted sign is to be removed. Developer shall repair any damage to the bridge fascia during removal of hardware.

Developer shall install graffiti shields on all signs which are mounted on the following bridges in accordance with the ADOT *Signing and Marking Standard Drawings S-18*:

- A. 48th Street Southbound;
- B. 48th Street Northbound / SR 143 Northbound; and
- C. Guadalupe Road.

In the event existing sign structures are removed from median barrier, the foundations and median barrier transitions shall be removed to a minimum of three feet below grade and replaced with median barrier.

No existing sign structures shall be reused within the Project Limits unless the sign structures are located near the Project termini and currently hold existing guide signs that are allowed to be reused as specified in Section 700.01.03.03 of the TPs.

Developer shall coordinate with ADOT Central District Adopt-A-Highway permit technical, Sharon Williams (602) 712-6954 for the suspension of the Adopt-A-Highway program as well as the removal, salvage, design, and installation requirements of the Adopt-A-Highway Signs.

Grand Canyon State Logo Signs (GCSLS) is an ADOT program that installs and maintains wayfinding signs on the mainline and off-ramps to guide motorists to businesses along a given route throughout the State. There are existing logo signs within the Project Limits. Developer shall coordinate with GCSLS throughout the Project.

Developer is responsible for removing all logo sign panels and posts which are impacted by the Project. The sign panels and posts shall be removed in such a manner as to prevent any damage to the removed items. Logo sign panels, logos, and posts shall be preserved and delivered by Developer to the Grand Canyon State Logo Signs task force yard at 7638 W. Orangewood, Glendale, AZ 85303.

Developer shall contact David Abbott at (602) 799-8288 two weeks prior to delivery. Logo sign panels shall be stored and transported on sign racks and shall not be stacked on top of each other at any time. Logo sign panels, posts, and logos shall not be bent, scratched, or damaged during removal and delivery.

Signs to be maintained by the City of Phoenix shall be labeled with "City of Phoenix" on the front face of the sign panel and inventory label on the back. Developer shall coordinate with City of Phoenix for font requirements as well as notification and procedure for procuring and placement of labels prior to installation of signs.

700.01.04.04 Traffic Signal Systems

Developer shall deliver new permanent ADOT-maintained traffic signal cabinets to ADOT Traffic Operations, 2104 S. 22nd Avenue, Phoenix, AZ 85009, for assembling and testing by ADOT at least 30 Business Days prior to the scheduled traffic signal turn-on date. Upon successful testing by ADOT, Developer will pick up the cabinet for installation. A representative from ADOT Traffic Operations shall be present at the intersection during signal turn-on.

Refer to Section 104.15 of the TPs for Magnetic Detection for Underground Facilities.

700.01.04.04.01 City of Phoenix Traffic Signal Systems

Traffic signal systems shall comply with the City of Phoenix *Traffic Signal Standard Details*, included in TP Attachment 700-1. City of Phoenix *Traffic Signal and Traffic Signal Interconnect Specifications* are included in TP Attachment 700-1.

700.01.04.04.02 City of Tempe Traffic Signal Systems

Traffic signal systems shall follow the Maricopa Association of Governments *Uniform Standard Details and Specifications for Public Works Construction*, the City of Tempe *Supplement to the Maricopa Association of Governments Uniform Standard Details and Specifications for Public Works Construction*, and the City of Tempe *Engineering Design Criteria*. City of Tempe Traffic Signal and Traffic Signal Interconnect Specifications are included in TP Attachment 700-2.

Prior to removing any signal items, Developer shall contact the City of Tempe Traffic Operations Supervisor, Alan Rady, at (480) 350-8033 to determine if any existing equipment can be salvaged. Items that can be salvaged shall be delivered by Developer to the Tempe Transportation Maintenance Facility located at 945 W. Rio Salado Pkwy, Tempe, AZ 85281.

700.01.04.05 Lighting

Developer shall replace all ADOT locks on existing pull boxes at the beginning of the Project with locks installed by Developer (Developer Locks). New pull boxes shall have Developer Locks once conductors are installed. Prior to Substantial Completion Developer shall install ADOT locks on all new and existing pull boxes. Developer shall coordinate with ADOT timing of ADOT locks being placed on all pull boxes.

All luminaires shall be individually fused. Developer shall place the in-line fuse of high mast light fixtures that are mounted on lowering devices in the fixture housing. Developer shall place the in-line fuses of all other fixtures in the nearest pull box.

Developer shall record Global Positioning System (GPS) positions for each pull box in accordance with the ADOT Standard Specifications and the ADOT *Stored Specifications*. Developer shall prepare a Pull Box Location Report that includes the GPS positions for all pull boxes. Developer shall submit the Pull Box Location Report to ADOT for review and comment.

Developer shall attach maintenance unit (MU) device decals 42 inches above the base plate at 45 degrees in the direction of oncoming traffic on each electrical cabinet and lighting pole. The MU decals shall be comprised of individual 3-inch tall reflectorized alpha-numeric decals for each number or digit in the sequence. Developer shall prepare and submit a written Maintenance Unit Device Decal Request to ADOT to obtain the required MU numbers for the equipment. Developer is responsible for purchasing and installing MU stickers on the equipment.

Developer shall attach a permanent metal tag to the pole above the hand hole stating the manufacturer's name, pole type per the Plans, ADOT pole drawing number (if applicable), shaft length, and gage number. Pictures of sample metal tags are included in the RIDs.

Refer to TP Attachment 700-6 for Pull Box (No 4B) for additional requirements.

Refer to TP Attachment 700-7 for Luminaire (LED) (10,0000 Lumens) for additional requirements.

Refer to Section 104.15 of the TPs for Magnetic Detection for Underground Facilities.

700.01.04.05.01 City of Phoenix Lighting

Street lighting shall comply with the City of Phoenix Lighting Details and the City of Phoenix Streetlighting Layout Guidelines, included in TP Attachment 700-1.

700.01.04.05.02 City of Tempe Lighting

Street lighting shall comply with the City of Tempe *Design Criteria* and the City of Tempe *Supplement to the Maricopa Association of Governments Uniform Standard Details and Specifications for Public Works Construction*. Prior to removing any lighting items, Developer shall contact the City of Tempe Traffic Operations Supervisor, Alan Rady, at (480) 350-8033 to determine if any existing equipment can be salvaged. Items that can be salvaged shall be delivered by Developer to the Tempe Transportation Maintenance Facility located at 945 W. Rio Salado Pkwy, Tempe, AZ 85281.

700.01.05 Submittals

Table 700-3 reflects a nonexclusive list of Submittals identified in Section 700.01 of the TPs and is not intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 700-3 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
Pavement Marking Plan	3	0	1	At the same time as the Preliminary Design Submittal for Signing Plans	700.01.03.02.02
Signing Plan	3	0	1	At the same time as the Preliminary Design Submittal for Pavement Marking Plans	700.01.03.03.03
Signing Concept Plan	3	0	1	At the same time as the Preliminary Design Submittal and resubmitted as required	700.01.03.03.03
Photometric Analysis Strip Map	3	0	1	As part of the Lighting Design Report	700.01.03.05
Lighting Design Report	3	0	1	At the same time as the Preliminary Design Submittal of the roadway lighting system	700.01.03.05
Pull Box Location Report	3	0	1	In accordance with the ADOT Standard Specifications and the ADOT Stored Specifications	700.01.04.05
Maintenance Unit Device Decal Request	5	0	1	As determined by Developer	700.01.04.05
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

1 **700.06 Maintenance of Traffic**

2 **700.06.01 General Requirements**

3 Developer shall perform all maintenance of traffic (MOT) design work and construction work in
4 compliance with the requirements of Section 700.06 of the TPs.

5 **700.06.02 Administrative Requirements**

6 **700.06.02.01 Standards**

7 Developer shall perform all MOT Design Work in accordance with the standards, manuals, and
8 guidelines listed in Table 700-4 which are shown in no order of precedence; however, in the event of a
9 conflict, the more stringent requirement prevails.

Table 700-4 Design Standards		
No.	Agency	Title
1	FHWA	Manual on Uniform Traffic Control Devices (MUTCD), 2009
2	ADOT	Arizona Supplement to the MUTCD, 2009 with revisions
3	ADOT	ENG 07-3 Work Zone Safety and Mobility Policy
4	City of Phoenix	Barricade Manual
5	City of Tempe	Traffic Barricade Manual
6	ADOT	Standard Specifications for Road and Bridge Construction, 2008

10 **700.06.02.02 Project Specific Transportation System Management**

11 Developer shall hold a Project Specific Transportation System Management meeting, including
12 representatives of Developer, ADOT, cities, counties, tribal entities, law enforcement agencies,
13 emergency response providers, Governmental Entities, businesses, and other agencies whose
14 operations affect or are affected by the Project.

15 The purpose of the Project Specific Transportation System Management meeting is to:

- 16 A. Review and refine the Transportation Management Plan (TMP) and its implementation;
- 17 B. Review and refine Developer's MOT and Traffic Control Plans, specifications, and details;
- 18 C. Keep the motoring public, adjacent homeowners / businesses, transportation officials,
19 emergency responders and other interested parties informed of the status of construction and
20 changes in traffic-handling in conjunction with the requirements in Section 107.20.03 of the TPs;
- 21 D. Disseminate MOT and Traffic control information to meeting invitees; and
- 22 E. Determine additional membership invitees affected by the MOT and Traffic Control, as needed.

23 The Project Specific Transportation System Management shall be established, hold the initial meeting,
24 and meet at the frequency noted in Section 108.03.04 of the TPs.

1 **700.06.02.03 Transportation Management Plan**

2 Developer shall develop, implement, and maintain a TMP for the Project that complies with the ADOT
3 *ENG 07-3 Work Zone Safety and Mobility Policy*. The TMP shall include the following items:

- 4 A. Work zone Traffic Control Plans including entrances and exits from the Site and proposed haul
5 routes;
- 6 B. Procedures to communicate TMP information to the Public Relations Manager, Project
7 Communications Team, other public information personnel, and ADOT, and notify the public of
8 MOT issues in accordance with Section 107.20 of the TPs;
- 9 C. An emergency vehicle access plan that describes procedures to provide notification and access
10 to emergency responders (e.g., police, fire, ambulance, Arizona Department of Public Safety
11 (DPS), school districts, Flood Control District of Maricopa County) throughout the Site, including
12 critical flood control structures being constructed or reconstructed within the Project Limits.
13 Developer shall provide adequate room throughout work zone during nonworking hours for
14 emergency services access that is free of obstructions, including staging of materials or
15 equipment. In addition, Developer shall identify procedures and contacts to assist emergency
16 responders during an Emergency. Developer shall obtain approval of the emergency vehicle
17 access plan from all applicable emergency responders. Emergency vehicle access plan shall
18 be identified on MOT Plans as an appendix to the TMP;
- 19 D. Descriptions of the duties of the traffic personnel, by name and level of authority, with MOT
20 responsibilities;
- 21 E. Procedures to identify and incorporate the needs of emergency service providers, law
22 enforcement entities, Governmental Entities, Utility Companies, and other related corridor users,
23 which shall be presented in the emergency vehicle access plan;
- 24 F. Procedures to provide access and minimize disruption to U.S. mail, parcel delivery services,
25 Valley Metro, school buses, refuse collection, Governmental Entities, and Utility Companies'
26 maintenance activities, etc.;
- 27 G. Procedures to address special circumstances, such as equipment malfunction, traffic incidents,
28 Full and Lane Closures not reopening on time, motorists' property being damaged, and special
29 events;
- 30 H. Identification of, and procedures for addressing and resolving, Project-related construction traffic
31 impact issues on the Project, and recommendation of mitigation measures for Project-related
32 construction traffic impacts;
- 33 I. Identification of all special events, including location, anticipated attendance, publicized event
34 routes for attendees, and contact information for each event. Developer shall identify any
35 modifications to Traffic Control Plans or procedures to assist with event coordination;
- 36 J. Procedures to minimize Project-related traffic delays and potential collisions by the effective
37 application of traditional traffic mitigation strategies and an innovative combination of public and

motorist information, demand management, incident management, system management, alternate route strategies, construction strategies, or other strategies;

K. Identify areas with multiple preconstruction accidents stored in the ADOT Arizona Crash Information System (ACIS) database one-mile upstream and downstream and within limits of work zones and detour routes. Provide measures to mitigate accidents given traffic control implementation;

L. Incorporation of Crisis Communication Plan when applicable;

M. Procedures to modify the TMP as needed to adapt to current Project circumstances; and

N. Prior to issuance of NTP 2 or prior to any RFC Submittal of MOT Plans or TCP, whichever comes first, Developer shall submit the TMP to ADOT for review and approval. Developer shall present the TMP at the first pre-construction coordination meeting. The TMP is considered a living document. As changes occur in the MOT strategies proposed by Developer, Developer shall amend and submit the updated TMP to ADOT for review and comment.

700.06.02.04 Central District Transportation Systems Management Meetings

Developer shall attend monthly ADOT Central District Transportation Systems Management (TSM) Meetings prior to any construction activity throughout the completion of construction. The ADOT TSM meetings include emergency services, trucking industry, school transportation, USPS, other delivery services, Governmental Entities, and others. The intent of the ADOT TSM is to discuss and coordinate planned Full Closures and Lane Closures and restrictions on the state highway system in the ADOT Central District (Maricopa County region). ADOT's goal is to minimize impacts on first responders and other key stakeholders, special events, and the traveling public.

The ADOT Central District TSM meeting is currently held monthly, the second Wednesday of each month from 10am to 11am at 2140 W. Hilton, Phoenix, AZ 85009.

Developer shall brief the Project team of any concerns and feedback from the ADOT Central District TSM meeting at the following Project Specific Transportation System Management Meeting.

700.06.02.05 Regional Traffic Coordination

For Full Closures of I-10, US 60 and SR-143 Developer shall detour traffic within the ADOT regional system. Regional detours shall be coordinated with local Governmental Agencies as Full Closures and detours will affect their facilities.

700.06.02.06 Full Closure debrief meetings

Developer shall hold a debrief meeting 24 hours after each Full Closure. Developer shall report information regarding the specific closure including notifications, beginning and end time of full closures, delays, and incidents along detour routes with supporting traffic data, known delays and incidents along adjacent roadways to closure or detour routes, comments or complaints from other agencies, and any other lessons learned during the closure. Developer shall incorporate information gathered from the debrief and other information in subsequent Full Closure requests to improve upon ability to manage traffic.

ADOT will provide Developer access to the INRIX data portal currently owned and procured by ADOT. INRIX data for Developer use is subject to the same reliability and accessibility as that of ADOT. INRIX data available includes average speed, speed differentials along segments at various intervals, and average volume data. Developer shall designate two individuals to receive training and log-in access to the INRIX data.

700.06.03 Design Requirements

700.06.03.01 Maintenance of Traffic Plans

Developer shall prepare MOT Plans that provide for all construction stages and phasing in accordance with the requirements of the Contract Documents and Section 700.06 of the TPs. The MOT Plans shall include any proposed changeable message board legends and proposed messages on existing DMS. MOT Plans shall be required for the installation of temporary concrete barrier, temporary striping, or traffic control setups to be in place longer than 24 hours.

Maintenance of Traffic Plans shall include critical sections to ensure adequate horizontal and vertical clearances. Critical sections include existing and proposed bridge piers and spans, falsework, walls, utility poles, vaults, manholes and required maintenance spacing around such utility elements, overhead sign structures, DMS structures, and other locations where horizontal and vertical clearances are approaching minimum requirements of the Contract Documents.

Developer shall include "Minor Crash" signs (R16-4AZ), one per mile, throughout the mainline work zones.

Developer shall provide "Project Information" signs (G20-103) in both directions of mainline. Project information signs shall include the Project hotline number and dates of construction. Project information signs shall be located in both directions of traffic at both Project Limits along I-10 (near I-17 TI and near SR 202L Santan/South Mountain TI), along I-10 within the US 60 TI, along US 60 near Hardy Drive, and along SR 143 near Salt River Bridge. Project information signs shall be incorporated into the Project warning signing plans and MOT and Traffic Control Plans. Project information signs shall be incorporated into the Project advance warning signing plans and MOT and Traffic Control Plans.

Developer shall coordinate with all appropriate Governmental Entities and affected parties in the development of the MOT Plans.

Prior to work involving traffic, Developer shall submit MOT Plans to ADOT for review and comment. Developer shall obtain all permits and approvals from all applicable Governmental Entities.

Changes due to field conditions, public reaction to work zone, and necessary work zones must be approved by the Maintenance of Traffic Manager and implemented by Developer. Such approved changes shall be followed up with an RFI and/or NDC to the MOT Plans or Traffic Control Plans. The Maintenance of Traffic Manager shall maintain an accurate record of both the current and past in place Plans at all times.

700.06.03.02 Temporary Construction Design Speed

For temporary construction design, design speed on I-10 shall be 65 mph with a work zone posted speed of 55 mph. When ultimate C-D lanes are used as part of the temporary "Express Lanes" concept in accordance with Section 700.06.03.12 of the TPs, design speed shall be 55 mph with a work zone posted speed of 55 mph. Developer may use a design speed of 35 mph with a work zone posted speed of 35 mph on northbound SR 143 prior to adding westbound I-10 traffic add. Design speed on the remaining

portions of SR 143 shall be 45 mph with a work zone posted speed of 35 mph. Design speed and construction posted speed limit shall be shown on MOT Plans. Developer shall not use AASHTO Low-Speed Urban radii for curves on I-10, US 60, SR 143, or system interchange ramps.

700.06.03.03 Lane and Shoulders

The minimum allowable lane widths are 11 feet on all mainline roadways, ramps, and C-D roads, and 10 feet on crossroads during all phases of construction.

On I-10, a minimum 2 foot right shoulder and 3 foot left shoulder shall be provided during all phases of construction. In spot locations where sign foundations, bridge piers, and other existing elements prevent a continuous 3 foot left shoulder, a 2 foot shoulder will be allowed. All other roadways and ramps shall have 2 foot minimum shoulders.

Developer shall include emergency pull-off areas one per mile along both directions of I-10 in accordance with TP Attachment 700-8 where outside shoulder widths are reduced.

Developer shall maintain the existing number of general purpose, HOV and ramp lanes including auxiliary lanes at all times. Turn lanes at ramp / crossroad intersections may be reduced based upon Developer justification and review and approval by ADOT. Crossroad facilities shall maintain the existing number of lanes, or a minimum of two thru lanes of traffic in each direction, and one left turn lane where left turn lane(s) exist.

For the purpose of MOT, the SR 143 southern limit shall be defined as the intersection of SR 143 and the I-10 eastbound off-ramp. SR 143 northbound may be reduced to 1 lane north of the I-10 eastbound off-ramp. Westbound I-10 shall add two lanes to SR 143 with a dedicated auxiliary lane to University Drive off-ramp. Such restrictions in lanes shall be based upon the approval of ADOT and required for the Work activities.

Differential pavement elevations within the same travel lane or adjacent travel lanes will not be allowed. The temporary pavement drainage design shall not cause water to pond on the roadway.

Temporary pavement design shall be required for any proposed use of temporary pavement in conformance with Section 400 of the TPs. Temporary pavement limits shall be provided and sections shown on MOT Plans.

700.06.03.04 Pedestrian and Bicycle Access

Developer shall maintain and provide access along existing pedestrian and bicycle facilities, regardless of classification. Access along crossroads through bridge construction limits shall be maintained at a minimum on one side at all times. Pedestrian and bicycle access shall be shown on the MOT Plans or as separate Plans accompanying MOT Plans.

If access cannot be maintained, Developer shall prepare a Pedestrian Access Modification/Closure Request that includes Plans showing the proposed modification/closure, proposed signs, and indicating the applicable ADA path of travel and associated ADA requirements. At least 10 Business Days prior to the planned modification/Closure, Developer shall submit the Pedestrian Access Modification/Closure Request to ADOT and the applicable Governmental Entities for review and approval.

700.06.03.05 Temporary Lighting

Developer shall maintain at a minimum the existing light levels on the roadways during construction. For areas where existing lights will be removed during construction Developer shall meet, at a minimum, a horizontal illuminance of 0.6 footcandles with an average to minimum uniformity ratio of 4:1. Developer shall not use a light loss factor greater than 0.8 for determining light levels.

Existing lights to be removed, existing lights to remain active, proposed lights to be installed prior to, and temporary lights to be installed prior to each stage shall be shown on MOT Plans.

Lighting analysis showing fixture, mounting height and proposed light levels shall be submitted for review with each MOT Plan submittal.

700.06.03.06 Temporary Drainage Facilities & Management

Developer shall design and manage (including infield activities by ADOT and Developer) the temporary drainage systems to:

- A. Provide safe operation during construction through traffic control measures;
- B. Accommodate both existing and construction area runoff;
- C. Maintain Pre-project drainage patterns; and
- D. Comply with Good Industry Practices.

Developer shall incorporate the temporary drainage design and management systems on the MOT Plans.

700.06.03.07 ITS Facilities During Construction

Developer shall maintain existing fiber-optic communication, CCTV camera locations, and DMS locations during construction.

ADOT ITS trunk line shall be maintained and operational at all times of construction, including the Salt River Bridge widening.

Developer shall submit a Temporary ITS Plan for each phase of construction indicating the location of existing elements to be maintained; whether existing element is to remain, to be removed and replaced with temporary element; or to be removed and replaced with ultimate element with each MOT submittal. Temporary ITS Plan may be in the form of a Roll Plot submittal with specific details on Plan Sheets for clarity. A temporary wireless system may be utilized for maintaining necessary ITS elements during construction. The temporary wireless system must be equal to or better than the existing communication bandwidth it is replacing and meet security criteria of ADOT or other agency utilizing the data. All temporary elements proposed shall be equal to or better than existing element.

Ramp meters shall be operational for all two-lane entrance ramps whether in an existing, temporary, or proposed configuration at locations where ramp meters exist prior to any modification. Traffic count stations affected by modifying lane configuration or impacted by construction may be removed until the proposed station is in place and traffic is in the final proposed configuration.

- 1 The maximum disruption of the ITS system shall be no longer than 24 continuous hours with prior
 2 approval from agencies impacted. The maximum disruption of service for an individual ITS component
 3 (i.e., CCTV, DMS, and ramp meters) shall be no longer than 72 continuous hours.
- 4 Developer may use an alternative power source, including solar power, to temporarily service ITS devices
 5 until permanent power is installed. Power supply for temporary ITS devices shall be uninterrupted.
 6 Developer shall remove temporary ITS devices prior to Substantial Completion.
- 7 There are 911 and RCN fibers which are part of the ADOT trunk line. Contact information for owners are
 8 listed in Table 700-5.

Table 700-5 Contact Information		
No.	Agency	Contact
1	Maricopa Association of Governments	Ryan Gish, RCN Program Manager, (602) 254-6300
2	City of Phoenix	Scott Davis, Senior Communication Engineer, Information Technology Services, (602) 723-0983
3	City of Tempe	John Hoang, Senior Civil Engineer, (480) 350-8629

9 **700.06.03.08 Temporary Traffic Signals**

- 10 Developer shall design a temporary traffic signal system for intersections under construction as needed
 11 where existing traffic signals regulate and manage traffic. Temporary Traffic Signal Plans shall be
 12 included with MOT Plans and shall include pole types, signal head types and locations relative to traffic,
 13 phasing information, details for detection, conduit, and conductor information as well as information to
 14 maintain any existing interconnect and communications with adjacent traffic signals or signal systems.

15 **700.06.03.09 Detours**

- 16 Developer shall prepare Detour Plans for all proposed detours regardless of duration. Detour Plans
 17 shall be submitted with MOT Plans for detours accompanying MOT. Detour Plans shall include advance
 18 warning signs, trailblazing signs, portable message board locations and messages, and other information
 19 specific to the detour.

- 20 Detour Plans shall include detour dates and duration, horizontal and vertical clearances, weight
 21 restrictions, and all proposed signs, and shall ensure that all detoured vehicle types can negotiate
 22 the detoured path. The Detour Plans shall also address disruptions to public services, including the
 23 following:

- 24 A. Emergency responders;
- 25 B. U.S. Mail and parcel delivery services;
- 26 C. School buses;
- 27 D. Public transportation services;
- 28 E. Refuse collection;

F. Normal commercial activities (e.g., materials and products pick-ups and deliveries, customer access); and

G. Safe routes to school plans.

At least 15 Business Days prior to implementation of the proposed detour, Developer shall submit Detour Plans to ADOT and all applicable Governmental Entities.

700.06.03.10 Construction Ingress/Egress

Developer shall detail and show construction ingress and egress on the MOT Plans. Changes and relocation of construction ingress/egress shall be updated on MOT Plans as approved by the Engineer of Record. Changes and relocations of construction ingress/egress shall be communicated to Emergency Services, DPS, and other Stakeholders at the Project Specific TSM or more frequently as needed prior to implementation.

700.06.03.11 Phasing and Construction Sequence

Developer shall prepare a Phasing and Construction Sequence Table for each phase of Construction Work with each MOT submittal. Each Phasing and Construction Sequence Table shall address, at a minimum, construction activities, construction stage limits, construction sequencing, and traffic control.

700.06.03.12 Temporary “Express Lanes”

The Developer may use the collector-distributor (C-D) facilities to maintain the number of general purpose, HOV and ramp lanes on I-10 in accordance with Section 700.06.03.02 of the TPs through the Project corridor. Developer shall provide emergency pull-out areas in accordance with Section 700.06 of the TPs. Additionally, no less than 60 days prior to implementing the requested concept, Developer shall perform Public Information activities to alert the public of the concept. Such Public Information activities shall include, at a minimum, notifications in the App and on the Developer Website, advertisements in local media, billboards, and other reasonable methods of notification. Such advance Public Information activities shall be in addition to all Public Information activities to take place during the implementation of the concept.

700.06.04 Construction Requirements

700.06.04.01 Standards

Developer shall perform all MOT Construction Work in accordance with the standards, manuals, and guidelines listed in Table 700-6 which are shown in no order of precedence; however, in the event of a conflict, the more stringent requirement prevails.

Table 700-6 Construction Standards		
No.	Agency	Title
1	FHWA	Manual on Uniform Traffic Control Devices (MUTCD), 2009
2	ADOT	Arizona Supplement to the MUTCD, 2009 with revisions
3	ADOT	ENG 07-3 Work Zone Safety and Mobility Policy
4	City of Phoenix	Barricade Manual
5	City of Tempe	Traffic Barricade Manual
6	ADOT	Standard Specifications for Road and Bridge Construction, 2008

700.06.04.02 Construction Requirements

700.06.04.02.01 General

Developer shall manage traffic in accordance with the procedures and guidelines specified in the FHWA *MUTCD*, the ADOT *Arizona Supplement to the MUTCD*, and Developer's Traffic Control Plans.

Developer shall not close lanes on the mainline, ramps, adjacent freeways, or local roadways, prior to approval of the TMP by ADOT.

Developer shall maintain traffic, schedule Work, and implement procedures to minimize inherent delays during peak hours.

700.06.04.02.02 Traffic Control Devices

All traffic control devices shall comply with the requirements of the NCHRP *Report 350, Recommended Procedures for the Safety Performance Evaluation of Highway Features* or AASHTO *Manual for Assessing Safety Hardware* (MASH), in accordance with Federal Guidelines, Part VI of the *MUTCD* and the ADOT *Arizona Supplement to the MUTCD*.

IQF shall inspect and Developer shall maintain all traffic control devices a minimum of two times per day.

All orange signs shall use fluorescent orange sheeting.

700.06.04.02.03 Signs

Developer shall provide advance signing notifying all users of the proposed Closure a minimum of 5 Business Days prior to the proposed Closure. The advance signing shall include the Closure dates and duration. Developer shall provide advance notification through PCMS for all Closures and for each direction of traffic that is affected. Advance signing notification shall be provided as noted in Table 700-7.

Table 700-7 Advance Signing Notification	
Event	Advance Notification
Full Closures	5 Business Days
Construction phase changes	5 Business Days
Lane restrictions or Closures of ramps and crossroads	5 Business Days
Lane restrictions with detour implications or if traffic delays are expected	5 Business Days

The text for all temporary guide signs shall be at least 10 inches in height. Temporary sign formats shall be included with MOT Plans.

Developer shall completely cover or remove all signs that conflict with the Work during construction. Developer shall ensure that any modifications to the existing signing system during construction include: an exit sign at the exit gore and a minimum of one advance notice exit sign. If such signs are temporary signs, the temporary signs shall remain in place until the permanent signs are installed.

Signs outside Project Limits which are intended to remain and not affected by proposed design of this Project but are impacted by traffic control, shall be recorded on signing Plans as "existing to remain" to ensure proper location and messaging upon the completion of the traffic control phase.

700.06.04.02.04 Temporary Barrier, Attenuators, and Glare Screen

Developer shall use temporary barrier and attenuators to protect the travelling public from, at a minimum, the following:

- A. Fixed objects / work zone within the clear zone;
- B. Drop-offs greater than 2 inches that are not in accordance with the traffic control treatment of longitudinal joint and edge drop-off guidelines;
- C. Slopes steeper than 4:1 (H:V);
- D. Separate opposing travel lanes where posted speeds are greater than 45 mph; and
- E. Separate work activities within clear zone.

Developer shall install glare screens when temporary barriers separate opposing lanes of traffic and are less than 42 inches in height and within 50 feet horizontal offset.

Temporary Concrete Barrier shall be pinned where 2 foot deflection cannot be achieved. Pinned Temporary Concrete Barrier shall not be pinned into existing or new pavement to remain without repair procedures approved by ADOT.

Temporary Concrete Barrier shall not be placed on embankment. Additional temporary pavement for Temporary Concrete Barrier placement may be required.

700.06.04.02.05 Staging Areas

Developer shall secure all proposed staging areas, including obtaining and performing all applicable environmental work in accordance with the Contract Documents.

700.06.04.02.06 Arizona Department of Public Safety

Developer may request DPS officers to be on-site for freeway Closures. Developer shall submit a request for DPS services directly with DPS. Developer shall be responsible for providing for public safety notwithstanding the presence of DPS at the Site.

700.06.04.02.07 Temporary Traffic Signal Systems

Developer shall implement any temporary traffic signal timing or any phasing required for traffic management during construction. 20 Business Days prior to implementing the proposed timing or phasing changes, Developer shall prepare and submit a written Traffic Signal Modification Request for any proposed timing or phasing changes, including temporary signal head placement, to ADOT for review and comment. For traffic signal modifications at intersections controlled by the City of Phoenix or City of Tempe, Developer shall, concurrently with such submission to ADOT, also submit the Traffic Signal Modification Request to the applicable city for review and comment.

10 Business Days prior to implementing temporary phasing changes, Developer shall prepare and submit a written Temporary Phasing Controller Programing Request to ADOT for approval. ADOT will program the controller, no more than 7 Business Days after approval of the written request, after which Developer may implement the temporary phasing.

700.06.04.02.08 Temporary Pavement Marking

No stripe obliteration is allowed on the final pavement surface. Temporary pavement markings will be allowed on the final AR-ACFC pavement surface only at final pavement marking locations. Preformed tape is allowed to be placed over temporary paint in the permanent locations. Temporary or permanent pavement markings not utilized for a specific stage of construction shall be completely obliterated unless behind Temporary Concrete Barrier and not visible to the traveling public. The use of vertical panels, barrels, cones, or other traffic control devices to merge or shift traffic shall not be allowed, except for nighttime or weekend Lane Closures or Full Closures as approved by ADOT.

Temporary pavement markings shall be a minimum 60 mil (0.060-inch) thick ribbon extruded thermoplastic or two applications of paint. Temporary pavement markings shall be refreshed as directed by ADOT at Developer's expense.

Raised pavement markers shall be used as part of temporary pavement markings for lane lines in accordance with ADOT Standard Detail M-19 and through lane shifts and tapers along I-10, US 60 and SR 143.

700.06.04.02.09 Traffic Control Plans

Developer shall prepare Traffic Control Plans (TCPs) for each specific set up of Traffic control activities. TCPs may utilize MOT Plans. TCPs shall be reviewed by the Maintenance of Traffic Manager prior to submission to ADOT and submitted in accordance with Table 700-8. This review shall include both conformance to the Contract Documents as well as accuracy, including number of lanes, lane configuration, lane designation and posted speed limits. The Maintenance of Traffic Manager shall be responsible for approving necessary adjustments to the approved Traffic Control Plans due to safety and field conditions during a closure to install such Traffic Control Plans. Such approved adjustments shall be submitted by Developer the following Business Day.

Developer shall obtain a TRACS permit from City of Phoenix for applicable Roadway Closures/Restrictions, TRACS applications shall be submitted to RMP@phoenix.gov.

700.06.04.03 Access

Developer shall maintain access to all businesses within and adjacent to the Project at all times. Any proposed or necessary modifications to existing access shall be the responsibility of Developer and shall be coordinated with ADOT's ROW Department, Public Involvement, the Project Specific Traffic System Management invitees, and the specific Business Owner. Modification agreements shall be documented and submitted to ADOT 30 Days prior to any modification to existing access.

Access to Utility Company and Governmental Entity facilities within and adjacent to the Project shall be maintained at all times unless specifically agreed upon and approved by owning agency. SRP-Irrigation access to the existing Western Canal trash racks on the east side of I-10 at the US 60 interchange shall be maintained at all times. Access shall be coordinated with SRP-Irrigation.

Developer shall maintain existing emergency access to all turnarounds along I-10 for DPS use including the emergency vehicle turn around under the US 60 HOV flyover on I-10 and the motorcycle turn around on I-10 south of Guadalupe Road.

700.06.04.04 Mail Services

Developer shall temporarily or permanently relocate mail boxes, as required, in such a manner as to permit uninterrupted mail services. Developer shall comply with all applicable Governmental Entity requirements for the relocation of mail boxes.

700.06.04.05 Restrictions and Closures

700.06.04.05.01 Lane and Shoulder Closures

At least 5 Business Days in advance of any Lane Closure on mainline, ramps or crossroads, except for Lane Closures in cases of Emergency, Developer shall submit a written Lane Closure Request identifying the time window for the Lane Closure, along with Traffic Control Plans, to ADOT for approval in ADOT's good faith discretion. ADOT will input the time of all approved Closures into the ADOT Event Reporting System upon ADOT's approval of specific times for the Lane Closure Request or, if possible, in cases of Emergency. Approval is subject to availability as set forth in Section 6.5.2.1 of the Agreement. Developer shall participate in ADOT training prior to obtaining read access to the ADOT Event Reporting System. Developer shall notify ADOT immediately as soon as Developer becomes aware of a delayed or canceled scheduled Lane Closure.

Developer shall coordinate Lane Closure times with adjacent projects that may affect traffic during the same period and disclose all adjacent project Closures when requesting Lane Closures (e.g. regular I-10 Tunnel maintenance).

On I-10 during any Lane Closure, including Nighttime Lane Closures, Developer shall maintain a minimum of two open general purpose lanes, unless approved otherwise by ADOT.

Lane Closures shall occur only during the periods reflected in Table 700-8. Developer shall comply with all permit requirements for each applicable Governmental Entity for all crossroad closures and restrictions.

700.06.04.05.02 Full Closures

Unless the Full Closure results from an Emergency or non-foreseeable event, Developer shall submit proposed Full Closures to ADOT for approval. Closure times include setup of all traffic control devices. Traffic control devices shall be cleared and removed from the Project within one hour after reopening all lanes.

Developer is allowed 25 Eastbound I-10 Full Weekend Closures and 25 Westbound I-10 Full Weekend Closures for the duration of the Project from a western limit of the existing 48th Street / SR 143 bridge structures to an eastern limit of the existing Broadway Road bridge structure. Any Full Weekend Closure affecting I-10 between 48th Street and Broadway Road that are not limited to that boundary shall be included in the quantity of allowable limit of Full Weekend Closures. Partial Weekend Closures shall count towards one-half of a Full Weekend Closure. Full or Partial Weekend Closures shall be limited based upon the requested durations as identified in Table 700-8. Closures not in place for the full period will not result in a credit or partial count of allowable closure. Night Time Closures will not be limited in this areas in respect to the allowable Closure quantity.

Table 700-8 Allowable Closure Periods ¹	
Night Time Closures	Full Weekend Closures
Inbound & Outbound: 8:00 p.m. Sun to 4:00 a.m. Mon 8:00 p.m. Mon to 4:00 a.m. Tues 8:00 p.m. Tues to 4:00 a.m. Wed 8:00 p.m. Wed to 4:00 a.m. Thurs 8:00 p.m. Thurs to 4:00 a.m. Fri 10:00 p.m. Fri to 7:00 a.m. Sat 10:00 p.m. Sat to 9:00 a.m. Sun	Inbound & Outbound: 10:00 p.m. Fri to 4:00 a.m. Mon
Partial Weekend Full Closure ²	
Inbound & Outbound: 10:00 p.m. Fri to 10:00 p.m. Sat	Inbound & Outbound: 10:00 p.m. Sat to 4:00 a.m. Mon
Inbound = I-10 WB; US 60 WB; SR 143 NB Outbound = I-10 EB; US 60 EB; SR 143 SB 1. All lanes shall be open outside the listed times. Traffic control devices shall be picked up and completely removed from the clear zone within one hour after reopening the lanes. 2. Partial Weekend Closures shall begin at 10:00 p.m. Friday or Saturday evenings.	

1 A Full Closure of a mainline shall not exceed 5 miles. Developer shall not implement a Full Closure of
 2 mainline lanes in both directions at the same time. Developer shall not implement rolling Closures to
 3 transfer any equipment or perform any Work except at night with ADOT approval a minimum of 5
 4 Business Days in advance of the proposed rolling Closure. Developer shall not implement consecutive
 5 ramp Closures unless both are within an ADOT-approved Full Closure.

6 Full Closures of mainline or Full Closures of system-to-system interchange ramps shall require a Full
 7 Closure approval process, which shall be subject to ADOT's sole discretion. To obtain approval for a Full
 8 Closure of these facilities, Developer shall prepare Full Closure Package(s) that contains the following:

- 9 A. Location and vicinity maps showing the State highway(s), local street network, and other
 10 adjacent Lane Closures or nearby work that may affect traffic during the same period (including
 11 special events);
- 12 B. Dates, times, and locations of the Closure(s);
- 13 C. Description of the Work being performed during the Closure(s);
- 14 D. Description of each Closure and its anticipated effect on traffic including existing accident data
 15 from ADOT ACIS one mile upstream of lane closures and throughout the detour route;
- 16 E. Amount of expected delay and corresponding queue length for each Closure;
- 17 F. Summary of TMP strategies that Developer shall use to reduce delay and motorist
 18 inconvenience during the Closure(s) and mitigate accidents at locations with multiple existing
 19 incidents;

G. Communication between emergency services and Developer identifying points of contact during the Full Closure specifically as it relates to potential incidents outside of the Full Closure limits within a closure area; and

H. A contingency plan.

A minimum of 15 Business Days in advance of the proposed Full Closure, Developer shall submit Full Closure Package(s) to ADOT for approval in ADOT's good faith discretion.

Allowable closures listed herein still require Developer to submit appropriate notification and documentation for approval from ADOT.

700.06.04.05.03 Crossroads

Acceptable Lane Closures on crossroads shall be in accordance with permit requirements and approval from the applicable Governmental Entity. Eruv projects are present at locations throughout the Project. Developer shall coordinate with the committee and entity of the Eruv prior to any construction. Eruv elements shall be maintained throughout construction. Developer shall accommodate stipulations and regulations behind such elements. Developer may modify during construction and shall adjust Eruv elements as approved by the Eruv entity.

700.06.04.05.04 Holiday Restrictions

Lane Closures or Full Closures are not allowed on the holidays specified in this section or weekends that are adjacent to or following these holidays. The restricted holidays include New Year's Day, Martin Luther King, Jr. Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Columbus Day, Veterans Day, Thanksgiving Day, and Christmas Day. Lane Closures will not be allowed between November 15 and the weekend following January 1 (Holiday Moratorium). Developer shall remove all short-term traffic control for Lane Closures prior to these holidays or weekends that adjoin these holidays.

700.06.04.05.05 Special Events Restrictions

Developer shall coordinate Work activities with local Special Events in the area so that the Special Events will not be affected. Special Events are events that attract more than 30,000 people per day or create significant increase in traffic throughout the Phoenix area and may occur during the Work. Lane Closures and Full Closures may be denied if severe traffic congestion is expected. Special Events may include events that attract fewer people but are considered special events by the applicable Governmental Entities due to economic impact to the community or events that attract dignitaries or politicians. Lane Closures or full Closures are not allowed where a special event is occurring. Developer shall coordinate with ADOT and applicable Governmental Entity to identify the Special Events.

Developer is responsible for identifying and verifying the actual dates and related activities of all Special Events and for planning work activities around the events. Special Events include the NCAA Final Four and Super Bowl, and may include the Arizona Diamondbacks Championship Celebration, if ever. Special Events may take place at various venues, including the following locations:

A. State Farm Stadium, Glendale;

B. IMS Speedway, Avondale;

C. Chase Field, Phoenix;

D. Talking Stick Resort Arena, Phoenix;

E. Gila River Arena, Glendale;

F. Ak-Chin Pavilion, Phoenix;

G. Tempe Diablo Stadium;

H. Arizona State University;

I. Phoenix Convention Center; and

J. Arizona State Fair Grounds.

Lane and full closures of I-10, US-60, SR-143, 40th Street, 48th Street, Broadway Road, and Baseline Road will not be allowed on weekends of baseball games at Tempe Diablo Stadium being held on Friday, Saturday, or Sundays during Arizona Spring Training. Traffic Control and restrictions in place prior to Spring Training Months shall be reviewed and approved by the City of Tempe prior to implementation.

Developer shall incorporate the City of Phoenix Special Events Schedule.

700.06.04.05.06 Full Closure of Loop Ramp from SR 143 and I-10 Interchange

The Developer may implement a full closure of the loop ramp from southbound SR 143 to eastbound I-10 for a duration of 90 consecutive days. Developer shall follow all closure requirements of Section 700.06.04.05.02 and 700.06.04.05.06 of the TPs. If a full closure of the loop ramp is implemented, the Developer shall complete the following Work upon the conclusion of the full closure:

A. 48th Street/SR143 structures over I-10;

B. New 48th Street east-south off-ramp;

C. 48th Street realignment;

D. Eastbound C-D road construction;

E. Drainage basin and storm drain installation;

F. Fill placement;

G. Subgrade preparation;

H. Base and PCCP placement;

I. Curb and Gutter;

J. Barrier; and

K. Permanent lighting.

The Developer shall construct two temporary wall systems as a part of the loop ramp from SR 143 to I-10 maintenance of traffic.

Closure of the loop ramp that exceeds the time permitted shall be subject to the Liquidated Damages specified in Section 19.2 of the Agreement.

The Developer shall not close sequential ramps to the existing loop ramp at the same time as this full closure unless part of an ADOT-approved full freeway closure of I-10. The Developer shall schedule the full closure of the loop ramp to not occur during Special Events. Upon the completion of the long-term full closure, additional night and weekend closures of the SR 143 southbound to I-10 eastbound movement may only be Approved by ADOT for permanent signing and pavement markings. During this long-term full closure, the eastbound Broadway on-ramp shall remain open, unless within the limits of an ADOT-approved full freeway closure of I-10. Developer shall include all 3rd party Stakeholder approvals of the temporary long-term full closure of the loop ramp with the Full Closure Package in accordance with Section 700.06.04.05.02 of the TPs. Developer agrees that Section 19.2.2 of the Agreement is applicable to the requested ramp closure.

700.06.04.05.07 Allowable Closure Period Modification

Developer may request a Deviation pursuant to Section 6.2.4 of the Agreement or a Change Request pursuant to Section 14.2 of the Agreement, as applicable, to modify the opening and closing times in Table 700-8. ADOT will review such request, as provided in the Agreement, and any approval thereof may be subject to specific terms and conditions, including ADOT's right to require Developer to revert to the times specified in Table 700-8.

700.06.04.05.08 Temporary Long-Term Closures at Specified Ramps

Developer may implement temporary long-term service ramp closures at specified locations to facilitate construction of new ramps that are in conflict with existing ramps. Developer shall only be allowed one long-term temporary service ramp closure at each of the following locations and for the maximum time specified for each location:

- 40th Street EB Off-ramp for a maximum of 45 consecutive days;
- 32nd Street EB Off-ramp for a maximum of 45 consecutive days;
- 40th Street EB On-ramp for a maximum of 45 consecutive days;
- 32nd Street EB On-ramp for a maximum of 45 consecutive days;
- Broadway Road EB Off-ramp for a maximum of 60 consecutive days;
- Baseline Road EB Off-ramp for a maximum of 60 consecutive days;
- 40th Street WB Off-ramp for a maximum of 60 consecutive days
- 32nd Street WB Off-ramp for a maximum of 45 consecutive days;
- 32nd Street WB On-ramp for a maximum of 45 consecutive days; and
- 40th Street WB On-ramp for a maximum of 45 consecutive days.

Consecutive ramp closures will not be allowed unless within an ADOT-approved full weekend closure. The temporary long-term closure of the ramps specified in this Section 700.06.04.05.08 of the TPs is subject to the following:

- A. All Work related to, or necessary for, construction of the new ramps, excluding landscaping, must be completed during the maximum number of days allotted for each temporary long-term closure;
- B. The temporary long-term ramp closures are not permitted during the Holiday Moratorium, as stated in Section 700.06.04.05.04 of the TPs;
- C. The temporary long-term ramp closures are not permitted during Spring Training, as stated in Section 700.06.04.05.05 of the TPs;
- D. Developer shall obtain approvals from all third parties prior to implementation of any temporary long-term closures as provided in this Section 700.06.04.05.08 of the TPs;
- E. Developer shall be subject to the Liquidated Damages in Section 19.2 of the Agreement if any long-term temporary closure exceeds the permitted duration, and for any additional days or portions thereof that the ramps or any lane on the ramps are fully or partially closed except as provided in Section 700.06.04.05.08(F) of the TPs; and
- F. Additional night and weekend ramp closures and ramp lane closures may only be permitted for landscaping or where part of an ADOT-approved full freeway closure. Such closure(s) shall not be subject to the Liquidated Damages under Section 19.2 of the Agreement for the ramps specified in this Section 700.06.04.05.08 of the TPs.

700.06.05 Submittals

Table 700-9 reflects a nonexclusive list of Submittals identified in Section 700.06 of the TPs and is not intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 700-9 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Transportation Management Plan	4	0	1	Prior to issuance of NTP 2 or prior to MOT RFC Submittal	700.06.02.03

Table 700-9 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
Updated TMP	4	0	1	As changes occur in the MOT strategies proposed by Developer	700.06.02.03
Pedestrian Access Modification/Closure Request	4	0	1	15 Business Days prior to the planned modification/Closure	700.06.03.04
Detour Plans	3	0	1	15 Business Days prior to implementation of the proposed detour	700.06.03.09
Traffic Control Plans	3	0	1	Prior to Work involving traffic or work zone activities	700.06.04.02.09
Lane Closure Request	2	0	1	5 Business Days in advance of any Lane Closure	700.06.04.05.01
Full Closure Package	2	0	1	A minimum of 15 Business Days in advance of the proposed major Lane Closure	700.06.04.05.02
Temporary ITS Plan	4	0	1	Prior to Work impacting existing ITS facility	700.06.03.07
Traffic Signal Modification Request	4	0	1	15 Business Days prior to implementing the proposed timing or phasing changes	700.06.04.02.07
Temporary Phasing Controller Programming Request	3	0	1	10 Business Days prior to implementing temporary phasing	700.06.04.02.07
Maintenance of Traffic Plans	3	0	1	Prior to any modification of existing travel lanes	700.06.03.01

Table 700-9 Nonexclusive Submittals List				
Submittals	Level of Review*	Number of Copies		Section Reference
		Hardcopies	Electronic	
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)				

700.07 Intelligent Transportation System

700.07.01 General Requirements

Developer shall perform all Intelligent Transportation System (ITS) Design Work in compliance with the requirements of Section 700.07.01 of the TPs. Developer shall provide a fully operational ITS for the Project that integrates with the existing ADOT ITS elements and proposed ITS elements to ADOT Traffic Operations Center. The ITS elements include the following:

- A. Redundant ITS Backbone Communication network;
- B. Dynamic Message Signs;
- C. Closed Circuit Television Cameras;
- D. Detection Stations;
- E. Ramp Meters;
- F. Wrong Way Detection; and
- G. Existing Node Buildings.

Developer shall not be responsible for the central software integration of the ITS elements.

TP Attachment 700-4 contains ITS Technical Specifications that further describe the ITS requirements of the Work. The ITS Technical Specifications provided in TP Attachment 700-4 make reference to sections of ADOT Standard Specifications for Road and Bridge Construction. Those sections shall be adapted and cross referenced to sections of the Project Special Provisions for Construction per Section 120 of the TPs. References to standards, details, and other information within TP Attachment 700-4 that contradict the Contract Documents shall not replace such information in the Contract Documents.

700.07.02 Administrative Requirements

Developer shall perform all ITS Design Work in accordance with the relevant requirements of the standards, manuals, and guidelines listed in Table 700-10, which are shown in no order of precedence; however, in the event of a conflict, Local Requirements for the applicable Local Jurisdiction shall prevail. Otherwise, in the event of a conflict, the more stringent requirement prevails.

Table 700-10 Design Standards		
No.	Agency	Title
1	ADOT	Intelligent Transportation System Design Guide (2019)
2	ADOT	Ramp Metering Design Guide (2013) & Errata (2019)
3	ADOT	FMS Communications Master Plan (2010)
4	ADOT	Statewide Dynamic Message Sign Masterplan (2011)
5	AASHTO	Roadside Design Guide (2011)

Developer shall be responsible for the cost of all utility permit fees, the required service deposits, and turn-on fees prior to the successful completion of System Acceptance Test (SAT). No deposits or refundable fees shall be returned to Developer. The required service applications shall be made by Developer in the name of ADOT.

700.07.02.01 Typical Design-Build Process for ITS

TP Attachment 700-5 contains a flow chart which illustrates the minimum level of effort required by Developer for controlling the design, construction, and testing of ITS for this Project. The following are key requirements within the ITS Workflow Flow Chart and further described herein:

- A. Inventory and document existing ITS elements to remain with the existing traffic management functionality within Project Limits;
- B. Conducting ITS design workshops (Initial, during design and before construction starts);
- C. Preparing ITS Master Plan;
- D. Preparing equipment submittals;
- E. Preparing a comprehensive equipment and system testing plan;
- F. Conduct Pre-activity Meeting (including communication of operational impacts during construction);
- G. Conducting both pre- and post-installation testing;
- H. Providing comprehensive documentation;
- I. Provide for an orderly hand-over of the control of the Site; and
- J. Provide applicable warranties as required by Article 11 of the Agreement.

700.07.02.02 ITS Inventory

Developer shall inventory existing ITS elements to remain in place meeting the requirements of the TPs and ADOT ITS Standards and Guidelines and are in good working condition. Relocating existing equipment shall not be allowed with the exception of information herein. Developer shall photograph elements included in the ITS Inventory. Photos shall clearly depict the overall condition of the element and location, and any visible defects or damage that may warrant the element as not allowed. File and folder names shall be listed within the ITS inventory for reference to each element.

1 The ITS Inventory shall include type of element, location, route, direction of travel, identification numbers,
2 contents of element as applicable, condition, photo reference identification, and any other remarks
3 regarding the element.

4 The ITS Inventory shall be for existing elements Developer anticipates protecting in place throughout the
5 Work and functioning with the final ITS system. The ITS Inventory shall include items outside the Project,
6 where necessary, to show how the proposed ITS is to function with the existing ITS. Elements to be
7 removed or replaced are not required to be included in the Inventory. The ITS inventory shall be submitted
8 on Roll Plots.

9 CCTV poles, lowering devices, cabinets, cameras, and other features installed with ADOT Project
10 H867401C in working condition free of defects may be relocated. Relocated elements shall meet the
11 requirements of these Technical Provisions. If the elements do not meet all the requirements, the element
12 shall be removed and replaced with new elements to fulfil the requirements of the Technical Provisions.
13 Developer shall include elements to be relocated in the ITS Inventory including verification the element
14 meets all requirements. Existing foundations shall not be relocated. New foundations shall be designed
15 to meet the requirement of Section 600 of the TPs.

16 The ITS Inventory shall be submitted prior to NTP 2.

17 **700.07.02.03 ITS Maintenance during Construction**

18 Developer shall maintain existing ITS facilities during construction per Section 700.06.03.07 of the TPs.

19 **700.07.03 Design Activities**

20 **700.07.03.01 ITS Master Plan**

21 Developer shall prepare an ITS Master Plan. The ITS Master Plan shall provide an approximate 15
22 percent level design of the existing to remain and new ITS for the Project. The ITS Master Plan shall
23 include the following:

- 24 A. Traffic Flow Detection. Location of each existing and new traffic flow detection station with a
25 typical roadside cabinet, controller and hardware identified. Developer shall prepare a table of
26 detection station locations showing distances between each location in the same direction of
27 travel;
- 28 B. Closed-Circuit Television (CCTV). Location of each existing and new CCTV and lowering
29 device;
- 30 C. Ramp Meters. Location of existing and new ramp metering elements, site layout illustrating
31 signal and loop detector location, and approach for maintaining ramp metering during
32 construction;
- 33 D. Dynamic Message Signs. Location of each existing and new DMS; structural requirements at
34 each site and coordination with traffic signing plan. All new DMS signs shall be Developer
35 furnished. For the mainline traffic, DMS shall be installed in the median and for the C-D lane
36 users the DMS shall be installed beyond the right shoulder. Developer shall demonstrate the
37 DMS is in the cone of visibility of the driver anticipated to read each DMS. ITS Master Plan shall
38 show distances between DMS signs, distances between DMS sign and nearby upstream and
39 downstream static sign structures as well as distances to the nearest system interchange;

- E. Communication Network. Location of fiber optic trunk line, proposed ITS element, typical pull box design, connections to existing communication network, and extension of conduit runs for the entire length of the Project;
- F. Wrong Way Detection. Location of each new wrong way detection elements; and
- G. Power Distribution Network. Location of power distribution network, including load centers, connections, and transformers.

The ITS Master Plan shall be submitted on Roll Plots prior to the Preliminary ITS Design Plan submittal. Comments provided on the ITS Master Plan shall be incorporated into the Preliminary ITS Design Plans.

30 Days after the RFC of the ITS Design Plans, Developer shall update the ITS Master Plan and submit to ADOT.

700.07.03.02 Design Requirements

Upon approval of the ITS Master Plan, Developer shall design a fully operational ITS for the Project that integrates with the existing ADOT ITS elements to the Traffic Operations Center (TOC). Developer shall inspect all existing ITS elements to remain and software for adequacy and compatibility with the proposed ITS. The ITS elements shall include the following:

- A. ITS backbone communication network;
- B. Dynamic message signs;
- C. Closed circuit television cameras;
- D. Detection stations;
- E. Ramp meters;
- F. Existing Node buildings;
- G. Wrong Way Detection; and
- H. Irrigation Systems.

Developer shall prepare a written ITS Element Number Request for new ITS elements that includes the element type, the element location, and a site map or strip map of sufficient detail to clearly define the relationship of the street names and names of the pertinent features in the vicinity of the ITS element. With each ITS Final Design Submittal, Developer shall submit an ITS Element Number Request to ADOT. ADOT will provide ITS element numbers to Developer within 10 Days of receipt of the written request. Developer shall ensure that ITS element numbers are shown on the RFC Plans.

ITS Plans shall include specific tables and notes for field GPS data to be as-built on the RFC plans.

700.07.03.02.01 ITS Backbone Communication Network

Developer shall design the ITS backbone communication network to be a redundant system, including fiber communication, power, conduits, innerducts and pull boxes, in accordance with the ADOT ITS Design Guide and the Contract Documents. The ITS backbone conduit network shall connect to the traffic signal cabinets owned and operated by ADOT, irrigation controllers, all existing pump stations and any other existing connection shall be maintained and provided at the completion of the Project.

An existing MPD Traffic count location is identified along I-10 west of 32nd Street as Location ID 100111R. This MPD location is not required to be maintained during construction nor connected at the completion of the Project.

The ITS system shall support data and video communication between the ITS field devices and TOC. The system shall include 144-fiber (144 SMFO) cable on the both sides of I-10, SR 143 and US 60 to serve as the communications backbone. The design shall include splice closures to house and protect the splices, network switches, fiber distribution units, and upgrades at the node buildings as required to complete the ITS system. Communication to each field device shall be designed with a 12-fiber (12-SMFO) branch fiber optic cables that are spliced to the 144-SMFO backbone fiber and terminate at each field device on each side of the freeway. ITS Fiber Optic Cable shall meet the requirements of TP Attachment 700-4 (742).

Developer shall provide a backbone communications network connection along I-10 from Node Building 8, connecting to Node 12 and connect to the existing 144-SMFO backbone fiber between Ray Rd and Chandler Blvd.

Developer shall provide a backbone communications network connection from Node Building 12 at the I-10 / SR 143 TI north to the limits of construction on the east and west sides of SR 143 and north and south sides of US 60. Both SR 143 and US 60 backbone communications network connections shall be separate from the I-10 network and terminate within Node 12. Requirements for the SR 143 and US 60 backbone shall follow the same requirements as I-10 as referenced in Section 700.07 of the TPs.

Developer shall maintain existing connectivity and conduit for the City of Phoenix and City of Tempe ITS to the ADOT backbone fiber, including crossroads.

700.07.03.02.02 Dynamic Message Signs

Developer shall install at least 16 new Dynamic Message Signs (DMS). The design for the DMS shall conform to the ADOT ITS Design Guide and the ADOT DMS Master Plan and shall meet the following requirements:

- A. For the mainline traffic, DMS shall be designed to be installed in the median. For the C-D lanes, the DMS shall be designed to be installed beyond the right shoulder;
- B. The DMS support structures shall be designed as tubular butterfly structures consisting of a single tubular post with a minimum of two tubular mast arms on each structure;
- C. The DMS Sign shall be designed to not encroach on more than one lane, in each direction;
- D. The structure shall be designed to provide for front access to the DMS;

- E. The DMS shall meet the primary and secondary placement criteria per the DMS Master Plan and shall provide a minimum of 1000 feet visibility in a 30-degree cone of vision, both horizontally and vertically to the relevant traffic lanes;
- F. DMS controller cabinets shall be designed to meet the requirements of the ITS Design Requirements, be located within 300 feet of the DMS and as specified by the manufacturer, and be located within ADOT ROW on the outside of the rightmost mainline or C-D lane;
- G. Each DMS sign shall be controlled by its own unique controller cabinet assembly; and
- H. The locations of all DMS structures and cabinets installed shall meet the clear zone requirements of Section 200 of the TPs.

The existing DMS mounted on the Warner Road and Ray Road bridges shall remain. Developer shall install catwalk extensions from the existing DMS to the outside shoulder. Catwalks shall be designed and detailed in accordance with Section 600 of the TPs, not extend below the bottom of the bridge structure and shall not obstruct the adjacent overhead guide signs. The overhead sequential guide sign panel for eastbound I-10 on Ray Road bridge may be reused in accordance with Section 700.01.03.03. If Developer damages the sign panel during removal, storage, or installation it shall be replaced at the cost of Developer.

Included with the ITS Master Plan and each ITS Design submittal, Developer shall provide DMS cone of vision exhibits illustrating the cone of vision for each DMS.

700.07.03.02.03 Traffic Detection System and Ramp Metering System

Developer shall provide a Traffic Detection System including any ancillary and incidental equipment required for providing a complete, fully functioning system per the ITS Design Guide. Locations of proposed Traffic Detection Systems shall be in the relative proximity to existing Traffic Detection Systems. Additional new Traffic Detection Systems may be required if spacing criteria per the ITS Design Guide is not achieved by existing Traffic Detection Systems. The new Traffic Detection Systems shall include all HOV, HOV Ramp, general purpose, auxiliary, and C-D lanes. Due to the number of lanes at specific locations eastbound and westbound directions of travel may require separate cabinets for one location.

An existing MPD Traffic count location is identified along I-10 west of 32nd Street as Location ID 100111R. This MPD location is not required to be maintained during construction nor connected at the completion of the Project.

Developer shall provide new ramp metering at the following locations:

- A. 32nd St./University Drive eastbound/westbound ramps to I-10;
- B. 40th St. eastbound/westbound ramps to I-10;
- C. Broadway Rd. westbound ramp to I-10;
- D. Baseline Rd. eastbound ramp to I-10;
- E. Elliot Rd. eastbound/westbound ramps to I-10;

1 F. Warner Rd. eastbound/westbound ramps to I-10;

2 G. Ray Rd. eastbound/westbound ramps to I-10;

3 H. Priest Dr. eastbound ramp to US 60;

4 I. University Dr. southbound at SR 143; and

5 J. University Dr. northbound to at SR 143.

6 System interchange ramps shall not be metered. The mainline and service interchange ramps shall
7 employ loop detection and shall be designed per the ADOT Ramp Metering Design Guide and Errata.
8 Existing ramp metering equipment not meeting the requirements of the ADOT Ramp Metering Guide at
9 the above locations shall be replaced.

10 At locations where the number of lanes exceed that as shown in the ITS Standard Drawings, Developer
11 shall coordinate with the cabinet manufacturer to ensure the cabinets are pre-wired to accommodate
12 loops and detectors for all lanes of traffic.

13 Each detector cabinet shall be placed for convenient and safe maintenance access per the ITS Design
14 Guide requirements. Detector cabinets shall not be placed in the medians nor between mainline and
15 ramps.

16 **700.07.03.02.04 Closed Circuit Television**

17 The CCTV system shall be designed per the requirements of the ADOT ITS Design Guide and shall meet
18 the following minimum requirements:

- 19 A. The CCTV system including new and existing CCTVs shall be designed to provide 100 percent
20 coverage of the freeway, system interchanges, one camera at each of the traffic interchange
21 intersections, the C-D road system, and a view of the DMS messages within the Project Limits.
22 100 percent coverage shall include a distance of at least 30 feet beyond the shoulder of freeway
23 lanes and interchange ramps;
- 24 B. Developer shall demonstrate that the required coverage is achieved using plan/profile exhibits,
25 site line exhibits, 3D-coverage map or other means approved by ADOT; and
- 26 C. All CCTV poles in the system including new and existing poles shall be equipped with a camera
27 lowering device.

28 At the same time as the ITS Master Plan submittal, Developer shall submit documentation supporting
29 their location of CCTV cameras to ADOT.

30 Developer shall obtain an FAA Determination of No Hazard, in accordance with Section 119.02.06.02 of
31 the TPs, for any new CCTV Pole which meet the requirements for construction or alteration requiring notice
32 in 14 CFR 77 (Code of Federal Regulations). Developer shall revise any design determined to exceed
33 obstruction standards and follow any requirements to install obstruction lighting, paint, or other warning
34 device based on FAA response.

700.07.03.02.05 Power Distribution System

Developer shall provide all electrical system components required for providing power service to proposed ITS equipment. This design for the electrical work shall include:

- A. Coordination of power sources with the Utility Adjustment Coordinator;
- B. Load assessment; and
- C. Sizing of conductors, transformers, breakers, lightning protection, and grounding.

700.07.03.02.06 ITS Cabinets

The design for cabinet locations shall be in accordance with the ITS Design Guide and ITS Standard Drawings and shall comply with ADOT *Roadway Design Guidelines*. Concrete Maintenance Pads shall be provided in accordance with ITS Standard Drawings.

Cabinet locations shall be designed to easily accessible from the ramp and/or the mainline by maintenance and operations personnel. Controller cabinets shall be placed with consideration of convenient and safe access and feasibility of performing any required calibration activities. System-to-system stations shall be placed such that controller cabinets can be placed on ground level.

700.07.03.02.07 ITS Conduits and Pull Boxes

ITS conduit currently exists along I-10, US 60, SR 143 and crossroads within the Project Limits. Any conduit impacted due to roadway widening shall be removed and replaced with new conduit in accordance with the requirements of the ADOT ITS Design Guide. Existing conduit and pull boxes may remain if not impacted by the Work. These conduits and pull boxes shall be inventoried. No. 9 pull box lids that do not meet the current requirements of that for new No. 9 pull box lids may be retrofit in accordance with TP Section 700-4 in place. No other retrofit of existing No. 9 pull boxes will be allowed. Locations of retrofit No. 9 pull boxes shall be identified on the ITS Inventory, ITS Master Plan, and ITS Plans.

No. 9 pull boxes shall be provided at every splice location with intermediate No. 9 pull boxes installed so the distance between No. 9 pull boxes is no greater than 1,500 feet. No. 7 pull boxes shall be provided as required to facilitate connectivity of field devices. The placement of the conduit and pull boxes shall be in conformance with the requirements of the ADOT ITS Design Guide and TP Attachment 700-4. Pull boxes design shall include avoidance of drainage swales, slopes steeper than 2:1, maintenance vehicle pathways, utility easements, and other areas of conflict.

Pull boxes shall not be located in travel lanes under any circumstances.

Areas where ROW or roadside topography does not allow for the installation of the trunk line outside the paved shoulder may require pull boxes within the shoulder. Developer shall identify these areas on the ITS Inventory and may only install traffic rated pull boxes in the shoulder with ADOT approval. Additional pull boxes shall be utilized to minimize the locations of pull boxes in shoulders.

The trunk line conduits on each side of I-10, SR 143, and US 60 shall consist of three principal conduits that shall be dedicated to the following functions:

- A. Conduit closest to the roadway shall be allocated to fiber cable. This conduit shall have two 1-inch innerducts with detectable pull tape installed;

1 B. The middle conduit shall be kept as spare. A detectable pull tape shall be installed; and

2 C. The third conduit shall contain the high voltage electrical power cables to device
3 cabinets/transformer cabinets. A detectable pull tape shall be provided in this conduit when no
4 power cables are installed.

5 Loop lead-in cables, branch fiber cables, and low voltage power for local connections (ramp meter
6 signals, ramp meter flashers, CCTV cameras, and DMS signs) shall not be designed to run through the
7 three 3-inch primary conduits.

8 Direct-buried conduit shall be PVC. Exposed conduit shall be Rigid Metal Conduit (RMC) and Flexible
9 Metal Conduit. Intermediate Metal Conduit shall not be utilized for ITS elements. Developer may
10 substitute HDPE conduit with prior approval of ADOT. HDPE conduit shall conform to the requirements
11 of TP Attachment 700-4. Conduit type shall be clearly identified on the Plans.

12 Conduit crossing new and existing structures shall be placed between girders such that conduit and
13 support elements, including hanger, are not exposed from the exterior "outboard" side of exterior
14 elements of the bridge framing. Hanger details shall be referenced on the Bridge Plans and included in
15 the ITS Details. Hangers, RMC, and Flexible Metal Conduit shall be painted to match the exterior color
16 of the existing or new structure. Conduit embedded within the structure is not required to be painted.
17 Expansion couplings or sleeves shall be in accordance with TP Attachment 700-4. Couplings and sleeves
18 shall not be exposed to the elements and shall be fully contained within concrete or covered by a metal
19 plate recessed into the barrier across the expansion joint.

20 ITS Plans shall indicate the station and offset of 3-inch "Y" directly over ITS conduit on rolled or vertical
21 curbs.

22 **700.07.03.02.08 Existing Node Building Connection**

23 Developer shall connect the ITS system to the existing node building at I-10/Broadway Road. Developer
24 shall evaluate the impact of the Project improvements to the existing node building at I-10/I-17. Developer
25 shall design and construct modifications to the communication infrastructure to accommodate the Project
26 improvements at both node buildings to provide a functional ITS system connected to the ADOT Traffic
27 Operations Center.

28 **700.07.03.02.09 ITS for Irrigation Controllers**

29 Developer shall integrate the irrigation system controllers to the ITS system to provide communication
30 with the TOC. Developer shall provide new 2-inch Conduit and 12-SMFO branch fiber optic cable through
31 the conduit from the new and existing irrigation controllers and splice at the nearest No. 9 pull box.

32 **700.07.03.02.10 Wrong-Way Detection**

33 Developer shall design a fully functional wrong-way detection system in accordance with the ITS Design
34 Guide and TP Attachment 700-4. Where no modifications to existing signals are being proposed,
35 Developer shall install new camera poles and equipment required to allow for a wrong-way detection
36 system. Developer may utilize thermal cameras for signal detection such that all the requirements for
37 both signal detection and wrong-way detection are met.

38 Developer shall not install wrong-way detection cameras on traffic signal mast arms or luminaire mast
39 arms. Wrong-way detection equipment shall not be installed in traffic signal cabinets. Developer shall

install a minimum of one wrong-way detection camera located near the intersection of each exit ramp and crossroad at each diamond interchange and a minimum of two wrong-way detection cameras located mid-way along each exit ramp at each Single Point Urban Interchange (SPUI).

Illuminated wrong-way sign assemblies shall be shown on both ITS and Signing and Pavement Marking Plans.

Developer shall provide wrong-way detection systems at the following locations:

- A. 32nd Street/University Drive eastbound and westbound off-ramps at I-10;
- B. 40th Street eastbound and westbound off-ramps at I-10;
- C. University Drive northbound and southbound off-ramps at SR 143 (SPUI);
- D. Broadway Road eastbound and westbound off-ramps at I-10;
- E. Priest Drive westbound off-ramp at US-60;
- F. Baseline Road eastbound and westbound off-ramps at I-10;
- G. Elliot Road eastbound and westbound off-ramps at I-10;
- H. Warner Road eastbound and westbound off-ramps at I-10;
- I. Ray Road eastbound and westbound off-ramps at I-10; and
- J. Chandler Boulevard eastbound off-ramp at I-10.

The wrong-way detection shall be capable of detecting the presence of wrong-way vehicles and bicycles on the ramps over virtual detection zones, which are placed on a thermal image. Using a thermal detection sensor and in the absence of occlusion, the system shall be able to:

- A. Detect vehicle presence with 98% accuracy under normal conditions (days and nights), and 96% accuracy under adverse conditions (fog, rain, snow); and
- B. Detect bicycle presence with 95% accuracy under normal conditions (days and nights), and 92% accuracy under adverse conditions (fog, rain, snow), with separation of bicycles from other vehicles such as cars and trucks.

700.07.04 Construction Requirements

Prior to starting ITS construction, Developer shall conduct a pre-construction coordinating meeting in accordance with the requirements of Section 108.03.07 of the TPs.

700.07.04.01 Standards

Developer shall perform all ITS Construction Work in accordance with the relevant requirements of the standards, manuals, and guidelines listed in Table 700-11, which are shown in no order of precedence; however, in the event of a conflict, Local Requirements for the applicable Local Jurisdiction shall prevail. Otherwise, in the event of a conflict, the more stringent requirement prevails.

Table 700-11 Construction Standards		
No.	Agency	Title
1	ADOT	ITS Standard Drawings (2019)
2	ADOT	ITS Specifications (TP Attachment 700-4)

700.07.04.02 ITS Equipment and Testing Plan

Developer shall perform detailed ITS equipment and system testing before and after installation or disturbance of new or existing ITS components per requirements of the manufacturer. As a separate section of the Construction Quality Management Plan, Developer shall prepare and submit a comprehensive ITS Equipment and System Testing Plan. This ITS Equipment and System Testing Plan shall indicate the type and frequency of the full range of tests to be undertaken. The ITS Equipment and System Testing Plan shall indicate when and where the tests are to take place, and who (which organization or agency) will be conducting each test. The ITS Equipment and System Testing Plan shall be updated and reissued as required to indicate the current version and status of test specifications for each item within the Plan. Developer shall submit all ITS testing documentation to ADOT for approval. All submittals shall meet the requirements of Section 116 of the TPs.

Developer shall demonstrate that the equipment and the systems furnished and installed function as required by the Contract Documents.

ITS equipment and system testing requirements are found in TP Attachment 700-4. The ITS Equipment and System Testing Plan shall include:

- A. Fiber optic cable tests;
- B. Power Meter tests;
- C. OTDR tests;
- D. Loop Detector tests (including Loop Detection Test Plan);
- E. Loop lead-in cable tests;
- F. Cabinet assembly tests including:
 - 1. ITS Cabinet Assembly test;
 - 2. Traffic volume and speed tests; and
 - 3. Ethernet switch tests;
- G. Subsystem tests;
- H. System Acceptance Tests (SAT) including:
 - 1. SAT Minor Failure log; and
 - 2. SAT Major Failure log;

- I. Signal head test;
- J. CCTV camera test;
- K. CCTV camera lowering device tests;
- L. DMS tests; and
- M. Wrong-Way driver system tests.

For Ethernet Switch Testing, Developer shall provide documentation indicating the names of the individuals performing the work, company they work for, contact information, relevant experience and the amount of time spent on each project, and any other supporting information to ADOT for approval 20 Days prior to the start of Ethernet switch installation in accordance with the requirements in Section 114.03 of the TPs. Minimum qualifications for Developer personnel performing installation and testing of the Ethernet Switches shall be:

- A. Three years' experience in installation, testing and maintenance of Ethernet network equipment.
- B. Performed two installations where Ethernet Switches were deployed and the network has remained in continuous satisfactory operation for at least two years.

Requirements to be delivered to, submitted to, or Approved by ADOT per TP Attachment 700-4 shall be identified for each test identified in the ITS Equipment and Testing Plan.

700.07.04.03 Equipment Submittals

Prior to purchase or fabrication of any equipment or material, Developer shall submit appropriate catalog cut sheets, shop drawings, and specifications for all ITS elements to ADOT. Equipment shall per the Contract Documents, Section 700.07 of the TPs, and TP Attachment 700-4.

700.07.04.04 Construction

During construction, Developer shall hold monthly ITS activity meetings. The topics for the ITS activity meetings should generally correspond to the major ITS components of Work and shall update the schedule of completion, testing, inspection, certification, and receipt of ITS elements. Failures in testing, delays in procurement of materials, field changes, design changes, and disruption of ITS elements shall be discussed at the ITS activity meeting.

700.07.04.04.01 ITS Components

700.07.04.04.01.01 ITS Backbone Communication Network

Developer shall do no work within the Traffic Operation Center (TOC). All interface cabling (i.e., video or data) that may be required in the TOC will be furnished and installed by ADOT personnel. Developer shall complete the integration work in the node building, including supplying the required cabling and equipment.

Developer shall provide sufficient slack fiber in pull boxes and cabinets per the ADOT ITS Design Guide requirements.

1 10 Days prior to approved disconnecting existing conductors or cables, Developer shall submit a
2 schedule for disconnection and reconnection of existing cables for approval by ADOT.

3 **700.07.04.04.01.02 Dynamic Message Signs**

4 All new DMS shall be Daktronics model number VF2420-96X400-20-RGB.

5 Developer shall have permanent (vs. generator) power available to the new DMS locations so the DMS
6 supplier can complete the sign stand-alone test at the time of installation. The new DMS equipment shall
7 conform to the ADOT ITS Specifications and shall meet the following minimum requirements.

- 8 A. Developer shall submit drawings and design calculations for the DMS support structure and
9 foundations, including all mounting hardware. The Final DMS support structure shop drawing
10 shall be submitted after Developer conducts field survey including high point or roadway and
11 foundation elevations;
- 12 B. Developer shall ensure that any photoelectric controller, light-meter, or any other equipment
13 controlling the 'dimability' function of the DMS is not obscured and full functionality is provided
14 in the event of back-to-back DMS signs being installed on the same supporting structure;
- 15 C. Foundations for mainline DMS shall be embedded in the median concrete barrier that shall be
16 transitioned in both directions of traffic to accommodate the entire width of the foundations;
- 17 D. The top elevations of DMS foundations shall be installed flush with the median. Allowable barrier
18 tapers shall be in accordance with Section 200 of the TPs;
- 19 E. Each DMS sign shall be controlled by its own unique controller cabinet assembly; and
- 20 F. DMS controller cabinet shall be installed to provide complete view of the DMS to a technician
21 working at the cabinet, while the cabinet door is open.

22 The DMS items of work shall include the following:

- 23 A. 20 mm full-matrix, front access DMS;
- 24 B. Sign case, sign controller, cabinet;
- 25 C. Conduits and cabling (power and communications);
- 26 D. Foundations and structural supports, including mounting hardware;
- 27 E. Traffic control (as required); and
- 28 F. Foundations for cabinets (including conduits as required).

29 **700.07.04.04.01.03 Traffic Detection Systems and Ramp Metering System**

30 Installation of ramp metering field equipment shall include:

- 31 A. Inductance loops (saw cut and preformed);

- 1 B. Ramp meter signal assembly (and associated signs);
- 2 C. Ramp meter flasher assembly (and associated signs);
- 3 D. Loop slot sealant;
- 4 E. Loop lead-In cable;
- 5 F. Connectors;
- 6 G. Controller cabinet complete with foundations and conduit connections;
- 7 H. Ramp meter controller;
- 8 I. Ramp metering central system license;
- 9 J. Ramp metering software; and
- 10 K. Loop detector surge protector.

11 Ramp meter controllers shall be delivered to ADOT TSMO YM PM02 Basement at 2302 W Durango
12 Street, Phoenix, AZ, 85009 for programming and testing of controllers. Developer shall notify ADOT
13 TSMO at least 2 Business Days prior to the scheduled delivery of the controllers.

14 All loop detectors on the mainline within the Project Limits and on portions of the ramp affected by
15 widening, and loop amplifier cards within existing or new ramp meter and count station cabinets shall be
16 new. Developer shall furnish and install an Ethernet switch within all cabinets. This switch will facilitate
17 all communication to the associated hardware as defined in TP Attachment 700-4.

18 **700.07.04.04.01.04 Closed Circuit Television**

19 CCTV cameras shall be Bosch model MIC-7502-Z30W.

20 The CCTV system shall include cameras, poles, lowering devices, power source and ITS backbone
21 connection at each location, and other ancillary and incidental equipment required for assembling a
22 complete, fully functioning system.

23 New CCTV equipment furnished and installed by Developer shall include the following:

- 24 A. CCTV Camera;
- 25 B. CCTV Poles;
- 26 C. Lowering devices;
- 27 D. Foundations and structural supports, including mounting hardware;
- 28 E. Conduits (power and communications);
- 29 F. Video, power, and data cabling; and

G. Surge protectors.

Installation of CCTV equipment shall conform to TP Attachment 700-4. New CCTV cameras to meet the requirements of Section 700.07.03.02.04(A) of the TPs and view the message on DMS signs shall not be installed until after the DMS installation is complete to ensure DMS message coverage is obtainable.

700.07.04.04.01.05 Power Distribution System

Work to provide all electrical system components required to power new ITS equipment shall include, the following items:

A. Provision of electrical service;

B. Power distribution wiring;

C. Transformer cabinets; and

D. Work to provide power distribution system shall comply with all Laws.

700.07.04.04.01.06 Cabinets

Cabinets shall be installed such that the signal display, ramp and mainline loops are visible from the front door.

All environmentally sensitive equipment shall be housed within weatherproof outdoor cabinets. All ITS cabinets shall meet the requirements of the ADOT ITS Specifications found in TP Attachment 700-4.

Developer shall provide complete ITS Cabinet Wiring Diagrams and Schematics for all ITS Cabinet assemblies at the time of installation. ITS Cabinet Wiring Diagrams and Schematics shall be submitted as one PDF and one 11-inch by 17-inch hardcopy with each ITS Cabinet assembly.

Developer shall notify ADOT 5 Days prior to requiring entry to an ITS cabinet. ITS cabinet locks shall remain ADOT locks at all times.

700.07.04.04.01.07 Conduits and Pull Boxes

Developer shall replace all ADOT locks on existing pull boxes at the beginning of the Project with Developer locks. Any new pull boxes installed prior to Substantial Completion shall be installed with Developer locks. Developer shall provide ADOT three keys to Developer locks on ITS pull boxes prior to removing ADOT locks.

All new conduit and pull boxes shall be installed in accordance with the ADOT *ITS Specifications*.

Conduits originating from device cabinets shall enter the same No. 9 pull boxes as the backbone conduits through available entry ports.

Conduit warning tape shall be provided for all ITS Conduit.

The record drawings shall include lateral offset dimensions of conduit referenced from back of curb, edge of pavement, barrier, guard rail, bridge wall, or other fixed landmark. The dimensions shall be provided for new conduit at angle points and tangent sections.

1 Trenchless installation methods of conduit shall be coordinated with ADOT and clearly identified on the
2 ITS Plans. Proposed profile including surveyed underground features and potholes shall be submitted to
3 ADOT 10 Days prior to installation. Open cutting and trenching existing pavement to remain shall not be
4 allowed.

5 Pull Box lids shall be locking and bear the words "ADOT FMS" meeting the requirements of TP
6 Attachment 700-4. Prior to Substantial Completion Developer shall install ADOT locks on all existing and
7 new pull boxes. Developer shall coordinate with ADOT timing of ADOT locks being placed on all pull
8 boxes.

9 **700.07.04.04.01.08 Node Building**

10 If Developer plans to enter a node building, Developer shall prepare a Node Building Access Request
11 that includes the date and time Developer needs access to the node building, node building number,
12 purpose of the requested access, and a description of the work to be performed in the node building. A
13 minimum of 5 Days prior to any planned work within an existing node building, Developer shall submit
14 a written Node Building Access Request to ADOT for approval.

15 **700.07.04.04.01.09 Irrigation Systems**

16 New 2-inch Conduit for future ITS connections from the nearest ITS No. 9 pull box shall be terminated
17 inside new irrigation controller cabinets. 2-inch conduits from the nearest ITS No. 9 pull box to existing to
18 remain-in-place irrigation controller cabinets shall be stubbed-out adjacent to and within two feet from the
19 cabinet. 12 strand branch fiber shall be pulled through all new conduit to the new irrigation controllers.

20 **700.07.04.04.01.10 Wrong-Way Detection**

21 Wrong-Way Detection systems shall be constructed in accordance with ITS Standard Drawings, the RFC
22 Plans and TP Attachment 700-4.

23 Thermal cameras shall be FLIR TrifiSense-2.

24 Developer shall coordinate with ADOT for the final locations of Wrong Way Sign Assemblies in the field.
25 Wrong Way Sign Assembly final locations shall be identified on the Record Drawing Plans.

26 **700.07.04.04.01.11 Wrong-Way Detection Mounting**

27 Developer may use the new CCTV structures for mounting thermal cameras for the wrong-way driver
28 detection system instead of new, dedicated Type G poles in one quadrant of each traffic interchange (TI)
29 where wrong-way detectors are required. Developers use of new CCTV poles, shall be designed for a 1
30 inch maximum deflection at the top of the pole under a 30 mile per hour non-gust wind speed. The CCTV
31 poles shall be compliant with the 2015 interim revisions to the AASHTO Standard Specifications for
32 Structural Supports. Developer shall follow all other requirements in Section 700.07.04.04.01.10 of the
33 TPs and TP Attachment 700-4.

34 **700.07.04.04.02 Operational Support and Warranty**

35 Developer shall provide operational support and warranty until Substantial Completion, beginning when
36 Developer is notified of successful completion of the System Acceptance Test (SAT).

37 The operational support and warranty services shall include maintenance, emergency repairs, and
38 technical support for ADOT to operate the ITS system. Operational support does not replace ADOT's
39 Emergency maintenance; rather, it shall supplement it.

Developer shall furnish staff trained to understand, use, and configure the supplied equipment and identify, diagnose, and troubleshoot all component failures. A single staff contact shall be assigned for 24-hour emergency response service. The initial assistance may be provided by telephone. If telephone contact is not sufficient to solve the problem, Developer shall assign staff to assist on-site within 24 hours of the initial contact.

Developer shall furnish all spare parts, the required test/diagnostic equipment, and additional support equipment required to successfully operate, maintain, and troubleshoot the ITS equipment throughout the duration of the warranty period.

ADOT will notify Developer of hardware and software component failures. Developer shall correct any component failure within 2 Days from the notification. Developer shall maintain a log of the repairs, including date, nature of failure, make, and model of failed unit and cause.

700.07.05 Submittals

Developer shall prepare and submit reports and other Project documentation for the ITS portion of the Work. All reports including design analysis, calculations, record of approvals and minutes of design meetings shall be prepared in Microsoft Word and be digitally submitted. Developer shall provide engineering drawings in accordance with the requirements of Section 116.04 of the TPs. All submittals shall include files in their native format. The following reports shall be prepared and submitted as specified below.

700.07.05.01 Design Documentation

Developer shall prepare and submit documentation for the ITS portion of the Work in accordance with the requirements of Section 116.02.02 of the TPs. Specific reports and documentation required for the ITS portion of the Work includes:

- A. Inventory of existing ITS components to remain and documentation of existing conditions to remain in the presence of the ADOT;
- B. ITS Master Plan;
- C. DMS cone of vision;
- D. CCTV coverage map (or other deliverable);
- E. ITS Plans and details;
- F. ITS equipment submittals; and
- G. Design calculations and analysis.

700.07.05.02 Construction Documentation

Developer shall prepare and submit documentation during the construction of the ITS components in accordance with the CQMP and quality control Plans detailed in Section 113.02.03.01.02 of the TPs. Specific reports and documentation required for the ITS portion of the Work include:

- A. ITS Equipment and System Testing Plan;

- B. Material for Construction Coordination Meetings;
- C. Equipment submittals;
- D. Certificates of Compliance for ITS elements per TP Attachment 700-4;
- E. Construction Quality Control Inspection Reports;
- F. Fiber-Optic Cable Installation Sequential Report;
- G. Record Drawing Cable Schedule;
- H. Work Plans and Schedules; and
- I. GPS data for elements identified in Section 751-2.02 of TP Attachment 700-4.

In-Progress Documentation shall be kept current within 14 Days of ITS Work being performed through Substantial Completion. Documentation shall include those items listed in Section 700.07 of the TPs and TP Attachment 700-4.

700.07.05.03 ITS Final Compiled Documentation

Developer shall compile a final set of documentation at the completion of ITS construction activities. The documentation package shall include:

- A. ITS Master Plan;
- B. ITS Record Drawings;
- C. Approved Equipment Submittals;
- D. ITS Specific Project Technical Specifications;
- E. ITS Equipment and System Testing Plan;
- F. Testing Procedures;
- G. Testing Reports;
- H. Manuals:
 - 1. Installation manuals;
 - 2. User manuals;
 - 3. Operation manuals;
 - 4. Programming manuals;
 - 5. Theory of operation manuals;

- 1 6. Diagnostic manuals; and
 - 2 7. Maintenance procedure manuals;
 - 3 I. Equipment assembly drawings;
 - 4 J. Cabinet rack wiring diagrams (including node building racks);
 - 5 K. Electrical schematic and wiring diagrams;
 - 6 L. Record Drawing Cable Schedule;
 - 7 M. System connection diagrams;
 - 8 N. Fiber optic splices and splice closures diagrams;
 - 9 O. Installation details for all new or nonstandard installations;
 - 10 P. Warranties and guarantees;
 - 11 Q. Certificates of compliance and certificates of analysis;
 - 12 R. Shop drawings and modifications; and
 - 13 S. All other written or recorded documents.
- 14 The ITS Final Compiled documentation shall be indexed and submitted electronically and in hard cover
15 three-ring binder prior to substantial completion.
- 16 Additional copies of items within the Compiled Documentation shall be required per Section 700.07 of
17 the TPs and TP Attachment 700-4.

18 **700.07.05.04 Submittals**

19 Table 700-12 reflects a nonexclusive list of Submittals identified in Section 700.07 of the TPs and is not
20 intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit
21 all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental
22 Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and
23 hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer
24 shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs:

Table 700-12 Nonexclusive Submittals List					
Document	Level of Review*	Number of Copies		Delivery Schedule	Section Reference
ITS Inventory	3	0	1	Prior to NTP 2	700.07.02.02
ITS Master Plan	3	0	1	Prior to the first Preliminary Design Submittal	700.07.03.01

Table 700-12 Nonexclusive Submittals List					
Document	Level of	Number of Copies		Delivery	Section
Updated ITS Master Plan	3	0	1	30 Days after the RFC of ITS Design Plans	700.07.03.01
ITS Element Number Request	5	0	1	With each ITS Final Design Submittal	700.07.03.02
Node Building Access Request	3	0	1	A minimum of 5 Business Days prior to any planned Work within an existing node building	700.07.04.04.01.08
ITS Cabinet Wiring Diagrams and Schematics	3	1	1	At the time of delivery of ITS Cabinet to ADOT for testing	700.04.04.01.06
Schedule for disconnection and reconnection of existing cables	3	0	1	10 Days prior to disconnection of conductors or cables	700.07.04.04.01.01
ITS Boring / Drilling profile	3	0	1	10 Days prior to installation	700.07.04.04.01.07
ITS Equipment and Testing Plan	3	0	1	With Construction Quality Management Plan	700.07.04.02
ITS Final Compiled Documentation	3	1	1	Prior to Substantial Completion	700.07.05.03
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

End of Division

Division VIII, Roadside Development

800 LANDSCAPE, AESTHETICS, IRRIGATION DESIGN & EROSION CONTROL

800.01 General Requirements

Developer shall perform all Landscape Architectural Design, Aesthetics Design, Irrigation Design, and Erosion Control in compliance with the requirements of Section 800 of the TPs.

800.02 Administrative Requirements

800.02.01 Standards

Developer shall perform all Landscape, aesthetics, irrigation design and erosion control in accordance with the standards, manuals, and guidelines listed in Table 800-1 which are shown in no order of precedence; however, in the event of a conflict, the more stringent requirement prevails.

Table 800-1 Design Standards		
No.	Agency	Title
1	ANA	Container Grown Tree Guide
2	ANLA	American Standard for Nursery Stock (Sponsor American Association of Nurserymen, Inc.) ANSI Z60.1
3	ADOT	Invasive Noxious Plant Species List for Construction Projects
4	ADOT	Roadside Vegetation Management Guidelines
5	ADOT	Erosion and Pollution Control Manual for Highway Design and Construction
6	AASHTO	A Guide for Transportation Landscape and Environmental Design
7	ADWR	Low Water Use Drought Tolerant Plant List; Official Regulatory List for the Arizona Department of Water Resources, Phoenix Active Management Area
8	UL	Underwriters Laboratories
9	NFPA	National Electrical Code
10	ALCA	Sustainable Landscape Management: Standards for Landscape Care in the Desert Southwest
11	ADOT	Guide, Pruning Techniques
12	ADOT	Publication, Slope Erosion Control for Urban Freeways in Arid Climates
13	ADOT	Construction Standard Drawings
14	ADOT	Standard Specifications for Road and Bridge Construction, 2008

800.02.02 Meetings

Refer to Section 108.03 of the TPs for landscape, aesthetics, and erosion control meetings.

800.02.03 Plant Inventory

ADOT Preliminary Plant Inventory summary spreadsheets and an electronic point file are included in the RIDs.

Developer shall submit their Preliminary Plant Inventory. Developer shall be responsible for conducting its own Plant Inventory of all saguaros, barrel cacti, ocotillos, and all native tree species, including blue palo verde, foothills palo verde, ironwood, mesquite, and other species with a caliper 4 inches or greater, measured 6 inches above existing ground, within the Project Limits. Limits of grading disturbance will

include areas of planned or actual construction impacts. The Preliminary Plant Inventory shall include a list and disposition of all plants determined by Developer to be salvaged or non-salvageable, removed or remain in place. All plants determined to be non-salvageable or removed by Developer shall be cleared and grubbed. Palm trees within the Schematic ROW between 40th Street and Alameda Drive may be protected in place if not impacted by the Work. Developer shall submit a Final Plant Inventory and a Plant Salvage Operations Plan for the plants to be salvaged, as approved by ADOT.

Each plant inventoried shall be given an identification number (ID number) that is associated with that plant through the salvaging, nursery, and replanting process. Developer shall prepare a matrix of inventoried plants that includes plant ID number, the species, caliper, and height of all trees, as well as the overall height of all saguaros and barrel cacti. The matrix shall also identify whether each plant listed is salvageable or non-salvageable or protect in place for all inventoried plants.

Developer shall prepare Plant Inventory providing the location of each inventoried plant and its associated ID number.

The Plant Inventory shall include the following:

- A. Cover page;
- B. Table of contents;
- C. Matrix of inventoried plants with disposition;
- D. Assessment of health and aesthetics condition of plants; and
- E. Plant Inventory exhibits and Plans.

Prior to ground disturbing activities but excluding geotechnical activities not disturbing native plants, and as a condition precedent to ADOT's issuance of NTP 2, Developer shall submit the Preliminary Plant Inventory. Developer shall update and submit the Final Plant Inventory with the Final Landscape Plan Submittal.

800.02.04 Salvage Operation Plan

Developer shall prepare a Salvage Operation Plan that details the processes for plant salvage, nursery setup and operation, and replanting of salvaged plants. Developer shall salvage all plants as identified in the Plant Inventory.

The Salvage Operation Plan shall include the following:

- A. Cover page;
- B. Table of contents;
- C. Timing for salvage operations for optimum success;
- D. Anticipated phasing schedule for salvage and replanting of plant materials;
- E. Methods for protecting and maintaining all plants to be protected in place;

F. Details and specifics of:

1. Mechanical and manual equipment to be used;
2. Pruning;
3. Side boxing, top wood, and bottom boxing;
4. Boxing support and bottoming materials and sizes;
5. Transporting boxed materials to the nursery;
6. Plant excavation techniques and processes; and
7. Salvaging and transporting saguaros and cacti; and

G. Nursery details, including:

1. Anticipated nursery locations(s);
2. Security measures for nursery site(s);
3. Maintenance and inspection requirements and schedules;
4. Plant irrigation materials and shop drawings;
5. Watering times and frequencies; and
6. Methods and details for replanting boxed trees, saguaros, and cacti.

At the same time as the submittal of the Final Plant Inventory, Developer shall submit the Preliminary Plant Salvage Operation Plan to ADOT for review and comment. Developer shall provide the Final Salvage Operation Plan at least 10 Days prior to beginning plant salvage operations.

800.02.05 Noxious and Invasive Species Control Plan

Developer shall inventory the presence of Noxious and Invasive Species in the Project ROW, in conformance with Environmental Mitigation measures of Section 119 of the TPs. A Noxious and Invasive Species Control Plan shall be prepared describing the proposed methods and products for minimizing the spread and growth of noxious and invasive species found, from NTP 2 through Final Acceptance. If noxious and invasive species are not found during the inventory, Developer shall state so in the Noxious and Invasive Species Control Plan. The Noxious and Invasive Species Control Plan shall include the following:

- A. Cover page;
- B. Table of contents;
- C. Discussion, including the following:

1. Information on the species that are found in the Project ROW;
- Maps of the locations and approximate area of each type of species found; and
- Proposed chemical or mechanical means to minimize germination of these plants.

Developer shall submit the Noxious and Invasive Species Control Plan to ADOT for approval as a condition precedent to ADOT's issuance of NTP 2. Developer shall prepare an updated Noxious and Invasive Species Control Plan as needed.

800.02.06 Topsoil Report

Developer shall conduct soils sampling, which at a minimum complies with the following:

- A. 1-mile increments in existing freeway landscape areas along both sides of the Project ROW excluding the area south of Baseline Road along I-10;
- B. Areas made up of surface bed-rock may be excluded from testing; and
- C. System interchange locations shall contain a minimum of 4 sampling sites evenly distributed within the interchanges;

Boring samples shall vary in depth from one to six feet below existing site grade. Developer shall analyze the samples for compliance with Table 804-1 of the ADOT Standard Specifications and the bio-assay test and agronomic testing detailed in Table 800-2. Areas with surface bed-rock are exempt from topsoil and soil amendment requirements.

Table 800-2	
Agronomic Testing Requirements	
Agronomic-based saturated paste determinations of:	
pH	
soluble salts	
sodium adsorption ratio	
Ammonium Acetate extraction of:	
estimated exchangeable sodium percent	
Sample Analysis of:	
organic matter	
Nitrate	
bicarbonate phosphorus	
Potassium	
Sulfur	
DTPA soluble zinc	
Iron	
Manganese	
Copper	
Boron	
gypsum requirement	
Gravel	

1 From this sampling, Developer shall identify soil amendments needed for incorporation into the prepared
2 soil only used in the plant pits as defined in Section 806-2.05 of the ADOT Standard Specifications to
3 provide optimum plant growth. If existing Project areas are not to be plated with topsoil, the existing in-
4 situ soil shall comply with the soil characteristics in Table 804-1 of the ADOT Standard Specifications.

5 If alternative/borrow imported topsoil is to be used in lieu of or in addition to on-site material, Developer
6 shall provide independent soil laboratory results showing that the imported topsoil from each source
7 complies with these requirements and Table 804-1 of ADOT Standard Specifications.

8 Developer shall prepare and submit 60 days prior to planting a Topsoil Report that includes the following:

9 A. Cover page;

10 B. Table of contents;

11 C. Discussion, including the following:

12 1. Introduction;

13 2. Description of existing soils;

14 3. Proposed amendments as required;

15 4. How and where Developer will excavate, transport, stockpile, amend, and place topsoil;
16 and

17 5. The equipment that Developer will use to place topsoil.

18 D. Appendix, including the following:

19 1. Summary and results of the soil analyses;

20 2. Sources of all topsoil, including imported materials;

21 3. Laboratory testing results;

22 4. Independent soil laboratory testing results; and

23 5. Sampling map showing where test samples were taken.

24 **800.02.07 Erosion Control and Pollution Prevention**

25 Developer shall prepare the permanent Stormwater Pollution Prevention Plans (SWPPP) in accordance
26 with Section 104.09 of the TPs. Developer shall be responsible for completing all temporary and
27 permanent erosion control Plans in accordance with the ADOT *Erosion and Pollution Control Manual for*
28 *Highway Design and Construction* and the Project-specific Construction General Permit issued to
29 Developer by ADEQ.

800.03 Design Requirements

Developer shall produce plans and specifications to implement the landscape, irrigation components, and aesthetic treatments that conform to the Character Areas shown in the Aesthetics Concepts and Details included in the RIDs. Each Character Area has its own theme, rustication pattern, and planting theme. All landscape architectural, aesthetics treatments, erosion control plans, specifications, and reports shall be signed and sealed by a registered Professional Landscape Architect in the State.

Since aesthetics and maintenance considerations will directly influence Project components, it is important for Developer and ADOT to reach concurrence on the design concepts to be incorporated into the final design.

800.03.01 Bridge and Structure Aesthetics Design

Rustication is considered an aesthetics treatment. Rustication is defined as any change in the pattern or texture of built structure as compared with a standard smooth finish. Rustication, whether it protrudes out or is inset into the structure, shall comply with the structure requirements in Section 600 of the TPs. The dimensions of rustication relief as shown in the Aesthetics Concepts and Details included in the RIDs are the minimums allowed.

For areas adjacent to existing structures with rustication, the rustication of proposed structures shall match existing rustication patterns within thirty feet of existing structures. When proposed structures extend continuously beyond existing structures more than thirty feet, rustication shall transition from dimensions matching existing rustication to minimum dimensions shown in the RIDs. Developer shall include transition details in the aesthetic plans.

All exposed surfaces of built structures shall be rusticated as specified herein. Built structures include, bridge barriers, barriers on approach slabs, bridge abutments, bridge wing and cheek walls, bridge piers, noise barriers, retaining walls, and sign foundations exposed more than three feet in height.

Built structures do not include lined drainage channels, drainage head walls, roadside barriers, median barriers, or sign foundations exposed 3 feet or less.

Developer shall be responsible for developing Design Documents that incorporate and show the structure aesthetic treatments. Developer shall submit the drawings and specifications to ADOT for approval prior to fabricating any form liners as required in Section 800.03.01.05 of the TPs. The drawings and specifications shall include:

- A. Dimensions, shape, orientation, textures, and colors of aesthetic treatments including recessed and built up (inward/outward) features of each treatment type and location. The drawings and details provided by Developer shall specify the inward/outward distance of each aesthetic element, which is an important part of the aesthetics effect;
- B. An elevation of the expected visible portions of the features for all structures receiving aesthetic treatments. The elevation shall demonstrate the placement of the treatment above the ground line, the top/bottom and outline of background wall, and the locations of construction and/or expansion joints within ten feet of the treatments.
- C. Common construction materials, patterns, and textures and demonstrate a coordinated visual appearance and construction technique regardless of their location within the Project area.

Pedestrian bridge aesthetic design shall be designed in accordance with the standards and guidelines of the maintaining agency, as approved by ADOT. See Section 100.05.03 of the TPs for additional requirements.

Refer to Section 600 of the TPs and Sections 601-3.02 (C) and 610-1 through 610-3.06 of the ADOT Standard Specifications for additional criteria related to structure aesthetics.

800.03.01.01 Bridges

Developer is not required to provide rustication on bridge barriers separated by two feet or less from an adjacent bridge barrier when bridges are adjacent to each other. Bridge barrier rustication shall extend to the end/beginning of the bridge approach slabs. Rustication and paint shall be on the non-traffic side of the barrier only. Developer shall rusticate piers adjacent to or within the view of vehicular traffic.

Aesthetic treatments placed on bridge fencing shall be limited to aesthetic concepts shown for the Broadway Underpass Bridge. Aesthetic treatments on bridge fencing is not required at Guadalupe Road Underpass.

800.03.01.02 Noise Barriers and Walls

All new noise barrier, noise barrier extensions (horizontal and vertical) and new retaining walls throughout the Project shall receive rustication patterns and paint on all exposed surfaces.

Vertical steps between noise barriers on bridges and the adjacent noise barrier on anchor slab or approach slab are not allowed.

800.03.01.03 Crossroad Medians

New crossroad medians between the on- and off-ramp intersections and under bridges shall be hardscaped with pavers. Developer may use stamped concrete in lieu of pavers. Stamped concrete shall have a pattern, finish, and color that matches the paver pattern. Existing crossroad median pavers impacted by the Work shall be repaired, reconstructed, replaced, or modified to accommodate the impacts. Crossroad medians with less than two feet between face of curbs shall be capped with concrete.

800.03.01.04 Accessory Structures

Accessory structures shall use materials and colors that match the Character Area in which they occur.

800.03.01.05 Design of Formliners

As part of the Preliminary Design Submittal, Developer shall provide photographic evidence that the selected formliner fabrication method will produce the desired finished appearance and is suitable for the intended purpose of this Project. Photographs from a minimum of three previous projects shall be included. After the Preliminary Design Submittal and comments for a specific formliner are resolved, Developer shall develop a sample of the formliner for approval. The formliner developed for review shall be full scale as detailed in the plans and specifications.

As part of this process, Developer is responsible for the transportation and associated costs for two ADOT representatives to visit the formliner manufacturer's facility once during the production of the master molds and formliners. During the visit, the ADOT representatives will be given the opportunity to make decisions on the acceptability of the quality and character of aesthetic features produced from the fabrication molds. Developer shall make modifications as directed by ADOT. Developer may propose to satisfy the requirements of this section by providing photographs, videos, or alternative fabrication

methods of the work products. Such methods shall provide sufficient detail to physically represent the final appearance of the aesthetics. The approval of these alternative methods for formliner approval are at the sole discretion of ADOT.

The visit to the formliner manufacturer's facility shall be identified in the Project Baseline Schedule.

800.03.01.06 Formliner Fabrication

All materials used in the creation of the formliners shall be free from defects affecting the accuracy of shape, strength, rigidity, relief, and texture of the aesthetics treatments.

Prior to fabrication, Developer shall submit shop drawings for all formliner work for approval by ADOT. The shop drawings shall show the location of construction joints, use of special forming materials if required, type and location of form ties, layout, and repetition of custom formliners, location of background materials, patterns and seams, methods of sealing forms at formliner joints, and pour rates and form work pressures. All seams and cuts shall be located as noted on the approved shop drawings. Developer shall not create seams or cut through any pattern face unless approved by ADOT.

ADOT will review the shop drawings for conformance with the approved Plans.

800.03.02 Landscape Design

Goals and objectives for landscape design are to achieve a context sensitive, integrated, and cohesive visual experience throughout the Project and shall include an evident sense of uniformity and continuity in pattern, material, size, color, and intensity throughout.

Developer shall be responsible for placing nursery grown or salvaged plant material to meet the minimums identified in Table 800-3.

Table 800-3 Minimum Plant Material					
Limits	Character Area	15-Gallon Trees	5-Gallon Trees (Basins only)	5-Gallon Shrubs	5-Gallon Accents
West project limits to Sta 8062+00	CA1	180	13	390	130
Sta 8062+00 to Sta 8112+00 limits	CA1	480	37	987	329
Sta 8112+00 to Baseline Road	CA2	326	48	677	226
Baseline Road to South Project Limits	CA2	0	0	0	0
South of Baseline	All attempts shall be made to protect existing plants in place. Plants removed or damaged by Developer shall be replaced by a plant species selected from the Character Area 2 plant list and at size of a similar size as the plant removed or replaced.				

Landscapable Areas, minimum plant requirements, and protect in place areas shall conform to exhibits contained in the Landscape and Irrigation Concepts and Details included in the RIDs. The Final Design may result in areas with restrictions to planting locations within the Project ROW. Developer shall protect in place the existing landscaping within the planter boxes along the north and south side of Southern Avenue. Existing landscaping impacted by the Work shall be replaced in kind.

Landscapable Areas and protect in place areas shall be identified in the Landscape Plans. Below are features that shall be accommodated in the delineation of Landscapable Areas and protect in place areas:

- A. Grading disturbance include areas of planned and actual construction impacts;
- B. Roadway clear zones and visibility criteria;
- C. Designated maintenance access and paths;
- D. Protect in place areas;
- E. Existing and proposed Utility easement setbacks;
- F. Utility-specific planting lists and guidelines;
- G. The area behind the new noise barrier along the west side of I-10 south of Guadalupe is excluded from the Landscapable Area;
- H. Setbacks for pull boxes, light poles, sign foundations, and impact devices; and
- I. Other existing elements designated to remain.

The following conditions can be excluded from the Landscapable Area considerations:

- A. Restricted slope locations (e.g., top 2/3 of a 2:1 slope);
- B. Exposed bedrock or rock cut areas;
- C. Areas necessary to maintain drainage function of channels, basins, and low flow channels (e.g., plant only the top 1/3 of slopes inside drainage features);
- D. Riprap, lined channels, or other large diameter surface treatments (e.g., other stabilized outfalls);
- E. Areas behind MSE retaining walls (distance equal to tieback length).

Landscape design shall also comply with the following objectives:

- A. Provide for ease and efficiency of landscape maintenance;
- B. Comply with sight visibility criteria to minimize trimming operations;
- C. Avoid the creation of "hidden" areas for transient habitation;

- D. Maintain maintenance access areas free of vegetation;
- E. Keep vegetation away from pull boxes, light poles, sign foundations, and impact devices;
- F. Vegetation shall not obscure signage;
- G. Maintain the drainage function of channels, basins, and low flow structures including by not planting on the bottom 2/3 of these drainage structures slopes;
- H. Planting the bottom of drainage basins (1 acre or larger) with a wash seeding mix;
- I. Ensure sustainability of the landscaping by selecting lower maintenance plant species, limiting use of higher maintenance species, and proper spacing and densities of plant material;
- J. Ensure that views of private business developments, signs, and advertisements along the freeway are not obstructed by in landscape layout and species selections;
- K. Ensure compatibility with existing elements designated to remain;
- L. Address maintenance access for permanent roadway features; and
- M. Identify portions of the Project that are to remain in place through Final Acceptance.

800.03.02.01 Plant Materials

Trees shall be used in mass plantings and groups, where possible, to provide vertical structure and relief, vegetative texture accent, and seasonal interest while breaking up the monotony of the horizontal plane.

Shrubs shall be used to provide a year-round layer of texture and color that shall serve to articulate the ground plane and provide intermediate vertical relief. Within the limits of the Project ROW and subject to plant spacing requirements, mass plantings of shrubs shall further delineate naturalistic or geometric forms.

Accents and large salvaged trees shall be used to highlight ramps, cross street intersections, pedestrian bridges, and highly visible areas for the Project and provide contrasting textures, colors, and feature desert adapted plantings.

Developer shall provide a design to fulfill the following objectives:

- A. Trees shall be planted to screen undesirable views and enhance positive views;
- B. Deciduous and evergreen trees and shrubs shall be utilized for year-round color and form;
- C. Shrubs shall be planted in masses of like variety;
- D. Flowering shrubs shall be used whenever possible; and
- E. Utilize prickly pear species in the vicinity of the Western Canal pedestrian bridge and the Alameda pedestrian bridge to compliment the City of Tempe artist components. They shall be

located in areas visible to mainline traffic, along both sides of the freeway, and within 500 feet in either direction of the bridges.

All trees and plant material with the potential to reach a 4-inch diameter trunk shall be located in accordance with the ADOT Clear Zone Requirements as approved by ADOT.

Salvaged trees and saguaro, barrel cacti and ocotillos shall be in accordance with the Plant Inventory Plans. All of the plants shown on the approved Plant Inventory Plans as salvageable shall be salvaged and incorporated into the Landscape Plans.

Developer shall furnish a preliminary Plant Availability List of all the plant species and quantities needed for this Project at the same time as the Final planting Plans. The list shall include the species name, size, and estimated quantity of the proposed plant material. The list shall also include the anticipated nursery source(s) for the planting stock.

800.03.03 Landscape Plating Materials

All areas within the Project ROW shall be plated with inert materials (decomposed granite, granite mulch, and rock mulch).

Landscape plating materials shall match the color and size of the existing landscape plating materials unless otherwise approved by ADOT. Granite mulch, rock mulch, decomposed granite, and riprap shall all match color within their respective character area.

All landscape plating materials and rock mulch used for erosion/sediment control shall be fractured/crushed rock that is angular in shape.

800.03.03.01 Granite Mulch

All granite mulch shall be placed in accordance with Section 803-3.02 of the ADOT Standard Specifications and Section 800.03.03 of the TPs.

All ADOT maintained areas shall receive granite mulch, at the minimum depth of 2 inches.

800.03.03.02 Rock Mulch

Rock mulch areas shall consist of and be placed in drainage swales, around drainage catch basin aprons, behind sloped retaining walls, behind box culvert headwalls, wingwalls and pipe end sections, on slopes greater than 6:1 of earthen dams in accordance with Section 803-3.03 of the ADOT Standard Specifications and Sections 800.02.07 and 800.03.03 of the TPs. Developer shall prepare all Plans and details for these installations and provide them for review with the Landscaping Submittals. Rock mulch shall be placed at a minimum depth of 8 inches for drainage/erosion control applications and 4 inches for earthen dams.

800.03.03.03 Decomposed Granite

Decomposed granite shall be placed in the Project ROW maintained by the Cities of Phoenix, Chandler, and Tempe, and in accordance with Section 803-2.02 of the ADOT Standard Specifications and Section 800.03.03 of the TPs.

Landscaped areas of city crossroads shall receive 3/4-inch screened decomposed granite at a minimum depth of 2 inches. Decomposed granite colors shall be as required by the City in which the decomposed

granite is placed and shall match existing decomposed granite material colors if the affected City does not designate a color.

800.03.03.04 Rip Rap

All rip rap for erosion control shall match the approved color of the adjacent granite mulch, rock mulch and decomposed granite. Rip rap for erosion control shall comply with gradation requirements of Section 810-2.03 of the ADOT Standard Specifications. Rip rap for erosion control shall comply with installation requirements of sections 913-3.03 through 913-3.07 of the ADOT Standard Specifications. Rip rap and rock mulch for drainage shall comply with Section 500 of the TPs.

800.03.03.05 Seeding

Wash seeding shall be required for the bottoms of all drainage basins and drainage channels not treated with decomposed granite, granite mulch, or rock mulch.

800.03.04 Water Distribution

The irrigation design shall distribute irrigation water to all existing protected in place plants, salvaged and replanted plants, and new nursery stock plants installed throughout the Project Limits. Developer shall install new and/or replace existing ADOT irrigation controllers. Developer shall also replace all backflow preventers, master valves/flow meters, filters, associated cabinets, and controller enclosures at each point of connection that is utilized.

Developer shall design new ADOT irrigation systems throughout the Project Limits. Existing ADOT irrigation systems shall be removed including foundations and enclosures.

Developer shall reduce the quantity of points-of-connections where possible, bring the corridor up to current design standards and guidelines, and provide irrigation coverage throughout the Project Limits. Developer shall provide a final irrigation system zoning plan for review and comment by ADOT prior to the design of any specific irrigation zone.

Developer shall perform an irrigation system walkthrough of the Project with IQF to inventory the existing irrigation systems and document the existing conditions of these systems in accordance with Section 105.15 of the TPs.

Developer shall design Utility service connections for irrigation improvements in accordance with Section 107.15.05.05 of the TPs. The area behind the new noise barrier along the west side of I-10 south of Guadalupe is excluded from the ADOT irrigation system needs.

800.03.04.01 Irrigation Water Use and Conservation Plan

Developer shall not exceed the existing corridor baseline water usage of 0.54 ac-ft/acre/year during both construction activities and permanent installations. Developer shall be responsible for the cost of any water usage above the identified existing corridor baseline water usage rate in accordance with Section 2.2.2.2(c) of the Agreement.

Developer shall prepare an Irrigation Water Use and Conservation Plan based on the Landscape Plans. The Irrigation Water Use and Conservation Plan shall include the following:

- A. Cover page;

- B. Table of contents;
- C. Discussion, including the following:
 - 1. Detailed methodology proposed to determine how much irrigation water will be applied during the Work;
 - 2. Description of how the irrigation schedule will be developed and how water use will be monitored;
 - 3. Description of how mature protect-in-place plant material shall be watered between NTP 2 and Substantial Completion; and
 - 4. Plan for recording water meter use at regular monthly intervals and delivering the results to IQF for review.
- D. Proposed controller programming schedule;
- E. Description of planting design theory describing how the majority of plants to be used will be the lowest water users and where and how the higher water using plants will be located; and
- F. Appendices, including the following, at a minimum:
 - 1. Baseline water usage for existing plant material in protect in place areas that are watered between NTP 2 and Landscaping Establishment Phase; and
 - 2. Irrigation water use calculations by point of connection.

Developer shall submit the Irrigation Water Use and Conservation Plan with the Landscape Plans.

800.03.04.02 Irrigation Requirements

Developer shall design the irrigation system in accordance with the following criteria:

- A. Minimum design pressure 65 pounds per square inch;
- B. Maximum pipe water velocity five feet per second;
- C. Minimum 50 pounds per square inch operating pressure at individual remote-control valve locations;
- D. Minimum 86 percent distribution uniformity;
- E. Include flow monitoring and flow control;
- F. Include remote monitoring of controllers through a central control;
- G. Include the ability to operate the irrigation system with hand-held devices remotely;
- H. Include low-flow drip emitter systems for all planting;

- 1 I. Include ability to measure rainfall utilizing rain bucket technology;
- 2 J. Trees and shrubs shall be valved separately;
- 3 K. All control valves, mainlines, and pressure regulators shall be placed, whenever site conditions
4 allow, a minimum of:
- 5 1. Outside of the roadway clear zone when located behind curb and gutter, or
- 6 2. Eight feet behind all barriers when along freeway mainline and ramps, or
- 7 3. Five feet behind sidewalks along cross streets, or
- 8 4. Or as approved by ADOT;
- 9 L. Irrigation pipes and equipment shall comply with all applicable health code requirements;
- 10 M. Irrigation systems shall tap into existing or new City of Phoenix, City of Chandler, or City of
11 Tempe water supply;
- 12 N. All Irrigation controller electrical services shall be metered in accordance with ADOT and Utility
13 Company requirements;
- 14 O. Irrigation controllers shall be Motorola:
- 15 1. Include ICC PRO Package Software Upgrade;
- 16 2. Motorola control system shall have the ability to monitor current watering and weather
17 conditions; and
- 18 3. Irrigation control system shall have the ability to initiate, adjust, or cancel an irrigation
19 cycle based on actual real-time rain bucket technology readings;
- 20 P. Conduit connections at the bottom of new and existing controller cabinets for future ITS
21 connections as defined in Section 700.07.04 of the TPs;
- 22 Q. All existing irrigation controller equipment, back flow preventers, master valves, etc. that are
23 removed or replaced shall be returned to ADOT;
- 24 R. Irrigation control system locations, layout, and coverage requirements are shown the Landscape
25 and Irrigation Concepts and Details included in the RIDs.
- 26 S. Use appropriate water meter size and flow capacity as required to meet the Irrigation Zoning
27 Plan and Water Use requirements.
- 28 T. All new pipe sleeves shall be per ADOT Standard Detail C-16.40; and.
- 29 U. Comply with the applicable sections of the existing and/or approved Maintenance Exhibits
30 shown in the Intergovernmental Agreements.

800.03.04.03 City Right-of-Way Irrigation

Irrigation systems for landscape within the City of Phoenix, City of Chandler, or City of Tempe rights-of-way shall be independent from the freeway irrigation system. All irrigation system requirements for these locations are to be in accordance the applicable Local Jurisdiction's requirements.

800.03.05 Construction Drawings and Design Calculations

800.03.05.01 Construction Drawings

Developer shall prepare landscape, irrigation, and aesthetics Construction Drawings and details that include, at a minimum, the following:

- A. Face sheet;
- B. Standard sheets, if applicable;
- C. Design Plan Sheets;
- D. Summary sheets, including:
 - 1. Legends;
 - 2. Key Maps; and
 - 3. General notes;
- E. Landscape Plans and detail sheets;
- F. Landscape plating materials Plan and detail sheets;
- G. Irrigation Plans and detail sheets;
- H. Structure rustication layout and detail sheets; and
- I. SWPPP per Section 104.09 of the TPs.

800.04 Construction Requirements

800.04.01 Standards

Developer shall perform all Landscape Architectural Design, Aesthetics Design, and Erosion Control Construction Work in accordance with the standards, manuals, and guidelines listed in Table 800-4 which are shown in no order of precedence; however, in the event of a conflict, the more stringent requirement prevails.

Table 800-4 Construction Standards		
No.	Agency	Title
1	ADOT	Standard Specifications for Road and Bridge Construction, 2008

800.04.02 Structures Aesthetics

800.04.02.01 Aesthetics Mockups

Developer shall prepare full-size mockups with cement finish and paint colors of each Character Area's rusticated elements. These elements include:

- A. Full size mockups of each bridge barrier rustication pattern within the Project Limits. The mockup length for the bridge barrier rustication shall be a minimum of 10 feet long. The height shall be the actual height indicated on the plans;
- B. Full size mockups of accent rustication for the noise barriers and retaining walls for each material fabrication type used and for each Character Area. The minimum length shall be 20 feet, capturing the full accent rustication module along the wall. The height shall be the full height of the intended noise barriers and retaining walls. For elements with varying height, the height may be the average height of the element;
- C. Full size mockups of one bridge pier with rustication represented on all sides for each pier type and for each Character Area. The minimum height shall be ten feet exposed;
- D. Full size mockups of each rustication pattern for bridge wing walls, cheek walls, and abutment walls for each Character Area. At minimum, the mockup shall include a 1 foot by 3 foot mockup for each rustication pattern and shall contain the array of textures, features, and elements within that aesthetic treatment;
- E. Full size mockups of accent rustication for the lightweight noise barriers on the bridge for each Character Area. The minimum shall be 1 panel (both sides), or the minimum quantity of panels capturing the full accent rustication; and
- F. Any aesthetic treatments developed in the design phase that are not addressed in the Aesthetics Concepts and Details included in the RIDs shall also require full size mockups and contain the array of textures, features, and elements within that aesthetic treatment.

A minimum of 60 Days prior to construction of the items listed herein, Developer shall construct mockups for ADOT's review and approval. The mockups do not need to include the full cross section depth of the element on which it will be placed in the finished construction. Developer shall place mockups for each new rustication pattern within the Project Limits, oriented in a similar manner as the final constructed structures they represent, which shall remain in place for the duration of the construction of the structures associated with the aesthetics.

Developer shall ensure that the minimum cover is maintained over reinforcing steel. Cover is measured from the deepest point of the rustication to the outside of the nearest reinforcement bar. No twisted wire ties are permitted in areas with rustication. Changes to reinforcing or structural dimensions are not allowed.

Developer is responsible for the design and adequacy of the formwork and any falsework or shoring required for support of the formliners.

1 **800.04.02.02 Paint**

2 Developer shall submit the name of the paint manufacturer along with the manufacturer's specifications
3 for mixing and application to IQF for approval. Paint shall be pigmented water-repellent acrylic paint or
4 an equal that meets the requirements of Section 1002-2.04 of the ADOT Standard Specifications. Paint
5 colors shall be as specified on the structure Aesthetics Plans.

6 **800.04.02.02.01 Painting New Structures**

7 Developer shall paint the exposed structural surfaces of new structures as specified in Section 610-3.05
8 of the ADOT Standard Specifications and paint all light and sign foundations and above ground junction
9 structures located on the outside shoulder of the roadway where any portion is exposed by two feet or
10 more. Paint shall extend to two feet below finished grade to the top of foundations.

11 New structure rustication painting shall conform to the color requirements in the plans and to the following:

- 12 A. Concrete and masonry main structural surfaces: base color, flat finish
- 13 B. Standard metal elements (handrail, fencing, etc.): base color, semigloss finish
- 14 C. Rustication accents: regardless of material, accent color, gloss finish

15 Lined drainage channels, drainage head walls, drainage box culverts, roadside barriers, and median
16 barriers shall not be painted.

17 Developer shall paint the Alameda Drive and Western Canal pedestrian bridge structures including
18 pedestrian fencing. Paint color shall be per the City of Tempe art concepts per the direction of City of
19 Tempe and ADOT approval.

20 **800.04.02.02.02 Repainting Widened or Extended Existing Structures**

21 Developer shall repaint the identified limits of previously painted exposed surfaces in conformance with
22 locations and as shown in Table 800-5 and requirements herein. Existing and previously painted exposed
23 surfaces where new/revised, or extended surfaces are constructed shall be repainted with a single coat
24 of base paint color, for a minimum length up to 100 feet, extended to the next full construction joint of the
25 existing structure. The repainted section shall provide a transition from the paint on existing surfaces to
26 seamlessly match the newly painted surface. Developer shall apply additional paint as needed in the
27 transition area to match the newly painted surfaces.

Table 800-5 Existing Structures Repainting List	
Structure / Name	Re-Painting Surfaces
Guadalupe Road Underpass Structure No. 02725	ABUT, PIER, 1BAR, 1G
Priest Drive Overpass Structure No. 02351	ABUT, PIER, 1BAR, 1G
I-10 WB to US 60 EB Ramp Structure No. 02367	ABUT, 1BAR, 1G (or box)
Structure Type Key: ABUT = Abutments, Cheek, Retaining and Wing walls associated with bridges PIER = Piers, Pier caps 1 BAR = Non-traffic side or sides of Bridge barrier, Approach slab, or Roadway Barrier (minimum 30 feet beyond approach slabs if previously painted) 1G = First girder only on exterior face and bottoms of first girders and deck overhang exterior of the girder.	

Portions of the existing painted surfaces that will be covered or obscured by newly constructed Project elements may be exempt from the repainting requirements, subject to ADOT's approval. To obtain an exemption, Developer shall submit sufficient information to ADOT to enable ADOT to determine whether the existing painted surfaces will be covered or obscured.

Where Developer's design differs from the Schematic Design in a manner that results in preservation of structures not listed in Table 800-5, Developer shall inform ADOT, and ADOT shall review and determine whether repainting is required. Developer shall not be entitled to an increase in the Contract Price, adjustment of a Completion Deadline or any other Claim due to such repainting.

Developer shall prepare and submit a Repainting Plan for existing structures that are modified that details:

- A. Proposed plan for cleaning and preparing surfaces for repainting, including any repairs needed to provide a smooth, finished surface;
- B. Removing and replacing or otherwise protecting obstacles, landscape plating materials, and other existing non-painted elements from damage during Work; and
- C. Repainting the existing painted surfaces.

800.04.02.02.03 Paint Draw Downs

A minimum of 30 Days prior to painting mock ups, Developer shall submit paint draw downs to ADOT for review and comment. Paint draw downs shall be submitted on 8.5-inch by 11-inch sheets, and shall include initial samples of each color to be used. Developer shall provide up to five additional sample colors draw downs of alternate colors as directed by ADOT.

800.04.02.02.04 Paint Quality

All paint shall resist chipping, flaking, fading, staining, and chalking. All paint shall conform to the requirements of Section 1002-2.04 of the ADOT Standard Specifications.

Developer shall be responsible for allowing aesthetic elements sufficient time to cure after construction to avoid efflorescence through the paint. Developer shall be required to treat, prepare, and repaint all elements that show any sign of efflorescence, at no additional cost to ADOT until Substantial Completion.

800.04.03 Landscaping

The work under this section consists of furnishing and planting trees, shrubs, accent species, and groundcovers at the locations shown on Developer approved Project Plans. This section shall also include the salvaging, transporting, and replanting of all designated plant material (trees, shrubs, saguaro, ocotillo, and barrel cacti) in accordance with Section 806-3 of the ADOT Standard Specifications, these TPs, and the approved Plant Salvage Operations Plan.

The Work shall also include the machinery, equipment, labor, and materials to install the plant materials at the final planting locations, including excavating and backfilling; the preparation, modifications, and implementation of the Plant Inventory; Plant Salvage Operations Plan; Noxious Invasive and Species Control Plan; and Topsoil Report.

The Work shall also include mixing and applying chemical solutions, herbicides, fertilizers, and amendments; the maintenance of the salvaged plant material; warranty of workmanship; the storage and protection of all planted and unplanted salvaged plant material and other materials; bracing; guying; staking; and wrapping; cleanup of the Project and nursery(ies) areas, and disposal of unwanted and deleterious materials.

Not all existing landscape areas are to be cleared and grubbed. The Preliminary Plant Inventory Plans shall identify portions of the Project that are to remain in place throughout the Construction Work and Landscaping Establishment Phase.

800.04.03.01 General

Developer shall install plants in such a manner as to provide optimum growth and health of the plants. Developer shall plant all plants as specified in the Landscape Plans prior to Substantial Completion.

Developer shall repair, restore, or replace all existing landscape and aesthetic improvements that are damaged or disturbed to their existing condition prior to construction and in accordance with the approved Landscape Plans.

Developer shall maintain all existing landscaping and irrigation to remain in place in a manner as to provide optimum growth and health of the plants for the duration of the Work, including the Landscaping Establishment Phase.

Refer to the Landscaping Maintenance Requirements for existing and newly planted and irrigated areas in TP Attachment 105-1.

All nursery stock plant material shall comply with the applicable requirements and standards as listed in Section 800.01 of the TPs.

Developer shall review the Plant Availability List approved as part of Section 800.03.02 of the TPs and provide confirmation of continued plant availability and anticipated nursery source(s) a minimum of 60 Days prior to the start of landscaping activities.

If any of the plant materials on the Preliminary Plant Availability List are expected to be unavailable prior to the time specified in the schedule for planting, Developer shall notify ADOT a minimum of 60 Days prior to start of landscaping activities. Developer shall provide documentation from a minimum of 5 sources of unavailability and seek alternative means, including contract growing, for securing the required plant material as directed by ADOT. ADOT will provide Developer with comments on the proposed

alternatives and, following further discussion with Developer, determine the approach preferred for implementation (including substitution, change of species, or deletion and redistribution of planting percentages).

Approval of the Plant Availability List by ADOT does not relieve Developer of the responsibility for providing plantings that will pass the inspection required in Section 806 of the ADOT Standard Specifications. Prior to starting the irrigation trenching or plant pit excavation, Developer shall lay out the planting pits in accordance with the approved Developer Landscape Plans. Developer shall make adjustments to the layout as directed by IQF.

All plants scheduled to be salvaged shall be excavated, side boxed or bare rooted, and removed from their in-situ locations prior to initiation of clearing and grubbing or any other ground disturbing activities in the plant salvage locations.

No planting shall occur until a complete, fully functioning irrigation system for the location's irrigation zone (i.e. all components from a POC to the end caps) is installed, tested, and approved.

Salvaged trees and cacti shall be staked/braced in accordance with the approved Plant Salvage Operations Plan. Nursery stock shall be staked/braced in accordance with the approved planting details. Bracing materials shall not cause conditions that may be detrimental to the plants (i.e., bruising or scarring the cambium layer or skin, providing opportunities for fungus and bacteria at the contact areas, etc.).

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

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

800.04.03.02 Materials

Amend Section 806-2 of the ADOT Standard Specifications to add the following:

Amendments/fertilizers shall be as required by the Topsoil Report and the agronomic testing results and as follows:

- A. Packaged Materials. Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with all Laws, if applicable;
- B. Bulk Materials. Do not dump or store bulk materials within the Clear Zone (ADOT *Roadway Design Guidelines* Table 303.2A), near structures, utilities, walkways, and pavements, or on existing turf areas or plants;
- C. Provide measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing runoff; creation of airborne dust reaching adjacent properties, deposits into water conveyance systems, or onto walkways;
- D. Each delivery of bulk materials to be accompanied by appropriate certificates;

- 1 E. Soil Sulfur. Soil sulfur shall be 85-95 percent pure soil sulfur. Soil sulfur shall be granular,
2 biodegradable, and contain a minimum of 90 percent elemental sulfur, with a minimum of 99
3 percent passing through a No. 6 sieve and a maximum of 10 percent passing through a No. 40
4 sieve;
- 5 F. Iron Sulfate. Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent
6 sulfur;
- 7 G. Agricultural Gypsum. Minimum 90 percent calcium sulfate, finely ground with 90 percent passing
8 through a No. 50 sieve; and
- 9 H. Sand. Clean, washed, natural or manufactured, free of toxic materials, and in accordance with
10 ASTM C 33.

11 Amendments shall be inspected separately before adding to soil conditioner to ensure quality control.
12 Pre-packaging of amendments is prohibited.

13 Developer supplied trees, exclusive of those salvaged, shall be multi-trunk or single trunk trees as shown
14 in Developer's approved Landscape Design Plans. Multi-trunk formation shall consist of two to five trunks
15 originating from the soil line at the base of the tree.

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

17 **800.04.03.03 Prepared Soil**

18 Amend Section 806-2.05 of the ADOT Standard Specifications to add the following:

19 Developer shall utilize existing soil removed from the plant pit to produce the prepared soil. The prepared
20 soil shall consist of the following with soil conditioner(s) and amendments:

- 21 A. Ratio of soil conditioner to soil: 1 part soil conditioner: 3 parts excavated soil by volume; and
- 22 B. Amendments and fertilizers in the quantities and amounts as specified in the approved Topsoil
23 Report.

24 Large rocks that have a dimension greater than 2 inches in any direction shall not be buried in the plant
25 pit but may be incorporated as embankment on the site by Developer as approved by the IQF. Large soil
26 clumps shall not be used to support the plants or be permitted in the planting pit.

27 **800.04.03.04 Water**

28 Amend Section 806-2.07 of the ADOT Standard Specifications to add the following:

29 Water used during landscape construction to properly excavate salvaged plants, water plants in the
30 nursery, install plantings, maintain, and care for the plant material until Substantial Completion shall be
31 provided by Developer at no cost to the City of Phoenix, City of Tempe, and City of Chandler or ADOT.
32 If Developer elects to use water through the existing meters that provide water by the affected Local
33 Jurisdiction, Developer shall pay for the cost of the additional construction water used above the existing
34 corridor baseline water usage rate described in Section 800.03.04.01 of the TPs. ADOT must approve in
35 writing, and an acceptable agreement with the affected Local Jurisdiction must be executed, for
36 Developer to use water through existing meters.

Only potable water shall be used for the plants to remain in place, plant salvage operation, nursery watering, landscape and irrigation installations and maintenance work.

800.04.03.05 Hardware

Amend Section 806-2.10 of the ADOT Standard Specifications to add the following:

A. Hardware materials shall include the nursery fence, gates, security devices, fasteners, and posts; bracing and guying materials; shade screens, liners, and fabrics; and calibrated measuring materials and devices;

B. Shade screens in physical contact with cactus shall be made of burlap, hemp, or other breathable fiber material as approved by IQF; and

C. All water distribution materials shall comply with Section 808-2 of the ADOT Standard Specifications and the TPs, including the approved Plant Salvage Operations Plan.

800.04.03.06 Insecticide

Amend Section 806-2 of the ADOT Standard Specifications to add the following:

A. Insecticide shall be a commercially-prepared product suitable for the intended purpose and approved by ADOT; and

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

800.04.03.07 Excavation

Amend Section 806-3.02 of the ADOT Standard Specifications to add the following:

Prior to plant layout, all grasses and weeds shall be removed from the planting areas. The planting pit shall be excavated and inspected to ensure complete eradication of any roots or rhizomes that may have grown into the area.

Developer shall flag for IQF's approval all plant locations prior to the excavation of plant pits and installation. Flag colors shall be gray or white only. A minimum of 5 Days' notice is required for inspection of flagging, prior to trenching and planting. The flagging shall remain in the center of the planting pit until the plant is planted. All trees and plant material with the potential to reach a 4-inch diameter trunk shall be located in accordance with the requirements of Section 200 of the TPs.

All plant materials, including salvaged plants, shall be planted at their original growing depth. No root system shall be visible.

After the planting pits are excavated and the irrigation system has been installed, the planting pits shall be watered by the irrigation system for a minimum duration of 12 hours. Planting shall be accomplished during a 3-Day period starting 2 Days following the pre-wetting as specified. Areas not planted during the 3-Day period shall be re-watered and allowed to dry.

Work that is required to achieve proper drainage of the planting pits is the responsibility of Developer.

1 The excavation shall be accomplished in accordance with the Plant Salvage Operations Plan method
2 approved by ADOT. Developer shall demonstrate and removal of all salvage plant material that the
3 proposed excavation process will provide sufficient root lengths and locate and expose the roots without
4 damage of the stock from the equipment and machinery used for the excavating and transporting of the
5 plants.

6 Salvaged plants that are side boxed shall be left side-boxed for minimum of 3 weeks prior to bottoming
7 and moving to the nursery or as approved in the Plant Salvage Operations Plan. Watering of boxed plants
8 shall be done as determined by Developer based on seasonal considerations. While in the field-boxed
9 condition, Developer shall label the designated caliper and box size, I.D. number, side boxing, and bottom
10 boxing date for the tree on the north side of the box. These items shall correspond to the tag numbers
11 on the tree.

12 Salvage tree box sizes shall be determined by Developer in accordance with acceptable horticultural and
13 box size standards used in the current plant salvage trade industry practices. Developer shall choose
14 box sizes that will maximize the chances of survival.

15 **800.04.03.08 Planting**

16 Amend Section 806-3.04 of the ADOT Standard Specifications to add the following:

17 Clods or stones exceeding 2 inches in diameter and foreign matter deemed objectionable by IQF will not
18 be allowed in the plant pits. All excess soil excavated from the plant pits that has stones objectionable to
19 IQF shall be either wasted in the area immediately around the plant pit prior to covering with granite
20 mulch or disposed of in a manner acceptable to IQF.

21 Place prepared soil in lifts not exceeding more than half of the planting pit depth for material compacted
22 by compaction equipment, and not more 18 inches for material compacted by hand-operated tampers.
23 When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill.
24 Repeat watering until no more water is absorbed.

25 The cactus planting pits shall be backfilled with dry site soil only.

26 **800.04.03.08.01 Salvaged Planting**

27 Developer, with ADOT's approval, may be allowed to make use of a different plant that meets or exceeds
28 the specie, size and quality of the plants designated on the Plant Inventory and on the Salvage Plans to
29 be salvaged. This option, if approved by ADOT, does not eliminate Developer's obligation to salvage and
30 replant the required specie, quantity, size, and quality of plant material specified and shown on the
31 approved Plans and to manage the salvage inventory so that all plantings shown on the Landscape Plans
32 meet or exceed these specified requirements.

33 Developer has the option of maintaining the nursery(ies) beyond Substantial Completion for use during
34 the Landscaping Establishment Phase as approved by ADOT. If the nursery is within the Project Limits,
35 no exceptions for Work required to obtain Substantial Completion will be granted.

36 Developer may choose to locate the required nursery(ies) in areas that are not within the established
37 Project Limits. If Developer chooses any area outside of the Project Limits, Developer shall be
38 responsible to obtain all necessary and required clearances and permits.

800.04.03.09 Pruning and Staking

Amend Section 806-3.05 of the ADOT Standard Specifications to add the following:

- A. Developer-supplied plants shall be pruned in accordance with the current version of ANSI Z60.1; and
- B. All wounds and/or cuts made to cacti shall be treated with powdered sulfur or bactericide on the same Day that the cut and/or wound was made.

800.04.03.09.01 Staking, Bracing, and Wrapping

Saguaros seven feet in height and taller shall require bracing in the nursery and in their final location. The bracing shall sustain the salvaged plant material in its vertical position. Developer shall submit a materials list and shop drawings of the proposed bracing, herbivore protection, and/or supporting methods and include these items in the Plant Salvage Operations Plan. Bracing materials shall not cause conditions that may be detrimental to the plants (i.e., bruising or scarring the cambium layer or skin, providing opportunities for fungus and bacteria at the contact areas, etc.).

Salvaged trees shall be staked/braced as approved in the Plant Salvage Operations Plan.

Developer-supplied plants shall be staked in accordance with approved Landscape Design Details.

The bracing, staking, wrapping, herbivore protection and supporting materials shall remain in place through the Landscaping Establishment Phase. However, at the completion of the first six months of the Landscaping Establishment Phase, IQF will evaluate the condition of the planted stock for stability and root growth and provide a status report within 10 Days to Developer on the results of that evaluation and may allow some supports to be removed. Removal of all bracing, staking, and/or supporting materials at any time during the Work shall be at Developer's discretion. These materials shall become the property of Developer and shall be removed and disposed of off the Site. Removal of staking and/or bracing will not relieve Developer of its obligation to maintain the plant material in a vertical and upright position through the Landscaping Establishment Phase.

800.04.03.10 Care and Protection of Trees, Shrubs, and Plants

Amend Section 806-3.06 of the ADOT Standard Specifications to add the following:

Nursery-stored plants will be reviewed for overall condition including pruning and compliance with the Plant Salvage Operations Plan. During the reviews, Developer must present copies of a log that includes species identification number, box size, and dates side boxed, bottomed and delivered to the nursery. IQF may make notations as to any unacceptable plants, plants in shock or other pertinent information.

800.04.03.11 Seeding

Developer shall install seed such that the growth coverage success rate is 70 percent. Success is measured by a growth coverage area with bare spots no larger than 8 square inches and with barren areas not exceeding 25 percent of the total seeded area. Plants in the growth coverage areas shall be healthy. Seeding shall be in accordance with Section 805 of the TPs.

800.04.04 Landscape Plating Materials

Amend Section 803-3 of the ADOT Standard Specifications to add the following:

- A. Developer shall install landscape plating materials so that the installed materials resists erosion (rilling of the slope); and
- B. Developer shall prepare color samples of each landscape plating material proposed for each color and supplier proposed. The sample shall be spread to a 10 foot by 10 foot area to a minimum depth of 2 inches, to represent how the landscape plating material will look relative to the existing granite mulch in the I-10 Corridor. A minimum of 60 Days prior to the scheduled construction of the associated element, Developer shall submit color samples to ADOT for review and comment.

800.04.04.01 Decomposed Granite and Granite Mulch:

Decomposed granite and granite mulch shall meet the gradation shown in Table 800-6.

Table 800-6 Granite Mulch Gradation Requirements	
Passing Sieve	Percent
1¼ inch	100
¾ inch	60-80
½ inch	45-65
No. 40	5 -20

Within the City of Phoenix-, City of Tempe- and City of Chandler-maintained areas, the decomposed granite shall meet the gradations shown in Table 800-7:

Table 800-7 City Controlled Decomposed Granite Gradation Requirements	
Passing Sieve	Percent
¾ inch	100
½ inch	60-70
No. 40	5 -20

For each source of granite mulch and decomposed granite size and color provided, Developer shall provide a 5-gallon sample to IQF for approval. Developer will choose the source of granite to be used on the Project. For each source, Developer shall provide IQF with the following:

- A. Written acknowledgement from the granite mulch and decomposed granite supplier that the material can be provided in the quantities of granite mulch needed for the Project; and
- B. Written acknowledgement that granite mulch and decomposed granite material will be provided within the time frame necessary to be available for the Work.

800.04.04.02 Rock Mulch

Rock mulch used on the Project shall come from the same source and be the same color as the adjacent granite mulch and decomposed granite.

1 Rock mulch shall meet the gradation requirements of Gradation C in accordance with Section 810-2.03
2 of the ADOT Standard Specifications.

3 For each source of rock mulch size and color provided, Developer shall provide a 5-gallon sample for
4 review and approval by IQF with the following:

5 A. Written acknowledgement from the Rock Mulch supplier that the material can be provided in the
6 quantities of Rock Mulch materials needed for the Project; and

7 B. Written acknowledgement that Rock Mulch material will be provided within the time frame
8 necessary to be available for the Work.

9 The colors of landscape plating materials used on the Project shall come from a single source for each
10 existing plating material that must be matched.

11 Prior to placement of the landscape plating materials, areas to receive landscape plating materials shall
12 be graded and compacted and made completely free of all grass, weeds, or other miscellaneous
13 vegetation growth. Eradicate existing grasses and weeds with application(s) of an approved herbicide
14 and/or by mechanical methods.

15 After rough spreading and rough grading of the granite mulch and decomposed granite within the
16 designated areas, the granite mulch and decomposed granite shall be raked evenly and thoroughly to
17 blend the different gradation sizes. Granite mulch and decomposed granite shall be installed to a
18 minimum depth of 2 inches after compaction.

19 The use of conveyor belt type equipment for placing landscape plating materials shall not relieve
20 Developer from the requirements of obligation to compact the landscape plating materials.

21 When using herbicides, Developer shall comply with all applicable Laws, including laws and regulations
22 per the Pest Management Division of the Arizona Department of Agriculture. All dead vegetation (grass
23 and weeds) shall be removed and properly disposed. Water shall be applied to each application to
24 activate the herbicide.

25 Developer shall apply one application of an approved pre-emergent herbicide prior to placement of
26 landscape plating materials and one application after the final placement of the landscape plating
27 materials. Water shall be applied to each application to activate the herbicide as per the manufacturer's
28 recommendations.

29 **800.04.05 Water Distribution**

30 Developer shall install all new ADOT irrigation systems within the Project Limits, including the removal
31 and replacement of all emitters and distribution tubing to the plants that have been designated as remain
32 in place.

33 Amend Section 808-3 of the ADOT Standard Specifications to add the following:

34 The work under this section consists of furnishing and installing a full, complete, and functional irrigation
35 system, starting downstream of the water meter in accordance with the approved Landscape and
36 Irrigation Construction Drawings and these TPs.

1 The Watering Plan of the Plant Salvage Operations Plan shall contain Developer's proposal for supplying
2 water to the salvage nursery plants and remain in place plants. Truck watering of the remain in place
3 plants will not be allowed.

4 The work of this section also includes the identification and location of existing irrigation sleeves. Existing
5 sleeves under mainline I-10, SR 143 and US 60 shall not be used for the final irrigation system. Existing
6 irrigation sleeves under mainlines shall have irrigation equipment removed, extended, and
7 capped/plugged. These sleeve extensions and capping/plugging details must be approved through the
8 design submittals. Developer shall extend existing irrigation sleeve for future use in areas with widenings.
9 Developer shall record on plans the exact location in 3-dimensions (longitude, lateral and depth) in
10 addition to placing self-leveling ball or plate style electronic sleeve markers at both ends in alignment with
11 each sleeve and in accordance with the manufacturer requirements.

12 Developer shall install all new mainline, remote control valves, pressure regulators, control and common
13 wire, gate valves, submains, laterals, and provide all new irrigation system components for each Point of
14 Connection. This includes protect in place landscape areas.

15 Developer shall create an emitter schedule for all emitters.

16 Developer shall repair and restore municipal systems impacted by construction activities and make the
17 systems operational prior to Substantial Completion. Developer shall arrange a final walkthrough and
18 review with the governing municipality for approval prior to Substantial Completion.

19 Developer shall replace all existing ADOT Controllers, Flow Meter/Filter/Master Valve Assemblies, and
20 Controller equipment enclosures with new equipment as specified in Section 800.04.05.01 of the TPs.

21 The 24-volt control and common wire for operation of remote-control valves shall conform to the
22 requirements of Section 808-2.01 (F) of the ADOT Standard Specifications. All control ("hot") wire shall
23 be of a contrasting color to white common or ground wire. Black wire will not be acceptable for use on a
24 24-volt control circuit. Control wires to shrub valves shall be different color than those to tree valves. Wire
25 color shall be as approved by ADOT.

26 Remote control valves with hydraulic flows of less than 0.5 gallons per minute shall have the flow control
27 stem properly adjusted, all to the satisfaction and approval of the IQF.

28 Two spare wires sized to match the common wires for the controller and colored different than the control
29 and common wires shall be run from the controller to the furthest valve on each wire segment. Loop the
30 spare wires through each valve box on the segment coiling a 5 foot coil within each valve box.

31 All pressure regulators shall be tested at 60 Day intervals during the Construction Work and Landscaping
32 Establishment Phase. In addition, the regulators shall be tested prior to planting operations and prior to
33 Final Acceptance.

34 On ramps and crossroads, sleeves shall extend 12 inches minimum beyond the back of proposed curb
35 or sidewalk or 24 inches minimum beyond edge wall footing or barrier. Sleeves shall be per ADOT
36 Standard Detail C-16.40 or Developer prepared Irrigation Details.

37 No emitter laterals or piping shall be installed through or beneath plant pits. The minimum distance
38 between plant pit perimeter and piping shall be 18 inches. The maximum distance between the plant pit
39 and piping shall be governed by maximum emitter supply tubing lengths as specified on the Section
40 800.04.05.01.01 of the TPs.

- 1 A rectangular irrigation valve box shall be provided at each end of pipe sleeves where control wires cross
2 ramps and/or crossroads.
- 3 All trenches excavated for the systems shall be backfilled within 5 Days after testing the system from the
4 Day they are excavated. TCB shall be placed by excavated ditches located within 30 feet of the traveled
5 way unless behind roadway barriers.
- 6 Developer shall perform additional flushing of the irrigation system in addition to that specified to ensure
7 proper operation of system components.
- 8 Wire connections at remote control valves and at field splices shall be made with epoxy resin filled type
9 wire connectors installed as recommended by the manufacturer.
- 10 Control and common wire placed through pipe sleeves shall be encased in 2-inch (minimum) schedule
11 40 PVC electrical conduits for the full length of the sleeve and shall extend least one foot past the existing
12 sleeve to terminate in a pull box and continuous from pull box to pull box without wire splices outside of
13 the pull boxes. Electrical conduit shall be sized to ensure no more than a maximum of 60 percent of the
14 interior pipe sleeve diameter is utilized.
- 15 The No.10 bare copper grounding wire shall be used to connect grounding rods to the controller's
16 protective grounding circuit. The resistance of the ground to the controller shall exceed 10 ohms, as
17 measured with a ground rod test set, to meet controller manufacturer's warranty criteria. In sandy soils
18 that drain rapidly, or otherwise dry soils, Developer shall, if necessary, bury multiple grounding rods or
19 use a coil of No.10 bare copper wire.
- 20 Controller units shall be programmed to operate the valve groups, in terms of time and flow, as designated
21 by Developer's approved Irrigation Design prior to Substantial Completion.
- 22 Developer shall prepare and implement a 12-month irrigation schedule, based on seasonal changes, in
23 conformance with the approved Irrigation Water Use and Conservation Plan. Adjustments shall be made
24 as needed to the system within the year. IQF must approve the schedule prior to implementation. The
25 controllers shall be programmed based on quantity of water as determined by the approved irrigation
26 schedule. The monthly projected hours of irrigation as well as gallons to be delivered by valve group,
27 according to the 12-month irrigation schedule, shall be provided to ADOT within 30 Days prior to the start
28 of the Landscaping Establishment Phase.
- 29 A wiring schematic shall be placed in each controller cabinet. The schematic shall show all wire
30 connections, including the wire connections at the controllers and field splices in pull or junction boxes,
31 such as those not occurring in scheduled and planned valve boxes.
- 32 Support and thrust blocks shall be placed on undisturbed soil or soil that has been compacted as specified
33 in Section 203-5.03B(4) of the ADOT Standard Specifications.
- 34 Thrust blocks shall be implemented to protect irrigation pipes greater than 2 ½ inches in diameter.
- 35 Installation of PVC piping and fittings shall be in accordance with the published instructions and Section
36 808 of the ADOT Standard Specifications.
- 37 As part of the pressure testing for the new sections of the irrigation system, Developer shall isolate the
38 new sections from the existing sections prior to completion of pressure testing.

1 All pipe shall cure for 24 hours before being subjected to hydraulic pressure.

2 Before Substantial Completion, Developer shall contact the ADOT Phoenix Landscape Maintenance
 3 Group, Attn: John Zandler (602) 463-0398, for a final check to ensure that all units are communicating as
 4 designed. Developer shall field verify communication between all controllers, the ADOT Central Control
 5 and required maintenance field units and make all necessary modifications to the controllers, antenna,
 6 and other programs as necessary to establish communication. Developer shall work with ADOT Phoenix
 7 Landscape Maintenance Group in preparing an irrigation program to be used during the Landscaping
 8 Establishment Phase.

9 **800.04.05.01 Materials**

10 **800.04.05.01.01 Emitter**

11 Developer shall install emitters including the flexible vinyl distribution tube, polypropylene tube stake
 12 and appropriate polyethylene adapters required to connect emitter to supply tubing and emitter
 13 assembly to rigid PVC emitter lateral as detailed in the Landscape Plans.

14 The emitter shall be capable of continuous, clog free operation with 30-mesh (minimum) filtration and
 15 capable of being installed in any position and maintain its given flow characteristics. The emitter shall be
 16 nonadjustable, and the flow regime shall be maintained by flexible orifice silicone diaphragms.

17 The emitter shall function with a system pressure range of 15 PSI minimum to 30 PSI maximum. Emitter
 18 Manufacturing Requirements are as set forth in Table 800-8. The single or multi-outlet emitter shall be
 19 capable of delivering one of the following quantities from each of the outlets of the emitter regardless
 20 of the number of outlets open.

Table 800-8 Emitter Manufacturing Requirements		
G.P.H.	at	P.S.I.
0.60		20
0.71		25
0.80		30
or		
1.00		20
1.15		25
1.34		30
or		
1.50		20
1.80		25
2.00		30

21 The supply tubing for emitters shall be flexible polyethylene for pressure application, manufactured from
 22 100 percent Union Carbide G-Resin 7510 Natural 7 virgin resin with minimum 2 percent carbon black
 23 content and with the following physical characteristics shown in Table 800-9:

Table 800-9 Supply Tubing Characteristics	
I.D.	0.250 inches
O.D.	0.350 inches
Wall thickness	0.050 inches

- 1 The flexible distribution tube for use with multi-outlet emitter shall be a black vinyl blend suitable for use
2 as emitter outlet tubing with the following physical characteristics shown in Table 800-10:

Table 800-10 Emitter Tubing Characteristics	
I.D.	0.160 inches
O.D.	0.220 inches
Wall thickness	0.030 inches

3 **800.04.05.01.02 Pressure Regulator**

- 4 Developer shall install nonadjustable pre-set type pressure regulators. Each regulator shall have a flow
5 range from 0.33 GPM to 12 GPM with a regulated nominal outlet pressure of 25 PSI with an inlet
6 pressure range of 0 to 120 PSI.

- 7 The pressure regulators shall have 3/4-inch FPT inlet and 3/4-inch MHT outlet for installation with a 1/8-
8 inch MPT Schrader type pressure-check valve that shall be used in conjunction with the specified
9 pressure gauge/tire chuck to verify system performance.

10 **800.04.05.01.03 Backflow Preventer**

- 11 Developer shall install backflow preventers with lockable enclosures. The backflow preventer shall
12 conform to the requirements of Subsection 808-2.01(A)(3) of the ADOT Standard Specifications.

- 13 The copper pipe and fittings shall be as detailed and in accordance with the following:

- 14 A. The copper pipe shall be Type "K", conforming to the requirements of ASTM B-88 for backflow
15 prevention assemblies.

- 16 B. The copper or cast bronze fittings shall conform to the requirements of ANSI STD B 16.22 and
17 ANSI STD B 16.18.

- 18 All backflow prevention assembly conduit, reinforcing, anchor bolts and other embedded items shall be
19 in place and inspected by IQF prior to placing the concrete slab and enclosure.

- 20 The enclosure shall be the size recommended by the enclosure manufacturer for the model of backflow
21 preventer used and shall be a minimum of 10 inches wide, 24 inches high and 22 inches long and large
22 enough to accommodate the backflow preventer. Color shall be 'Desert Tan'. Developer shall use a
23 lock shield that protects the lock from vandalism.

- 24 Developer is responsible for obtaining all permits necessary for the backflow preventer installation and
25 the performance of all required testing and certification. The tester shall be State-certified to perform the
26 required tests.

Developer shall measure the incoming water pressure at each new backflow prevention assembly and report the results in writing to IQF prior to the installation and operation of the irrigation system.

800.04.05.01.04 Gate Valves

Gate valves shall be iron body, bronze mounted and shall conform to the requirements of Federal Specification WW-V-58 Class 1, Type 1, for Class 125.

The bronze components of the valve shall conform to the requirements of ASTM B 62 except for the stem which shall conform to ASTM B 371, Alloy 694. The valves having non-rising stem, bolted bonnet, resilient wedge configuration, square operating nut, threaded inlet and outlet and meet the requirements of AWWA-C509-80.

The gate valve body shall be epoxy coated conforming to AWWA C-550.

The valve boxes for mainline valves shall be a two-piece, adjustable box consisting of top and bottom sections. Box assemblies shall be manufactured of a rigid combination of polyolefin and fibrous inorganic component. The bottom section shall have an integral formed bell, 9 inches inside diameter and an inside height of 6 inches. The top section shall accommodate the lid as supplied by the manufacturer. Top and bottom sections shall be threaded to facilitate field adjustment as required.

800.04.05.01.05 Remote Control Valve

The plastic remote control valve shall be a normally closed, 24-volt A.C., 50/60-cycle, solenoid-actuated globe pattern, diaphragm-type valve capable of regulating water flow for the specified system operation. Valve pressure rating shall not be less than 200 pounds per square inch.

The valve body and bonnet shall be constructed of glass filled nylon with the handle, rings, and diaphragm hardware of Acetal. Diaphragm shall be constructed of nylon reinforced Nitrile rubber. "O" rings shall be Ethylene Propylene rubber. Valve stem shall be brass and all studs and flange nuts shall be stainless steel.

The valve shall be actuated by a low power, epoxy encapsulated 24-volt A.C., 50/60-cycle solenoid with an in-rush power requirement of 0.41 amperes (9.9 VA) and a holding current of 0.23 amperes (5.5 VA). Control water pressure for the solenoid actuator shall be delivered from the inlet of the valve to the actuator by means of an internal or external passage particular to the valve size.

Each valve shall be equipped with a manual on-off control and flow adjustment control. Manual operation of the valve shall be by manual internal or external bleed.

The ball valve shall be an in-line, full port, dual blocked, true union, PVC ball valve type shutoff with a minimum rating of 150 psi at 120°F. O-rings shall be manufactured of EPDM and factory tested. The seat shall be EPDM or PTFE and the connections shall be threaded. The ball valve shall be the same size as the remote-control valve.

The valve construction shall be such as to provide for all internal parts to be removable from the top of the valve without disturbing the valve installation.

The valve box, cover and necessary extensions shall be manufactured of molded, virgin plastic materials conforming to the physical characteristics in Table 800-11:

Table 800-11 ASTM Test		
Property	Method	Requirement
Tensile Strength	D-638	3400 p.s.i. (minimum)
Deflection Temperature at 66 p.s.i. Stress	D-648	170°F

The valve box shall be rectangular, measuring approximately 24-inch by 18-inch by 12-inch and supplied with stainless steel nuts and bolts for securing lids to the box. Valve box lids shall be imprinted "Irrigation Control Valve".

800.04.05.01.06 Flow Sensor

Developer shall install in-line, nonmagnetic, impeller (paddle wheel) type flow meters capable of transmitting an electronic pulse through conductors to the back indicator function of the field satellite for subsequent transmission to the central computer.

The flow meters shall conform to the following physical characteristics:

- A. Flow Range (Velocity) 0.3: 15 feet/sec.;
- B. Size: 1.5 inches;
- C. Body Cast: 85-5-5-5 Bronze;
- D. Connections: Female pipe thread;
- E. Sensor: Pulse generated by digital integrated solid-state rotation sensor housed in PVDF housing;
- F. Impeller: Glass reinforced nylon;
- G. Bearing Assembly: Pennlor (UHMWPE);
- H. Shaft: Tungsten Carbide;
- I. Rating: 400 PSI to 100 deg. F; and
- J. Performance: +/- 1 percent accuracy, +/- 0.7 percent linearity, +/- 0.7 percent repeatability.

Back-indicator cable from the flow sensor to the flow monitor shall be as recommended by the manufacture and approved by ADOT.

The flow monitor shall be a wall mountable, microprocessor-based unit with a 2-line, sixteen-character LCD display and shall be field calibrated to pipe size and flow rates by a front mounted keyboard. The monitor shall provide a programmable pulse output interface with the field satellite (automatic controller). The monitor shall store all calibrations, pulse outputs and flow totals in a nonvolatile memory circuit for up to 10 years without battery back-up, in the event of power failure.

1 The flow sensors shall be installed with a straight run of 10 pipe diameters (flow sensor size) upstream
2 of the meter and five pipe diameters downstream of the meter.

3 **800.04.05.01.07 Hose Bib**

4 Developer shall install a 3/4-inch bronze loose key hose bib at each flow meter/master valve assembly.

5 **800.04.05.01.08 Master Valve**

6 Developer shall install a master valve with an electrically actuated ball valve capable of effectively
7 stopping all water flow to the irrigation system, upon signal from the field satellite.

8 The master valves shall have the following physical characteristics:

- 9 A. Body: Brass; Ball and Stem:
10 B. 316 Stainless Steel;
11 C. Seat: Teflon;
12 D. Seal: Teflon;
13 E. Pipe Ends: Threaded;
14 F. Breakaway Torque: 300 inch-pounds; and
15 G. Pressure Rating: 1,000 WOG (water, oil, gas).

16 There shall be a manual override to permit operation in case of power failure and to act as a visual
17 position indicator.

18 The master valve actuator shall be factory equipped with additional contacts for transmitting valve
19 position indication to the field satellite by means of back-indicator wires from the actuator to the back-
20 indication terminals on the automatic controller. All actuators shall also provide visual position indication
21 at the actuator.

22 The electric actuator shall have the following physical characteristics in Table 800-12:

Table 800-12	
Electric Actuator Characteristics	
Voltage	115 VAC, 60 Hertz
Current	0.45 A.
Torque	600 inch-pounds
Duty Cycle Time	15 seconds, at 75 percent duty cycle
Operating Temp	-40°F to 150°F

23 The master valve shall serve as a shut-off safety valve when the pressure drops below a set pressure
24 sensed by a pressure transducer.

1 The field satellite shall receive flow information, interpret it, and actuate the master valve, closing down
2 flow to the system until such time as shutdown has been investigated, corrected and the master valve
3 manually reopened.

4 **800.04.05.01.09 Filter**

5 As a part of the backflow preventer assembly, Developer shall install filter units made of a welded
6 stainless steel tube fabricated in a wye configuration and containing a filter screen element. The minimum
7 pressure drop through the new and clean filter, under normal flow rates, shall be established between 5
8 to 7 psi.

9 The air/vacuum release valve shall be a simple body combination type air valve with 1-inch FIPT inlet
10 and shall function as an air and vacuum valve for discharging or admitting large amounts of air during
11 pipe filling and draining and as an air release valve for continuous venting of accumulated air.

12 The operating range of the valve shall be 0 - 150 psi.

13 **800.04.05.01.10 Pressure Transducer**

14 Developer shall install a pressure sensor of the pressure transducer type. The pressure sensor shall be
15 fully compatible with the satellite controller and be fully automatic and nonadjustable.

16 Each pressure sensor shall have the following physical characteristics:

17 A. Operating Range: 1-200 psi;

18 B. Body Stainless Steel;

19 C. Output: 4-20mA; and

20 D. Accuracy: +/- 0.25 percent.

21 The pressure sensor shall sense gauge pressure fluctuations in the system supply line and transmit the
22 information by back-indicator wires to the automatic controller, for subsequent transmission to the central
23 computer console.

24 **800.04.05.01.11 ADOT Controller Enclosure**

25 Developer shall install ADOT controller enclosures as described in the Landscape and Irrigation
26 Concepts and Details in the RIDs and the following:

27 A. The shade cloth shall be formulated to include the highest level of ultraviolet blocking additives
28 reasonably available in a shade cloth product. The shade factor shall be a minimum of 88-90
29 percent. The shade cloth material, along with related attachment materials must be approved by
30 IQF prior to installation.

31 B. Decorative concrete masonry units shall be 8-inch by 8-inch by 16-inch 'Sonoran Split Face' and
32 smooth block with a 2-inch by 8-inch by 16-inch masonry cap. The block shall be painted.

33 C. The wrought iron fence posts, vertical pickets, horizontal rails, top railing, shade screen rails,
34 fittings and gates shall be painted with a Three Paint Coating System in accordance with

Subsection 1002-2.01 and Section 610 of the ADOT Standard Specifications. The paint color shall be ADOT Standard 'Tan', exterior flat finish for concrete block and semi-gloss for wrought iron.

800.04.05.01.12 Tipping Bucket Rain Gauge

Developer shall install a tipping bucket rain gauge shall consist of the tipping action rain gauge, communication cable, mounting hardware and junction box as detailed in Table 800-13.

Table 800-13 Tipping Bucket Rain Gauge Characteristics	
Capacity	Unlimited
Resolution	0.01 inches
Accuracy	+/- 1% at 1 inch per hour
Output	4-20 mA
Average Switch Closure Time	135ms
Maximum Bounce Setting Time	0.75ms
Maximum Switch Rating	30 VDC @ 0.2A
Operating Temperature Range	32°F to 123.8°F
Tipping Standard	0.01 inch per tip

The tipping bucket rain gauge shall sense rainfall and interface with the field satellite (automatic controller) and be compatible with the irrigation control system.

The tipping bucket rain gauge shall be mounted to the Irrigation Station Enclosure in a vertical position.

800.04.05.02 Controllers

Developer shall install Motorola ACE or M irrigation controllers with ACE controllers sized to accommodate remote control valve station requirements with secondary surge protection, and remote/auxiliary capabilities, installed in a stainless-steel enclosure pedestal.

Each controller shall be capable of two-way communication with the ICC Pro Software, self-initiate communication to report alarms, system failures, and it shall upload or download program content and accumulation tables.

The Motorola ACE (AC) Controllers shall include an 800 Mhz radio suitable for narrow space configurations. If an ACE controller controls any M controller(s), then a second 400 Mhz radio shall be included to slave to the M unit(s).

The Motorola M (AC) Controllers shall include a 400 Mhz radio suitable for narrow space configurations and configured to slave to an ACE controller.

The controllers shall communicate via: Motorola 800 or 400 MHz radio or TCP/IP with the ICC PRO V5. (use current version as of Setting Date) Enterprise Application Software (EAS).

Developer shall be responsible for contacting the following representatives of Mottech (David Peters, at (469) 571-7212) and Inter-spec (Stephen Pittsinger, at (214) 325-1503) to coordinate the controller configurations and software upgrades for each location as determined by Developer's approved irrigation design Plans and completing the replacement and upgrade of the controllers and ICC PRO Software as

required and approved by ADOT. Developer shall also be responsible for coordination with ADOT IT personnel (Brian Quinn, (602) 712-6987) to assist with the software upgrades as required by Mottech to complete the ICC PRO upgrades on the ADOT network and required ADOT maintenance field units.

Developer shall be responsible for conducting the necessary testing to verify that all controller units and the new software is communicating to the ADOT central controller and required ADOT desktop/handheld/laptop field units. Developer shall verify in writing to IQF that all controller units are operational and communicating as required.

Each controller unit shall include a backup battery to provide real-time and program memory protection.

800.04.05.03 ICC PRO Package Software

Developer shall be responsible for the purchase, delivery, and set up of the irrigation system control software, technical support, and training to ADOT irrigation maintenance staff that includes:

- A. Complete ICC PRO V5 current version (available as of the Setting Date) Enterprise Application Software (EAS) Package;
- B. One year of telephone/remote technical support; and
- C. On-site complete server system set-up, conversion requirements, and training for the ICC PRO Package.

The server, static IP addresses and all ADOT network related services will be provided by ADOT and compatible with the ICC PRO V5 current version (available as of the Setting Date) EAS minimum specifications.

Developer shall provide:

- A. IS-ICCPRO-100: ICC PRO V5 current version (available as of the Setting Date) software up to 10,000 I/O's consisting of all onboarding and integration with the ADOT server and coordination with ADOT Information Technology Group staff;
 - 1. Conversion, onboarding, and integration of the controllers to ICC PRO V5 shall be limited to those within the Project Limits.
- B. IS-TRAINING: On-site and phone/video training for ADOT RDS Maintenance Irrigation Staff in the use and management of the ICC PRO V5 current version (available as of the Setting Date); and
- C. Coordination with ADOT Information Technology Group for installation of all new software and all conversion requirements a minimum of 60 Days prior to activation of the first controller.

800.04.06 Landscaping Establishment

Developer shall maintain all landscape materials and irrigation systems, including newly installed landscaping and irrigation and the areas identified to remain in place for 365 Days, starting from the Substantial Completion Date. The landscape shall be maintained in a weed and grass free condition at all times, including all unwanted plant growth, noxious plants, trash, debris, and litter in accordance to

the Noxious and Invasive Species Control Plan and the Landscape Maintenance Plan prepared in accordance with Section 105.15 of the TPs.

Developer shall provide regular seasonal tree, shrub and ground cover trimming for all plants. Any required fertilization and insect control necessary to maintain the health and vigor of the plant material, as determined by IQF shall be a part of Developer's responsibility.

Developer shall be required to remove and properly dispose of all debris resulting from the landscape and irrigation maintenance operations.

Developer shall replace all dead or sub-standard plant material on a monthly basis.

Landscaping Establishment submittals shall include the following:

A. Pruning, Staking, and Irrigation Operations Plan shall detail the work requirements, schedules, and operations as required in the Section 807-3 of the ADOT Standard Specifications and submitted for review and approval by ADOT;

B. Schedule of landscape maintenance operations and inspections during the Landscaping Establishment Phase to ADOT for approval; and

During the Landscaping Establishment Phase, Developer shall apply additional applications of an approved pre-emergent herbicide on all unpaved surfaces, including the remain in place areas, within the Project ROW. The first application shall be completed at the midpoint of the Landscaping Establishment Phase; the final application within 30 Days prior to completion of the Landscaping Establishment Phase. Watering in of the pre-emergent applications shall be completed in accordance with the manufacturer's recommendations for each application. Developer shall be responsible for supplying the water for pre-emergent application at no cost to ADOT or the City of Phoenix, City of Tempe, and City of Chandler; this water shall not be sourced through the installed irrigation system.

Developer shall be responsible to keep a log during the Landscaping Establishment Phase. The log shall contain a record of the time and date of field inspections, watering time durations and dates, fertilizer applications, repairs, replantings, and other operations conducted by Developer. Developer shall submit for IQF's approval the format for recording these activities prior to undertaking the work.

Traffic control required during the Landscaping Establishment Phase and all plant material replacements, as described above, shall be considered as included in the Contract Price. Developer shall provide a crash attenuator truck or other protection for Work within the clear zone.

800.04.06.01 Establishment Inspections

Developer will perform visual inspections in the presence of IQF once every 30 Days during the Landscaping Establishment Phase, unless ADOT and Developer agree to other arrangements in writing. Developer shall modify the maintenance practices and water delivery to the plants to maintain optimum growing conditions.

Developer is required to replace the unacceptable or dead stock plant materials with the same species, size, appearance, and quality as originally planted, as determined by IQF.

800.04.06.02 Materials

Developer shall be responsible for all materials, equipment, and labor necessary to deliver the water to the installed plants.

A pre-emergent herbicide shall be used to control weed and grass growth within the designated granite mulch areas. Weed and vegetation control in some areas determined by IQF may also be required using manual removal methods. Herbicide shall be determined based on season of application and weed growth that needs to be controlled. All applications and types of herbicides selected must be approved by ADOT prior to any applications.

800.04.06.03 Plant Survivability

All new plants shall have a survivability rate of 100 percent at the end of the Landscaping Establishment Phase. Plants that are salvaged and replanted shall have a survivability rate of 85 percent at the end of the Landscaping Establishment Phase. Plants that do not survive shall be replaced as shown on the approved RFC Plans.

800.05 Submittals

Table 800-14 reflects a nonexclusive list of Submittals identified in this Section and is not intended to be an exhaustive listing of Submittals. Developer shall determine and submit all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental Entities. At a minimum and unless otherwise specified in the Contract Documents, Developer shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs.

Table 800-14 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Preliminary Plant Inventory	4	0	1	Prior to NTP 2 and ground disturbing activities for existing ROW and after new parcels become available.	800.02.03
Final Plant Inventory	4	0	1	At the same time as the Final Landscape Plan Submittal.	800.02.03
Construction Drawings and Design Calculations	4	0	1	As Determined by Developer	800.03.05
Noxious and Invasive Species Control Plan	4	0	1	Prior to NTP 2	800.02.05
Preliminary Plant Salvage Operations Plan	4	0	1	At same time as Final Plant Inventory	800.02.06
Final Plant Salvage Operations Plan	4	0	1	At least 10 Days prior to beginning plant salvage operations	

Table 800-14 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Topsoil Report	4	0	1	60 days prior to planting	800.02.06
Erosion Control (SWPPP) Plans and Details	4	0	1	In accordance with AZPDES Permitting Requirements	800.02.07
Erosion Control and Pollution Prevention	4	0	1	In accordance with AZPDES Permitting Requirements	800.02.07
Irrigation Water Use and Conservation Plan	4	0	1	At same time as the first Initial Irrigation Design Submittal	800.03.04
Paint Draw Downs	4	5	1	As Determined by Developer	800.04.02.02.03
Aesthetics Mock-ups	4	1	1	After approval of Aesthetics Drawings and at least 60 Days prior to installation of related element.	800.04.02.01
Nursery Plant Availability List	4	0	1	As Determined by Developer	800.04.02
Landscape Maintenance Plan	4	0	1	Minimum 60 Days prior to start of NTP 2	<u>TP Attachment 105-1</u>
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

805 SEEDING

805.01 General Requirements

Developer shall perform all seeding Work in compliance with the requirements of Section 805 of the TPs.

The Work under this section shall consist of furnishing all materials, preparing the soil, applying seed, establishing, and maintaining the seeded areas, and installation of a final mulch cover.

The areas to be seeded must include the disturbed or unvegetated areas, as listed in the Landscape and Irrigation Concepts and Details document included in the RIDs, and outlined in the SWPPP to be proposed by Developer and approved by ADOT. Unless otherwise prohibited by environmental permit, seeding is required to stabilize unpaved, disturbed dry area within the Waters of the U.S. Seeding area below the Ordinary High-Water Mark (OHWM) shall exclude any definable low-flow channels.

Seeding may be included as part of the Project or used for erosion control as part of a Storm Water Pollution Prevention Plan (SWPPP).

1 In either case, seeding shall be accomplished in two stages.

2 Stage 1 Seeding: shall consist of tillage; furnishing and applying compost, chemical fertilizer, and sulfur;
3 furnishing and planting the contract-specified seed mix; and furnishing, applying, and affixing final mulch
4 cover.

5 Stage 2 Maintenance: starts once Stage 1 has been accepted by the IQF and continues through NOT as
6 defined in section 104.09.09.of the TPs.

7 **805.02 Materials**

8 **805.02.01 General Requirements**

9 Appropriate documentation, as specified below, shall be submitted to IQF a minimum of 30 Days before
10 the start of a scheduled seeding activity. No materials shall be delivered to the site until the documentation
11 has been approved by IQF.

12 Unless otherwise specified, Certificates of Compliance conforming to the requirements of Section 106.05
13 of the TPs shall be provided for all materials.

14 Developer shall also provide test from accredited laboratories for all materials, as specified herein. Should
15 Developer perform its own testing, such test results shall also be provided to IQF.

16 **805.02.02 Seed**

17 **805.02.02.01 General Requirements**

18 The species, variety, and strain of seed (designated elsewhere in this Section 805 of the TPs as “contract-
19 specified seed”) shall be as shown on the plans or as specified herein. The contract-specified seed shall
20 be obtained from seed suppliers through harvesting of wildland collections, or field grown seeds.

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

28 If the samples indicate species listed as noxious, restricted, or invasive, the lot will be rejected or
29 evaluated for use on the Project. The list of noxious, restricted or invasive species is located at the
30 following website: [http://www.azdot.gov/business/engineering-and-construction/roadway-
31 engineering/roadside-development](http://www.azdot.gov/business/engineering-and-construction/roadway-engineering/roadside-development)

32 Within 30 Days after NTP 2, Developer shall submit the name of the seeding subcontractor to be used,
33 along with written confirmation from seed suppliers and/or collectors, on their letterhead, that the
34 source(s) for the contract-specified seed has been secured. A minimum of three separate confirmation
35 letters from seed suppliers, providers, and/or collectors shall be provided to IQF for evaluation from
36 reliable sources. If any of the contract-specified seed is expected to be unavailable prior to the time
37 specified for seeding, Developer shall notify IQF at this same time.

The seed shall be delivered to the Project site unmixed in standard, sealed, undamaged containers for each seed species. Each container shall be labeled in accordance with the appropriate provisions of the Arizona Revised Statutes and the U.S. Department of Agriculture rules and regulations under the Federal Seed Act. Labels shall indicate the scientific genus, species, subspecies/varieties or strains of seed, the percentage of germination, purity, weed content, and testing information. Unless otherwise approved by ADOT, the date of analysis for Tetrazolium Test (TZ) shall not be more than 15 months prior to the delivery date from a seed provider/supplier. A Certificate of Analysis from an accredited seed-testing laboratory, and conforming to Section 106.05 of the TPs, shall accompany each container of seed.

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

In addition to Federal Seed Act Regulations, unless otherwise approved by ADOT, the contamination of seed lots from the following noxious / invasive plant species shown in Table 805-1 shall not be permitted.

Table 805-1 Noxious/ Invasive Weeds Watch List For the Contaminated Seed Lots	
SCIENTIFIC NAME	COMMON NAME
<i>Amaranthus retroflexus</i>	Redroot Amaranth / Redroot Pigweed / Red-Rooted Pigweed / Rough Pigweed
<i>Bassia scoparia</i> (syn. <i>Kochia scoparia</i>)	Kochia / Fireweed
<i>Bothriochloa bladhii</i> (syn. <i>Andropogon bladhii</i> / <i>Andropogon caucasicus</i> / <i>Andropogon intermedius</i> / <i>Bothriochloa caucasica</i> / <i>Bothriochloa intermedia</i>)	Caucasian Bluestem
<i>Bothriochloa ischaemum</i>	Yellow Bluestem
<i>Brassica tournefortii</i>	Sahara Mustard / Mediterranean Mustard / Prickly Turnip
<i>Bromus tectorum</i>	Cheatgrass / Downy Brome / Broncoglass / Downy Chess / Soft Chess / Drooping Brome
<i>Cynodon dactylon</i> (syn. <i>Capriola dactylon</i>)	Bermudagrass / Devilgrass
<i>Cenchrus spinifex</i> (syn. <i>Cenchrus incertus</i> / <i>Cenchrus pauciflorus</i> / <i>Cenchrus parviceps</i>)	Field Sandbur / Coastal Sandbur / Common Sandbur
<i>Chorispora tenella</i>	Crossflower / Purple Mustard / Blue Mustard / Musk Mustard / Beanpodded Mustard / Tenella Mustard
<i>Eragrostis lehmanniana</i>	Lehmann Lovegrass
<i>Euphorbia esula</i>	Leafy Spurge / Green Spurge / Wolf's Milk
<i>Euphorbia prostrata</i> (syn. <i>Chamaesyce prostrata</i> / <i>Euphorbia chamaesyce</i>)	Prostrate Spurge / Prostrate Sandmat / Ground Spurge / Blue Weed
<i>Onopordum acanthium</i>	Scotch Thistle / Cotton Thistle
<i>Pennisetum ciliare</i> (syn. <i>Cenchrus ciliaris</i>)	Buffelgrass / African Foxtail Grass
<i>Salsola kali</i> subsp. <i>tragus</i> (syn. <i>Salsola iberica</i>)	Russian Thistle / Tumbleweed
<i>Setaria faberi</i>	Japanese Bristlegrass / Giant Foxtail
<i>Setaria pumila</i> (syn. <i>Chaetochloa glauca</i> / <i>Chaetochloa lutescens</i> / <i>Panicum glaucum</i> / <i>Setaria glauca</i>)	Yellow Foxtail / Pigeon Grass / Yellow Bristlegrass

Table 805-1 Noxious/ Invasive Weeds Watch List For the Contaminated Seed Lots	
<i>Setaria viridis</i>	Green Bristlegrass / Pigeon Grass / Wild Millet / Green Foxtail
<i>Solanum physalifolium</i> (syn. <i>Solanum physalifolium</i> / <i>Solanum sarachoides</i> / <i>Solanum villosum</i>)	Hoe Nightshade / Argentine Nightshade / Green Nightshade / Hairy Nightshade

Developer shall submit all seed tag labels and Certificates of Analysis from all seed to be used on the Project to IQF for review.

Both Developer and the seed supplier shall store seed under dry conditions, at temperatures between 35°F and 120°F, and out of direct sunlight. Prior to using the seed, Developer as well as seed supplier shall both provide a certification letter to IQF verifying that the seed was stored as specified herein.

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

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

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

Seed mix species and the PLS rates are shown in Table 805-2 below.

Seed mix shall be applied to revegetation areas beyond the traffic clear zone/recovery areas as well as all unpaved disturbed soil areas as shown in the revegetation/seeding layout plans. Seed mix shall not be placed within the traffic clear zone/recovery area as defined in ADOT *Roadway Design Guidelines* (303.2 to 303.3 Roadside Recovery Area). Seed mix shall not be used within ten feet behind guardrails/barrier walls, or within 20 feet of the inlets and outlets of drainage facilities. Seed mix shall not be applied to the dry flow paths of the inlets and outlets of drainage facilities or maintenance access paths as required in Section 200.03.02.09 of the TPs.

Table 805-2 Seed Mix		
Botanical Name	Common Name	PLS Rate (Pounds Per Acre)
<i>Abronia villosa</i>	Sand Verbena	1
<i>Acacia greggii</i>	Catclaw Acacia	0.5
<i>Aristida purpurea</i>	Purple Threeawn	2
<i>Atriplex canescens</i>	Fourwing Saltbush	0.25
<i>Atriplex lentiformis</i>	Quail Bush	0.25
<i>Atriplex polycarpa</i>	Desert Saltbush	0.25
<i>Baileya multiradiata</i>	Desert Marigold	1.5

Table 805-2 Seed Mix		
Botanical Name	Common Name	PLS Rate (Pounds Per Acre)
<i>Bouteloua aristidoides</i>	Needle Grama	2
<i>Calliandra eriophylla</i>	Fairy Duster	1.5
<i>Cercidium floridum</i>	Blue Palo Verde	0.5
<i>Chilopsis linearis</i>	Desert Willow	0.5
<i>Celtis pallida</i>	Desert Hackberry	0.25
<i>Distichlis stricta</i>	Desert Saltgrass	1
<i>Dyssodia pentachaeta</i>	Golden Dyssodia	1.5
<i>Encelia farinosa</i>	Inciense Brittlebush	1
<i>Encelia frutescens</i>	Button Brittlebush	0.25
<i>Eschscholtzia mexicana</i>	Mexican Poppy	2
<i>Hilaria berlandieri</i>	Curly Mesquite Grass	2
<i>Kallstroemia grandiflora</i>	Arizona Poppy	1
<i>Larrea tridentata</i>	Creosote Bush	0.5
<i>Lesquerella gordonii</i>	Gordon's Bladderpod	2
<i>Lupinus sparsiflorus</i>	Desert Lupine	2
<i>Lupinus succulentus</i>	Arroyo Lupine	5
<i>Lycium exsertum</i>	Arizona Desert Thorn	0.5
<i>Olneya tesota</i>	Desert Ironwood	3
<i>Plantago ovata</i>	Desert Indian Wheat	1.75
<i>Phacelia crenulata</i>	Arizona Desert Bluebell	0.5
<i>Prosopis pubescens</i>	Screwbean Mesquite	1
<i>Senna covesii</i>	Desert Senna	2.5
<i>Salvia columbariae</i>	Desert Chia	1.5
<i>Simmondsia chinensis</i>	Jojoba	5
<i>Sphaeralcea ambigua</i>	Desert Globemallow	1
<i>Sporobolus airoides</i>	Alkali Sacaton	1
<i>Sporobolus cryptandrus</i>	Sand Dropseed	0.75
<i>Verbena goodingii</i>	Desert Verbena	1

1 805.02.02.02 Seed Substitution

2 No substitution of the contract-specified seed will be allowed unless evidence is submitted documenting
3 that Developer has made a diligent effort to obtain the contract-specified seed from either seed suppliers
4 or collectors, and that the contract-specified seed will not become available prior to the time specified for
5 seeding in Developer's approved construction schedule.

6 Should a substitution of the contract-specified seed be requested, Developer shall request such Deviation
7 as outlined in Section 6.2.4 of the Agreement. The alternate seed will only be allowed when there is an
8 insufficient quantity of the contract-specified seed for the areas to be seeded as called for herein or as
9 required for erosion control. Developer shall obtain and apply the alternate seed, as required, to all such
10 remaining areas. Unless otherwise approved by ADOT, the approved alternate seed will only be allowed
11 until such time that contract-specified seed meeting the availability requirements specified herein can be
12 provided.

1 No seeding shall occur until approval of the seed sources and seed mix has been provided by ADOT.

2 **805.02.03 Tacking Agent**

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

7 Developer shall have the tacking agent swell volume tested by an approved testing laboratory using the
8 USP method. The standard swell volume shall be considered as 30 milliliters per gram. Material shall
9 have a swell volume of at least 24 milliliters per gram. Certified laboratory test results for homogenous
10 consistency shall be furnished to IQF for each shipment of tacking agent to be used on Project areas.
11 Tacking agent rates shall be adjusted to compensate for swell volume variation. Material tested with
12 lesser swell volume shall have the tacking agent rate increased by the same percentage of decrease in
13 swell volume from the standard 30 milliliters per gram. Material tested with greater volume may reduce
14 tacking agent rates by the same percentage of increase in swell volume from the standard 30 milliliters
15 per gram. Tacking agent shall be pure material without starches, bentonite, or other compounds that
16 would alter the swell volume test results of mucilage, or the effectiveness of the tacking.

17 **805.02.04 Thermally-Refined Wood Fiber**

18 Wood cellulose fiber mulch shall conform to the requirements of Section 805-2.03 of the ADOT Standard
19 Specifications, except as modified herein, and shall be from thermo-mechanically processed wood,
20 processed to contain no growth germination inhibiting factors. The mulch shall be from virgin wood
21 manufactured and processed so the fibers will remain in uniform suspension in water under agitation to
22 form homogenous slurry. Paper products will not be considered as virgin wood. The thermally-refined
23 wood fiber mulch shall have the properties shown in Table 805-3 below:

Table 805-3	
Thermally-Refined Wood Fiber Properties	
Virgin Wood Cellulose Fiber	90% min.
Recycled Cellulose Fiber	10% max.
Ash Content	0.8% +/- 0.3%
pH	4.5 +/-1.0
Water Holding Capacity	10:1 (water:fiber) min.

24 **805.02.05 Weed Free Straw Mulch**

25 **805.02.05.01 General Requirements**

26 Straw mulch including barley straw shall conform to the requirements of Section 805-2.03 of the ADOT
27 Standard Specifications, except as modified herein, and shall be from the current season's crop. A letter
28 of certification from the supplier shall be required stating that the straw was baled less than 12 months
29 from the delivery date. Additionally, a bill of sale for straw material shall be presented for IQF's evaluation
30 within context from reliable sources.

31 All straw, including hydraulically applied straw, shall be free from noxious weeds in compliance with the
32 standards and procedures of the North American Weed Management Association (NAWMA) or the
33 Arizona Crop Improvement Association (ACIA). Developer shall provide documentation, including a
34 transit certificate, and appropriate labels and/or marking twine, from the ACIA or NAWMA that straw
35 materials to be used for mulch are free of noxious weeds. The straw shall be accompanied by the

certification, labels and/or marking twine at the time of delivery to the Project site. Straw delivered to the Project without such information will be rejected, and promptly removed from the Project.

Rye straw and oat straw will not be acceptable.

805.02.05.02 Weed Free Straw Mulch for Hydraulic Application

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

Hydraulically applied straw mulch shall also contain 20 percent of wood fiber in dry weight. The combined dry weight percentage of paper, cotton, and wood fiber materials together shall be not less than 15 percent nor more than 30 percent of the hydraulically applied straw mulch.

The date of installation of hydraulically applied straw mulch cover shall be less than 12 months from the date of production. The date of production of hydraulically applied straw mulch material shall be presented for verification to IQF. All hydraulically applied straw mulch material shall also meet the requirements of Section 800.03.05 of the TPs.

805.02.06 Slow-release Chemical Fertilizer and Sulfur

Chemical fertilizer shall conform to the requirements of Section 805-2.06 of the ADOT Standard Specifications and shall be the kind hereafter specified. Fertilizer shall be composed of a mixture of one part sulfur-coated urea 25-4-8, one part monoammonium phosphate 11-5-20, and one part methylene urea 38-0-0. The sulfur-coated urea, a blended fertilizer 25-4-8, shall have approximately 80 percent of the nitrogen defined as slow release, and contain five percent Iron, ten percent sulfur and trace amounts of zinc and manganese. The result shall be a 24-18-2 chemical blended fertilizer, as specified herein.

In addition to the fertilizer mixture, agricultural sulfur compounds, comprised of between 80 percent and 96 percent sulfur, shall be applied at the rate specified in Section 805.03.02 of the TPs. Chemical fertilizer and sulfur shall not be applied for the seeding area below the OHWM.

805.02.07 Water

Water shall be free of oil, acid, salts, or other substances which are harmful to plants. All non-potable water shall be tested for its suitability for seeding/planting with the water related concerns of salinity, pathogens, and contaminants. The water quality results shall be provided for ADOT's evaluation and review. Reference *An Arizona Guide to Water Quality and Uses* (weblink <https://wrrc.arizona.edu/guide-water-quality-uses>). Figure 8, Water Quality and Uses Triangle shall be considered as reference for testing result evaluation and approval.

Water Quality Standards for seeding on construction projects that reach or exceed one contiguous acre permit threshold soil/ground disturbance defined under current Arizona Pollutant Discharge Elimination System (AZPDES) Construction General Permit (CGP) and/or National Pollutant Discharge Elimination System (NPDES) CGP.

On Arizona Non-Native Americans Land (Non-Tribal), water quality for seeding construction within 0.25-mile buffer zones of Impaired and/or Outstanding Arizona Waters (OAWs) shall meet the

standards of current AZPDES CGP, as well as requirements of the TPs. The web link for ADEQ's eMaps within the State of Arizona: <http://gisweb.azdeq.gov/arcgis/emaps/?topic=impaired>.

The source of water must be approved by ADOT prior to use.

805.02.08 Compost

Compost in bulk or furnished in containers or bags, shall consist of composted organic vegetative materials, and may contain worm castings. No animal manures or city biosolids shall be used in the composting or added to the compost. Prior to being furnished on the Project, compost samples shall be tested for the specified microbiological and nutrient conditions, including maturity and stability, by a testing laboratory approved for testing of organic materials. During pre-activity seeding construction meeting, compost test written results submitted to IQF for approval shall be within 9 months from the date of the official lab test.

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

Bulk Compost shall also meet the requirements of Table 805-4:

Table 805-4 Bulk Compost Requirements	
Cation Exchange Capacity (CEC)	Greater than 45 meq/100 g
Carbon:Nitrogen Ratio (C:N)	Less than 20:1
pH (of extract)	6.5 – 8.5
Organic Matter Content	Greater than 30%
Total Nitrogen (not added)	Greater than 1%
Micronutrients (added)	S, Ca, Mg, Na, Fe, Al, Mn, Cu, Zn, B
Maturity Index	Greater than 50% on Maturity Index at a 10:1 ratio
Stability Indicator, CO ₂ Evolution: Biologically Available C (BAC)	Less than 4mg CO ₂ -C/g OM/day is desirable. From 4 through 8mg CO ₂ -C/g OM/day is acceptable. Greater than 8mg CO ₂ -C/g OM/day is not acceptable.
The CEC lab testing method shall refer to EPA9081 at the web link: https://www.epa.gov/sites/production/files/2015-12/documents/9081.pdf	

Bulk compost is preferred and shall be applied to areas designated for seeding at the specified rate of 15 cubic yards per acre prior to final tillage for incorporation into the soil seedbed. Unless otherwise approved by IQF, bulk compost shall be engaged to all areas where equipment can be operated for final tillage in order to incorporate into the soil seedbed. Bulk compost may be substituted with hydraulically applied compost for small sized projects that cover less than five acres of Seeding as approved by ADOT.

The volume of bulk compost shall be measured and documented for verification and approval by IQF.

In areas where bulk compost cannot be applied by broadcast methods, compost shall be applied hydraulically as per the approval of IQF. Hydraulically applied compost shall be applied at the rate of 3,000 pounds per acre to mini-benched slopes or on other approved areas for incorporation into the soil seedbed. For seeding areas 3:1 and flatter where bulk compost cannot be employed, hydraulically applied compost shall be utilized at the rate of 3,000 pounds per acre as per the approval of IQF. Hydraulically applied compost may also be combined with soil amendments and fertilizer in the same slurry under the approval of IQF. Seed shall be employed separately after the implementation of hydraulically applied compost and prior to the final mulch cover.

The weight of hydraulically applied compost shall be measured and documented for verification and approval by IQF.

Hydraulically applied compost shall meet the requirements of Table 805-5 below:

Table 805-5 Hydraulically Applied Compost Requirements	
Cation Exchange Capacity (CEC)	Greater than 55 meq/100 g*
Carbon:Nitrogen Ratio (C:N)	Less than 20:1
PH (of extract)	6.5 – 8.5
Organic Matter Content	Greater than 35%
Total Nitrogen (not added)	Greater than 1%
Micronutrients (added)	S, Ca, Mg, Na, Fe, Al, Mn, Cu, Zn, B
Stability Indicator, CO ₂ Evolution: Biologically Available C (BAC)	Less than 4mg CO ₂ -C/g OM/day is desirable. From 4 through 8mg CO ₂ -C/g OM/day is acceptable. Greater than 8mg CO ₂ -C/g OM/day is <u>not</u> acceptable.
Moisture Content by Weight	From 25% through 35%
The CEC lab testing method shall refer to EPA9081 at the web link: https://www.epa.gov/sites/production/files/2015-12/documents/9081.pdf	
* When CEC is from 50 meq/100 g through 55 meq/100 g, in order to be approved, Developer may add 100 pounds additional Hydraulically Applied Compost per acre to compensate for the lower-than-standard CEC value.	

Compost shall not be applied for the seeding area below the OHWM. The choice between bulk compost and hydraulically applied compost shall be evaluated and reviewed by the Engineer of Record according to specific Project conditions with the approval of ADOT.

805.02.09 Soil Conditioners

Soil conditioners, when required, will be as shown in Section 800.04.03.03 of the TPs.

805.03 Construction Requirements

805.03.01 General Requirements

805.03.01.01 Seeding Operations

After acceptance of the form stated above, IQF and Developer shall determine a 0.5 acre sample demonstrative area to be seeded and mulched prior to applying seed to the remainder of the Project.

Both regular straw mulch and hydraulically applied straw mulch shall be applied to the sample demonstrative area, as determined during on-site pre-activity seeding construction meeting. Both straw mulches shall be representative of the materials proposed for use on the Project. If the seeding and mulching procedures, as well as outcomes are acceptable to IQF, Developer shall begin seeding operations as specified herein. Photographic Documentation of 0.5 acre sample demonstrative seeded/mulched area shall be recorded and submitted to IQF, as comparative standard representation (mandatory visual reference) for Seeding Acceptance as stated below.

Developer shall notify IQF at least two Days prior to commencing any phase of seeding operations for the remainder of the Project.

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

It is Developer's responsibility to furnish all suitable equipment for soil tillage, seeding, and mulching incidental to the work in this Section.

Unless specified otherwise in the TPs, seeding operations shall not be performed on undisturbed soil outside the clearing and grubbing limits of the Project or on steep rock cuts.

Developer shall coordinate the seeding operations with the grading operations to determine mobilization frequency as embankment and cut slopes are finished throughout the duration of the Project. Seeding shall be done during suitable weather and soil conditions (soil-water and soil-temperature regimes) for tillage and placement of materials. Seeding operations shall not be performed when wind exceeds ten miles per hour or, if in the opinion of IQF, conditions would prevent uniform application of materials or would carry seeding materials into areas not designated for seeding.

Developer shall not expose an area greater than 750,000 square feet (≤ 17.22 acre) at any one location within the Project Limits until the seeding proposed for that portion of the Project has been installed and accepted by IQF. Seeding shall be accomplished within 14 Days after slopes and disturbed areas have been completed. Seeding operations shall comply with Section 104.09 of the TPs and the applicable portions of Section 203 of the ADOT Standard Specifications, and as directed by IQF.

Frequent mobilizations may be required to accomplish seeding as specified herein. ADOT will consider the cost of such multiple mobilizations to be included in the price bid for the seeding. No adjustments will be made to the contract for the number of seeding mobilization activities. Should Developer fail to provide seeding for a sub-area as specified herein, IQF will immediately notify Developer of such noncompliance.

805.03.02 Tillage

Where equipment can operate, the area to be seeded shall be prepared with a ripper bar, chisel plow, or with other devices to provide thorough soil cultivation to the depth specified below. It is Developer's responsibility to furnish all suitable equipment for soil tillage incidental to this work item.

Where equipment is not suitable for operation, hand tillage and/or other manual methods shall be utilized as approved by IQF. Tillage depth shall follow the requirements specified herein in accordance with assessment/measurement as well as acceptance by ADOT.

For areas too steep to be prepared for seeding after the slope has been completed, as determined by IQF, tillage shall be accomplished with appropriate equipment as the slope is being constructed. On slope areas, all tillage shall be horizontal and parallel to the contours of the areas involved in order to create a

roughened surface condition. All seeded areas suitable for tillage shall be pre-tilled to promote on-site stormwater infiltration and alleviate stormwater surface runoffs, as a part of stormwater Volume Reduction Approaches (VRAs). All areas which are eroded shall be restored to the specified condition, grade, and slope as directed prior to seeding.

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

Except as specified herein, slopes shall be constructed in accordance with Section 203-3.03(B) of the ADOT Standard Specifications. Cut slopes flatter than 3:1 (horizontal to vertical) shall be tilled a minimum of 12 inches in depth, and fill slopes flatter than 3:1 shall be tilled to 6-inch minimum depth. All slopes steeper than 3:1, and areas which could potentially be affected by underground utilities, shall be tilled to a minimum 6 inches in depth, and left in a roughened surface condition as they are constructed.

Tillage shall be a minimum of 2 inches in depth for the first 10 feet from the toe of AC wedge or from the outside edge of curb and gutter.

Care shall be taken during the seeding operations to prevent damage to existing trees and shrubs in the seeding area in accordance with the requirements of Section 107.11 of the ADOT Standard Specifications.

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

All competitive vegetation shall be uprooted prior to seeding and the soil shall be left in a friable roughened surface condition free of clods or large stones over 4 inches in any dimension, and other foreign material that would interfere with the seeding operation. Exposed stones larger than 4 inches shall be removed and disposed of in an approved manner prior to grading and seeding. Invasive and non-native weed species shall be eradicated.

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

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

Unless otherwise approved by IQF, bulk compost shall be applied using broadcast methods to all areas where equipment can be operated. For areas where bulk compost cannot be applied by broadcast methods, as evaluated and determined by IQF, compost shall be applied hydraulically at the rate specified in Section 805.03.05 of the TPs. Hydraulically applied compost shall not be combined with seed and/or final mulch cover in the same slurry. However, sulfur and fertilizer may be utilized together with hydraulically applied compost in the same slurry with the approval of IQF.

Slopes 3:1 and flatter shall have fertilizer, sulfur, and compost tilled/disked into a minimum of the top 4 inches of the surface. Slopes steeper than 3:1 shall have fertilizer, sulfur, and compost uniformly broadcast for incorporation into the soil as directed by IQF. Unless otherwise operated together with hydraulically applied compost for the approved locations, fertilizer and sulfur shall not be applied hydraulically to areas for seeding.

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

3 Seeding shall not initiate until all tillage areas and/or mini-benched slopes are accomplished as approved
4 by IQF.

5 **805.03.03 Seeding**

6 **805.03.03.01 General Requirements**

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

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

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

14 Final straw mulch cover or hydraulically applied straw mulch cover shall be applied on all seeded areas,
15 as specified below, within 24 hours of seed application. Seeding application shall be accomplished prior
16 to installation of straw mulch cover or hydraulically applied straw mulch cover. Combining the seed
17 application process with the mulching process will not be acceptable. By implementing Low Impact
18 Development (LID) source-control measure, Developer shall install final straw mulch cover or
19 hydraulically applied final straw mulch cover to minimize raindrop splash erosion and wind erosion/dust,
20 as close as possible at the source of disturbance to protect all seeded areas. Thermally-refined wood
21 fiber shall not be utilized solely as final mulch cover to protect all seeded areas.

22 Unless otherwise specified in the TPs, seeding areas shall not be watered after planting.

23 **805.03.03.02 Drill Method**

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

28 Seed shall be planted approximately 1/4-inch deep, with a maximum depth of 1/2-inch. The distance
29 between the furrows produced using the drill process shall not be more than 8 inches. If the furrow
30 openers on the drill exceed 8 inches, the area shall be drilled twice. Seeding shall be done with grass
31 seeding equipment with double disc openers, depth bands, packer wheels or drag chains, rate control
32 attachments, seed boxes with agitators and separate boxes for small seed. Seed of different sizes shall
33 be sowed from at least two separate boxes adjusted or set to provide the planting rate as specified.

34 **805.03.03.03 Hydroseed Method**

35 Areas and seed types not suitable for drill-seeding, as determined by Developer, shall be hydroseeded.
36 The contract-specified seed shall be applied in a slurry containing 200 pounds of thermally-refined wood
37 fiber and a minimum of 40 pounds tacking agent per acre. Seed shall not be in the slurry for more than
38 30 minutes. Hydroseeded areas shall have 100 percent coverage from all directions as evaluated and

approved by IQF. Hydroseeded areas shall also be mulched, as specified in Section 805.03.04 and Section 805.03.05 of the TPs within 24 hours of application of the seed.

805.03.03.04 Manual Application

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

805.03.04 Applying Straw Mulch

805.03.04.01 General Requirements

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

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

Except as specified in the next paragraph, straw mulch applied to seeded areas shall be immediately affixed by crimping and tacking after application. No mulch shall be applied to seeding areas which cannot be crimped and/or tacked by the end of each Day. Any drifting or displacement of mulch before crimping and/or tacking shall be corrected by Developer and is incidental to the cost of this task.

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

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

805.03.04.02 Anchorage by Crimping

Except as specified above in Section 805.03.04.01 of the TPs, crimping shall be required for all straw mulched areas. Straw mulch shall be anchored into the soil with a heavy disc. Discs shall be flat and serrated, with at least 1/4-inch thickness having dull edges, and spaced no more than 9 inches apart. Straw mulch shall be anchored to a depth of at least 2 inches and shall not be covered with an excessive amount of soil. Anchoring operations shall be across the slopes where practical, with no more than 2 passes of the anchoring equipment. Immediately following the crimping operation, the crimped area shall be tacked as specified below.

805.03.04.03 Anchorage by Tacking

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

805.03.05 Hydraulically Applied Straw Mulch with Tacking Agent

Areas seeded but not practical for straw mulch, as determined by ADOT, shall have hydraulically applied straw mulch with tacking agent applied at the variable rates shown in the Table 805-6 below.

Table 805-6			
Hydraulically Applied Straw Mulch with Tacking Agent Rates			
Slope (H:V)	Hydraulically Applied Straw Mulch (pounds per acre – dry weight)	Tacking Agent (pounds pure mucilage per acre – dry weight)	Thermally-Refined Wood Fiber (pounds per acre – dry weight)
Flat to 6:1	2,000	150	400
From greater than 6:1 to 3:1	2,500	150	500
Greater than 3:1	3,000	200	600
Erosive Soil Slopes or Highly Erosive Areas*	3,500	250	700
* As determined by ADOT			

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

805.03.06 Seeding Acceptance

After application IQF will inspect seeded areas or sub-areas for conformance to the contract requirements. Developer shall correct, to the satisfaction of IQF, any areas not conforming to the specifications.

Developer shall maintain and stabilize each area or sub-area, including edge of pavement build-up areas, through the Landscaping Establishment Period after application of the seeding and mulching materials as evaluated and approved by IQF. Any areas damaged from erosion, or that have less than 90 percent of remaining final mulch cover, shall be re-seeded, re-mulched, and re-tacked at no additional cost. IQF will assess the seeded area in comparison to the pre-established 0.5 acre sample demonstrative area for Seeding to determine the necessity of re-seeding, re-mulching, and re-tacking.

End of Division

Division IX, Incidentals

900.01 Mobilization

900.02 ROW Fencing

900.02.01 Design Requirements

Refer to Section 200.03.02.11 of the TPs for ROW fencing.

900.08 Sidewalk

900.08.01 Design Requirements

Refer to Section 200.03.02.10 of the TPs for sidewalks.

900.14 Walls

900.14.01 MSE Walls

Refer to Section 300.04.03 of the TPs for MSE walls.

900.14.02 Soil Nail Walls

Refer to Section 300.04.04 of the TPs for soil nail walls.

900.14.03 Noise Barriers

Refer to Section 600.03.05 of the TPs for noise barriers.

925 LAND SURVEYING

925.01 General Requirements

Developer shall perform all land surveying Construction Work in compliance with the requirements of Section 925 of the TPs. Developer shall provide all surveying, construction staking, and layout required to complete the Work in accordance with the Contract Documents. Developer shall perform all land surveying Construction Work under the supervision of the Survey Manager.

925.02 Administrative Requirements

925.02.01 Standards

Developer shall perform all land surveying Construction Work in accordance with the standards, manuals, and guidelines listed in Table 925-1 which are shown in no order of precedence; however, in the event of a conflict, the more stringent requirement prevails.

Table 925-1 Standards		
No.	Agency	Title
1	Arizona State Board of Technical Registration	Arizona Revised Statutes Title 33
2	Arizona State Board of Technical Registration	Arizona Boundary Survey Minimum Standards
3	ADOT	Intermodal Transportation Division Engineering Technical Group Engineering Survey Section Manual of Field Surveys
4	ADOT	Construction Manual

925.03 Construction Requirements

925.03.01 Perpetuation of Survey Monuments

Developer shall locate and maintain all existing survey monuments, including section line, ROW, and roadway monuments. Developer shall re-establish all disturbed monuments in accordance with Arizona State Board of Technical Registration *Arizona Revised Statutes Title 33* and *Arizona Boundary Survey Minimum Standards*. Developer shall ensure that the referencing and re-setting of any impacted aliquot corners and major street monumentation is signed and stamped by the Survey Manager.

Developer shall set all ROW monuments in accordance with ADOT *Intermodal Transportation Division Engineering Technical Group Engineering Survey Section Manual of Field Surveys*.

925.03.02 Construction Surveys

Developer shall verify Project ROW boundaries and location as parcels become available for Developer's use, prior to construction staking at such parcels. Developer shall perform all land surveying Construction Work necessary to facilitate all construction operations during the Work.

References to "contractor" in the ADOT Construction Manual shall be revised to read "Developer". References to "engineer" in the ADOT Construction Manual shall be revised to read "IQF" when referring to acceptance and "ADOT" when referring to administration, with ADOT having the final determination of how the term "engineer" is applied.

References to "surveyor" in the ADOT Construction Manual shall be revised to read "Developer".

Unless specifically defined to be performed by the ADOT, tasks within or referenced within, the ADOT Construction Manual, Section 1150 Contractor Construction Surveying shall be conducted by Developer.

All words such as "should", "may", "might", "could", "can", "normally", "generally", "usual", "recommend", "desired", and "can" appearing in the standards, manuals, and guidelines setting forth Developer's obligations, liabilities and duties, including the requirements to be satisfied and/or performed by Developer, mean "shall" unless ADOT directs otherwise.

Developer shall stake all locations on the Site prior to and during all Construction Work. Developer shall place control stakes containing station, offset, and elevation, along each geometrical alignment at all times. These control stakes shall be located every 100-foot along each alignment and no more than 50 feet away from all Construction Work at all times.

The written outline required by both the 925 ADOT Standard Specification and Section 1150-1 General Instructions of the ADOT Construction Manual, must receive ADOT's good faith discretion approval prior to the issuance of NTP 2.

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If Developer proposes to replace any procedures in this Section 925 of the TPs or in the ADOT Construction Manual, it must be submitted with the written outline and subject to ADOT's approval.

925.03.03 Construction Survey Records, As-Built Surveys, and Reports

Developer shall maintain accurate and complete documentation for all land surveying Construction Work. These records shall include all calculations, mapping, staking notes, cut sheets, and field crew daily diaries. Developer shall perform as-built surveys for the Project in accordance with the ADOT *Construction Manual*. Developer shall compile and prepare a complete formal Construction Survey Report that includes the materials listed in the ADOT *Construction Manual* and the following:

- A. All survey calculations related to control survey and design survey data;
- B. Documentation of the information and rationale used to perform the land surveying Construction Work;
- C. Field notes;
- D. Cut sheets;
- E. Data collection downloads;
- F. Maps;
- G. CAD files; and
- H. As-built survey.

Developer shall ensure that the Construction Survey Report is sealed by a land surveyor registered in the State. At the same time as the Record Drawings Submittal, Developer shall submit the Construction Survey Report to ADOT.

925.04 Submittals

Table 925-2 reflects a nonexclusive list of Submittals identified in Section 925 of the TPs and is not intended to be an all-inclusive or exhaustive listing of Submittals. Developer shall determine and submit all Submittals as required by the Contract Documents, Governmental Approvals, and Governmental Entities. Unless otherwise indicated, Developer shall submit all Submittals in both electronic format and hardcopy format. At a minimum and unless otherwise specified in the Contract Documents, Developer shall submit the following to ADOT in the formats described in Section 116.02.02 of the TPs.

Table 925-2 Nonexclusive Submittals List					
Submittals	Level of Review*	Number of Copies		Submittal Schedule	Section Reference
		Hardcopies	Electronic		
Written Outline	2	0	1	Approval prior to issuance of NTP 2	925.03.02
Construction Survey Report	5	0	1	At the same time as the Record Drawings Submittal	925.03.03
*Levels of Review 1. Sole discretion or absolute discretion approval (Section 3.1.3.1 of the Agreement) 2. Good faith discretion approval (Section 3.1.3.2 of the Agreement) 3. Reasonableness approval (Section 3.1.4.1 of the Agreement) 4. Review and comment (Section 3.1.5 of the Agreement) 5. Submit/receive and file or comment/no hold point (Section 3.1.6 of the Agreement)					

- 1 **926 ENGINEER'S FIELD OFFICE**
- 2 Refer to Section 112 of the TPs for Engineer's Field Office
- 3 **End of Division**

TP EXHIBIT 1 - TP ATTACHMENTS INDEX

This table of contents has been added to this document as a reference. The TP Attachments are provided as separate files.

TP Attachment 105-1	Maintenance During Construction
TP Attachment 107-1	Prior Rights Document Index
TP Attachment 107-2	Utility Specific Technical Provisions
TP Attachment 107-3	SRP Technical Provisions
TP Attachment 113-1	Quality Assurance Program
TP Attachment 113-2	ADOT Construction Bulletins
TP Attachment 118-1	Acquisition and Relocation Status Report
TP Attachment 118-2	Twin Buttes Cemetery Aerial Easement Requirements
TP Attachment 118-3	ADOT Property at 48 th Street and Broadway Road (APN 12457002F)
TP Attachment 118-4	Parcel 7-12000 No Impact Exhibit
TP Attachment 119-1	Environmental Mitigation Commitments
TP Attachment 119-2	Environmental Study Area
TP Attachment 120-1	Summary Index of Standard Specifications and Stored Specifications
TP Attachment 200-1	Roadway Design Criteria
TP Attachment 200-2	Roadway Classification Exhibit
TP Attachment 200-3	Design Exceptions and Design Variances
TP Attachment 200-4	Maintenance Access (Exceptions to Continuous Access)
TP Attachment 200-5	ADA Asset Spreadsheet
TP Attachment 400-1	Pavement Design Summary and Materials Design Report
TP Attachment 400-2	City of Phoenix Technical Provision Stipulation for Pavement Design
TP Attachment 400-3	City of Tempe – Microsurfacing Specification
TP Attachment 500-1	Rock Mulch Protection
TP Attachment 500-2	Sand and Gravel Company Locations

1	TP Attachment 600-1	Bridge Repair Penetrating Deck Sealer - Methacrylate
2	TP Attachment 600-2	Repairs and Modifications to Existing Bridges
3	TP Attachment 600-3	Repairs and Modifications to Existing Salt River Bridge
4	TP Attachment 600-4	Soil Nail Wall Systems
5	TP Attachment 600-5	Alameda Pedestrian Bridge
6	TP Attachment 600-6	Mechanically Stabilized Earth (MSE) Wall Systems
7	TP Attachment 700-1	City of Phoenix Traffic Specifications and Details
8	TP Attachment 700-2	City of Tempe Traffic Specifications
9	TP Attachment 700-3	Uninterruptible Power Supply
10	TP Attachment 700-4	ITS Technical Specifications
11	TP Attachment 700-5	ITS Workflow Flow Chart
12	TP Attachment 700-6	Pull Box (No. 4B)
13	TP Attachment 700-7	Luminaire (LED) (10,000 Lumens)
14	TP Attachment 700-8	Temporary Emergency Pull-Off Detail
15	TP Attachment 800-1	Alameda and Western Canal Art Bridges

TP EXHIBIT 2 - STORED SPECIFICATIONS INDEX

KEY	TITLE	DATE	SECTION	APPLICATION
☐ A	101ABRV	03/15/18	101.01	New Abbreviations
☐ A	101DEFN	02/22/16	101.02	Definitions
☐ F	102NOBID	09/19/12	102.03	Suspension from bidding - Fed. aid projects only
☐	104APA	02/26/99	104.04	Air Pollution Advisory; projects in Maricopa County.
☐	104DUST	11/01/95	104.08	Dust Control Plan for Projects in Maricopa Co.
☐	104MTBRN	06/04/96	104.08	Burning - all Maricopa and Pima County projects
☐	104MAGDET	05/03/16	104.15	Magnetic Detectable Warning Strips
☐ A	105PLNS	10/18/10	105.03	Plans and Working Drawings
☐	106SRP	05/29/08	106.01	Water from Salt River and Verde River watersheds
☐ A	106QCMAT	05/03/16	106.04(A)	Control of Material
☐ A	106CERT	02/26/19	106.05	Certificates - All projects
☐ A	106APL	03/19/20	106.14	Approved Products List - all projects
☐ A	106DMAT	02/15/11	106.15	"Buy America" clause - all projects
☐	107SRPCL	09/04/98	107.02	Use when working in S.R.V.W.U.A. Facilities or Right-of-Way
☐ A	107PCS	02/13/17	107.08	Emergency Vehicle Access Plans
☐ A	107FINA	09/19/12	107.19	Federal Immigration and Nationality Act - all projects
☐	201MTBRN	10/18/10	201-3.02	Burning - all Maricopa and Pima County Projects
☐	202RMVL	10/03/14	202-3.07	Removal of Structures and Obstructions
☐	202ASB	01/26/16	2020360+	Removal of Asbestos Material and ACP
☐	202LEAD	02/20/20	2020365+	Removal of Lead-Based Material

1	☐	203QCEW	07/15/05	203-2.02	Earthwork - quality control (over 5000 CU. YD.)
2					
3	☐ E	203ERWK	03/23/11	203-5.03(B)(4)	Earthwork
4		208GEOM	12/03/91	2080031	Geomembrane
5		209WTR	03/17/08	209-1	Furnish Water
6	☐	303QCAB	07/15/05	303-3.04	Aggregate subbases and bases-quality control (over 1000 C.Y.)
7					
8		404PRBRN	07/31/90	4040410	Waterproof Membrane
9		414ACFAR	01/13/20	414	Asphaltic Concrete Friction Course (Asphalt-Rubber)
10					
11	☐	501PIPE	01/14/20	501-1	Pipe Culvert and Storm drains
12	☐	501QCDRN	07/15/05	501-3	Pipe-Quality Control (60 inches diameter or over 600 feet length)
13					
14		601PRCST	03/31/05	601-1	Pre-approved Precast Structures
15		601FSWK	08/07/18	601-3.02	Falsework
16	☐	601CONC	08/07/18	601	Concrete structures
17	☐	602PRSTR	09/08/11	602-1	Prestressing Concrete
18		604STLSTR	09/04/18	604-3.01	Shop and Working Drawings
19	☐	606OHST	05/08/19	606-1	Overhead Sign Structures
20	☐ A	607POST	09/08/11	607-1	Roadside Sign Supports
21	☐	608GRAFF	07/11/19	608-1	Graffiti shield
22	☐ A	608PANEL	01/26/16	608-1	Sign Panels
23	☐	609DRSFD	10/24/19	609-1	Drilled Shafts
24	☐ A	610PNT	08/29/12	610.01	Painting
25	☐ A	704THRMO	01/16/18	704-1	Thermoplastic Pavement Markings
26	☐ A	705PVMRK	08/18/14	705-1	Preformed Plastic Pavement Marking
27	☐ A	708WPM	09/06/19	708-1	Waterborne Pavement Markings
28	☐ A	734PATSC	07/01/14	734-2.01(D)	Traffic Controller Assembly
29	☐	735LOOP	02/07/13	735-1	Detectors

1	☐	736LED	12/10/19	736-1	Highway Lighting
2	☐	810ERCON	03/24/11	810-2.06(A)	Erosion Control
3	☐	905GRDRL	06/14/19	905-2	Guardrail
4	☐	908CGSD	03/19/20	908	Curbs, Gutters, Sidewalks, and
5					Driveways
6	☐	913BKPRT	03/15/18	913	Bank Protection
7	☐	921MEDPA	03/19/20	921	Median Paving
8	☐	924CQC	03/02/09	9240170	Contractor quality control
9	☐	925SRVY	08/16/19	925	Construction surveying and layout
10	☐	1002PNT	11/06/12	1002-1	Paint
11	☐	1003REBAR	01/26/16	1003-1	Reinforcing Steel
12	☐	1006PCC	02/13/17	1006-1	Portland cement concrete
13	☐	1006QCPC	07/12/05	1006-4.01	P.C.C. quality control (over 300 cubic
14					yards)
15	☐	1007REFS	11/05/13	1007-1	Retroreflective Sheeting
16	☐	1010PIPE	01/14/20	1010-3	Drainage Pipe
17	☐	1012GRDRL	01/25/18	1012-2	Guardrail Materials
18	☐	1013BRPD	10/09/08	1013-2	Bearing pads
19		1014FAB	05/07/13	1014-1	Geosynthetics
20		1015EPOX	03/15/18	1015	Epoxy Anchoring Adhesive
21		1017GRT	08/07/18	1017	Nonshrink Grout

22 Note: Additional Stored Specifications are required in the Materials Design Report.