COCONINO COUNTY ARIZONA
PUBLIC WORKS

PROJECT SPECIAL PROVISIONS

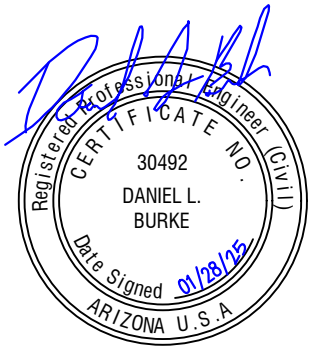
FOR

Shadow Mountain Drive Reconstruction

Project # 41ESMDR

WLB Project # 323015A001

January 24, 2025



This project was designed and will be administered based on the most current version of the Maricopa Association of Governments (MAG) Uniform Standard Specifications for Public Works Construction, 2025. The purpose of these special provisions is to supplement, modify, replace, and/or delete that portion of the MAG Uniform Standard Specifications for Public Works Construction, 2024, and include portions of the Arizona Department of Transportation (ADOT) Standard Specifications for Road and Bridge Construction 2021, and all subsequent revisions thereto, which do not meet specific requirements of this project. These Special Provisions shall supersede the Standard Specifications where there is a conflict.

SCOPE: The scope of work includes furnishing of all labor, materials, equipment, fixtures, and services required for Asphaltic Pavement reconstructing for approximately 18,300 square yards of Shadow Mountain Drive.

Work included for the base bid shall include construction of a 36’ wide asphalt pavement section, asphalt pavement safety edge, asphalt pavement aprons, recycled milling shoulders, and new culvert inlets with rip rap. Other associated work includes mobilization/demobilization, traffic control, survey/layout, roadway striping, signage improvements, roadside drainage improvements, stormwater pollution prevention plan (SWPPP), and reseeding of disturbed areas.

The scope shall also include, 13,460 SY 4” AC over 2” AB over 6"” Cement Treated Base, 1,415 SY 4” AC over 6” ABC, 3,125 SY, 1” mill with 2” AC overlay and 175 SY Epoxy Sealant on the existing Concrete Box Culvert, as well as landscaping and concrete improvements on the existing roundabout on Shadow Mountain Drive.

The work within the roundabout will be an alternative bid. The County intends to award the alternative bid if the work is within the project budget. If the bids fall outside of the project budget the work within the roundabout will not be awarded.

All work is to be done in accordance with the plans, specifications, and contract documents.

PRE-BID MEETING: Contractor shall attend a mandatory pre-bid meeting that is to be set by owner; date and location of meeting is to be determined. Bid shall not be accepted for project if Contractor does not attend Pre-Bid Meeting.

CONTRACT TIME: Completion of work under this contract shall have a fixed end date of June 15, 2025 for Final Completion and the final billing statement shall be submitted by June 20, 2025.

WORKING HOURS: Work hours shall be within the hours of 7:00 a.m. to 5:00 p.m., unless otherwise approved by the County Engineer in writing. The Contractor and all its subcontractors shall work the same hours.

RESTRICTED WORK: No work shall occur in unauthorized areas where the County does not have Right-of-Way (ROW) or permission to work.

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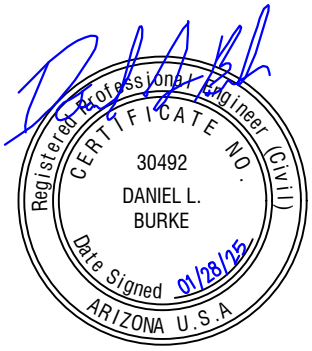


UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, MARICOPA ASSOCIATION OF GOVERNMENTS

MAG SECTION 101 – ABBREVIATIONS AND DEFINITIONS

101.2 DEFINITIONS AND TERMS:
Is revised to include:

"County" definition, is revised to read:

Coconino County, organized and existing under and by virtue of the laws of the State of Arizona, also known as the "Owner."

"Engineer" definition, is revised to read:

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

"Working Day" definition, is revised to read:

A calendar day, corresponding with a County working day of eight (8) hours a day five (5) days a week, exclusive of Saturdays, Sundays, and legal holidays recognized by the County, on which weather and other conditions not under the control of the Contractor will permit construction operations to proceed for six (6) or more hours with the normal working force engaged in performing the controlling item or items of work which would be in progress at that time.

MAG SECTION 102 – BIDDING REQUIREMENTS AND CONDITIONS

102 BIDDING REQUIREMENTS AND CONDITIONS:
Is revised to include:

102.14 COOPERATIVE USE OF THIS CONTRACT:

This agreement may be extended for use by other governmental agencies and political subdivisions of the State including members of SAVE (Strategic Alliance for Volume Expenditures). Any such usage by other entities must be in accordance with the laws, ordinances, rules and regulations applicable to such entity, and the approval of the

Contractor and the County. The provision of goods or services to other agencies under this contract does not absolve the Contractor from fully complying with the requirements set forth within the contract for materials and services to be provided to the County under this contract. Any attempt to represent any material and or service as being under this contract with Coconino County, which is not a subject of, or an addition to this contract, is a violation of the contract. Any such action is subject to legal and contractual remedies available to Coconino County including, but not limited to, cancellation or suspension of the contract.

In the event that another governmental agency or subdivision chooses to use this agreement for procurement purposes, the procuring party shall be solely responsible for the ordering of materials, services or construction under this agreement. Payment, inspection and acceptance of goods or services ordered by the procuring party shall be the exclusive obligation of the procuring party. County shall not be liable in any way for alleged or actual violations by the procuring party or Contractor, and the procuring party shall hold County harmless from any liability which may arise from the action or inaction of the procuring party. Contractor agrees to look solely to the procuring party in pursuing all legal remedies that may be available to Contractor for acts or inaction of the procuring party.

The procuring party shall not use this agreement as a method for obtaining additional concessions or reduced prices for similar products or services.

MAG SECTION 103 – AWARD AND EXECUTION OF CONTRACT

103.3 AWARD OF CONTRACT:

Is revised to include:

103.3.1 PRE-AWARD CONFERENCE:

A pre-award conference shall be scheduled by the Engineer. Attendance of the Contractor's construction superintendent, project manager, and foremen is required at the scheduled place and time. If requested, at the pre-award meeting the Contractor shall present the following: (1) past performance references on projects that have occurred within the prior two years, (2) a list of equipment to be utilized on this project, (3) a schedule of manpower to be utilized on this project, (4) a detailed construction schedule including all construction phasing, (5) Material Submittals, (6) List of long lead time items, and (7) any other special documentation requested by the County to ensure the contract requirements for workmanship and materials can be met. Pre-award submittals shall be subject to approval by the County prior to award of this contract. If the selected bidder's pre-award submittals do not meet the standards set forth in the contract documents, then the selected bidder will be notified in writing with an explanation why their submittal and bid are being rejected. If this occurs, the County shall exercise its rights to award to the

next most qualified bidder as determined by the selection panel that can meet the contract requirements for workmanship and materials.

MAG SECTION 104 – SCOPE OF WORK

104.1.1 GENERAL:

Paragraph two is revised to read:

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

Change Orders
Addendum
Special Provisions
Project Plans
Coconino County Engineering Design and Construction Manual
MAG Uniform Standard Specifications for Public Works Construction
MAG Uniform Standard Details for Public Works Construction
ADOT Standard Specifications for Road and Bridge Construction
ADOT Construction Standard Drawings

104.1.2 MAINTENANCE OF TRAFFIC:

Is revised to include:

Within seven (7) calendar days following receipt of the notice of award, the contractor shall submit a traffic control plan to the Engineer. The Engineer shall review the construction schedule and traffic control plan and either approve them or provide a written list of the items that will require revision. The contractor shall submit the corrected construction schedule and traffic control plan within seven (7) calendar days of receiving the list of required revisions. The corrected construction schedule and traffic control plan submittal shall address all required revisions.

The detailed traffic control plan shall be submitted to Engineer and approved by the Engineer prior to the start of work. The plan shall include provisions for access to all adjacent private properties within the project area. Through advance written notice and coordination with the Engineer and the property owners, the Contractor may temporarily limit vehicular or pedestrian access to a property only if acceptable alternate access is provided.

The Contractor shall be required to provide no less than one (1) week advance written notice of all street closures and traffic restrictions, and commencement of construction activity to all affected property owners, business owners, residents, and the surrounding neighborhood as well as to the Engineer. The Engineer will indicate the limits of the notification. The notice shall include the projected date and duration of the closure and

alternate detour routes. Each notice shall include the name of the Contractor, name and phone number of the Superintendent, and the Owner's public outreach contact information, countyroadsinfo@coconino.az.gov and 928-679-8300.

Existing pedestrian and bicycle facilities shall be continued through or detoured around the construction zone.

School bus stops and pedestrian access thereto shall be maintained. Should construction occur during the school year, any existing school bus stops will need to be temporarily relocated to another location acceptable to the Flagstaff Unified School District Transportation Director. The Contractor shall coordinate any school bus relocations through the Flagstaff Unified School District Transportation Director, Patrick Fleming at 928-527-2301.

All closures required must include notification and detour information for all School agencies affected. Contractor shall contact appropriate authorities 24 hours prior to any closures to coordinate access.

Any operations requiring lane closures will be accomplished with the use of flaggers and pilot vehicles, if needed, at which the maximum traffic cycle time is 5 minutes. Cycle time is the time that any vehicle is delayed by the lane closure and flagging operation. Pilot vehicles used during paving and other roadway projects shall be clearly marked, be equipped with warning lights, and be in radio communication with flaggers at each end of the traffic control area. Traffic control shall be maintained in accordance with the manual on uniform traffic control devices (MUTCD). Lane closures are only allowed during work hours. One travel lane in each direction is required at the completion of that day's work unless other arranges are approved by the engineer.

Solid Waste Pickup

When construction activity interferes with solid waste pickup, the Contractor shall provide for solid waste vehicle access to the affected properties or relocate the trash containers where access is acceptable.

Traffic Control and Safety

The Contractor shall designate an employee, other than the Project Superintendent, who is well qualified and experienced in construction traffic control and safety, to be available on the project site during all periods of construction to coordinate and maintain safe barricading whenever construction restricts traffic. The contractor shall designate and provide the contact information of one person who shall be available during non-construction hours in case of any traffic control and/or safety items that need to be handled in an urgent manner. This representative must be able to operate equipment and must be TCS certified. Traffic control shall include all forms of transportation, including pedestrian and vehicular traffic.

Emergency Access
All roadway closures shall be coordinated by the Contractor with the Engineer at each weekly meeting or at least 72 hours in advance of the roadway closures. The Contractor shall forward the street closure information to the Fire Department and Police Department.

Ponderosa Fire Department Station 24/7 Access

A 24/7 access driveway shall be provided to the existing fire station. The driveway roadway section shall support a 75,000 lbs. fire apparatus.

U.S. Postal Service Access
The Contractor shall be responsible for maintaining access for United States Postal Service deliveries within the project area at all times. Mailboxes shall be protected in place. Should an existing mailbox be damaged by construction activity, the Contractor shall promptly remove and replace the damaged mailbox with like kind; including post and foundation, at no cost to the resident or the County. Placement of any mailbox shall be in accordance with USPS requirements.

MAG SECTION 105 – CONTROL OF WORK

105.5 COORDINATION OF CONTRACTOR:
Is revised to include:

The contractor will be responsible for locating and controlling all staging areas.

105.5.1 WEEKLY CONSTRUCTION MEETING:
Is revised to include:

The Superintendent shall attend weekly construction progress meetings. The Superintendent shall be prepared to discuss construction schedule, construction activities projected for the next two weeks, problems, issues and any other pertinent project details as may be required by the Engineer. The Superintendent shall prepare a meeting agenda and meeting notes and distribute such documentation to all the attendees.

105.5.2 PROTECTION OF WORK:
Is revised to include:

The Contractor is required to protect work during inclement weather. The contractor shall grade areas to drain and utilize pumps to remove ponding water immediately during all stages of construction during both working and non-working hours.

105.7 COOPERATION BETWEEN CONTRACTORS:
Last paragraph, is revised to read:

The Contractor is required to coordinate any access required by or from other contractors working on adjacent project. The Contractor should coordinate the construction activities with other Contractors to avoid any delays or destruction of work on said project. The County will not honor any claim for extra compensation due to delays, extra work, or extension of time caused by any other Contractors working within the limits of same project and adjacent projects.

105.8 CONSTRUCTION STAKES, LINES, AND GRADES:
Is revised to read:

The Contractor shall layout the work from the lines, grades and dimensions shown on the drawings. The Contractor shall be responsible for all such work for the duration of the project. Any dimension or grade errors shall be immediately transmitted in writing to the Engineer for clarification, before proceeding with the work.

105.8.1 RECORD DRAWINGS:
Is added to read:

Record Drawings are Construction drawings, documents or plans sealed and signed by a professional registered in the State of Arizona (Professional Engineer or Registered Land Surveyor) which depict the locations of actual improvements to serve as a record of all improvements and changes to the original, approved plans.

Record Drawings shall show all changes that occurred during construction, including changes in materials, distances, lengths, locations, elevations, volumes, etc. and shall contain a Record Drawings certification conforming to these Standards. A certification statement as follows shall be placed on cover sheet of Record Drawings:

> *"I certify, to the best of my knowledge and belief, that the construction of the public improvements are in substantial conformance with the approved construction plans and specifications. The construction details as shown on the Record Drawings are accurate and complete. The preparation of Record Drawings were performed by me or under my direct control and supervision with information provided by the Contractor and the County.*

The Contractor shall be responsible to accurately maintain records of the construction activities. This shall be provided to the Engineer of Record (Engineer) upon completion of the work and prior to final acceptance. This shall be accomplished by recording redlines of the work performed on the construction plans. This is to include all work performed by Subcontractors as well.

As-Built Redlines can be provided in the form of annotations on the construction documents, and/or digital format (PDF or CAD files); redlines must be legible and to the satisfaction of the Engineer. In order for the Engineer to develop Record Drawings, the

Contractor shall include, as appropriate, but not be limited to, the following within the As-Built Redline submittal:

1. Place “As-Built” lettering and date in lower right-hand corner of all sheets.
2. Contain all horizontal and vertical design information, sizes, thicknesses, and material types of improvements shown on the design/construction plan set (even if unchanged during construction).
3. Improvements deleted in the field shall be crossed out with and “x” and labeled “not built”.
4. Improvements changed from the approved design plans shall be reflected and clearly called out by “clouding”.
5. Plan sheets that represent improvements that were not changed from the approved design plans, shall have “Per Plan” placed in the lower right hand corner of that plan sheet.
6. Pipe, culvert, or encasement stations, invert elevations, offsets, and length.
7. Identification, station, offset, distance between new infrastructure and elevation where crossing of existing utilities are encountered.

In addition, the Contractor shall be required to have a licensed Land Surveyor perform finished grade elevation checks to confirm design intent is met from the original plans. Elevation checks shall be performed intermittently along improvements (e.g., centerline and edge of pavement) to the satisfaction of the Engineer. Final grade elevations shall be documented and provided in the Redlines that are to be furnished to the Engineer (County).

Review of As-Built Redlines

The Engineer, Contractor, and/or project personnel will perform a review of the As-Built Redlines from the review, the Engineer will consolidate comments identifying issues that need to be resolved prior to County acceptance.

Acceptance of As-Built Redlines

When the County determines that the Contractor has met the requirements of the Contract Specification, the As-Built Redlines will be accepted. It should be noted that it may be necessary to perform several iterations of the review, comment, and resolution process prior to acceptance. Upon acceptance, the County will release any retained payments.

Payment for this effort shall be bid as a Lump Sum per the Bid Schedule.

MAG SECTION 106 – CONTROL OF MATERIALS

106.2 – SAMPLES AND TESTS OF MATERIALS:

Third paragraph, second sentence is revised to read:

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

106.2.1 CERTIFICATE OF COMPLIANCE:
Bullet 6, is revised to read:

6. A statement that the individual identified in item eight below has the legal authority to bind the manufacturer or the supplier of the material. The person signing the certificate shall be in one of the following categories:

A. An officer of a corporation.
B. A partner in a business partnership or an owner.
C. A general manager.
D. Any person having been given the authority in writing by one of the three listed above. The manufacturer or supplier may submit a list of those who are authorized to sign certificates. This list shall be submitted under the name, title, and signature of one of the first three listed above. This list will be kept on file for subsequent certificates received on that project.

106.2.1 CERTIFICATE OF COMPLIANCE:
Is revised to include:

The contractor shall submit to the Engineer an original or copy of either a Certificate of Compliance or a Certificate of Analysis, as required prior to the use of any materials or manufactured assemblies for which the specifications or these Special Provisions require that such a certificate be furnished.

The Engineer may permit the use of certain materials or manufactured assemblies prior to, or without, sampling and testing if accompanied by a Certificate of Compliance or Certificate of Analysis, as herein specified. Materials or manufactured assemblies for which a certificate is furnished may be sampled and tested at any time, and, if found not in conformity with the requirements of the contract documents, will be subject to rejection, whether in place or not.

The following is a list of materials generally requiring Certificates as specified in the Standard Specifications or by Policy and Procedure Directives. Materials in addition to this list may require a certification, as specified in the project Special Provision. Each of the below items require a Certificate of Compliance, except where a Certificate of Analysis is required as noted.

1. Concrete Admixtures
2. Metal Pipe

3. Geosynthetics (Geotextile Fabrics, etc.)
4. Sign Panels and Related Materials
5. Reflective Sheeting
6. Thermoplastic Pavement Markings
7. Preformed Plastic Pavement Markings
8. Materials Used in Spillways, Down drains, Inlets and Outlets
9. Seeding and Planting Materials
10. Bituminous Materials
11. Paint (Certificate of Analysis)

MAG SECTION 107 – LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC

107.2 PERMITS:

Is revised to include:

The Contractor shall be required to obtain County, ADEQ, and other required permits and always keep a copy available onsite during construction.

Erosion Protection and Site Restoration

The disturbance area size of this project is approximately six (6) acres. Due to the project having a disturbance area that is greater than one (1) acre, the Contractor is required to submit a Notice of Intent (NOI) and a Notice of Termination (NOT) to the Arizona Department of Environmental Quality. The Contractor shall use best management practices (BMP) in controlling stormwater runoff.

The contractor shall develop the stormwater pollution prevention plan (SWPPP). As a part of the SWPPP, the Contractor shall implement and maintain all BMPs and implement dust control at all times under this item. The Contractor shall develop and maintain a SWPPP inspection and maintenance binder that is to be kept on site during construction.

Measurement and Payment

Measurement shall include all items required to comply with the requirements of the AZPDES permit program and County requirements. The cost for obtaining and complying with the AZPDES permit, inspection documentation, installation and maintenance of temporary BMP erosion control devices, dust control, and all work associated with stormwater protection shall be included in the pay item for SWPPP. A Payment of 25% shall be made once the NOI is submitted to the county. The other 75% shall be made shall be made proportionate to the agreed upon percentage of work complete at the end of the period as invoiced.
The waddle bid item is for final stabilization only, that quantity and payment identified in the bid schedule is not for the installation and maintenance of the SWPPP waddles.

107.7 BARRICADES AND WARNING SIGNS:
Second paragraph, is revised to read:

The Contractor shall erect warning signs in advance of any place on the project where operations may interfere with the use of the road by traffic, and at all intermediate points where the new work crosses or coincides with an existing road. Such warning signs shall be constructed and erected in accordance with the Manual of Uniform Traffic Control Devices, latest edition, supplemented by the ADOT Traffic Control Manual for Highway Construction and Maintenance, latest edition, which are hereby made a part of these specifications.

107.9 PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE:
Is revised to include:

The Contractor shall take special care to control construction-related dust and noise and to keep the project site cleaned up to the greatest extent possible. The Contractor is responsible to coordinate alternate measures for any impacted operations as mentioned which are acceptable to the parties involved.

Survey monuments and property corners shall be protected and not disturbed unless specifically called out on the plans for replacement. All costs associated with protecting or re-establishing disturbed survey monuments and property corners shall be borne solely by the Contractor.

The Contractor is responsible for replacing and/or restoring landscaping (including but not limited to fences, retaining walls, landscape walls, pavers, aggregate rock ground cover, plantings, sod) and owner improvements associated with the project to a pre-existing condition. Any fencing, if impacted, must be immediately replaced (in kind). All cost shall be as incidental to the work, unless specified in the bid schedule or plans.

With the exception of areas disturbed by proposed work, the existing improvements and utilities beyond the edge of pavement shall remain in current condition.

107.11 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTY AND SERVICES:
Is revised to include:

Locations of underground utilities shown on the plans are to be regarded as approximate only. Contractor shall contact Blue Stake to locate all the utilities within the project limits prior to any construction operation. Relocation of utilities is to be completed prior to the beginning of work by the contractor.

Not all service lines are shown on the plans and it is the Contractor's responsibility to determine their location in the field at the beginning of the project. The investigation of utilities and coordination is considered incidental to the construction of the project.

The Contractor is responsible for providing written notification to each affected resident at least 48 hours prior to any disruption to water service in the construction area. The notice must include the exact time of the disruption of service and the expected duration of the loss of service.

The Contractor shall protect existing water, power, cable, and gas service lines where the proposed work crosses the main and the individual service lines.

Protection or repair of existing service lines not in conflict with the work is also considered incidental. In the event that there is a physical conflict between an existing service line and the proposed work, the Contractor shall immediately notify the Engineer of the conflict. The County Engineer will make a determination as to how the conflict will be resolved. Any extra work required as a result of an unforeseen service conflict will be ordered and paid for in accordance with MAG General Provision Section 104.2.3.

Removal of any project elements including but not limited to guardrail and culverts shall be done with due caution so as to not disturb any of the existing utilities. Any damage to the existing utilities shall be Contractor's responsibility and shall be repaired at no additional cost. Any utilities if found to be in conflict with project improvements that are not identified as relocations should be immediately notified to the Engineer. No work shall be done at conflict locations until further notification by the Engineer.

All the utility relocations that are in conflict should be relocated by respective utility franchise companies prior to the commencement of the work. If during the construction, any conflicts arise the Contractor should immediately notify the County Representative and the Engineer before continuing construction activities around utilities. The following is the contact information of the utility companies for all the utilities within the project limits:

Utility Company	**Representative**	**Contact Information**
APS-Power	Jonathan Dufek	Jonathan.Dufek@aps.com 928-220-5709
Lumen (CenturyLink)	Daniel Goette	Daniel.Goette@lumen.com
Optimum Cable	Jason Quinlan	Jason.quinlan@AlticeUSA.com 928-202-6287

Unisource Energy Services Gas	Martin Conboy	mconboy@uesaz.com 928 226-2269
Utility Source LLC (Water and Sewer)	Lonnie McCleve Jeremy McCaleb	lonniemccleave@me.com 480-540-5656 wyldmon@gmail.com 928-699-2226

MAG SECTION 108 – COMMENCEMENT, PROSECUTION AND PROGRESS

108.7 DETERMINATION AND EXTENSION OF CONTRACT TIME:
Is revised to include:

It is the Contractor's responsibility to request in writing any claims for the delay of critical work within two working days of experiencing adverse weather and associated project delays. This is a fixed end project there will no adverse weather days awarded to this project. All work shall be completed by June 15th and the final billing statement shall be submitted by June 20, 2025.

108.8 GUARANTEE AND WARRANTY PROVISIONS:
First paragraph, is revised to read:

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

108.9 FAILURE TO COMPLETE ON TIME:
First sentence in first paragraph, is revised to read:

For each and every working day that work shall remain incomplete after the time specified for the completion of the work in the proposal, or as adjusted by the Engineer, the sum per calendar day shown in Table 108-1, unless otherwise specified in the proposal form, may be deducted from monies due to or to become due to the Contractor, not as a forfeit or penalty but as liquidated damages.

MAG SECTION 109 – MEASUREMENTS AND PAYMENTS

109.7 PAYMENT FOR BOND ISSUE AND BUDGET PROJECTS:

Subsection (B), first paragraph, is revised to read:

Request for final payment must be submitted to the Engineer by June 20, 2024. No additional pay requests will be considered after the final pay request is submitted. All prior estimates and partial payments will be subject to correction in the final estimate for payment.

MAG SECTION 205 - ROADWAY EXCAVATION

205.1 DESCRIPTION:

Add the following:

All excavation, backfill, and embankment work shall exclude the cost of rock excavation, handling rock or disposing of rock in the bid schedule unit cost for excavation, backfill and embankment and no separate measurement or payment shall be made (See Section 205.7 below).

205.1.1 DEWATERING:

Add a new subsection:

Any water encountered during any earthwork operation shall be disposed of by the Contractor in a manner that will not damage public or private property or create a nuisance or health problem. The cost of furnishing pumps, pipes, disposal, and equipment for dewatering shall be considered incidental to the work and no additional payment shall be made.

205.2 UNSUITABLE MATERIAL:

Add the following:

Material that is unsuitable for the intended use shall be excavated and removed from the site or otherwise disposed of as directed by the County Inspector and County Project Manager. A contingency has been established for removal and disposal of unsuitable material, and to include approved backfill material and its placement. If unsuitable material is encountered, the contractor shall notify the County Inspector immediately. The contractor shall be reimbursed on a time and materials basis plus the allowable markups outlined in section 109.5 of the MAG Standard Specifications. The Contractor and County Inspector shall track all the personnel time, equipment time, and materials needed to address the unsuitable materials. The extent of unsuitable material shall be measured in the field by the County Inspector and contractor. It shall be understood that the amount for this item in the contract is an estimate only (Contingency) and no guarantee is given that the full amount or any portion of it will actually be utilized. It shall not be utilized without specific written authorization by the County Engineer or his/her designee.

205.5 SLOPES:
Add the following:

Grading limits and slope construction need to be smooth transitions without rocks, drop offs, or other obstructions. Top of slopes shall be rounded. Tolerance on slope matchup is per MAG.

205.7 MEASUREMENT:
Revise to include the following:

An estimate of earthwork is provided on the construction plans and measured per Cubic Yard (CY). No account is made for shrink or swell in this quantity. A separate Roadway Embankment (Fill) quantity is provided as well and shall adhere to MAG Section 211.

The Contractor is responsible for independently estimating and accounting for earthwork including the determination of import/haul off quantities and requirements. The Contractor shall review the reports on geotechnical investigation and sampling results prior to bidding (attached).

205.8 PAYMENT:
Revise to include the following:

No payment will be made for roadway excavation in the base bid. It shall be considered incidental to the infrastructure associated with it. This includes cut, fill, import, export, shaping and compaction and the placement of millings.

MAG SECTION 230 – DUST PALLLITIVE APPLICATION :

Entire Section is revised to read:

MAG SECTION 230 shall not be applicable to project. All dust control related activities shall be incidental to the pay item for the SWPPP.

MAG SECTION 301 – SUBGRADE PREPARATION:

301.1 DESCRIPTION:
Add the following:

The work under this section shall be in accordance with Section 301 of the MAG Standard Specifications and The Geotechnical Investigation prepared by Western Technologies Geotechnical Evaluation, Shadow Mountain Road Reconstruction, Bellemont, Arizona – Western Technologies Job No. 25-223549-0R, dated December 15,

2023, Addendum 1, Dated February 8, 2024, and Addendum 2, Dated December 19, 2024.

Sub-grade preparation shall include removal of the existing asphalt concrete and aggregate base course material in a stockpile, and blending to ensure that it is a relatively uniform mixture for use cement treated base. Following removal of the existing pavement section, the subgrade soils shall be graded to the grades shown on the plans. Once the subgrade soils have been graded, it shall be proof rolled, and any loose, soft, disturbed, or otherwise unsuitable materials shall be per Section 205.2 of these special provisions.

Prior to installing the cement treated base the contractor shall have their surveyor submit a sealed grading certificate that states the subgrade meets the design elevations.

301.8 PAYMENT:
Is revised to read:

No payment will be made for subgrade preparation in the base bid. It shall be considered incidental to the infrastructure associated with it. This includes cut, fill, import, export, shaping and compaction and the placement of millings.

MAG SECTION 312 – CEMENT TREATED BASE:

312.1 DESCRIPTION
First Paragraph modified to read:

Cement Treated Base shall consist of pulverized asphalt/aggregate base course from the roadway and 5% Portland Cement as specified in Section 705 to achieve a compressive strength of 500 to 750 psi as noted in the geotechnical report. The contractor is to prepare a mix design with the onsite material per Section 304-2.04 of the ADOT Standard Specifications for Roadway and Bridge Construction to determine the final cement content to the blended material removed from the roadway. Contractor shall submit mix design 14-days prior to any scheduled mass production of the cement treated base. Mix design must be approved by Engineer prior to mass production of the cement treated base.

If the approved mix design percent of Portland Cement differs from 5% a change order will be issued. The change order shall only be for the difference in cement material needed for the approved mix design. Contractor will have to provide the documentation of the difference in material in Tons and the difference in the cost of the cement for the change order.

312.2 GENERAL
Add the following to the start of the third paragraph:

Cement Treated Base to be mixed in place.

312.3 CONSTRUCTION METHODS:
Add the Following:

The base course for the treated base will consist of pulverized asphalt and aggregate base course from the existing road. The material is to be well blended prior to preparing a mix design and placing the material. To avoid having the roadway subgrade exposed for an extended period of time the Contractor is to remove three (3), 10' long sections the full width of the roadway. Contractor shall utilize the same equipment that will be used for mass removal, to prepare the material that will be used in the mix design for the CTB, prior to starting mass removal operations. The location of the three (3) sections is to be approved by the County prior to removal. Once the material for the preparation of the mix design is removed, the contractor is to fill the locations with AB until the mix design is approved for placement.

The subgrade soils are to be prepared per Section 301.1. Prior to installing the asphalt concrete the contractor shall have their surveyor submit a sealed grading certificate that states the cement treated base and AB meets the design elevations.

312.6 CURING:
Add the following:

The use of bituminous curing seal is not allowed for this project without prior approval from the engineer.

Third Paragraph modified to read:

The contractor to keep the surface of the compacted base continuously moist until overlaid with the aggregate base course. The aggregate base or the surfacing may be placed as soon as the cement treated base has been compacted. The spray equipment on the water truck shall be approved by the Engineer prior to the use of this equipment to spray the soil cement base course. The spray equipment must produce a fine, even spray to prevent washing of the surface of the base course. A cement treated section may be opened to all traffic immediately after placement and compaction of the aggregate base surface.

312.8 PAYMENT:
Second Paragraph modified to read:

Payment for base material will be made by square yards of blended asphalt/aggregate base course complete in place includes pulverizing asphalt, removing the asphalt

aggregate base, stockpiling and mixing, spreading, and compacting. The cost of the mix design preparation is incidental to the placement of the cement treated base and is the responsibility of the contractor. No separate payment will be made for the preparation of the mix design.

MAG SECTION 317 – ASPHALT MILLING

317.1 DESCRIPTION:

First paragraph modified to read:

The work under this section shall consist of milling existing asphalt concrete pavement where shown on the Plans or requested. Millings not used for roadway shoulders shall be blended with the subgrade as needed or as specified in the plans. Excess millings will become the property of the Contractor.

317.2 CONSTRUCTION REQUIREMENTS:

Is revised to include:

Quality Assurance

Ensure that the milling operation produces a uniform pavement texture that is true to line, grade, and cross section.

Milled pavement surfaces are subject to visual and straightedge inspections. A ten (10) foot straight edge shall be used to measure surface irregularities of the milled pavement surface. The cross slope shall be uniform and no depressions or slope misalignments greater than 1/4 in per ten (10) feet exist when the slope is tested with a straightedge placed perpendicular to the center line.

Milling Operation

During production milling operation if the Engineer determines that the desired surface finish is not being achieved, the contractor shall stop milling. Milling shall not resume until the Engineer is satisfied that the requirement can be met or until successful completion of another test section. The forward speed of the milling machine shall be checked throughout each production day, or at the discretion of the engineer. If the desired surface finish is not met, the Contractor shall reduce the forward mill speed as specified by the Engineer.

The profile of the milled surface, in both the longitudinal and transverse directions, shall not vary by more than 1/4 inch over a distance of ten feet, verified by a 10’ straight edge test.

Milling operations shall progress from the low side of each roadway barrel or lane and progress towards the high side. Each successive pass of the milling machine shall meet the line and grade of the previous pass. All mainline milling shall be completed first before side streets and driveways are milled. The speed of the milling machine shall be maintained at a rate which results in a uniform pavement texture, as approved by the engineer.

Milling shall result in a grid-patterned textured pavement surface with longitudinal ridges approximately the same distance apart as the cutting teeth. The ridges shall be consistent in depth, width, and profile. The distance between the top of each ridge and the adjacent valleys shall not exceed 1/8 inch.

Milled pavement surfaces which do not conform to the requirements above shall be corrected by the Contractor. The Contractor shall prepare and submit to the Engineer for approval a correction plan prior to initiating corrective action.

Milling methods that will produce a uniform finished surface and maintain a constant cross slope between extremities in each lane shall be required. The Contractor shall maintain the existing pavement profile cross-slopes & provide positive drainage in all existing directions.

Positive drainage shall be provided to prevent water accumulation on the milled pavement, as shown on the plans or directed by the Engineer.

Any damage to the existing infrastructure—including but not limited to the valve risers, manholes, survey monuments, concrete collars, curb ramps, sidewalks, and concrete curb & gutter—shall be repaired and/or replaced by the Contractor to the satisfaction of the Engineer.

Under no circumstances shall the removal of existing asphaltic concrete begin until the mix design for replacement surface treatment has been approved by the Engineer.

If during the milling operation, the Contractor breaks through the asphaltic concrete (AC) layer into the base/sub-base material, the disturbed base/sub-base material shall be reshaped, re-graded and re-compacted at the direction and to the satisfaction of the Engineer prior to the placement of the new AC. After the milling operation, any unstable remaining bituminous material shall be completely removed and replaced with an adequate thickness of AC to achieve the final total thickness of AC, per plans or as directed by the Engineer, with the binder specified in the Special Provisions. Payment for additional work shall be compensated according to the Special Provisions, i.e. time and materials or quotes.

Work Site Maintenance
Remove dust, milling slurry & residue, and loose milled material from the milled surface. Do not place the new surface treatment on the milled surface until removal is complete.

A self-loading motorized street sweeper equipped with both brooms and a vacuum system, and a functional water spray system shall immediately follow the milling machine. Sweeping shall continue until loose millings, silt, slurry and residual asphalt concrete materials have been completely removed and as requested by the Engineer. The Contractor shall maintain the milled surface for cleanliness until the surface treatment is applied.

317.3 MEASUREMENT AND PAYMENT:
Is revised to read:

If separately identified in bid schedule, all work under this item for this project shall be measured and paid for per the contract unit price per square yard, inclusive of all labor, material, equipment, and incidentals necessary to complete the work. Payment shall be made proportionate to the agreed upon percentage of work complete at the end of the period as invoiced.

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

MAG SECTION 321 – PLACEMENT AND CONSTRUCTION OF ASPHALTIC PAVEMENT

321.1 DESCRIPTION:
Is revised to include:

Asphalt binder for the ½" mix and ¾" mix shall be PG64 – 28TR+.

321.3 WEATHER AND MOISTURE CONDITIONS:
Is revised to read:

Asphalt concrete shall be placed only when the surface is dry, and when the ambient temperature in the shade is 40 degrees F or above and rising, or above 50 degrees F if the temperature is falling. No asphalt concrete shall be placed when the weather is foggy or rainy, or when the base on which the material is placed is unstable, is in a wet condition (in excess of optimum), or in a frozen condition. Asphalt concrete shall be placed only when the Engineer determines that weather conditions are suitable.

321.7 TRANSPORTATION:
First paragraph is revised to include:

No free treating fluid shall be present in the truck bodies at the time of asphalt concrete loading. Diesel fuel shall not be used as a treating fluid.

321.8.1 PLACING:
Is revised to include:

It shall be the contractor's responsibility to immediately clean up any spillage. Failure to limit spillage and keep the job site cleaned up from such spillage shall be justification to shut the work down until adequate procedures and resources are provided to resolve the problem. Asphalt concrete found deficient in temperature shall be rejected and removed from the job site at no cost to the contracting agency.

321.8.2 JOINTS:
Is revised to include:

Unless otherwise approved by the Engineer, mainline paving shall be done prior to side road matching, widenings, and turnouts. All longitudinal joints shall be raked and compacted and not vary more than *1/4 inch* vertically from adjacent new pavement.

321.8.4 COMPACTION: ASPHALT BASE COURSE AND SURFACE COURSE:
First paragraph, is revised to read:

It is the contractor's responsibility to perform Quality Control monitoring and/or testing during compaction operations to achieve the required compaction. The temperature of the asphalt concrete immediately behind the laydown machine shall be at least 275 degrees F. A probe type electronic thermometer with a current calibration sticker attached will be used to measure the temperature of the asphalt concrete mixture. When measuring the temperature of the mat, the probe shall be at a point 1 inch below the surface at the point of delivery and as horizontal as possible to the mat. The minimum placement temperature may need to be increased if material is found unworkable by the Engineer. The contractor is responsible for achieving the required compaction.

321.8.4 COMPACTION: ASPHALT BASE COURSE AND SURFACE COURSE:
Fourth paragraph, is revised to read:

The Contractor shall determine the equipment and pattern of rolling that will provide the proper compaction, cost of which shall be considered incidental to the asphaltic concrete pay items. The Engineer will determine the acceptability of the pavement compaction in accordance with Section 321.10 of the MAG Standard Specifications.

321.8.5 SMOOTHNESS:
Is revised to read:

The completed surfacing shall be thoroughly compacted, smooth, true to grade and cross-section, of uniform texture and appearance, and free of ruts, humps, roller marks, depressions or irregularities. An acceptable surface shall not vary more than *one-fourth (1/4) inch* from the lower edge of a *12-foot straightedge* when the straightedge is placed parallel and perpendicular to the centerline of the roadway.

321.11 REFEREE:
Is revised to include:

If necessary, the Owner shall engage an accredited independent, third-party materials testing laboratory which shall perform a new set of acceptance tests representing the area or set of tests in question. Payment for the referee testing shall be the responsibility of either the Owner or the Contractor, depending on the new results. If the referee testing results are found to confirm the Quality Control results, as determined by the Contractor's Quality Control Engineer, then the Owner shall be responsible for the costs of the referee testing. Otherwise, the Contractor is responsible for covering the additional testing costs. The results of these referee determinations will be binding to both the Contractor and the Owner.

321.13 PAYMENT:
Is revised to read:

All work under this item for this project shall be measured and paid for per the contract unit price per square yard (SY), inclusive of all labor, material, equipment, and incidentals necessary to complete the work. Payment shall be made proportionate to the agreed upon percentage of work complete at the end of the period as invoiced.

MAG SECTION 329 – TACK COAT

329.7 PAYMENT:
Is revised to read:

No separate payment will be made for tack coat; all associated work and material for tack coat application shall be considered incidental to the contract.

MAG SECTION 401 – TRAFFIC CONTROL

401.1 DESCRIPTION:
Is revised to read:

All Traffic Control shall be in accordance with Section 401 of the MAG Standard Specifications and the **Manual on Uniform Traffic Control Devices, 11th Edition (MUTCD)**, U.S. Department of Transportation, Federal Highway Administration, and all subsequent revisions thereto and as modified herein shall consist of furnishing, installing, maintaining, moving and removing barricades, warning signs, lights, signals, cones, and other traffic control devices, including construction signing of detour routes to provide safe and efficient passage through and/or around the work for movement of traffic through construction zones and to protect workmen in or adjacent to the work zone. The requirements of the MUTCD shall be considered as the minimum standards for the protection of workmen and the traveling public.

401.4 TRAFFIC CONTROL MEASURES:
Is revised to include:

The Contractor is required to provide a Work Plan with a detailed Traffic Control Plan, Phasing Plan, and Property Access Plan per MAG Specification Section 401. This plan shall be submitted to the Engineer for review and approval.

At all times, the Contractor shall conduct the construction activities to safeguard pedestrians and vehicular access in the vicinity of the project. All holes or trenches left open adjacent to the roadway and within the clearance of the road shall be protected by TCB and if left overnight, shall be surrounded by Type II barricades with Type A flashing warning lights, connected by warning tape or rope, as directed by the Engineer. The Contractor shall provide coverings or some other protection over holes satisfactory to the Engineer. There will be no direct measurement or additional payment for providing coverings or the warning tape, Type II barricades or rope, the costs being considered as included in the original cost of the contract.

The contractor shall maintain access to the local fire department driveways at all times. Accesses to the neighborhood roads may be restricted with one-week advance notice to the residents and an approved detour plan. The contractor shall maintain at least one lane of traffic in each direction at all times on Shadow Mountain Drive.

401.5 GENERAL TRAFFIC REGULATIONS:
Sixth paragraph is revised to read:

Vehicular access shall be maintained to developed properties at all possible times. Full closure of any roads within this project will not be permitted. However, limited 15-minute increments closures will be permitted. When access must be restricted for construction, the Contractor shall give written notice to each affected resident, business, and association not less than one (1) week in advance.

The contractor shall maintain one lane of traffic in both direction during construction operation hours. Any operations requiring lane closures will be accomplished with the use

of flaggers and pilot vehicles, if needed, at which the maximum traffic cycle time is 5 minutes. Cycle time is the time that any vehicle is delayed by the lane closure and flagging operation. Pilot vehicles used during paving and other roadway projects shall be clearly marked, be equipped with warning lights, and be in radio communication with flaggers at each end of the traffic control area. Traffic control shall be maintained in accordance with the manual on uniform traffic control devices (MUTCD). Lane closures are only allowed during work hours. One travel lane in each direction is required at the completion of that day's work unless other arrangements are approved by the engineer. During non-working hours the contractor shall delineate the center line with vertical panels.

A separate traffic control plan will be required for the work done within the roundabout. The contractor will have to have to pay special attention to protect the improvements under live traffic within the roundabout.

401.6 METHOD OF MEASUREMENT:
First paragraph is revised to read:

Traffic control shall be measured as a Lump Sum (LS) item and shall include all items, materials, equipment, workmen, devices, facilities and work necessary to provide adequate traffic control and detours as specified in the Traffic Control Plan and as directed by the Engineer.

401.7 PAYMENT:
Is revised to read:

All work under this item for this project shall be included as a component of the overall lump sum contract amount, inclusive of all labor, material, equipment, and incidentals necessary to complete the work. Payment shall be made proportionate to the agreed upon percentage of work complete at the end of the period as invoiced.

MAG SECTION 405 – SURVEY MONUMENTS

405.1 DESCRIPTION:
Is revised to include:

Plans identify some survey monuments to remain in place and shall be protected. If the existing monuments are found to be too close to the existing grade that they cannot be protected in place, notify the Engineer before removing the monuments and replacing them with a Type A monument. The Contractor is to prepare a Record of Survey (ROS) for the monuments that are set and record it with the Coconino County Recorder office. The cost of the ROS is incidental to the setting of the monuments.

405.5 PAYMENT:
Is revised to read:

All work under this item for this project shall be measured and paid for per the contract unit price, inclusive of all labor, material, equipment, and incidentals necessary to complete the work. Payment shall be made proportionate to the agreed upon percentage of work complete at the end of the period as invoiced. The ROS is to be recorded with the Coconino County Recorder prior to final payment.

MAG SECTION 430 – LANDSCAPING AND PLANTING

430.7 NATIVE SEED:
Is revised to read:

Supply and placement of grass seed mix shall be per the Coconino County Seeding Specification, included herein as Attachment A. The work shall include the supply and transport of all labor, material, and equipment required for soil preparation, furnishing, and placing seed as shown on the plans and to the requirements of the seeding specification.

430.8 DECOMPOSED GRANITE AREA:
Replace with the following:

Decomposed granite shall be free of lumps or balls of clay and shall not contain calcareous coatings, organic matter, overburden soils, or any other foreign substances. All material shall be from a single production source and shall present a uniform appearance throughout the project. Color of decomposed granite shall be “Black Cherry.” Inert mulch size gradation shall be 3/4-inch screened.

The Contractor shall supply to the Engineer, at least seven days in advance of supply or delivery of inert mulch, a typical sample of the material from the source proposed for use on the project together with gradation test results for the sample submitted. The Engineer shall review the submitted test results and either approve the source for use or reject the material as not in compliance with these Specifications. Upon approval of the source by the Engineer, actual materials delivered to the project shall not vary from the limits specified above.

Weed barrier fabric shall be Reemay Typar Type 3301 (12 mil) or approved equal. The Contractor shall supply to the Engineer, at least seven (7) days in advance of supply or delivery of weed barrier fabric a typical sample of the material proposed for use on the project. Weed barrier fabric shall be black or dark gray in color.

Contractor shall obtain approval of subgrade prior to installing decomposed granite. Fine grade and rake smooth <u>all areas prior to applying weed barrier and spreading inert decomposed granite.</u>

Weed barrier fabric shall be placed in all areas to receive decomposed granite. Weed barrier fabric shall be placed according to manufacturer's recommendations. Place to minimize seams. Minimum overlap at seams shall be 6 inches.

Place decomposed granite in a single 3 inch lift. Water to settle and rake surface smooth.

Unless otherwise specified, decomposed granite shall be measured by the square foot, in place, including subgrade preparation, weed barrier, placement, and finish grading.

The quantities measured as provided above will be paid for at the contract price per square foot for furnishing and placing decomposed granite. Said price shall be full compensation for the complete item as described and specified.

430.10 MEASUREMENT AND PAYMENT:
Is revised to read:

SUPPLY & PLACE GRASS SEED MIX shall be measured and paid on a per acre basis as determined from the plans and shall include all other areas disturbed by construction operations. Site preparation shall be incidental to those operations, and no separate payment will be made. No payment will be made for areas seeded with unapproved seed. No adjustment in payment will be made for the number of seeding mobilization activities.

Final payment will be made after determination of seeding establishment by the County.

The accepted quantities of seeding, measured as provided above, will be paid for at the contract price for the pay unit specified in the bidding schedule, complete in place.

No direct measurement or payment will be made for the preservation or repairs of seeded areas.

SECTION 540 – Bridge Deck Crack Seal

Modified to ADD:

540.1 DESCRIPTION
Bridge deck crack seal shall include all material and labor needed to epoxy inject all the bridge deck cracks greater than and equal to 1/16 – inches wide.

540.2 GENERAL
Prior to the installation of the Methacrylate seal, the contractor shall use an epoxy injection material on the ADOT Approved Projects List, Section 1015 Epoxy Resin Adhesive, to repair all bridge deck cracks greater than and equal to 1/16-incehs wide. The Contractor shall follow the product manufactures specifications and recommendations of the preparation of the surface prior to the installation of the epoxy resin. At a minimum the

contractor shall sweep the surface, blow out the cracks, using compressed air, and ensure the surface is dry prior to installing the epoxy crack repair material.

540.3 MEASURMENT

Bridge deck crack sealing shall be measured by the total square yard of the bridge deck being crack sealed.

540.4 PAYMENT

Payment for bridge deck crack sealing shall be on a square yard basis and shall include all the labor, equipment, materials, and work associated to crack sealing the bridge deck as stated above.

SECTION 541– PENETRATING DECK SEALER (METHACRYLATE):

Modified to ADD:

541.1.0 Description:

The work under this Item shall consists of furnishing and applying a methacrylate penetrating crack seal material (hereinafter called sealant material) on the entire bridge deck, approach slabs, and anchor slabs in accordance with the requirements of the project plans, the manufacturer's recommendations, and the requirements of these specifications.

541.2.0 Materials:

541.2.01 High Molecular Weight Methacrylate:

The penetrating crack sealer material shall be a two-component, low viscosity, 100 percent solids, high molecular weight methacrylate (HMWM) penetrating crack sealer conforming to the physical and performance requirements shown in Table 1.

Table 1	
Material Requirements of High Molecular Weight Methacrylate (HMWM) Crack Sealers	
Viscosity, ASTM D2196	25 cP (or less)
Tack Free Time, ASTM D1640	< 400 minutes (6.67 hours)
Compressive Yield Strength, ASTM D695	2500 psi 2-day minimum
Flash Point, ASTM D3278	180°F minimum
Tensile Strength, ASTM D638	1500 psi minimum

The contractor shall review and follow all of the manufacturer's recommendations on how to use and mix the products.

541.2.02 Broadcast Sand:

Provide a commercial-quality, dry-blast sand for a skid resistance surface. The size of the sand shall be such that 95 percent or more shall pass the No. 8 sieve, and 95 percent or more shall be retained on the No. 20 sieve.

541.3.0 Safety and Construction Requirements:

The application of sealant material shall not begin until the completion of the bridge deck repair work and the bridge deck has cured.

Prior to start of the work, the contractor shall submit a safety plan for use of the penetrating crack sealers. The plan shall identify personnel that have been trained by the manufacturer in the handling, transport, and mixing of the penetrating crack sealer. Personnel who have not been trained by the manufacturer shall not handle, transport, or mix the material, but may apply the crack sealer only under the direct supervision of manufacturer trained personnel. The manufacturer training shall include the following topics:

1. Proper handling, storage, and waste disposal methods to eliminate fire, reactivity and explosion hazards and protect personnel from injury caused by exposure to and contact with the components of the material.

2. Use of effective protective clothing, especially aprons, gloves, goggles, respirators, emergency devices, and adequate ventilation in storage areas.

3. Training in safe work habits, first aid procedures, effective measures for coping with emergencies, and accidents.

The safety plan shall identify the location of storage, the method of transporting the material to the project location, the proposed mixing location, and the mixing procedure to be used at the project site.

The safety plan shall identify processes and precautions used to protect the public. This may include controlling temperatures for storage of the product, protective clothing, equipment used in the handling and application of the material, the transportation procedures, the transportation routes, safety protection plan in the event of a spill, fire, or required clean-up, and maintaining sound safety practices.

The Engineer will review the safety plan for use of the penetrating crack sealer products and will either approve it or return it to the contractor for corrections no more than 10 working days after receipt. The contractor shall then modify the safety plan, if necessary, and resubmit to the Engineer within five working days. The contractor shall allow five working days for each subsequent review. The contractor shall not commence work until

the safety plan has been approved. No increase in contract time will be granted for the contractor's failure to provide acceptable submittals of the safety plan.

The contractor shall follow the approved safety plan. If it is determined by the Engineer that the measures taken by the contractor are inadequate to provide for public safety, the contractor shall revise his operation. No further work shall be performed associated with the penetrating crack sealer until the public safety measures are adequate and, if required, a revised safety plan has been approved.

Application equipment shall be as recommended by the manufacturer. The spray equipment, tanks, hose, brooms, rollers, coaters, squeegees etc. shall be thoroughly cleaned, free of foreign matter, oil residue and water prior to applying the penetrating crack sealer to the bridge deck.

If the concrete deck requires repair, crack sealing shall not begin until all concrete deck repairs and any other corrective actions needed have been completed, and the repaired concrete has cured. The contractor shall furnish the Engineer with written instructions for surface preparation requirements, and a representative of the manufacturer shall be present to ensure that the surface condition meets the manufacturer's requirements.
All surfaces to be treated shall be thoroughly cleaned to remove dust, dirt, oil, wax, curing components, efflorescence, laitance, coatings, and other foreign materials. Cleaning equipment shall be fitted with suitable traps, filters, drip pans and other devices to prevent oil and other foreign material from being deposited on the concrete surface. The manufacturer or manufacturer's representative shall approve the use of chemicals and other cleaning compounds to facilitate removal of these foreign materials before use. All surfaces to be treated shall meet the manufacturer's requirements for surface condition prior to crack sealer application.

The penetrating crack sealer treatment shall be applied within 48 hours following surface preparation.

The concrete surface and ambient temperature during application shall be in the range of 50 degrees F to 90 degrees F unless otherwise approved by the Engineer or as specified by the manufacturer. The application temperature may affect the curing properties of the materials.

The sealer shall be applied at the application rate specified by the manufacturer. If a manufacturer application rate is not specified, the application rate shall not be less than 80 square feet per gallon. The material shall be spread evenly across the surface of the concrete in a manner to prevent puddles or excessive concentrations of material in small areas. If the applicator is unable to complete the entire application continuously, the location where the application was stopped shall be noted and clearly marked.

When applying the treatment, the contractor shall protect the adjoining surfaces of the structure that are not to be sealed by masking them off or by other means.

A system approved by the Engineer shall be used to provide a watertight seal for existing bridge joints and bridge drainage systems. Care shall be taken to not damage the water tight systems, during construction operations.

Broadcast sand shall be applied following the placement of a penetrating crack sealer on the bridge decks, approach slabs, and anchor slabs. Broadcast sand shall be applied within the period of time and at the rate recommended by the manufacturer. If there is no manufacturer recommended period of time for application of broadcast sand; the sand shall be applied within 20 minutes of penetrating crack sealer placement. If there is no manufacturer recommended application rate for broadcast sand; the rate of application shall be 2 pounds per square yard. If the sand does not adhere to the sealer, an additional application shall be made. All non-adhered sand shall be removed from the bridge deck, approach slabs, and anchor slabs by power sweeping. All non-adhered sand shall be removed from the bridge deck joints by vacuuming the joints.

Vehicular traffic shall only be allowed on the treated deck after meeting manufacturer's requirements and upon approval by the Engineer.

Areas of penetrating crack sealer not applied according to the manufacturer's recommendations or the specifications shall be removed and replaced at no cost to the Department.

541.4.0 Method of Measurement:

Penetrating Deck Sealer (Methacrylate) item will be measured by the square yard of bridge deck covered with sealant material.

541.5.0 Basis of Payment:

The accepted quantities of Penetrating Deck Sealer (Methacrylate) item, measured as provided above, will be paid for at the contract unit price per square yard, which price shall be full compensation for the work, complete in place, as shown on the project plans, as specified herein, and as directed by the Engineer.

No additional payment will be made for the development and preparation of the program for public safety associated with the use of the sealant material, the cost being considered as included in the price of the contract item.

No additional payment will be made for broadcast sand, the cost being considered as included in the price of the contract, regardless of how many applications the contractor applies in order for the sand to adhere to the sealer.

MAG SECTION 621 – CORRUGATED METAL PIPE AND ARCHES

621.1 DESCRIPTION:
Is modified to include:

Shadow Mountain Road has existing culverts along each side of the road at intersections leading to residential areas. The contractor is responsible to clean the culverts of sediment and debris to provide positive drainage through the culvert. This includes restoring the existing inlet and outlet aprons.

Existing Culvert crossings with damaged end sections and settlement build up have been identified for repair and maintenance to provide more efficient drainage. Culverts that have been identified as needing repair will require removal and/or replacement of up to 5' of pipe and installation of new end sections with riprap aprons graded to blend into the existing drainage channel.

Culverts that have been identified to remain shall be protected in place. Contractor shall ensure that culvert has protection during construction. Any irreversible damage to culvert(s) shall require the contractor to replace culvert(s) at their own expense. Existing culverts to remain in project shall be cleaned out to allow for proper drainage; this effort shall be incidental to the culvert line items.

621.5 MEASUREMENT:
Is revised to include:

The quantity for culvert maintenance and culvert repair will be per culvert and includes both the inlet and outlet.

621.6 PAYMENT:
Is revised to include:

All work under this item for this project shall be measured and paid for per the contract unit price specified in the bidding schedule (each), complete in place. Pay item shall be inclusive of all labor, material, equipment, and incidentals necessary to complete the work. Payment shall be made proportionate to the agreed upon percentage of work completed at the end of the period as invoiced.

MAG SECTION 702 – BASE MATERIALS

702.1 GENERAL:
Is modified to include:

The aggregate base course will be clean, free of organic matter, and be of such a nature that it can and will be compacted to a dense, firm layer capable of supporting loaded

trucks and self-propelled pavers without rutting. Volcanic cinders shall not be used for base materials.

MAG SECTION 705 – PORTLAND CEMENT TREATED BASE:

705.1 GENERAL:

First sentence replaced with:

The cement treated base shall consist of milled asphalt/aggregate base course, cement and water.

MAG SECTION 710 – ASPHALT CONCRETE)

710.1 GENERAL:

Second paragraph, second sentence is revised to read:

Each mix shall be designed using Marshal methods.

Is revised to include:

The mix designations are High Traffic 1/2” mix High Traffic for asphalt concrete in this project.

710.2.1 ASPHALT BINDER:

Is revised to read:

The asphalt binder specified in this section has been developed for use in mountain climate conditions, such as this project. The asphalt binder shall be Performance Grade Asphalt conforming to the requirements of Section 720, of these special provisions, for PG 64-28TR+, unless otherwise approved by the Engineer or specified differently in the plans or special provisions.

710.2.2 AGGREGATE:

Second paragraph, is revised to read:

Coarse aggregate for hot mix asphalt is material retained on or above the No. 4 sieve and Fine aggregate is material passing the No. 4 sieve. Aggregates shall be relatively free of deleterious materials, volcanic cinders, clay balls, and adhering films or other material that prevent coating with the asphalt binder. Coarse and Fine aggregates shall conform to the following requirements when tested in accordance with the applicable test methods.

710.2.3 RECLAIMED ASPHALT PAVEMENT (RAP):

Section to be removed.

No RAP with terminal blend mix.

710.3 MIX DESIGN REQUIREMENTS:
710.3(5) to be removed

710.3.2 MIX DESIGN CRITERIA:
Is revised to read:

The mix design shall be performed by Marshall Mix Design per 710.3.2.1. The 1/2" mix design criteria outlined in Table 710-3 shall be used. A minimum of 4 points will be used to establish the mix design results. The oven aging period for both Marshall and Gyratory mix design samples shall be 2 hours.

710.3.2.1 MARSHALL MIX DESIGN:
Is revised to include:

The percent of asphalt range for half (1/2) inch asphaltic concrete shall be between five and three-tenths percent (5.3 %) to six percent 6%. The asphalt cement content shall be considered acceptable if it is within -0.30% or +0.40% of the mix design target value

SECTION 720 TERMINAL BLEND ASPHALT CONCRETE MATERIALS:

720.1 Bituminous Material Requirements:

720.1.01 Asphalt Cement:

Terminal blend asphalt binder, PG 64-28 TR+, shall be a performance grade (PG) asphalt binder conforming to the requirements of AASHTO M 320 and Table 720-1 and 720-1a. Air blown/oxidized asphalt and recycled engine oil bottom (REOB) will not be accepted. Polyphosphoric acid (PPA) modification shall be limited to a maximum of 0.50 percent.

If, during asphaltic concrete production, it is determined by testing that asphalt cement fails to meet the requirements for the specified grade, the asphaltic concrete represented by the corresponding test results shall be evaluated for acceptance. Should the asphaltic concrete be allowed to remain in place, the contract unit price for asphalt cement will be adjusted by the percentage shown in table 720-1. Should the asphalt cement be in reject status, the contractor may, within 15 days of receiving notice of the reject status, supply an engineering analysis of the expected performance of the asphaltic concrete in which the asphalt cement is incorporated. The engineering analysis shall detail any proposed corrective action and the anticipated effect of such corrective action on the performance. Within three working days, the Engineer will determine whether or not to accept the

contractor's proposal. If the proposal is rejected, the asphaltic concrete shall be removed and replaced with asphaltic concrete meeting the requirements of the specifications at no additional expense to the Department. If the contractor's proposal is accepted, the asphaltic concrete shall remain in place at the applicable percent of contract unit price allowed, and any necessary corrective action shall be performed at no additional cost to the Department. 720.1.07 Requirements:

720.1.07 Requirements:

Requirements for bituminous materials shall conform to the requirements of Table 720-1, 720-1a and 720-1b.

Table 720-1
Terminal Blend rubberized binder (64-28 TR+) Adjustment Table

Test Property	AASHTO Test Method	Test Result	Percent of Contract Unit Price Allowed
Dynamic Shear of Original Binder: G*/Sin δ, kPa	T 315	≥1.00 0.90-0.99 0.70-0.89 < 0.70	100 95 85 70 (1)
Dynamic Shear of RTFO Binder: G*/Sin δ, kPa	T 315	≥ 2.20 2.00-2.19 1.60-1.99 < 1.60	100 95 85 70 (1)
Dynamic Shear of PAV Binder: G*Sin δ, kPa	T 315	≤ 5000 5001-5500 5501-7000 7001-8000 > 8000	100 95 85 75 65 (1)
Creep Stiffness of PAV Binder: S, Mpa	T 313	≤ 300 301-330 331-450 451-600 > 600	100 95 85 75 65 (1)
m-value at 60 sec.	T 313	≥ 0.300 0.270-0.299 0.230-0.269 < 0.230	100 95 80 65 (1)

Notes:
(1) Reject Status: The pay adjustment applies if allowed to remain in place.

(2) Specified properties in AASHTO M 320 for flash point, viscosity at 135 °C, and mass loss are not considered performance related. Specification deficiencies for

these properties shall be cause for a work stoppage until specification properties are met but will not be cause for a pay adjustment.

(3) Should the bituminous material be deficient on more than one property, the pay adjustment will be the greatest reduction to the contract unit price specified considering individual test results.

(4) The information presented in this table does not apply to asphalt cement used for tack coats.

TABLE 720-1a
Terminal Blend rubberized binder (64-28 TR+)

Test Property	Test Method	Requirement	Test Result	Percent of Contract Unit Price Allowed
Solubility, %, minimum	ASTM D7553 or ASTM 2042	98	-----	-----
Softening Point, ºC, minimum	AASHTO T 53	50	>50 47-49 <47	100 80 70 (1)
Elastic Recovery, @ 10 ºC, %, minimum	AASHTO T 301	75	75 70 - 74 < 70	100 80 65 (1)
Phase Angle (δ), @ 64 ºC @ 10 rad/sec, degrees, maximum	AASHTO T 315	75	≤ 75 76-83 > 83	100 85 65 (1)

(1) Reject Status: The pay adjustment applies if allowed to remain in place

Notes:

In case of dispute, ASTM D2042 shall be used to determine the Solubility.

The asphalt binder shall contain a minimum of 8 percent crumb rubber and a minimum of 3 percent SBS (styrene-butadiene-styrene) polymer.

The crumb rubber shall be derived from processing whole scrap tires or shredded tire materials. The tires from which the crumb rubber is produced shall be taken from automobiles, trucks, or other equipment owned and operated in the United States. The processing shall not produce, as a waste product, casings or other round tire material that can retain moisture when stored or disposed of above ground.

Modified binders shall be blended at the source of supply and delivered as a homogenous mixture to the job site.

Modified Binders stored at the asphalt concrete mixing plant for more than two weeks or beyond the supplier recommended shelf life, whichever is less, shall be sampled and tested.

The pressure aging temperature for PG 64-28 TR+ asphalt binder shall be 100 ºC

Table 720-1b
Other Requirements

Grade of Asphalt Specifications Designation	Range of Temperatures for Application by Spraying, °F (Not applicable for Plant Mixing)	Range of Aggregate Temperatures for Plant Mixing, °F	Basis of Conversion, Average Gallons Per Ton at 60 °F
Paving Asphalt PG 64-28 TR+	275 - 400	---------	235

SECTION 920 - WATERBORNE PAVEMENT MARKINGS – ADOT SECTION 708 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION:

Is revised to read:

920.1 DESCRIPTION:

The work under this section shall consist of cleaning and preparing the pavement surface, furnishing all materials and applying white or yellow, water-borne, fast-dry or rapid-dry traffic paint, and reflective glass beads at the locations and in accordance with the details shown on the plans, MUTCD, the requirements of these specifications, or as directed by the Engineer.

920.2 MATERIALS:

920.2.01 PAVEMENT MARKING PAINT:

(A) General:

All material used in the formulation of the pavement marking paint shall meet the requirements specified herein. Any materials not specifically covered shall meet the approval of the Engineer.

Only waterborne traffic paint that has been reviewed, evaluated, and approved by the ADOT Product Evaluation Program or equal, prior to the bid opening of each respective project, shall be used.

Copies of the most recent version of the Approved Products List (APL) are available on the internet from the ADOT Research Center through its Product Evaluation Program.

Certificates of Compliance shall be submitted along with precertification test results from the ADOT Central Laboratory for samples from each batch of material obtained for precertification at the production line of the manufacturer.

(1) Waterborne Pavement Marking Paint: Type I (Standard):

Type I (Standard) waterborne pavement marking paint shall be the traffic paint for long line and short line striping, arrows, symbols, and legends. Type I shall be used:
(A) At the end of the construction work shift if the roadway is open to traffic over an intermediate layer of pavement while the final lift or layer of pavement has not been placed yet;
(B) As a primer on the final lift or layer of pavement 30 days prior to the application of the durable pavement marking materials; and
(C) Final striping of Chipseal placement, and PMAC place. Two applications of waterborne paint will be required, allowing 20 to 30 days between applications. Type I paint shall be capable of performing as specified herein when subjected to high traffic volumes and severe wear conditions such as repeated crossing, starting, stopping, and turning movements.

(B) Composition Requirements:

The pavement marking paint shall be a ready-mixed, one component, waterborne traffic line paint of the correct color, to be applied to either asphaltic or Portland cement concrete pavements. The composition of the paint shall be determined by the manufacturer. It will be the manufacturer's responsibility to produce a pigmented waterborne paint containing all the necessary co-solvents, dispersant, wetting agents, preservatives and all other additives, so that the paint shall retain its viscosity, stability and all of the properties as specified herein.

Lead concentrations shall not exceed 0.009 percent by weight (90 ppm) using test method ASTM D3335.

The manufacturer shall certify that the product contains no detectable concentrations of:

Antimony, Arsenic, Cadmium, Mercury, Chromium, Inorganic, Chromium, Hexavalent, Toluene, Chlorinated solvents, Hydrolyzable chlorine derivatives, Ethylene-based glycol ethers and their acetates,
and/or A carcinogen as defined in 29 CFR 1910.1200.

(C) Manufacturing Formulations:

The manufacturer shall formulate the pavement marking paint in a consistent manner and notify the Engineer of any change of formulation. The formulation of the paint shall be determined by the manufacturer. It will be the manufacturer's responsibility to formulate paint which will meet the quantitative and qualitative requirements of this specification. Any change in the formulation of the paint shall be approved by the Engineer.

(D) Quantitative Requirements of Mixed Paints:

Table 920-1

	White	Yellow
Pigment: Percent by weight, ASTM D3723, Allowable variation from the qualifying sample	± 2.0	± 2.0
Non-Volatile Content/Non-Volatile Vehicle: Percent by weight, ASTM D2369, Allowable variation from the qualifying sample	± 2.0	± 2.0
Viscosity: Krebs Units at 77 ± 1 °F, ASTM D562	70 - 85	70 - 85
Weight per Gallon: Pounds per gallon 77 ± 1 °F, ASTM D1475, Allowable variation from the qualifying sample	± 0.3	± 0.3
Vehicle Composition: Vehicle Infrared Spectra, ASTM D2621, Allowable variation from the qualifying sample	None	None
PH: ASTM E70, Allowable variation from the qualifying sample	± 1.0	± 1.0
Fineness of Dispersion: HEGMAN, minimum, ASTM D121	3.0	3.0
Volatile Organic Compounds: Pounds per gallon of paint, maximum, ASTM D3960 according to 7.1.2.	2.1	2.1
Flash Point: Degrees F., minimum, ASTM D93, Method A	100	100
Dry Time to No Pick Up: With no beads: minutes, maximum, ASTM D711	10	10
Dry Through Time: Minutes, ASTM D1640 except no thumb pressure is used when thumb is rotated 90° on paint film	20	20
Flexibility: ASTM D522, Method B: Flexibility shall be tested per ASTM D522, Method B. Draw down the paint to a wet film thickness of 0.005 inches (0.13mm) on a clean bare coldrolled steel panel. Air-dry for 24 hours at standard conditions then bake for 5 hours at 221 °F ± 3 °F (105 °C ± 2 °C) and finally condition the panel for 30 minutes at standard conditions. When tested as specified the paint film shall not crack, chip,	Pass	Pass

or flake after the test panel is bent over a ½ inch (13 mm) diameter, cylindrical mandrel		

(E) Qualitative Requirements:

(1) Color of Yellow Paint:

The color of the yellow paint shall closely match Federal Standard 595b, Color No. 33538.

(2) Dry Opacity:

Dry opacity for the paint will be determined using a black-white Leneta Chart, Form 2C Opacity, or equal, and a calibrated reflectance meter capable of determining reflectance to the nearest 1 percent. Using a 10 mil gap doctor blade, a film of paint is drawn down, covering both black and white portions of the chart on a vacuum plate. The film shall be allowed to dry 24 hours. After calibrating the meter according to the manufacturer's instructions, measure the reflectance over the white and black portions according to the manufacturer's instructions. Dry Opacity for both white and yellow paint shall be at least 0.90.

(3) Yellowness Index:

Yellowness Index for white paint will be determined as described for dry opacity, only use a 15-mil gap doctor blade to draw down the paint. Calculate the Yellowness Index in accordance with ASTM E313. Yellowness Index for the white paint shall be a maximum of 10.

(4) Reflectance:

Reflectance for both white and yellow paint will be determined using the same 15-mil draw-down film as for the Yellowness Index. For white paint the same sample may be utilized for both the Yellowness Index and Reflectance. Measure the reflectance of the paint film using the reflectance meter according to the manufacturer's instructions. Reflectance for the white paint shall be at least 85. Reflectance for the yellow paint may range from 42 to 59, inclusive.

(5) UV Color Durability:

UV Color Durability shall be determined using a QUV Weatherometer, with Ultra Violet Light and Condensate Exposure according to ASTM G154, for 300 hours total. The repeating cycle shall be four hours UV exposure at 140 degrees F (60 degrees C) followed by four hours condensate exposure at 104 degrees F (40 degrees C). After 300 hours of exposure, the Yellowness Index for white paint shall not exceed 12, and yellow paint shall closely match Federal Standard 595b, Color No. 33538.

(6) Static Heat Stability:

To determine static heat stability for the paint, place 1 pint of paint in a sealed can and heat in an air circulation oven at 120 ± 1 degrees F (49 degrees C) for a period of one week. Remove the paint from the oven and check the viscosity in Krebs Units at 77 ± 1 degrees F (25 degrees C) according to ASTM D562. The viscosity measured shall be in the range from 68 to 90 Krebs Units, inclusive. Also, check for any signs of instability.

(7) Heat-Shear Stability:

To determine heat-shear stability for the paint, 1 pint of the paint is sheared in a Waring Blender at high speed to 150 degrees F (66 degrees C). The blender should have a tight-fitting lid taped onto it to minimize volatile loss. When the paint reaches 150 degrees F (66 degrees C), stop the blender, immediately pour the paint into a sample can, and apply a cover to seal the can. Let the paint cool overnight and examine for jelling or other signs of instability. Measure viscosity in Krebs Units at 77 ± 1 degree's F (25 degrees C), according to ASTM D562. The viscosity measured shall be in the range from 68 to 95 Krebs Units, inclusive. If not within the upper limit, run total solids on the sheared paint and adjust solids, if necessary, by adding water to reach the original solids content. If the solids content requires adjustment, again check the viscosity of the paint. The viscosity shall be in the range from 68 to 95 Krebs Units, inclusive.

(8) Scrub Resistance:

Scrub Resistance will be determined according to ASTM D2486. Use an appropriate doctor blade to provide a dry film thickness of 3 to 4 mils. Allow the paint to cure for 24 hours. Perform the scrub resistance test at 77 ± 1 degrees F (25 degrees C) and 50 ± 5 percent humidity. Record the number of cycles to remove the paint film. The number of cycles recorded shall be at least 800.

(9) Spraying Properties:

The paint shall be applied, in the field, at a 25 mils wet film thickness for Type I. Type I paint shall show the following properties at ambient temperatures of 50 to 100 degrees F (10 to 38 degrees C) with paint spray temperature of 150 degrees F (66 degrees C), maximum.

For Type I paint, 6 to 10 pounds of Type 1 beads shall be post-applied per gallon of paint. Beads shall conform to subsection 708-2.02 of the specifications.

(a) For rapid-dry paint applied in a mobile operation and not protected by temporary traffic control, dry to a
(b) For fast-dry paint applied within an established work zone behind temporary traffic control, dry to a no track condition in five minutes or less when the line is crossed over in a passing maneuver with a standard-sized automobile.
(c) Produce a clean-cut, smooth line with no overspray or puddling.

(d) Paint immediately after application shall accept glass beads so that the spheres shall be embedded into the paint film to a depth of 50 percent of their diameter.

(e) Paint when heated to the temperature necessary to obtain the specified dry time, shall show no evidence of instability such as viscosity increase, jelling, or poor spray application.

(10) Freeze-Thaw Properties:

The paint viscosity or consistency shall not change significantly when the paint is tested for resistance to five cycles of freeze-thaw according to ASTM D2243.

(11) Road Service Rating:

Test stripes of the paint shall be applied transversely across the road,6 inches in width and approximately 12 feet long at a location approved by the Engineer.

Wet film thickness of the test stripes shall be approximately 25 mils for Type I as determined according to ASTM D4414 and ASTM D713 prior to test stripe application. To aid in obtaining the correct film thickness, a length of roofing paper placed by the side of the road can be used. Place a rigid metal test panel on the roofing paper in the path of a test line. Immediately after the test line is applied by the striper, measure the wet film thickness. If not satisfactory, adjust the spray pressure and repeat until the target wet film thickness is attained. It is important that no glass beads be present that would give a false wet film thickness. When the wet film thickness is correct, apply a test line across a tared metal test panel. After this, apply another test line across a different tared metal test panel, this time also adding the beads. These samples are necessary to determine the initial bead retention.

Glass beads conforming to the requirements of Subsection 708-2.02 of the specifications (moisture proof type) shall be applied after the paint has been applied, but during the same striping operation at a rate such that the initial bead retention on the test line is at least 6 pounds of beads per gallon of wet paint for Type I paint.

(12) Workmanship:

Paint shall be free from foreign materials, such as dirt, sand, fibers from bags, or other material capable of clogging screens, valves, pumps, and other equipment used in a paint striping apparatus.

The paint pigment shall be well ground and properly dispersed in the vehicle. The pigment shall not cake or thicken in the container, and shall not become granular or curdled. Any settlement of pigment in the paint shall result in a thoroughly wetbvted, soft mass permitting the complete and easy vertical penetration of a paddle. Settled pigment shall be easily redispersed, with minimum resistance to the sidewise manual motion of a paddle across the bottom of the container, to form a smooth uniform product of the

proper consistency. If the paint cannot be easily redispersed, due to excessive pigment settlement as described above or due to any other cause, the paint shall be considered unfit for use.

The paint shall retain all specified properties under normal storage conditions for 12 months after acceptance and delivery. The contractor shall be responsible for all costs and transportation charges incurred in replacing paint that is unfit for use. The properties of any replacement paint, as specified herein, shall remain satisfactory for eight months from the date of acceptance and delivery.

(F) Manufacturing Requirements:

(1) Inspection:

The manufacturer of the paint shall furnish the Engineer free access to all parts of the plant involved in the paint manufacture and shall furnish every reasonable facility for sampling both the paint and the raw materials during the process of manufacturing.

All materials used in formulation shall meet the requirements herein specified. Any materials not specifically covered shall meet the approval of the Engineer.

All manufactured paint shall be prepared at the factory ready for application.

When paint is shipped to a distributor or paint applicator who will store the paint prior to its use, the distributor or paint applicator shall furnish the Engineer free access to all parts of the facility where paint is stored and shall furnish every reasonable facility for sampling the paint.

Paint may also be sampled at the place of storage either at a warehouse or on the site prior to application of the paint. Application of the paint will not be permitted until the paint has been approved by the Engineer. It is the contractor's responsibility to notify the Engineer at least 14 working days prior to any traffic painting operation and to allow access at that time for paint sampling at the storage location.

At least one paint sample shall be obtained from each lot of paint.

Check-samples of finished paint while being applied will be taken at intervals as determined by the Engineer.

920.2.02 REFLECTIVE GLASS BEADS (SPHERES):

(A) General:

The term "glass bead" shall be synonymous with the term "glass sphere" as used herein.

The beads shall be manufactured from glass of a composition designated to be highly resistant to traffic wear and to the effects of weathering.

The glass beads shall be moisture-proof; contain less than 0.25 percent moisture by weight; and be free of trash, dirt, or other deleterious materials.

Beads shall be essentially free of sharp angular particles showing milkiness or surface scoring or scratching. Beads shall be water white in color.

Certificates of Compliance shall be submitted.

(B) Physical Requirements:

(1) Gradation:

The gradation for the drop-on beads shall conform to AASHTO M 247 Type 1

(2) Roundness:

Glass beads shall conform to AASHTO M 247, Type 1. Beads retained on any screen specified in the gradation requirements shall contain at least 80 percent true spheres.

(3) Index of Refraction:

Glass beads shall conform to AASHTO M 247, Type 1

(4) Specific Gravity:

The specific gravity of the beads shall be in the range 2.40 to 2.60 when tested in accordance with the following procedures:

Place 100 grams in an oven at 230 degrees F (110 degrees C) for one hour.

Remove beads and place in a desiccator until the sample is cool.

Remove approximately 60 grams of beads from the desiccator and weigh the sample accurately.

Pour the beads slowly into a clean 100-milliliter graduated cylinder containing 50 milliliters of isopropyl alcohol. Make certain that air is not entrapped among the beads.

The total volume reading on the graduated cylinder, minus 50, will give the volume of the beads. Calculate the specific gravity as follows:

Specific Gravity = Weight of the sample/Volume of the sample

(5) Chemical Stability:

Beads which show any tendency toward decomposition, including surface etching, when exposed to atmospheric conditions, moisture, dilute acids, or alkalis or paint film

constituents, may be required to demonstrate satisfactory reflectance behavior, prior to acceptance, under such tests as may be prescribed.

(6) Hazardous Constituents:

Each lot shall be tested for heavy metal concentration as specified in the following table, tested by an independent laboratory approved by the Engineer, using EPA Method 3052 and EPA Method 6010B.

Table 708-2	
Heavy Metal	Concentration
Arsenic	< 75 ppm
Antimony	< 75 ppm
Lead	< 0.009% by weight (90 ppm)

The manufacturer shall certify that the product contains no detectable concentrations of other hazardous constituents, including:

Cadmium, Barium, Mercury, Chromium, Inorganic, Chromium, Hexavalent, and/or A carcinogen as defined in 29 CFR 1910.1200.

(C) Bead Coating:

All glass beads shall have a moisture-proof adhesion enhancing overlay, consisting of a properly formulated material which prevents bead clumping and clogging and promotes proper embedment and adhesion to the applied paint. Water repellent material applied during the process of bead manufacture. The beads so treated shall not absorb moisture in storage and shall remain free of clusters and lumps and shall flow freely from dispensing and testing equipment.

The beads shall conform to AASHTO T 346.

920.3 CONSTRUCTION REQUIREMENTS:

920.3.01 EQUIPMENT:

The traffic paint and beads shall be placed on the pavement by a spraytype, self-propelled pavement marking machine except that temporary striping during construction may be placed with other equipment designed for application of paint and beads.

The application equipment to be used on roadway installation shall have, as a minimum, the following characteristic and/or apparatus:

(A) Capable of applying clear-cut lines of the width specified on the project plans;

(B) Equipped with a mechanical device capable of placing a broken reflectorized line with a 10-foot painted segment and a 30-foot gap; and

(C) Equipped with an air-operated glass bead drop-in dispenser controlled by the spray gun mechanism.

A glass bead dispenser which is capable of placing the glass beads into the paint line as the paint is applied to the pavement shall be utilized. This dispenser shall provide satisfactory marking and delineation.

920.3.02 APPLICATION:

Pavement markings shall be applied when the pavement surface is dry and the weather is not foggy, rainy, or otherwise adverse to the application of markings. The surface shall be free from excess asphalt or other deleterious substances before traffic paint, beads or primer are applied. The contractor shall remove dirt, debris, grease, oil, rocks or chips from the pavement surface before applying markings. The method of cleaning the pavement surface and removal of detrimental material is subject to approval by the Engineer and shall include sweeping and the use of high-pressure air spray. The placing of traffic markings shall be done only by personnel who are experienced in this work.

Painting shall not be performed when the atmospheric temperature is below 50 degrees F (10 degrees C) when using waterborne paint, nor when it can be anticipated that the atmospheric temperature will drop below 50 degrees F (10 degrees C) temperature during the drying period. Waterborne paints shall not be applied if rain is expected within one hour of its application, unless otherwise approved by the Engineer. Waterborne paint shall not be heated to a temperature greater than 150 degrees F (66 degrees C) to accelerate drying.

The volume of paint in place shall be determined by measuring the paint tank with a calibrated rod. At the discretion of the Engineer, if the striping machine is equipped with air-atomized spray units (not airless) and paint gauges, the volume of paint may be determined by utilizing said gauges.

The quantity of glass reflectorizing beads in place shall be determined by measuring the glass reflectorizing bead tank with a calibrated rod.

The contractor shall provide the necessary personnel and equipment to divert traffic from the installation area where the work is in progress and during drying time when, in the opinion of the Engineer, such diversion of traffic is necessary.

Painted markings placed below the final surface shall be placed immediately after a change in long-term traffic patterns/configurations, when the need arises, or as directed by the Engineer. On intermediate lifts of overlay projects, painted markings shall consist

of at least 4-inch wide by 4-foot long strips of reflective material, placed at 40 foot intervals. In situations involving severe degree of curvature, the Engineer may direct that the length and spacing be adjusted to 2 feet and 20 feet, respectively. These requirements apply to white lane lines separating traffic moving in the same direction and to yellow center lines for two-lane, two-way roadways in areas where passing is permitted. Painted markings shall be placed on each subsequent pavement course.

Curing compound shall be removed from new concrete surfaces before the placement of painted markings.

Tolerances for Placing Paint, Beads, and Primer:

(A) The length of painted segment and gap shall not vary more than 4 inches in a 40-foot cycle;
(B) The finished line shall be smooth, aesthetically acceptable and free from undue waviness;
(C) Painted lines shall be 4, 6, or 12 inches wide as shown on the plans with a tolerance of ± 1/8 inch and shall be placed at a minimum rate of 16 gallons per mile for a solid 4-inch line and 4 gallons per mile for a broken 4-inch line, based on a 10-foot stripe and a 30-foot gap (40-foot cycle aggregate);
(D) Glass reflectorizing beads shall be applied on the wet paint. For Type I paint, 6 to 10 pounds of Type 1 beads shall be post-applied per gallon of paint. And; and
(E) Wet thickness shall not be less than 25 mils wet film thickness for Type I, unless otherwise shown on the plans.

920.4 METHOD OF MEASUREMENT:

Pavement marking paint will be measured by the linear foot along the centerline of the pavement stripe. Skips in dashed lines will not be included in the measurement. Length of pavement markings will be based on the width of the stripe. Measurement for striping with a plan width greater or less than shown on the plans will be measured according to the width of the stripe placed.

Symbols and legends will be measured by each unit applied. Each legend, regardless of the number of letters, will be considered as a single unit.

920.5 BASIS OF PAYMENT:

Pavement striping of the type specified, measured as provided above, will be paid for at the contract lump sum price for the total project. The price shall be full compensation for the work, complete in place, including glass beads, as described and specified herein

and on the project plans. Pavement symbols and legends measured as provided above, will be paid for at the contract lump sum price the painted symbol or legend, which price shall be full compensation for the work, complete in place, including glass beads, as described and specified herein and on the project plans.

SECTION 922 – DRIVEWAY APRON CONSTRUCTION

Section added to read:

922.1 DESCRIPTION:

The work under this section shall consist of constructing a paved driveway apron as specified in the plans.

922.2 MEASUREMENT AND PAYMENT:

No payment will be made for Driveway Apron Construction since it is considered incidental to the asphalt shoulder paving. This includes cut, fill, import, export, shaping and compaction and the placement of asphalt concrete materials.

END OF SECTION

APPENDIX A: COCONINO COUNTY SEEDING SPECIFICATION

1.0 GENERAL CONDITIONS AND REQUIREMENTS

1.1 DESCRIPTION

The work shall include the supply and transport of all labor, material, and equipment required for soil preparation, furnishing, and placing seed as shown on the plans and to the requirements of this construction specification.

1.2 SCOPE OF WORK

1.2.1 Temporary Seed Mix

If required, prepare seedbed and seed all disturbed areas with Temporary seed mix once final grading is achieved.

1.2.2 Permanent Seed Mix

Prepare seedbed and seed all disturbed areas with Permanent seed mix once final grading is achieved. This task may consist of two applications of the Permanent seed mix. A second application may be required once success or failure of the first application has been determined by the County. The second application may occur over the previously prepared bed or require additional preparation at the discretion of the County.

1.3 SUBMITTALS

- Permanent seed mix utilized including composition percentages and application rates
- If required, Temporary seed mix utilized including composition percentages and application rates
- Seed labels and certified laboratory analysis results
- If Hydroseeding is utilized, the tacking agent swell volume test results

2.0 MATERIALS

2.1 SEED

2.1.1 Seed Certification Requirements

Seed shall be labeled in accordance with the state laws and the U.S. Department of Agriculture rules and regulations under the Federal Seed Act in effect. Supplier will provide seed label with certified laboratory results for seed lot mix. Analysis shall include seed purity and percent inert matter, percent other crop seeds, percent weed seeds and name of restricted and noxious weed species (see below), percent germination along with percent hard and dormant seed, and any information on the certification class of seed. No seed will be accepted with a test date of more than 9 months before the delivery date to the site. Seed that does not meet the standard identified below will not be accepted. Seed should not be ordered or arrive on site until certified laboratory results have been reviewed and approved by the County. Seed that has become wet, moldy, or otherwise damaged in transit or storage will not be accepted. Seed bag tags provide the information needed to verify the quality and amount of seed in the lot. Bag tags should remain on the bags for inspector's verification.

- Live seed material not specified in the seed mix (see tables below) shall not exceed one percent (1%) by weight of the total mixture.

- No weeds on the Arizona Department of Agriculture's Arizona Noxious Weed List (updated January 2020) are allowed in the seed mix.

- Coconino National Forest maintains a list of Invasive Plant species for the area, which is categorized by level of concern. No category 'A', 'B', or 'E" species will be allowed in the seed mix. Category 'C' species in the mix will have the percent composition of the mix documented and reported to the project sponsor. The most recent Coconino National Forest Invasive Plant Species List is available from the USFS or Coconino County.

- The percent of noxious weed seed allowable shall be as defined in the current State laws relating to agricultural seeds or by the Coconino National Forest regulations, whichever is more restrictive. Coconino National Forest sets a high standard for weed management that is applicable to all Coconino County lands.

2.1.2 Seed Substitution

Substitutions for seed species or changes to percent composition of mix may be suggested by Contractor based on market availability of specified seed. However, all substitutions shall be reviewed and approved by the County prior to arrival on site and shall pass the same certification process as the original seed mix. Any cost reduction

created by substitutions or changes to the seed mix shall be passed back to County upon approval.

2.1.3 Seed Mixes

The Temporary seed mix shall be used for a short-term cover which germinates and establishes rapidly for effective erosion control, weed control and temporary cover. A Temporary seed mix shall be required and applied to all disturbed areas if disturbed areas are left untouched or open for more than six weeks during the growing season (March through September) or in disturbed areas that will require future weed management or grading and that are left open during the growing season. The Permanent seed mix shall be used as the final diverse native grass mix. The Permanent seed mix will be applied to all disturbed areas before the end of the project.

For wetlands, wet meadows, riparian areas, or other areas deemed a special concern for habitat, the seed mix will depend on site conditions and must be specially designed to meet those site conditions and habitat goals. For normal construction areas, right of way work and staging areas, the seed mix can be derived from the conditions set forth below.

The seeding rates given below are for broadcast seeding methods (both mechanical and hand) and hydroseeding. Seeding rates for drill seeding may be halved.

A. TEMPORARY SEED MIX

Species	**Scientific Name**	**% Composition**	**Seeding Rate**
QuickguardTM Sterile Triticale*	*Triticum aestivum x Secale cereale*	100%	20 PLS lbs/ac

*or similar

Note: Sterile triticale seed will provide one season of growth only and the area must be overplanted with a permanent cover. All materials shall meet the approval of the Engineer (and USFS biological specialists when on USFS lands) before purchase and application.

-or-

Alternatively, the Temporary seed mix shall consist of at least one cool season and one warm season grass that are native to the immediate area and appropriate for the soils, aspect and hydrologic regime of the site.

B. PERMANENT SEED MIX

i. For volcanic or limestone soils above 6,800 feet in elevation use:

Species	**Scientific Name**	**% Composition**	**Pure Stand Seeding Rate PLS lbs/ac**	**Final Mix Seeding Rate PLS lbs/ac**
Blue Grama	*Bouteloua gracilis*	25	4	1
Little Bluestem	*Schizachyrium scoparium*	25	10	2.5
Arizona Fescue	*Festuca arizonica*	25	6	1.5
Western Wheatgrass	*Pascopyrum smithii*	25	24	6

Potential Alternatives: Mountain Muhly (*Muhlenbergia montana*), Purple Three-awn (*Aristida purpurea*), or Pine Dropseed (*Blepharoneuron tricholepsis*) may be acceptable substitutions for Little Bluestem.

Muttongrass (*Poa fendleriana*), Slender Wheatgrass (*Elymus trachycaulus ssp. trachycaulus*), Bottlebrush Squirreltail (*Elymus elymoides*), Prairie Junegrass (*Koeleria macrantha*), or Needle and Thread (*Hesperostipa comata*) may be acceptable substitutions for Arizona Fescue or Western Wheatgrass.

ii. For volcanic or limestone soils below 6,800 feet in elevation use:

Species	**Scientific Name**	**% Composition**	**Pure Stand Seeding Rate PLS lbs/ac**	**Final Mix Seeding Rate PLS lbs/ac**
Blue Grama	*Bouteloua gracilis*	12.5	4	0.5
Sideoats Grama	*Bouteloua curtipendula*	12.5	14	3.5
Purple Three-awn	*Aristida purpurea*	25	12	3
Muttongrass	*Poa fendleriana*	25	5	1.25
Western Wheatgrass	*Pascopyrum smithii*	25	24	6

Potential Alternatives: Little Bluestem (*Schizachyrium scoparium*), Vine Mesquite (*Panicum obtusum*), Fringed Brome (*Bromus ciliatus*), Bottlebrush Squirreltail (*Elymus elymoides*), Slender Wheatgrass (*Elymus trachycaulus ssp. trachycaulus*), Needle and Thread (*Hesperostipa comata*), Prairie Junegrass (*Koeleria macrantha*), or Indian Ricegrass (*Achnatherum hymenoides*)

iii. For sand or cinder soils use:

Species	Scientific Name	% Composition	Pure Stand Seeding Rate PLS lbs/ac	Final Mix Seeding Rate PLS lbs/ac
Purple Three-awn	*Aristida purpurea*	25	12	3
Galleta Grass	*Pleuraphis jamesii*	25	16	4
Indian Ricegrass	*Achnatherum hymenoides*	25	14	3.5
Needle and Thread	*Hesperostipa comata*	25	20	5

Potential Alternatives: Spike Dropseed (*Sporobolus contractus*), Sand Dropseed (*Sporobolus cryptandrus*), Sideoats Grama (*Bouteloua curtipendula*), Blue Grama (*Bouteloua gracilis*), Cane Bluestem (*Bothriochloa barbinodis*), Sand Bluestem (*Andropogon hallii*), Thickspike Wheatgrass (*Elymus lanceolatus ssp lanceolatus*), Vine Mesquite (*Panicum obtusum:* lower elevation)

iv. For clay soils use:

Species	Scientific Name	% Composition	Pure Stand Seeding Rate PLS lbs/ac	Final Mix Seeding Rate PLS lbs/ac
Galleta Grass	*Pleuraphis jamesii*	35	16	5.6
Alkalai Sacaton	*Sporobolus airoides*	30	4	1.2
Western Wheatgrass	*Pascopyrum smithii*	35	24	8.4

Potential Alternatives: Blue Grama (*Bouteloua gracilis*), Buffalograss (*Bouteloua dactyloides*), Little Bluestem (*Schizachyrium scoparium)*, Muttongrass (*Poa fendleriana),* Curly Mesquite *(Hilaria belangeri)*

-or-

The permanent cover seed mix shall consist of, at minimum, two cool season and two warm season native, perennial grass species appropriate to the site. Chosen species should be dominant species from adjacent sites with similar soils, hydrology and aspect. Perennial forbs and annual grasses can be added as required per the goals of the revegetation plan. However, all materials shall meet the approval of the County (and USFS biological specialists when on USFS lands) before purchase and application.

2.2 HYDROSEED ADDITIVES (IF UTILIZED)

Hydroseeding requires the use of a tacking agent, hydraulic mulch, and usually an indicator dye. Inoculum and fertilizer may be used if recommended by the supplier.

2.2.1 Tacking Agent

Tacking agent shall be a naturally occurring organic compound (often guar gum or plantago based) and shall be non-toxic. The tacking agent shall be a product typically

used for binding soil and mulch in seeding or erosion control operations. The tacking agent shall be labeled indicating the type and purity. Tacking agents shall be applied at the rate recommended by the manufacturer or supplier.

2.2.2 Hydraulic Mulch

Hydraulic mulch shall be organic material (generally wood fiber or straw) that is designed to be used in hydroseeding. Hydraulic mulch should have low paper cellulose fiber content (high wood fiber or straw fiber content) and low ash content. Mulch shall be non-toxic, biodegradable, and have good absorbency or water holding content. Hydraulic mulch shall be applied at the rate recommended by the manufacturer or supplier.

2.2.3 Indicator Dye

An indicator dye should be used that is non-injurious to plant growth.

2.2.4 Inoculum and Fertilizer, if utilized

Inoculum and fertilizer can increase the success of seeding. Inoculum and fertilizer shall be used at the manufacturer recommended rate for hydroseeding.

3.0 EXECUTION

3.1 SEEDBED PREPARATION

Once the project area has been graded to appropriate elevations, ensure that the surface soil is in a roughened condition favorable for seed germination and growth. On sites where equipment can safely operate on slopes, the seedbed shall be adequately loosened (4 to 6 inches deep) and smoothed, with large clods being broken up. Areas that have been compacted by heavy equipment or other operations shall be ripped to a depth of at least 6 inches to ensure adequate permeability. All ripping should be conducted on contour to prevent rilling during runoff conditions. Disking, cultipacking, or both may be necessary to properly prepare a seedbed that is too rough to uniformly scatter seed. Where equipment cannot operate safely, the seedbed shall be prepared by hand methods by scarifying to provide a roughened soil surface so that broadcast seed will remain in place.

3.2 SEED APPLICATION

Application rate of seed, as specified, are for Pure Live Seed (PLS). PLS is a measure of seed that will germinate. PLS is determined by multiplying the percent purity by the sum of the percent of total viable seed (includes hard and dormant seed). Seed mix

species, percent composition, and the PLS application rates per acre are shown in the seed mix tables above, Part 2.1.

All seeding operations shall be performed in such a manner that the seed is applied in the specified quantities uniformly in the designated areas. Seed shall be incorporated into the soil, but not more than 0.5 inch deep if using the dry method or hand application, as described below. Seeding should occur before installation of erosion control fabric, if required. To control erosion and weeds, apply seed to disturbed soil and slopes as soon as is practical after disturbance.

To increase likelihood of seeding success, seeding should be timed to precede seasonal monsoon moisture or winter snow cover. Avoid leaving seed on the soil for long periods of time without adequate moisture for germination and growth or winter cover, as this will promote seed predation by birds and insects. Seed should be worked into ground and/or protected by mulch. Seeding that occurs late in summer towards end of monsoon season rains may germinate but lack adequate growth during the shortened wet season to successfully over winter.

3.3 SEEDING METHODS

The following methods may be used to place material:

- Hydroseeding Method. Mix seed, hydraulic mulch, tacking agents, dye, inoculum and fertilizer (if utilized) with water in the amount and order specified by the manufacturer or supplier. Apply it under pressure at the rates specified. Hydroseeding mixing has the potential to mechanically damage native grass seeds. The mix should be utilized within 1/2 hour of adding seed to avoid over agitation and seed damage.

- Dry Method. Use mechanical, landscape, or cultipacker seeders, seed drills, or other approved mechanical seeding equipment to apply the seed. Dry method application must also utilize a weed-free mulch or erosion control fabric application over the seedbed as specified by the County and placed per manufacturer’s specifications.

- Hand Application. Hand-operated seeding devices may be used to apply dry seed. Hand application method must also utilize a weed-free mulch or erosion control fabric application over the seedbed as specified by the County and placed per manufacturer’s specifications.

4.0 MEASUREMENT AND PAYMENT

SUPPLY & PLACE GRASS SEED MIX shall be measured and paid on a per acre basis as determined from the plans and shall include all other areas disturbed by construction operations. Site preparation shall be incidental to those operations, and no separate payment will be made. No payment will be made for areas seeded with unapproved

seed. No adjustment in payment will be made for the number of seeding mobilization activities.

Final payment will be made after determination of seeding establishment by the County.

*** END OF SECTION ***

APPENDIX B: GEOTECHNICAL EVALUATION

Prepared By: Western Technologies

Shadow Mountain Road Reconstruction
Job. No. 25-223549-0R, Dated: December 15, 2023
Addendum No.1, Dated: February 8, 2024
Addendum No. 2, Dated December 19, 2024

Western Technologies
An RMA Company

December 15, 2023

WLB Group, Inc.
500 North Beaver Street
Flagstaff, Arizona 86001

Attn: Mr. Dan Burke, P.E.

Re: Geotechnical Evaluation
Shadow Mountain Road Reconstruction
Shadow Mountain Road
Bellemont, Arizona

Job. No. 25-223549-0R

INTRODUCTION

Western Technologies Inc. (WT) has performed geotechnical engineering and pavement design services for the pavement reconstruction of Shadow Mountain Road in accordance with our proposal (Ref. No. 25-223549-P) dated August 10, 2023. A field exploration consisting of subsurface exploration including coring of the asphalt concrete layer and soil borings was conducted on October 4, 2023. The results of the field exploration and subsequent laboratory testing were used to develop this report.

PROJECT DESCRIPTION

Based on information provided by Mr. Dan Burke, P.E., the proposed project will consist of reconstruction of the existing asphalt paving of Shadow Mountain Road between the roundabout and the end of the pavement in Bellemont, Arizona with a total length of approximately 4,300 linear feet to determine the most efficient reconstruction procedures. Preliminary grading information was not available at the time of this proposal. It is assumed that the finished grades of the new pavement will be within about 1 foot of the existing alignment grades. Should any of our information or assumptions not be correct, we request that the Client notify WT immediately.

The geotechnical/pavement engineering services included coring to measure thickness of the existing pavement section (asphalt concrete and aggregate base course layers) and subsurface exploration and laboratory testing on collected subgrade soil samples for pavement analysis purposes. In addition, one R-value test was performed at a selected boring location. This parameter was then used in the pavement structural analysis to convert from R-value to Resilient Modulus (M_R).

SUBSURFACE EXPLORATION

The subsurface exploration consisted of coring the asphalt concrete layer at nine (9) locations and advancing soil borings at all locations to depths of about 2 to 5 feet below existing pavement grades. The approximate locations of the cores and soil borings are shown on Plate 1. Logs of the borings are included in Appendix A. Strata encountered during the subsurface exploration were identified and logged. Asphalt concrete cores and loose and relatively undisturbed samples of subgrade soils were obtained and submitted to the WT materials laboratory for testing. The borings were backfilled with native material and capped with non-shrink grout. Coring of the asphalt concrete pavement was performed before advancing the soil borings.

Soils encountered in the borings consisted predominantly of medium plasticity, medium dense to dense Clayey SANDS with variable amounts of gravel, and non-plastic, Silty GRAVELS with variable amounts of sand. Some of the soils may contain random amounts of cobbles and boulders. Soil strata and classifications are shown on the attached boring logs. The existing pavement sections encountered at the boring locations are presented in the following table:

Boring No.	AC (in.)	ABC (in.)	Total Thickness (in.)
B-1	3.0	4.0	7.0
B-2	3.0	4.0	7.0
B-3	4.0	3.0	7.0
B-4	3.0	4.0	7.0
B-5	3.0	4.5	7.5
B-6	3.0	4.0	7.0
B-7	3.0	4.0	7.0
B-8	3.0	4.0	7.0
B-9	3.0	4.0	7.0
Mean	3.1	3.9	7.0
St. Dev	0.3	0.4	0.7
Mean-St.Dev	2.8	3.5	6.3

For pavement design rehabilitation purposes, the thickness of the existing AC layer is considered to be **2.8** inches.

LABORATORY TESTING

Laboratory testing on collected subgrade soil samples consisted of in-situ dry density and moisture content, grain size distribution, Atterberg limits, maximum dry density/optimum moisture content, remolded expansion potential, R-value and soluble salt/sulfate/chloride contents. Laboratory test results are presented in Appendix B and are summarized below.

Relatively undisturbed samples obtained from the borings indicated in-situ dry densities ranging from 83 to 93 pounds per cubic foot (pcf) with a mean value of 87 pcf and standard deviation of 3.9 pcf (coefficient of variation, COV, of 4.5 percent). In-situ moisture contents ranged from 5.9 to 34.5 percent with a mean value of 21.7 percent and standard deviation of 10.2 percent (COV of 47.0 percent). The percentage of material passing the No. 200 sieve ranged from 16.3 to 42.6. The tested materials were predominantly medium plasticity Clayey SANDS; and non-plastic GRAVELS with liquid limits (LL) ranging from no value to 40 and plasticity indexes (PI) ranging from non-plastic to 20.

Three maximum dry density and optimum moisture content tests and one remolded expansion potential test were run on representative samples. The maximum dry density values obtained ranged from 105.8 to 111.3 pcf with optimum moisture contents of 13.2 to 17.6 percent. The remolded expansion potential sample was compacted to approximately 95 percent of the maximum density at about optimum minus 3 percent moisture and wetted. The expansion potential recorded was 4.2 percent under a 100 psf surcharge load. One R-value test was also performed on a separate sample, yielding a value of 24.

PAVEMENT DESIGN

R-Values and Resilient Modulus (M_R) for Pavement Design

The measured percentages passing the No. 200 sieve and PIs of the collected subgrade samples from Boring Nos. 1, 3, 4, and 6 were entered into the equations presented in the Arizona Department of Transportation (ADOT) *Preliminary Engineering and Design Manual* to obtain correlated R-values which are shown on the table below.

Test Boring	Depth (feet)	USCS	Minus 200	Plasticity Index	Correlated R-Value
B-1	1 - 5	SC	38.7	17	30
B-3	1 - 5	SC	42.6	20	25
B-4*	1 - 5	GM	16.3	NP	80
B-5	1 - 5	SC	40.3	16	31
Number					3
Mean					28.7
Standard Deviation					9.4

*Based on previous experience in the area and the field and laboratory testing on this project, this sample was considered an outlier and was omitted from the analysis.

Correlated R-values yielded values ranging from 25 to 31. The R-value used in design was one standard deviation below the mean. This procedure provided a mean design R-value of 20 which corresponds to a resilient modulus of approximately **5,700** pounds per square inch using a Seasonal Variation Factor (SVF) of 3.5 for the Bellemont area.

Equivalent Single Axle Load (ESAL) Calculations

No traffic data was available at the time of this report. Traffic data was assumed from the City of Flagstaff (COF) Pavement Design Manual for streets similar to Shadow Mountain Road classified as minor collectors, which shows an average daily traffic (ADT) of **2,500** for Shadow Mountain Road with no growth rate assumed. It was also assumed that about 98% of that traffic would be automobiles and about 2% would be heavy trucks with an ESAL Factor of 1.2. Based on a recent meeting with Coconino County, WT was informed that an ADT of 600 with 96% automobile traffic and 4% truck traffic is anticipated on Shadow Mountain Road between the intersections with Bellemont Springs Drive and Alpine Drive. Other factors used to estimate the total ESALs are:

- Directional Distribution (DD) Factor = 0.5
- Number of Lanes/Direction = 1
- Lane Factor for 1-Lane/Direction = 1.0
- Design Life = 20 Years
- Design Life = 40 Years (**Required by Coconino County**)

The total 18-kip Equivalent Single Axle Loads (ESAL) for Shadow Mountain Road are 219,000 for a 20-year design life and 438,000 for a 40-year design life. Calculations using the anticipated

traffic loading between the intersection of Bellemont Springs Drive and Alpine Drive results in total ESALs for this section of roadway of 105,000 for a 20-year design life and 210,000 for a 40-year design life. The selection of the parameters was based on a functional classification for Shadow Mountain Road corresponding to a minor collector roadway.

Level of Reliability, R (%)	85
Initial Serviceability Index, Po	4.5
Terminal Serviceability Index, Pt	2.5
Overall Standard Deviation	0.35
Seasonal Variation Factor – Bellemont	3.5
Drainage Coefficient	0.85
AC Structural Coefficient	0.40
ABC Structural Coefficient	0.12

PAVEMENT DESIGN RECOMMENDATIONS

Two pavement section alternatives were considered for rehabilitation purposes:

1) Full Reconstruction
2) AC Surface over Full Depth Reclamation (FDR)

At the time of our field exploration, some pavement areas were observed to exhibit severe alligator cracking and rutting, generally characteristic of subgrade failure. Prior to construction, WT should be contacted to identify these areas. Based on the severity of the distress, it is likely that reconstruction will be the only option in the heavily distressed areas.

Based on previous experience, the clay content and plasticity of the on-site soils are too high for suitable use of the LithTech product. However, research into aggregate base course alternatives suggests that Stabilization Products, LLC has had success in clay soils with their EMC Squared System products. WT has had previous experience in this area with lime stabilization for building pads, and we have presented recommendations with lime stabilized subgrade soils as a substitute for aggregate base course material.

Alternative No. 1: Full Reconstruction

Based on existing subgrade conditions, the following alternative pavement sections are recommended for reconstruction of Shadow Mountain Road:

20-YEAR DESIGN LIFE

Traffic Area	Asphalt Concrete (in.)	Base Course (in.)	*Aggregate Base Course with Triaxial (NX750) Geogrid (in.)	Lime Stabilized Native Soils
Shadow Mountain Road (heavy traffic frequency)	5	8	--	--
Shadow Mountain Road (heavy traffic frequency)	4	--	5	--
Shadow Mountain Road (heavy traffic frequency)	7	--	--	--
Shadow Mountain Road (heavy traffic frequency)	5	--	--	6
Shadow Mountain Road between Bellemont Springs and Alpine Drive (medium traffic frequency)	5	5	--	--

* Tensar NX750 triaxial geogrid installed at the bottom of the aggregate base course layer.

40-YEAR DESIGN LIFE

Traffic Area	Asphalt Concrete (in.)	Base Course (in.)	*Aggregate Base Course with Triaxial (NX750) Geogrid (in.)	Lime Stabilized Native Soils
Shadow Mountain Road (heavy traffic frequency)	5	11	--	--
Shadow Mountain Road (heavy traffic frequency)	4	--	7	--
Shadow Mountain Road (heavy traffic frequency)	8	--	--	--
Shadow Mountain Road (heavy traffic frequency)	5	--	--	12
Shadow Mountain Road between Bellemont Springs and Alpine Drive (medium traffic frequency)	5	7	--	--

* Tensar NX750 triaxial geogrid installed at the bottom of the aggregate base course layer.

Bituminous surfacing should be constructed of dense-graded, central plant-mix, asphalt concrete. Base course and asphalt concrete should conform with Coconino County specifications.

The gradient of paved surfaces should ensure positive drainage. Water should not pond in areas directly adjoining paved sections. The native subgrade soils will soften and lose stability if subjected to conditions which result in an increase in water content.

On-site clay soils may be mixed with hydrated lime to replace aggregate base course material. For initial cost-estimating purposes, it may be assumed that 6 percent lime (by dry weight of soil) will be required to stabilize the site soils. A mix design using the site soils and the lime product proposed for use will be required to determine the final lime content.

Lime stabilization of this type is typically achieved by creating a shallow stockpile with lime mixing of each individual layer as the stockpile is created. It has been our experience with the soils in this area that screening of oversized materials will likely be necessary to help reduce damage to the lime mixing equipment. A lime stabilization specialty contractor should be consulted to assess this condition and develop the required stabilization procedures.

Following lime stabilization and any mellowing period which may be required, place the mixture back into the roadway area as engineered fill compacted to a minimum of 95 percent of the maximum density within a moisture content range of optimum to 4 percent above optimum as determined by ASTM D698.

On site clayey soils used as fill and reworked should be compacted to a minimum of 95 percent of the maximum density with a moisture content in the range of 1 percent below to 3 percent above optimum. Imported aggregate base course materials should be compacted to a minimum of 100 percent of the maximum density with a moisture content in the range of 3 percent below to 3 percent above optimum.

Alternative No. 2: AC Surface over Full Depth Reclamation (FDR)

The advantage of this alternative is that the existing pavement section is reused. The existing AC is pulverized and blended with the existing base course and portions of the subgrade (if needed) to form the new base course. It may also require the addition of a chemical stabilization agent. Based on the laboratory test results, the most likely agent to be used for the type of subgrade soils at this location would be cement or emulsified foam asphalt. Because the native subgrade is left in place, the pavement analysis was performed using the M_R value for the native subgrade soil condition. The surface layer was fixed at 5 inches of newly

placed Asphalt Concrete layer (the minimum recommended for the assumed loading conditions) and the thickness of the FDR layer was calculated.

The structural layer coefficient for the FDR layer, as reported in the literature, can range from about 0.14 for an unstabilized FDR layer up to about 0.42 for foamed asphalt/asphalt emulsion stabilized FDR layers (Diefenderder, B.K and Apeagyei, A.K. "*Analysis of Full-Depth Reclamation Trial Sections in Virginia*," Virginia Center for Transportation, VCTIR 11-R23, 2011). For this analysis, a conservative value of 0.14 was used for the FDR layer coefficient. The results of the analysis are presented in the following table:

Design Life (yrs)	AC (in.)	FDR (in.)	Cement Treated Base (in.)	Total Thickness (in.)	M_R Native Subgrade (psi)
20	5	7	--	12	5,700
40	5	9	--	14	5,700
20	4	--	6	10	5,700
40	4		8	12	5,700

As requested, we have provided an alternative that includes cement treated aggregate base course material (CTB). The layer coefficient for CBT was assigned based on recommendations set forth in the Arizona Department of Transportation *Preliminary Engineering and Design Manual* (ADOTM-XII-TWO-C) that recommends layer coefficients between 0.15 and 0.29. For the CTB pavement section we assumed a layer coefficient of 0.24. This follows recommendations on Figure 203.00-5 in the ADOT Design Manual that assumes road mixing will occur, the unconfined compressive strength achieved will range between 500 and 750 pounds per square inch (psi), and the existing aggregate base course and milled asphalt mixture will be non-plastic. For initial cost-estimating purposes, it may be assumed that 5 percent cement (by dry weight of soil) will be required to stabilize the milled asphalt/aggregate base course soil mixture. A mix design using the milled asphalt/aggregate base course soil mixture and the cement product proposed for use will be required to determine the final cement content.

Following cement stabilization, place the mixture back into the roadway area as engineered fill compacted to a minimum of 95 percent of the maximum density within a moisture content range of optimum to 4 percent above optimum as determined by ASTM D698.

It should be noted that the total thickness of the aggregate base course and existing asphalt section combined ranges from 7 to 7.5 inches. The FDR analysis yielded an aggregate base course value of 9 inches for the 40-year design life. Based on the existing pavement thickness, some areas will require additional aggregate base course material to provide adequate support for the selected design life and anticipated traffic loading. All aggregate base course and

asphalt concrete should conform with Coconino County specifications. If this alternative is selected, it is recommended to perform an FDR mix design to determine the percent of cement or emulsified foam asphalt to be added to the mix before proceeding to construction.

CLOSURE

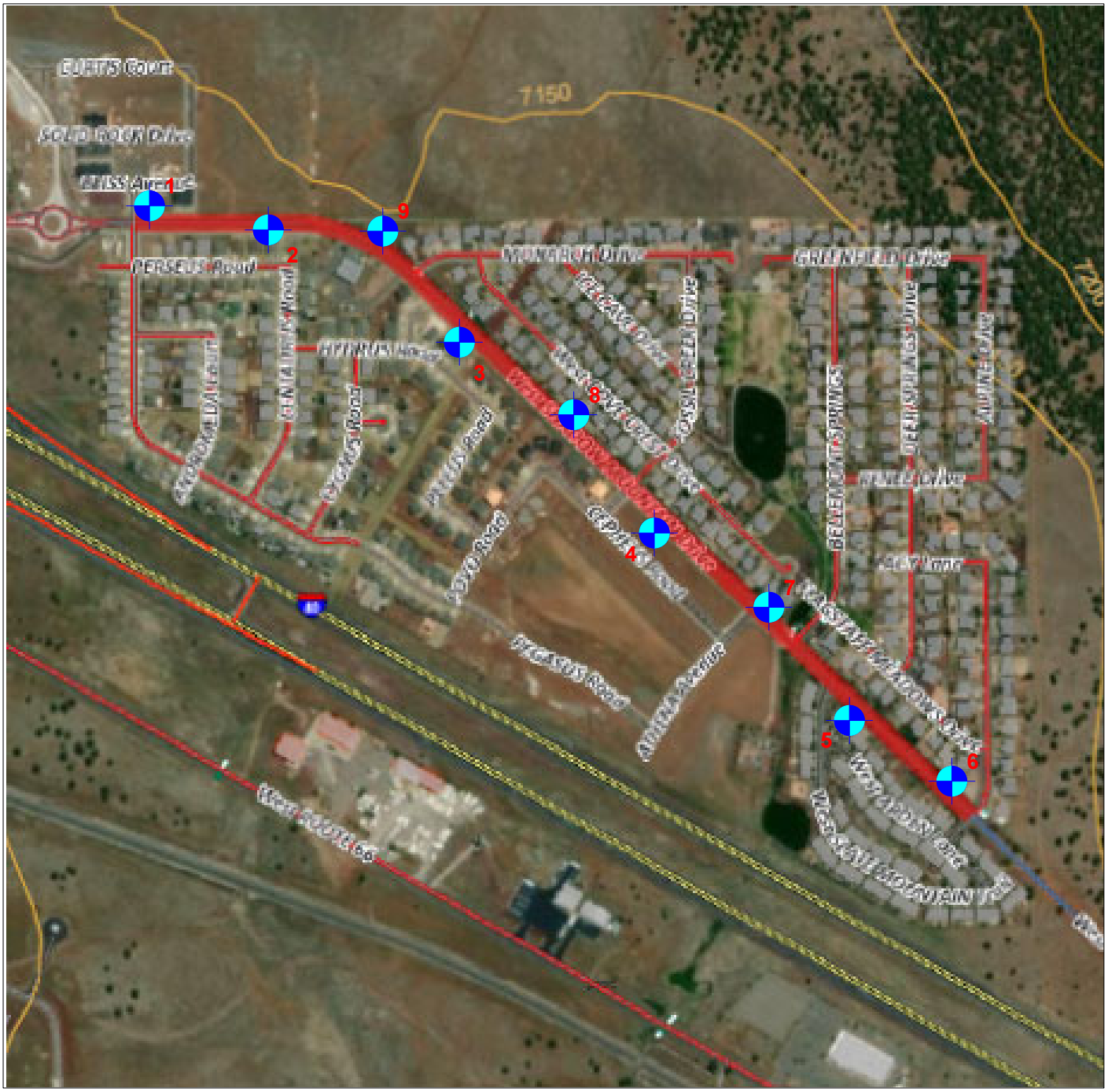
This report concludes our scope of services for Shadow Mountain Road Rehabilitation project. The boring logs and related information included in this report are indicators of subsurface conditions only at the specific locations and times noted. The recommendations presented are based in part upon data derived from a limited number of samples obtained from widely spaced subsurface explorations. Variations from the field conditions represented by the borings may become evident during construction. If variations appear, we should be contacted to re-evaluate our recommendations. We prepared this report as an aid to the designers of the proposed project. The comments, statement, recommendations and conclusions set forth in this report reflect the opinions of the authors. These opinions are based upon conditions at the location of specific tests, observations and data developed to satisfy the scope of services defined by the contract documents. Work on your project was performed in accordance with generally accepted industry standards and practices by professionals providing similar services in this locality. No other warranty, express or implied, is made. We appreciate being of service to you in the geotechnical engineering phase of this project and are prepared to assist you during the construction phases as well. If design conditions change, or if you have any questions concerning this report or any of our testing, inspection and consulting services, please do not hesitate to contact us. We look forward to working with you on this and future projects.

Sincerely,
WESTERN TECHNOLOGIES INC.

Gregory L. E. Burr, R.G., P.E.
Geotechnical Department Manager

Craig P. Wiedeman, P.E.
Senior Geotechnical Engineer

Copies to: Addressee (email)



Not to Scale

Approximate Test Boring Location

SHADOW MOUNTAIN DRIVE RECONSTRUCTION	
Boring Location Diagram	
Western Technologies Inc.	
Job No.: 25-223549-0	Plate: 1

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Allowable Soil Bearing Capacity	The recommended maximum contact stress developed at the interface of the foundation element and the supporting material.
Backfill	A specified material placed and compacted in a confined area.
Base Course	A layer of specified aggregate material placed on a subgrade or subbase.
Base Course Grade	Top of base course.
Bench	A horizontal surface in a sloped deposit.
Caisson/Drilled Shaft	A concrete foundation element cast in a circular excavation which may have an enlarged base (or belled caisson).
Concrete Slabs-On-Grade	A concrete surface layer cast directly upon base course, subbase or subgrade.
Crushed Rock Base Course	A base course composed of crushed rock of a specified gradation.
Differential Settlement	Unequal settlement between or within foundation elements of a structure.
Engineered Fill	Specified soil or aggregate material placed and compacted to specified density and/or moisture conditions under observations of a representative of a soil engineer.
Existing Fill	Materials deposited through the action of man prior to exploration of the site.
Existing Grade	The ground surface at the time of field exploration.
Expansive Potential	The potential of a soil to expand (increase in volume) due to absorption of moisture.
Fill	Materials deposited by the actions of man.
Finished Grade	The final grade created as a part of the project.
Gravel Base Course	A base course composed of naturally occurring gravel with a specified gradation.
Heave	Upward movement.
Native Grade	The naturally occurring ground surface.
Native Soil	Naturally occurring on-site soil.
Rock	A natural aggregate of mineral grains connected by strong and permanent cohesive forces. Usually requires drilling, wedging, blasting or other methods of extraordinary force for excavation.
Sand and Gravel Base Course	A base course of sand and gravel of a specified gradation.
Sand Base Course	A base course composed primarily of sand of a specified gradation.
Scarify	To mechanically loosen soil or break down existing soil structure.
Settlement	Downward movement.
Soil	Any unconsolidated material composed of discrete solid particles, derived from the physical and/or chemical disintegration of vegetable or mineral matter, which can be separated by gentle mechanical means such as agitation in water.
Strip	To remove from present location.
Subbase	A layer of specified material placed to form a layer between the subgrade and base course.
Subbase Grade	Top of subbase.
Subgrade	Prepared native soil surface.

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DEFINITION OF TERMINOLOGY

PLATE

A-1

COARSE-GRAINED SOILS
LESS THAN 50% FINES

GROUP SYMBOLS	DESCRIPTION	MAJOR DIVISIONS
GW	WELL-GRADED GRAVEL OR WELL-GRADED GRAVEL WITH SAND, LESS THAN 5% FINES	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE
GP	POORLY-GRADED GRAVEL OR POORLY-GRADED GRAVEL WITH SAND, LESS THAN 5% FINES	
GM	SILTY GRAVEL OR SILTY GRAVEL WITH SAND, MORE THAN 12% FINES	
GC	CLAYEY GRAVEL OR CLAYEY GRAVEL WITH SAND, MORE THAN 12% FINES	
SW	WELL-GRADED SAND OR WELL-GRADED SAND WITH GRAVEL, LESS THAN 5% FINES	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE
SP	POORLY-GRADED SAND OR POORLY-GRADED SAND WITH GRAVEL, LESS THAN 5% FINES	
SM	SILTY SAND OR SILTY SAND WITH GRAVEL, MORE THAN 12% FINES	
SC	CLAYEY SAND OR CLAYEY SAND WITH GRAVEL, MORE THAN 12% FINES	

NOTE: Coarse-grained soils receive dual symbols if they contain 5% to 12% fines (e.g., SW-SM, GP-GC).

FINE-GRAINED SOILS
MORE THAN 50% FINES

GROUP SYMBOLS	DESCRIPTION	MAJOR DIVISIONS
ML	SILT, SILT WITH SAND OR GRAVEL, SANDY SILT, OR GRAVELLY SILT	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50
CL	LEAN CLAY OF LOW TO MEDIUM PLASTICITY, SANDY CLAY, OR GRAVELLY CLAY	
OL	ORGANIC SILT OR ORGANIC CLAY OF LOW TO MEDIUM PLASTICITY	
MH	ELASTIC SILT, SANDY ELASTIC SILT, OR GRAVELLY ELASTIC SILT	SILTS AND CLAYS LIQUID LIMIT MORE THAN 50
CH	FAT CLAY OF HIGH PLASTICITY, SANDY FAT CLAY, OR GRAVELLY FAT CLAY	
OH	ORGANIC SILT OR ORGANIC CLAY OF HIGH PLASTICITY	
PT	PEAT AND OTHER HIGHLY ORGANIC SOILS	HIGHLY ORGANIC SOILS

NOTE: Fine-grained soils may receive dual classification based upon plasticity characteristics (e.g. CL-ML).

SOIL SIZES

COMPONENT	SIZE RANGE
BOULDERS	Above 12 in.
COBBLES	3 in. – 12 in.
GRAVEL	No. 4 – 3 in.
Coarse	¾ in. – 3 in.
Fine	No. 4 – ¾ in.
SAND	No. 200 – No. 4
Coarse	No. 10 – No. 4
Medium	No. 40 – No. 10
Fine	No. 200 – No. 40
Fines (Silt or Clay)	Below No. 200

NOTE: Only sizes smaller than three inches are used to classify soils

CONSISTENCY

CLAYS & SILTS	BLOWS PER FOOT
VERY SOFT	0 – 2
SOFT	3 – 4
FIRM	5 – 8
STIFF	9 – 15
VERY STIFF	16 – 30
HARD	OVER 30

RELATIVE DENSITY

SANDS & GRAVELS	BLOWS PER FOOT
VERY LOOSE	0 – 4
LOOSE	5 – 10
MEDIUM DENSE	11 – 30
DENSE	31 – 50
VERY DENSE	OVER 50

NOTE: Number of blows using 140-pound hammer falling 30 inches to drive a 2-inch-OD (1⅜-inch ID) split-barrel sampler (ASTM D1586).

PLASTICITY OF FINE GRAINED SOILS

PLASTICITY INDEX	TERM
0	NON-PLASTIC
1 – 7	LOW
8 – 20	MEDIUM
Over 20	HIGH

DEFINITION OF WATER CONTENT

DRY
SLIGHTLY DAMP
DAMP
MOIST
WET
SATURATED

Western Technologies
An RMA Company

METHOD OF CLASSIFICATION

PLATE

A-2

The number shown in **"BORING NO."** refers to the approximate location of the same number indicated on the "Boring Location Diagram" as positioned in the field by pacing or measurement from property lines and/or existing features.

"DRILLING TYPE" refers to the exploratory equipment used in the boring wherein **HSA = hollow stem auger**, and the dimension presented is the outside diameter of the HSA used.

"R" in "BLOW COUNTS" refers to a 3-inch outside diameter ring-lined split barrel sampler driven into the ground with a 140 pound drop-hammer dropped 30 inches repeatedly until a penetration of 12 inches is achieved or until refusal. The number of blows required to advance the sampler 12 inches is defined as the "**R**" blow count. The "**R**" blow count requires an engineered conversion to an equivalent SPT N-Value. Refusal to penetration is considered more than 50 blows per foot. An **X** within the symbol indicates no sample recovery. A half-filled **X** within the symbol indicates sample disturbance.

"SAMPLE TYPE" refers to the form of sample recovery, in which **R** = Ring-lined sample and **G** = Grab sample.

"DRY DENSITY (LBS/CU FT)" refers to the laboratory-determined dry density in pounds per cubic foot.

"WATER (MOISTURE) CONTENT" (% of Dry Wt.) refers to the laboratory-determined water content in percent using the standard test method ASTM D2216.

"USCS" refers to the "Unified Soil Classification System" Group Symbol for the soil type as defined by ASTM D2487 and D2488. The soils were classified visually in the field, and where appropriate, classifications were modified by visual examination of samples in the laboratory and/or by appropriate tests.

These notes and boring logs are intended for use in conjunction with the purposes of our services defined in the text. Boring log data should not be construed as part of the construction plans nor as defining construction conditions.

Boring logs depict our interpretations of subsurface conditions at the locations and on the date(s) noted. Variations in subsurface conditions and characteristics may occur between borings. Groundwater levels may fluctuate due to seasonal variations and other factors.

The stratification lines shown on the boring logs represent our interpretation of the approximate boundary between soil or rock types based upon visual field classification at the boring location. The transition between materials is approximate and may be more or less gradual than indicated.

Project: Shadow Mountain Road Reconstruction Project Number: 25-223549-0	**BORING NO. 1**	Western Technologies An RMA Company

Date(s) Drilled **10/4/23**	Logged By **E. Martinez**	Checked By **J. Quinlan**
Drilling Method **HSA**	Drill Bit Size/Type **7 In.**	Approximate Surface Elevation **Not Determined**
Drill Rig Type **CME-75**	Drilling Contractor **EDI**	
Groundwater Level and Date Measured **Not Encountered**	Location **See Location Diagram**	

Water Content, %	Dry Unit Weight, pcf	Sample Type	Sample	Sampling Resistance, blows/ft	Depth (feet)	Soil Type	Graphic Log	MATERIAL DESCRIPTION
					0	Asphalt		ASPHALT (3 Inches Thick)
								AGGREGATE BASE COURSE (4 Inches Thick)
						SC		Clayey SAND; with gravel, dark brown, medium dense, wet
			G					
34.5	83		R	25				
					5			Boring Stopped at 5 Feet
					10			

Figure A-4

Project: Shadow Mountain Road Reconstruction Project Number: 25-223549-0	**BORING NO. 2**	Western Technologies An RMA Company

Date(s) Drilled **10/4/23**	Logged By **E. Martinez**	Checked By **J. Quinlan**
Drilling Method **HSA**	Drill Bit Size/Type **7 In.**	Approximate Surface Elevation **Not Determined**
Drill Rig Type **CME-75**	Drilling Contractor **EDI**	
Groundwater Level and Date Measured **Not Encountered**	Location **See Location Diagram**	

Water Content, %	Dry Unit Weight, pcf	Sample Type	Sample	Sampling Resistance, blows/ft	Depth (feet)	Soil Type	Graphic Log	MATERIAL DESCRIPTION
					0	Asphalt		ASPHALT (3 Inches Thick)
								AGGREGATE BASE COURSE (4 Inches Thick)
						SC		Clayey SAND; with gravel, dark brown, dense, slightly damp
			G					
5.9	93		R	31				
								Auger Refusal at 3 Feet on Cobbles and Boulders
					5			
					10			

Figure A-5

Project: Shadow Mountain Road Reconstruction Project Number: 25-223549-0	**BORING NO. 3**	Western Technologies An RMA Company

Date(s) Drilled **10/4/23**	Logged By **E. Martinez**	Checked By **J. Quinlan**
Drilling Method **HSA**	Drill Bit Size/Type **7 In.**	Approximate Surface Elevation **Not Determined**
Drill Rig Type **CME-75**	Drilling Contractor **EDI**	
Groundwater Level and Date Measured **Not Encountered**	Location **See Location Diagram**	

Water Content, %	Dry Unit Weight, pcf	Sample Type	Sample	Sampling Resistance, blows/ft	Depth (feet)	Soil Type	Graphic Log	MATERIAL DESCRIPTION
					0	Asphalt		ASPHALT (4 Inches Thick)
								AGGREGATE BASE COURSE (3 Inches Thick)
						SC		Clayey SAND; some gravel, dark brown, medium dense, damp
			G					
			R	29				
					5			Boring Stopped at 5 Feet
					10			

Figure A-6

Project: Shadow Mountain Road Reconstruction Project Number: 25-223549-0	**BORING NO. 4**	Western Technologies An RMA Company

Date(s) Drilled **10/4/23**	Logged By **E. Martinez**	Checked By **J. Quinlan**
Drilling Method **HSA**	Drill Bit Size/Type **7 In.**	Approximate Surface Elevation **Not Determined**
Drill Rig Type **CME-75**	Drilling Contractor **EDI**	
Groundwater Level and Date Measured **Not Encountered**	Location **See Location Diagram**	

Water Content, %	Dry Unit Weight, pcf	Sample Type	Sample	Sampling Resistance, blows/ft	Depth (feet)	Soil Type	Graphic Log	MATERIAL DESCRIPTION
					0	Asphalt		ASPHALT (3 Inches Thick)
								AGGREGATE BASE COURSE (4 Inches Thick)
			G			GM		Silty GRAVEL; with sand, grey, slightly damp
								Auger Refusal at 2 Feet on Cobbles and Boulders
					5			
					10			

Figure A-7

Project: Shadow Mountain Road Reconstruction Project Number: 25-223549-0	**BORING NO. 5**	Western Technologies An RMA Company

Date(s) Drilled **10/4/23**	Logged By **E. Martinez**	Checked By **J. Quinlan**
Drilling Method **HSA**	Drill Bit Size/Type **7 In.**	Approximate Surface Elevation **Not Determined**
Drill Rig Type **CME-75**	Drilling Contractor **EDI**	
Groundwater Level and Date Measured **Not Encountered**	Location **See Location Diagram**	

Water Content, %	Dry Unit Weight, pcf	Sample Type	Sample	Sampling Resistance, blows/ft	Depth (feet)	Soil Type	Graphic Log	MATERIAL DESCRIPTION
					0	Asphalt		ASPHALT (3 Inches Thick)
								AGGREGATE BASE COURSE (4.5 Inches Thick)
						SC		Clayey SAND; with gravel, dark brown, medium dense, damp
			G					
15.2			R	25				
					5			Boring Stopped at 5 Feet
					10			

Figure A-8

Project: Shadow Mountain Road Reconstruction Project Number: 25-223549-0	**BORING NO. 6**	Western Technologies An RMA Company

Date(s) Drilled **10/4/23**	Logged By **E. Martinez**	Checked By **J. Quinlan**
Drilling Method **HSA**	Drill Bit Size/Type **7 In.**	Approximate Surface Elevation **Not Determined**
Drill Rig Type **CME-75**	Drilling Contractor **EDI**	
Groundwater Level and Date Measured **Not Encountered**	Location **See Location Diagram**	

Water Content, %	Dry Unit Weight, pcf	Sample Type	Sample	Sampling Resistance, blows/ft	Depth (feet)	Soil Type	Graphic Log	MATERIAL DESCRIPTION
					0	Asphalt		ASPHALT (3 Inches Thick)
								AGGREGATE BASE COURSE (4 Inches Thick)
						SC		Clayey SAND; with gravel, dark brown, dense, moist
			G					
23.5	84		R	43				
					5			Boring Stopped at 5 Feet
					10			

Figure A-9

Project: Shadow Mountain Road Reconstruction Project Number: 25-223549-0	**BORING NO. 7**	Western Technologies An RMA Company

Date(s) Drilled **10/4/23**	Logged By **E. Martinez**	Checked By **J. Quinlan**
Drilling Method **HSA**	Drill Bit Size/Type **7 In.**	Approximate Surface Elevation **Not Determined**
Drill Rig Type **CME-75**	Drilling Contractor **EDI**	
Groundwater Level and Date Measured **Not Encountered**	Location **See Location Diagram**	

Water Content, %	Dry Unit Weight, pcf	Sample Type	Sample	Sampling Resistance, blows/ft	Depth (feet)	Soil Type	Graphic Log	MATERIAL DESCRIPTION
					0	Asphalt		ASPHALT (3 Inches Thick)
								AGGREGATE BASE COURSE (4 Inches Thick)
						SC		Clayey SAND; with gravel, dark brown, medium dense, wet
			G					
29.3	88		R	14				
					5			Boring Stopped at 5 Feet
					10			

Figure A-10

Project: Shadow Mountain Road Reconstruction Project Number: 25-223549-0	**BORING NO. 8**	Western Technologies An RMA Company

Date(s) Drilled **10/4/23**	Logged By **E. Martinez**	Checked By **J. Quinlan**
Drilling Method **HSA**	Drill Bit Size/Type **7 In.**	Approximate Surface Elevation **Not Determined**
Drill Rig Type **CME-75**	Drilling Contractor **EDI**	
Groundwater Level and Date Measured **Not Encountered**	Location **See Location Diagram**	

Water Content, %	Dry Unit Weight, pcf	Sample Type	Sample	Sampling Resistance, blows/ft	Depth (feet)	Soil Type	Graphic Log	MATERIAL DESCRIPTION
					0	Asphalt		ASPHALT (3 Inches Thick)
								AGGREGATE BASE COURSE (4 Inches Thick)
						SC		Clayey SAND; with gravel, dark brown, medium dense, damp
			G					
			R	18				
					5			Boring Stopped at 5 Feet
					10			

Figure A-11

Project: Shadow Mountain Road Reconstruction Project Number: 25-223549-0	**BORING NO. 9**	Western Technologies An RMA Company

Date(s) Drilled **10/4/23**	Logged By **E. Martinez**	Checked By **J. Quinlan**
Drilling Method **HSA**	Drill Bit Size/Type **7 In.**	Approximate Surface Elevation **Not Determined**
Drill Rig Type **CME-75**	Drilling Contractor **EDI**	
Groundwater Level and Date Measured **Not Encountered**	Location **See Location Diagram**	

Water Content, %	Dry Unit Weight, pcf	Sample Type	Sample	Sampling Resistance, blows/ft	Depth (feet)	Soil Type	Graphic Log	MATERIAL DESCRIPTION
					0	Asphalt		ASPHALT (3 Inches Thick)
								AGGREGATE BASE COURSE (4 Inches Thick)
			G			GM		Silty GRAVEL; with sand, grey, slightly damp
								Auger Refusal at 2 Feet on Cobbles and Boulders
					5			
					10			

Figure A-12

Boring No.	Depth (ft)	USCS Class.	Particle Size Distribution (%) Passing by Weight						Atterberg Limits		Laboratory Compaction Characteristics			R-Value	Remarks
			3"	¾"	#4	#10	#40	#200	LL	PI	Dry Density (pcf)	Optimum Moisture (%)	Method		
1	1-5	SC	100	97	79	67	54	38.7	32	17				24	2
3	1-5	SC		100	86	75	60	42.6	40	20					2
4	1-2	GM	100	98	51	37	25	16.3		NP					2
6	1-5	SC		100	72	62	51	40.3	34	16					2

NOTE: NP = Non-plastic

REMARKS

Classification / Particle Size / Moisture-Density Relationship

1. Visual
2. Laboratory Tested
3. Minus #200 Only
4. Test Method ASTM D698/AASHTO T99
5. Test Method ASTM D1557/AASHTO T180
6. From the ADOT Family of Curves

Western Technologies
An RMA Company

PROJECT: SHADOW MOUNTAIN DRIVE RECONSTRUCTION

JOB NO.: 25-223549-0

SOIL PROPERTIES

PLATE

B-1

Boring No.	Depth (ft.)	USCS Class.	Initial Dry Density (pcf)	Initial Water Content (%)	Laboratory Compaction Characteristics			Expansion Properties		Plasticity		Soluble		Remarks
					Dry Density(pcf)	Optimum Moisture(%)	Method	Surcharge (ksf)	Expansion (%)	LL	PI	Salts (ppm)	Sulfate (ppm)	
1	1-5	SC			111.3	16.2	A							3
3	1-5	SC	100.4	10.2	105.8	13.2	A	0.1	4.2					1,2,3
6	1-5	SC			109.6	17.6	A							3

Notes: Initial Dry Density and Initial Water Content are remolded.

Remarks

1. Compacted density (approx. 95% of ASTM D698 max. density at moisture content slightly below optimum.)
2. Submerged to approximate saturation.
3. Test Method ASTM D698/AASHTO T99
4. Test Method ASTM D1557/AASHTO T180
5. From the ADOT Family of Curves

Western Technologies
An RMA Company

PROJECT: SHADOW MOUNTAIN DRIVE RECONSTRUCTION
JOB NO.: 25-223549-0

SOIL PROPERTIES

PLATE
B-2

Nortest Analytical
An RMA Company

Reported: 10/24/2023
Received: 10/20/2023

LABORATORY ANALYSIS REPORT

Project: 25-223549-0

Lab Number	Sample ID
23S0031	1(1-5)

Test Parameter

Test	*Method*	*Result*	*Units*
Soluble Salts	ARIZ 237b	491	ppm
Sulfate	ARIZ 733b	18	ppm
Chloride	ARIZ 736b	33	ppm

Plate B-3

Western Technologies
An RMA Company

February 8, 2024

WLB Group, Inc.
500 North Beaver Street
Flagstaff, Arizona 86001

Attn: Mr. Dan Burke, P.E.
Attn: Mr. Nate D. Reisner, P.E., Assistant County Engineer

Re: Shadow Mountain Road Reconstruction
Shadow Mountain Road
Bellemont, Arizona

Job No. 25-223549-0
Addendum No. 1

In accordance with the request of Mr. Nate D. Reisner, P.E., Assistant County Engineer, we have reviewed our geotechnical evaluation report for the above referenced project. The purpose of the review was to provide additional pavement recommendations for Asphalt Concrete over Full Depth Reclamation using a growth rate of 2%. Based on the review of our original report, the traffic loading conditions provided and the existing subgrade conditions, the following additional pavement sections are recommended for the areas indicated:

Traffic Area	Design Life (yrs)	AC (in.)	Cement Treated Base (in.)	Total Thickness (in.)	M_R Native Subgrade (psi)
Shadow Mountain Road	20	4	8	12	5,700
Shadow Mountain Road	40	4	10	14	5,700
Shadow Mountain Road between Bellemont Springs and Alpine Drive	20	4	5	9	5,700
Shadow Mountain Road between Bellemont Springs and Alpine Drive	40	4	7	11	5,700

Bituminous surfacing should be constructed of dense-graded, central plant-mix, asphalt concrete. Base course and asphalt concrete should conform with Coconino County specifications. Material and compaction requirements should conform to recommendations presented under **EARTHWORK** in the original report. The gradient of paved surfaces should ensure positive drainage. Water should not pond in areas directly adjoining paved sections. The native subgrade soils will soften and lose stability if subjected to conditions which result in an increase in water content.

The total 18-kip Equivalent Single Axle Loads (ESAL) for Shadow Mountain Road are 535,000 for a 20-year design life and 1,325,000 for a 40-year design life. Calculations using the anticipated traffic loading between the intersection of Bellemont Springs Drive and Alpine Drive results in total ESALs for this section of roadway of 130,000 for a 20-year design life and 320,000 for a 40-year design life. This assumes a 2% growth rate for all of the alternatives. All other pavement design information and assumptions were presented in the original geotechnical evaluation report.

This addendum should be attached to and become part of the original report. If you have any questions concerning this information, or require additional consultation, observation or testing services, please contact us.

Sincerely,
WESTERN TECHNOLOGIES INC.
Geotechnical Engineering Services

REGISTERED GEOLOGIST
CERTIFICATE NO.
67873
GREGORY
BURR
DATE SIGNED 2/8/24
ARIZONA U.S.A

Gregory L. E. Burr, P.E., R.G.
Geotechnical Department Manager

Registered Professional Engineer (Civil)
CERTIFICATE NO.
11860
CRAIG P.
WIEDEMAN
Date Signed 2/8/24
ARIZONA U.S.A

Craig P. Wiedeman, P.E.
Senior Geotechnical Engineer

Copies to: Addressee (emailed)

Western Technologies
An RMA Company

December 19, 2024

WLB Group, Inc.
500 North Beaver Street
Flagstaff, Arizona 86001

Attn: Mr. Dan Burke, P.E.
Attn: Mr. Nate D. Reisner, P.E., Assistant County Engineer

Re: Shadow Mountain Road Reconstruction
Shadow Mountain Road
Bellemont, Arizona

Job No. 25-223549-0
Addendum No. 2

In accordance with the request of Mr. Dan Burke, P.E., we have reviewed our geotechnical evaluation report for the above referenced project. The purpose of the review was to provide additional pavement recommendations for Asphalt Concrete over 2 inches of aggregate base course on 6 inches of cement treated base course material. Based on the review of our original report, the traffic loading conditions provided and the existing subgrade conditions, the following additional pavement section is recommended for the area indicated:

Traffic Area	Design Life (yrs)	AC (in.)	ABC (in.)	Cement Treated Base (in.)	Total Thickness (in.)	M_R Native Subgrade (psi)
Shadow Mountain Road	30	4	2	6	12	5,700

Bituminous surfacing should be constructed of dense-graded, central plant-mix, asphalt concrete. Base course and asphalt concrete should conform with Coconino County specifications. Material and compaction requirements should conform to recommendations presented in the original report. Prior to placement of fill and/or pavement materials, the exposed subgrade soils should be proof-rolled to verify that stable subgrade conditions exist. Any loose, soft, disturbed, or otherwise unsuitable materials should be overexcavated and replaced with engineered fill. The gradient of paved surfaces should ensure positive drainage. Water should not pond in areas directly adjoining paved sections. The native subgrade soils will soften and lose stability if subjected to conditions which result in an increase in water content.

All pavement design information and assumptions were presented in the original geotechnical evaluation report (25-223549R-0).

This addendum should be attached to and become part of the original report. If you have any questions concerning this information, or require additional consultation, observation or testing services, please contact us.

Sincerely,
WESTERN TECHNOLOGIES INC.
Geotechnical Engineering Services

Gregory L. E. Burr, R.G., P.E.
Geotechnical Department Manager

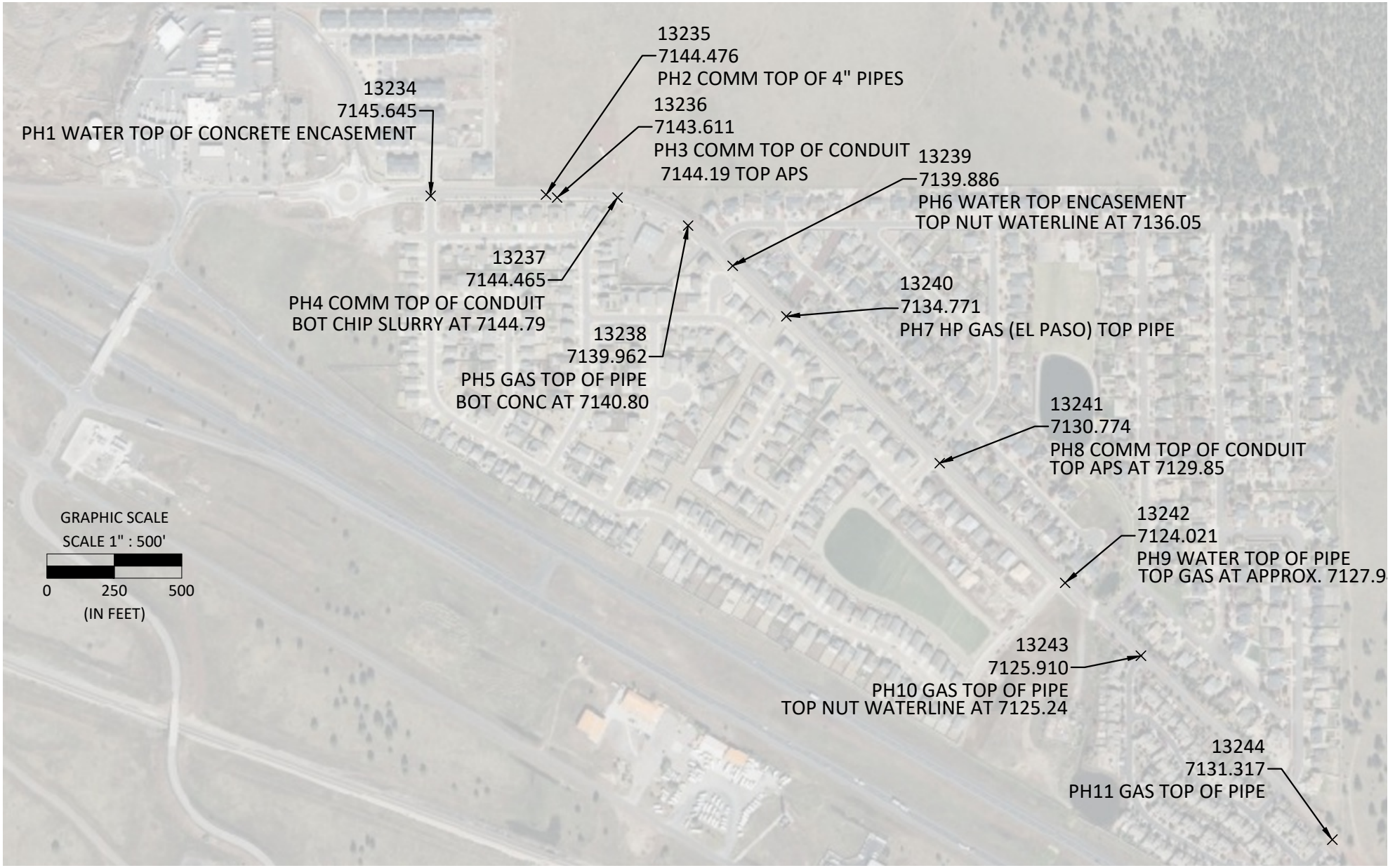
Craig P. Wiedeman, P.E.
Senior Geotechnical Engineer

Copies to: Addressee (emailed)

APPENDIX C: Pothole Report

Prepared By: Elevated Civil Construction, LLC

Shadow Mountain Road Reconstruction



TITLE

COCONINO COUNTY PUBLIC WORKS
POTHOLES
SHADOW MTN

DATE	REVISION	BY

SHEET #### OF #### | SCALE : AS NOTED | PROJECT No: ####

DESIGN | DRAWN

COCONINO COUNTY ARIZONA
PUBLIC WORKS DEPARTMENT

POTHOLE REPORT

ELEVATED CIVIL

Test Hole No.: I WATER Date Dug: 12.4.24

Project No.: 24287 Owner Project No.:

Project Name: Shadow MTN. Bellemont

Crew Members: Bill, Jose, Derek, Louis

General Location: Shadow MTN. Dr @ Pegasus Rd. Coordinates: 35°14'16"N 111° 49'9"W

Station & Offset

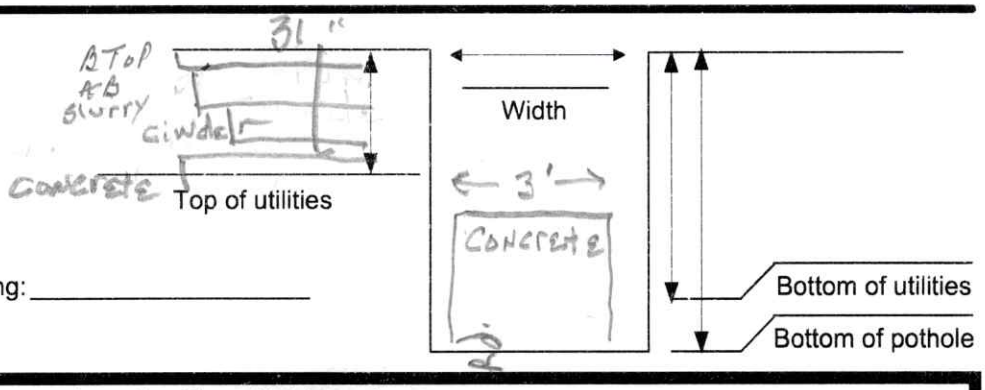
Distance from nearest back of curb (minimum two distances required): West East North South

Was requested utility found? ☐ Yes ☑ No Type of Utility: WATER

Other utilities found:

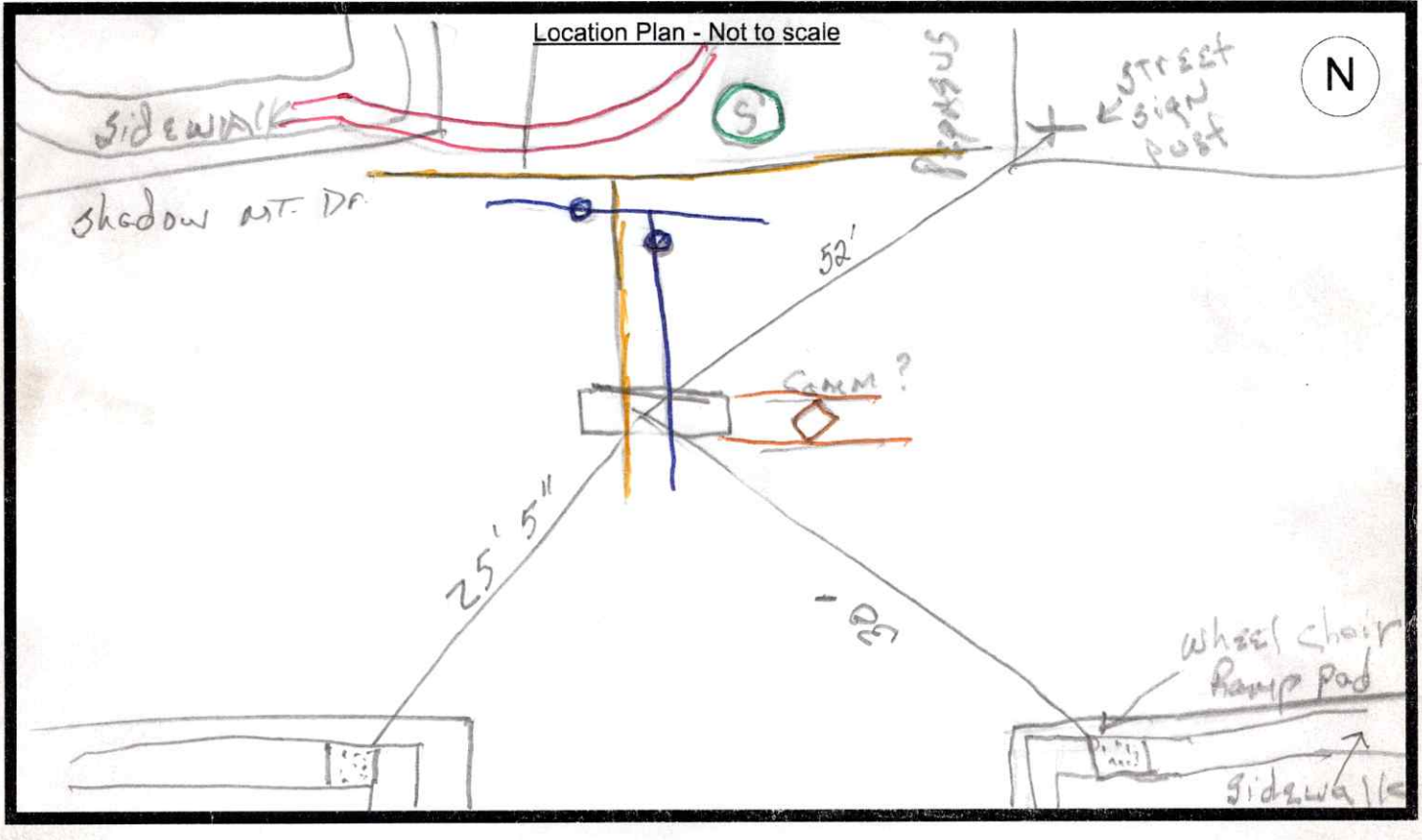
Concrete encased: ☑ Yes ☐ No Photos Attached: ☑ Yes ☐ No

Utility Cross Sectional View
Not to Scale



Ribbon Color: Facing:

Location Plan - Not to scale



Remarks:

POTHOLE REPORT

ELEVATED CIVIL

Test Hole No.: #2 Comm Date Dug: 12-4-24

Project No.: 24207 Owner Project No.:

Project Name: Shadows MT.

Crew Members: Bill, Jose, Derek, Louis

General Location: Shadow MT Drive Bellsmont Coordinates: 35°14'16"

111°49'4" W

Station & Offset

Distance from nearest back of curb (minimum two distances required):

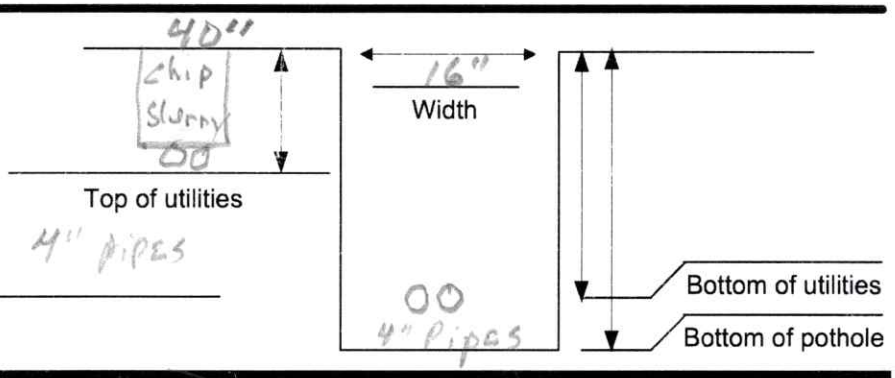
West	East	North	South
			16.8'

Was requested utility found? ☑ Yes ☐ No Type of Utility: Comm

Other utilities found: No

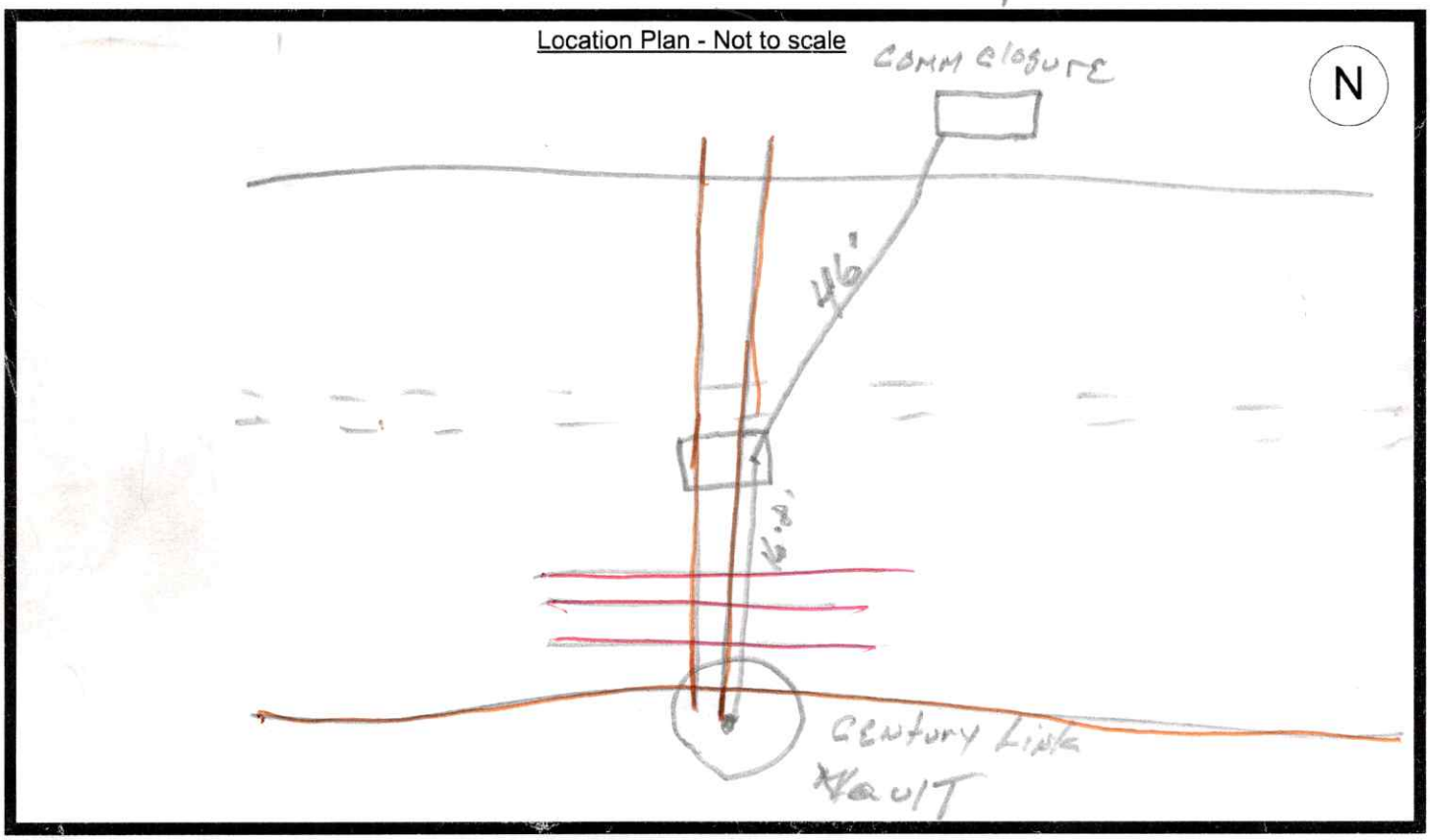
Concrete encased: ☑ Yes ☐ No Photos Attached: ☑ Yes ☐ No

Utility Cross Sectional View
Not to Scale



Ribbon Color: Facing:

Location Plan - Not to scale



Remarks:

POTHOLE REPORT

ELEVATED CIVIL

Test Hole No.: 3 Date Dug: 12-4-24

Project No.: 24207 Owner Project No.:

Project Name: Shadow Mt. Dr. Belmont

Crew Members: Bill, Jose, Derek, Lewis

General Location: Shadow Mt. Drive Coordinates: 35° 14' 16" N 111° 49' 4" W

Station & Offset

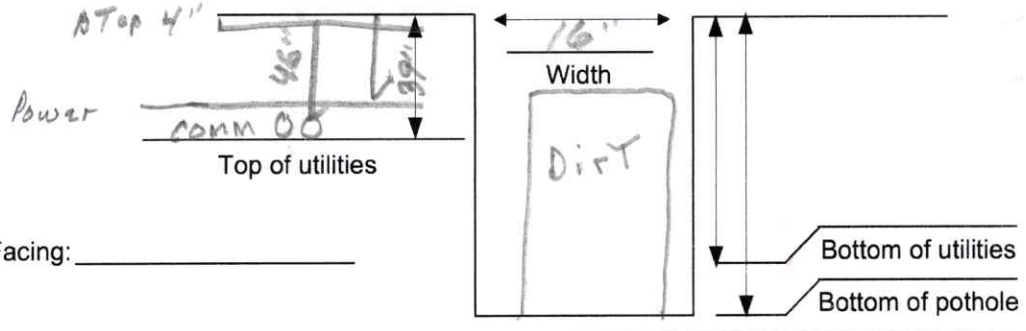
Distance from nearest back of curb (minimum two distances required): West East North South

Was requested utility found? ☑ Yes ☐ No Type of Utility: Comm

Other utilities found: power, Comm

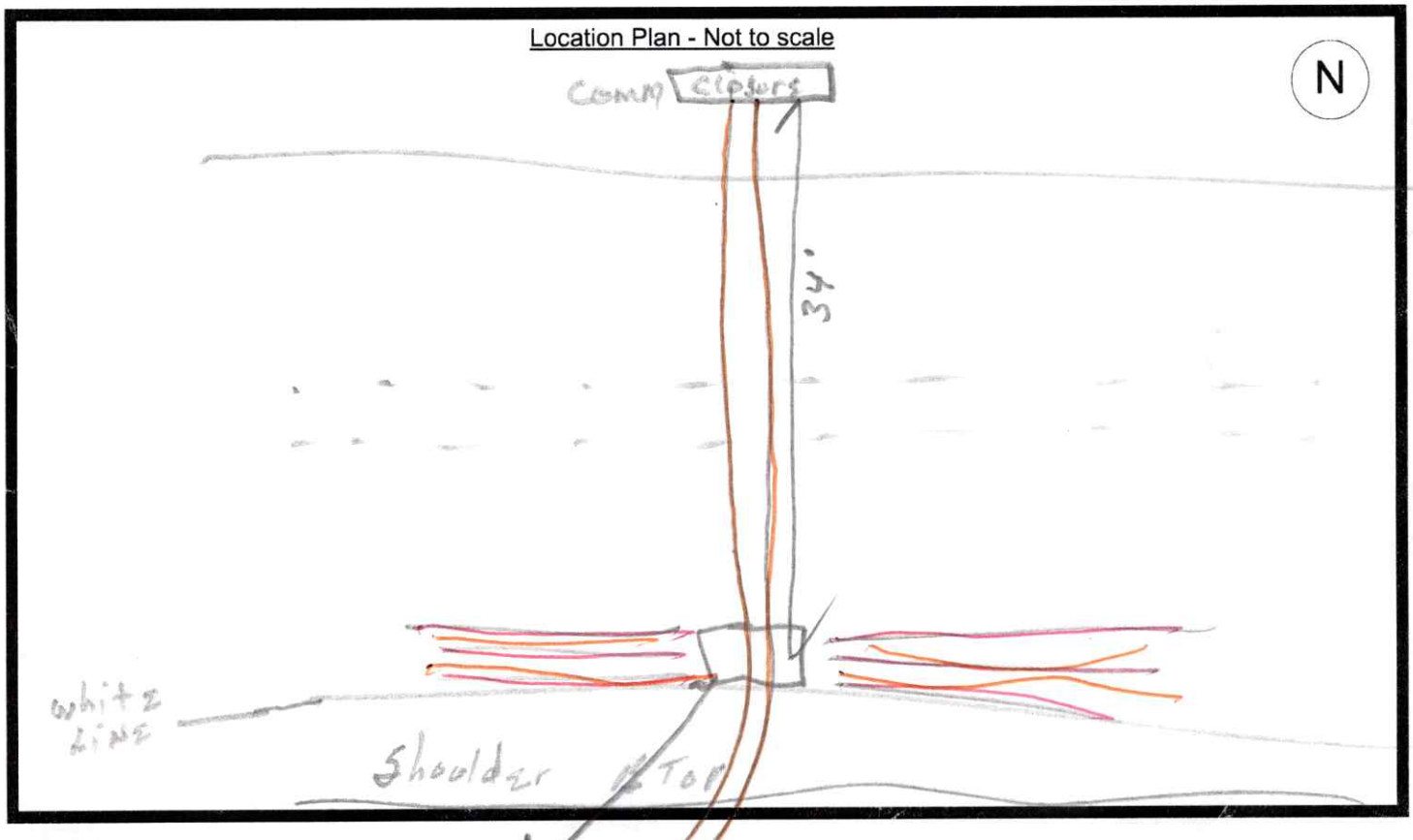
Concrete encased: ☐ Yes ☑ No Photos Attached: ☑ Yes ☐ No

Utility Cross Sectional View
Not to Scale



Ribbon Color: Facing:

Location Plan - Not to scale



Remarks:

POTHOLE REPORT

ELEVATED CIVIL

Test Hole No.: 4 Date Dug: 12-5-24

Project No.: 24207 Owner Project No.:

Project Name: Shadows MT. Dr. Belmont

Crew Members: Bill, Jose, Derek, Louis

General Location: Shadows MT. Drive Coordinates: 35° 14' 16" N 111° 49' 1" W

Station & Offset

Distance from nearest back of curb (minimum two distances required): West East North South

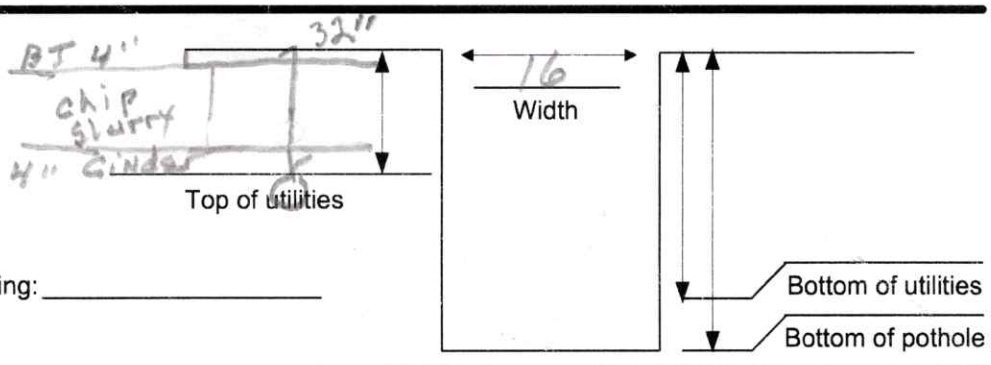
Was requested utility found? ☒ Yes ☐ No Type of Utility: Comm

Other utilities found: No

Concrete encased: ☐ Yes ☒ No Photos Attached: ☒ Yes ☐ No

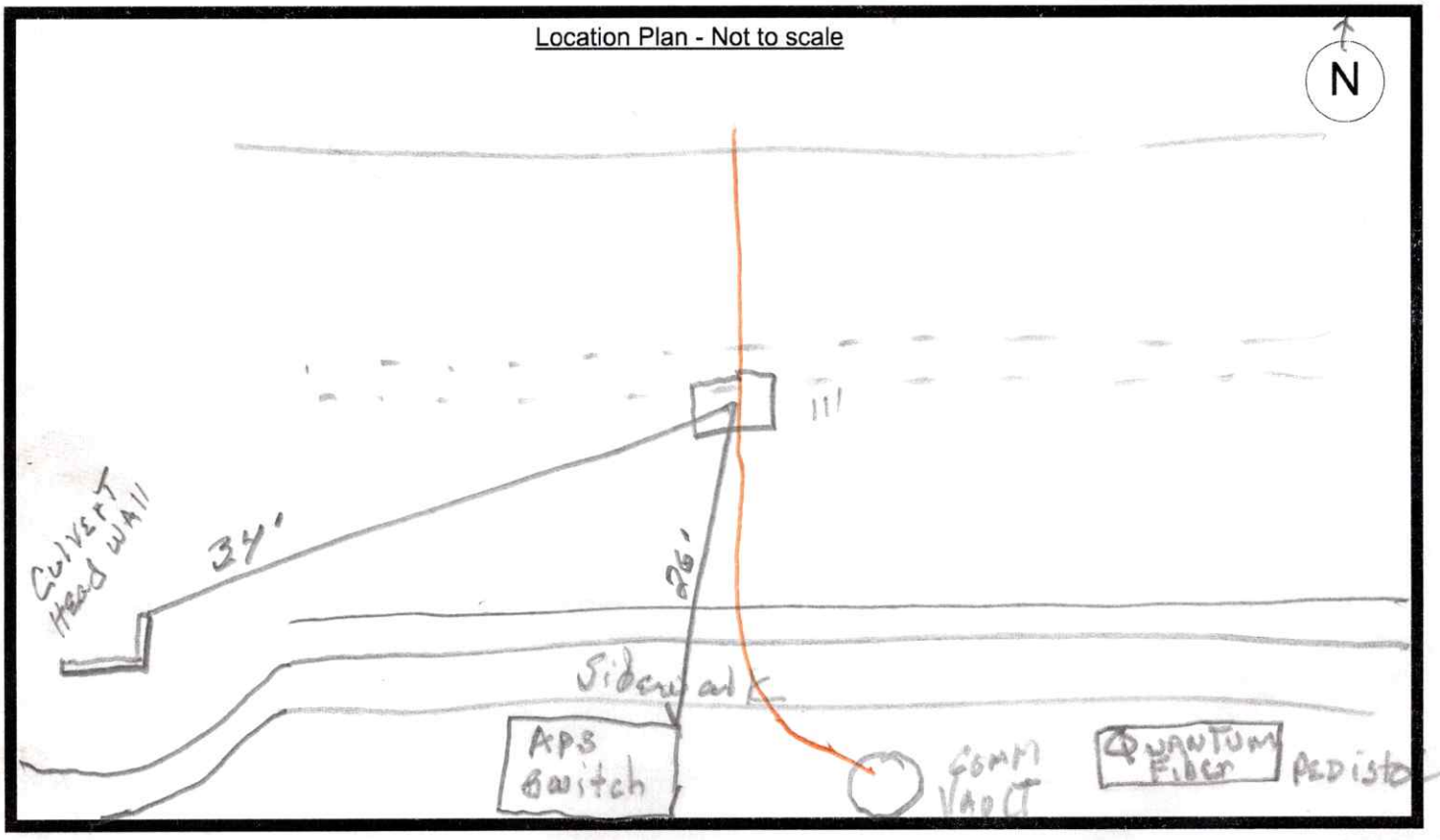
Slurry Capped

Utility Cross Sectional View
Not to Scale



Ribbon Color: Facing:

Location Plan - Not to scale



Remarks:

POTHOLE REPORT

ELEVATED CIVIL

Test Hole No.: 5 Gas Date Dug: 12-5-24

Project No.: 24207 Owner Project No.:

Project Name: Shadow MT Dr. Bellemont

Crew Members: Bill, Jose, Derek, Louis

General Location: Shadow MT. Dr Coordinates: 35°14'15" N 111°48'58" W

Station & Offset

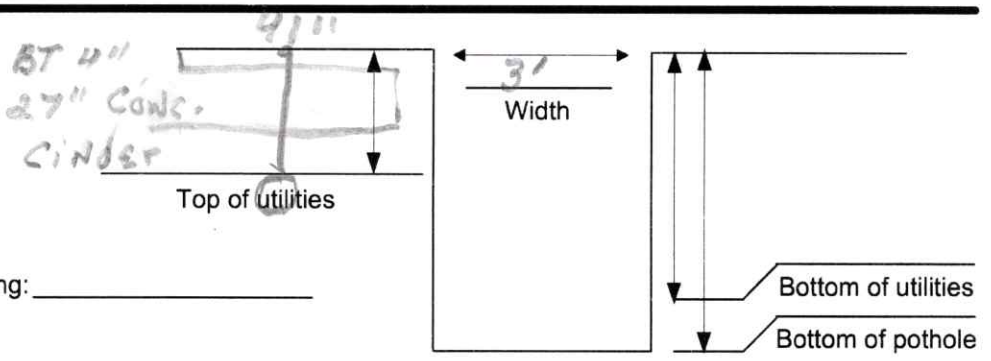
Distance from nearest back of curb (minimum two distances required): West East North South

Was requested utility found? ☑ Yes ☐ No Type of Utility:

Other utilities found: Capped

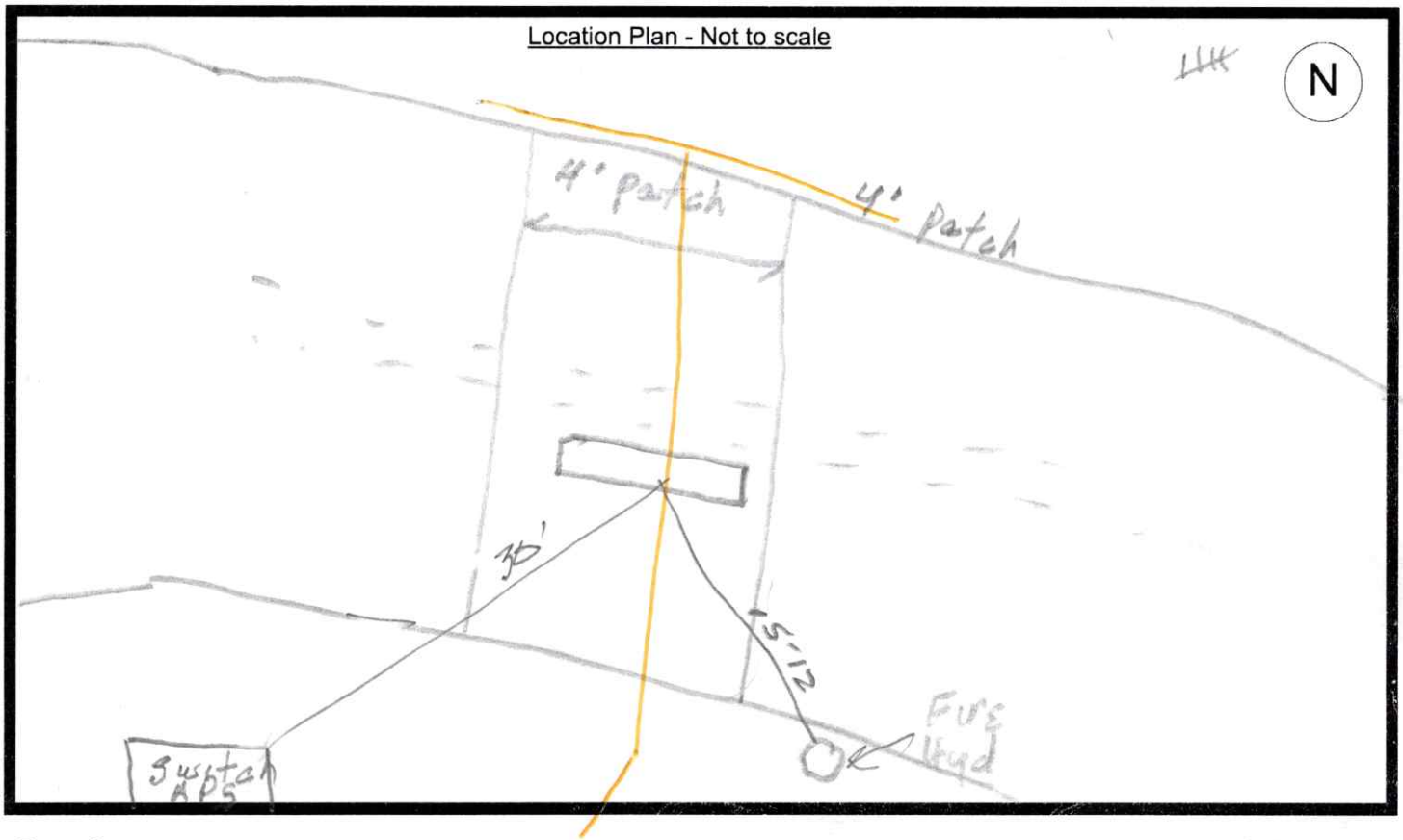
Concrete encased: ☑ Yes ☐ No Photos Attached: ☑ Yes ☐ No

Utility Cross Sectional View
Not to Scale



Ribbon Color: Facing:

Location Plan - Not to scale



Remarks: Approximately 2" OD plastic gas

POTHOLE REPORT

ELEVATED CIVIL

Test Hole No.: 6 WATER Date Dug: 12.5.24

Project No.: 24207 Owner Project No.:

Project Name: Shadow MT Dr. BELMONT

Crew Members: Bill, Jose, Derek, Lewis

General Location: Shadow MTN Dr. Coordinates: 35°14'14" N 114° 48'56" W

Station & Offset

Distance from nearest back of curb (minimum two distances required): West East North South

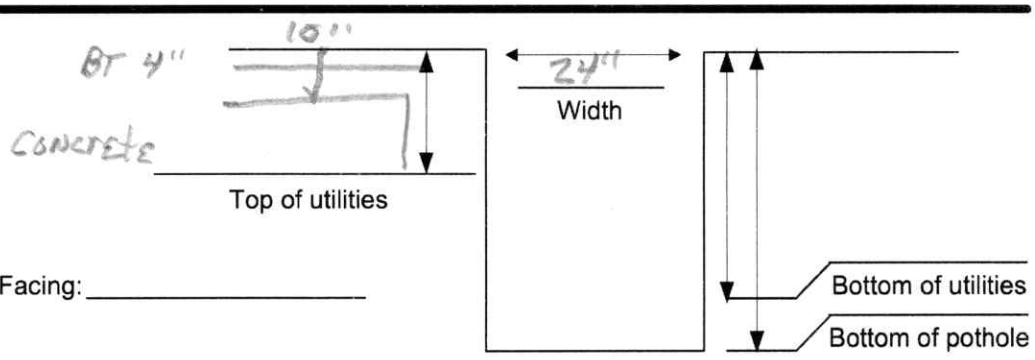
Was requested utility found? ☐ Yes ☒ No Type of Utility: Water

Other utilities found:

Concrete encased: ☐ Yes ☐ No Photos Attached: ☒ Yes ☐ No

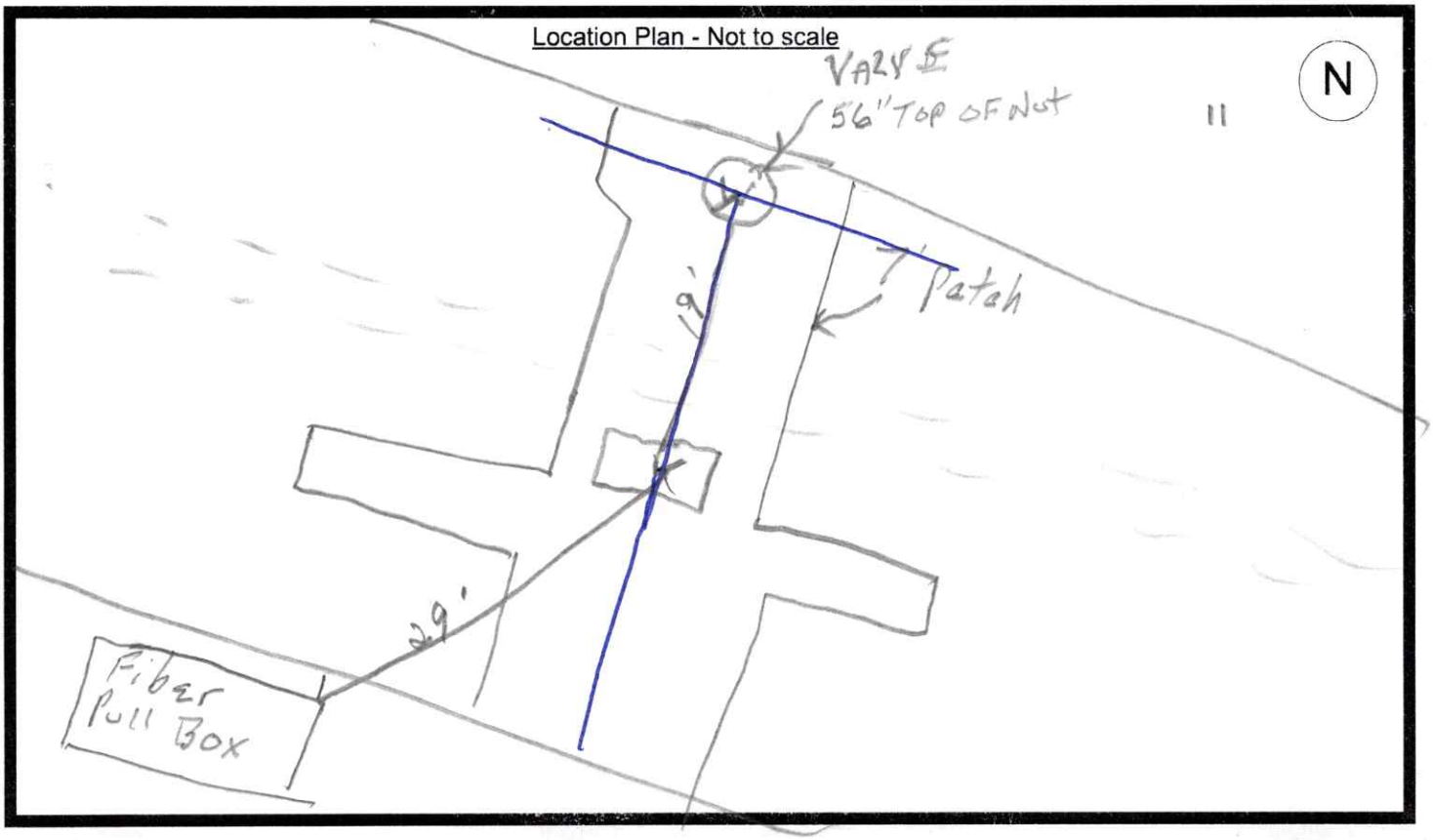
Capped ?

Utility Cross Sectional View
Not to Scale



Ribbon Color: Facing:

Location Plan - Not to scale



Remarks:

POTHOLE REPORT

ELEVATED CIVIL

Test Hole No.: #7 HP Gas El Paso Date Dug: 12.6.24

Project No.: 24207 Owner Project No.:

Project Name: Shadow Mtn. Dr. Belmont

Crew Members: Bill, Jose, Derek, Manuel

General Location: Shadow Mtn. Dr. Coordinates: 35°14'12" N 111° 48' 53" W

Station & Offset

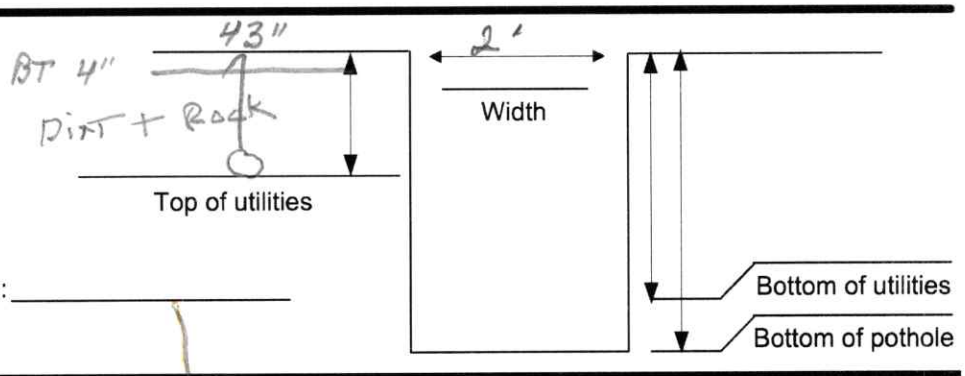
Distance from nearest back of curb (minimum two distances required): West East North South

Was requested utility found? ☑ Yes ☐ No Type of Utility: High P. Gas

Other utilities found:

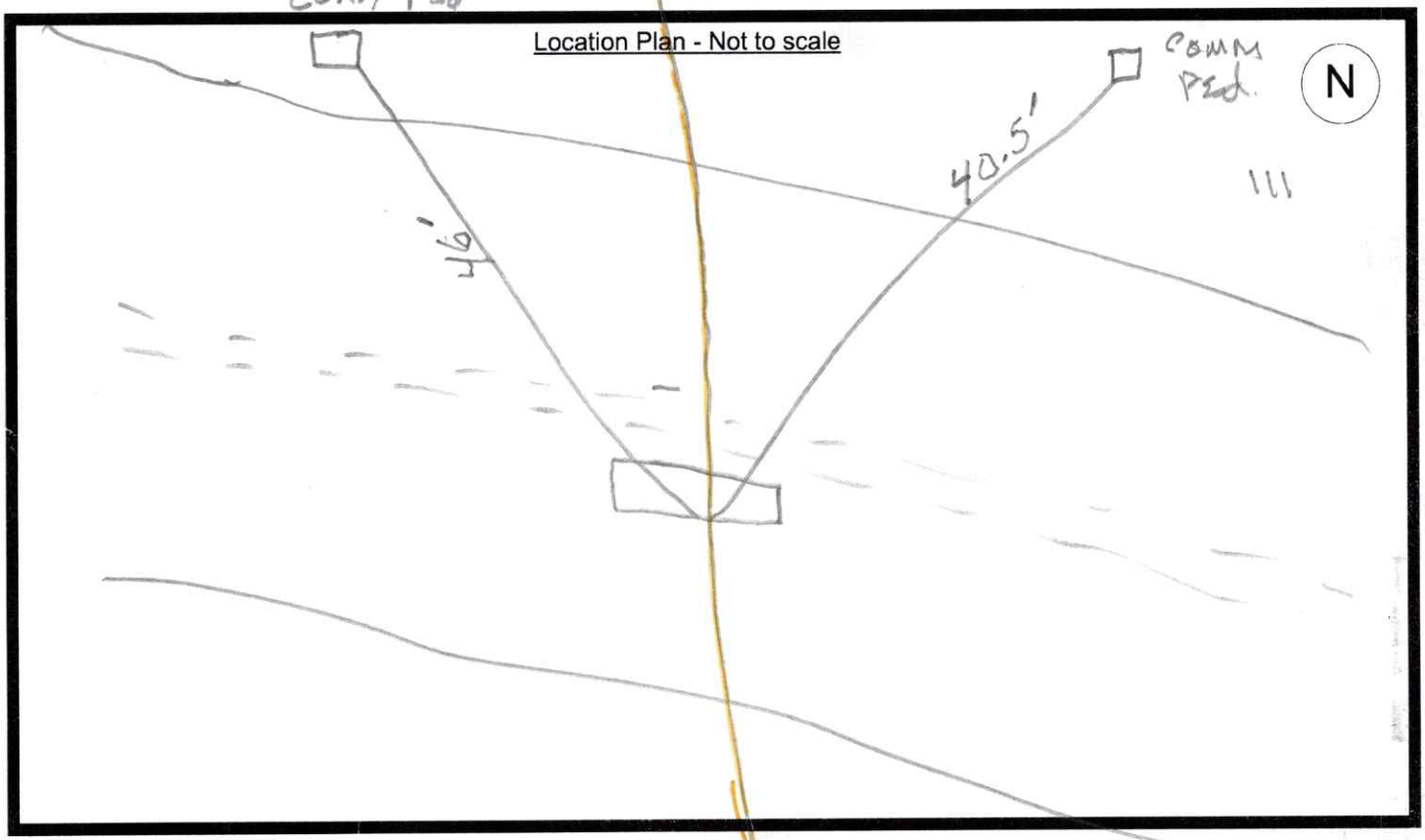
Concrete encased: ☐ Yes ☑ No Photos Attached: ☑ Yes ☐ No

Utility Cross Sectional View
Not to Scale



Ribbon Color: Facing:

Location Plan - Not to scale



Remarks:

POTHOLE REPORT

ELEVATED CIVIL

Test Hole No.: 8 Date Dug: 12.5.24

Project No.: 24207 Owner Project No.:

Project Name: Shadow MTN. Dr. Belmont

Crew Members: Bill, Jose, Derek, Louis

General Location: Shadow MTN. Dr. @ Fossil Creek Rd. Coordinates: 35°14'6" N 111°48'46" W

Station & Offset

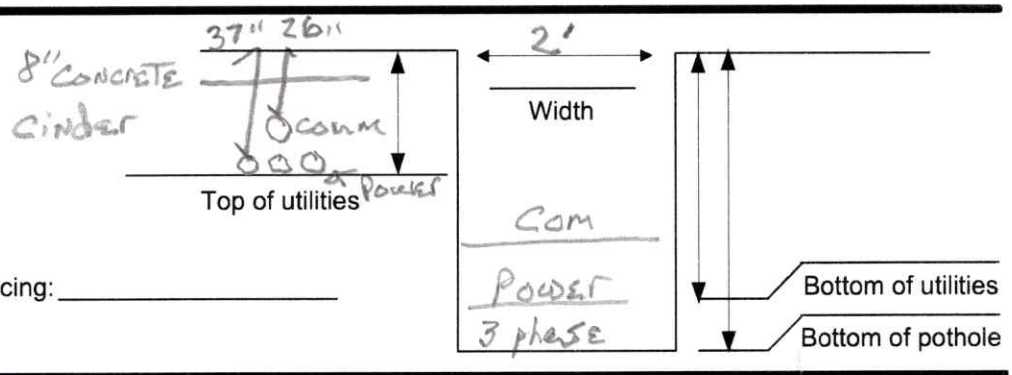
Distance from nearest back of curb (minimum two distances required): West East North South

Was requested utility found? ☒ Yes ☐ No Type of Utility: Power, Comm

Other utilities found:

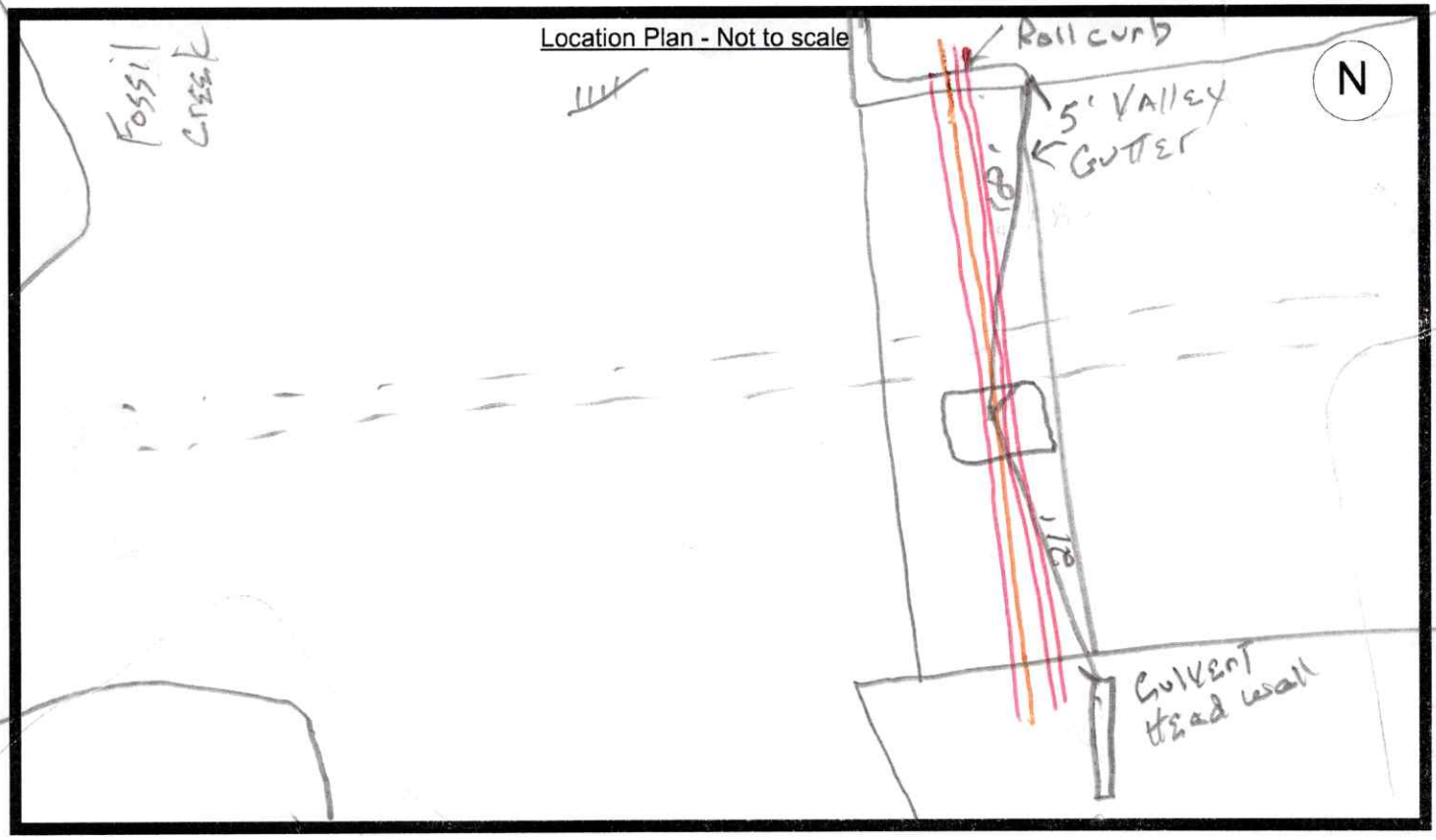
Concrete encased: ☐ Yes ☒ No Photos Attached: ☒ Yes ☐ No

Utility Cross Sectional View
Not to Scale



Ribbon Color: Facing:

Location Plan - Not to scale



Remarks:

POTHOLE REPORT

ELEVATED CIVIL

Test Hole No.: 9 WATER Date Dug: 12.5.24

Project No.: 24207 Owner Project No.:

Project Name: Shadow MTN. Dr. Belmont

Crew Members: Bill Foss, Derek, Luis

General Location: Shadow MTN. Dr. @ ATHENA AVE Coordinates: 35° 14' 2" N

Station & Offset 111° 48' 41" W

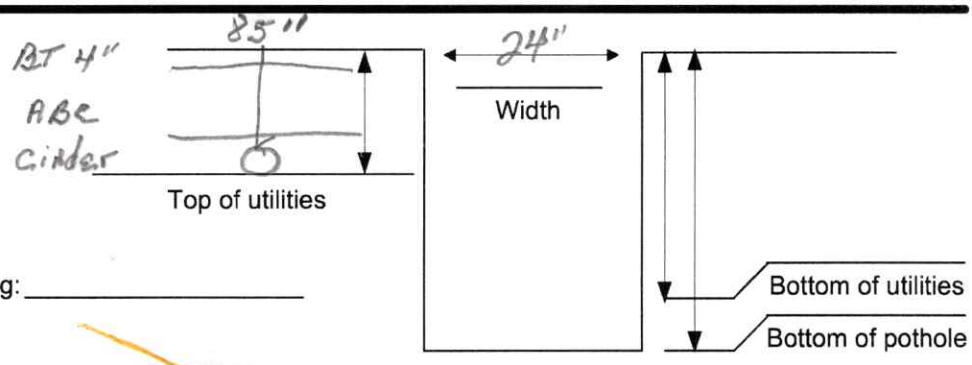
Distance from nearest back of curb (minimum two distances required): West East North South

Was requested utility found? ☒ Yes ☐ No Type of Utility:

Other utilities found:

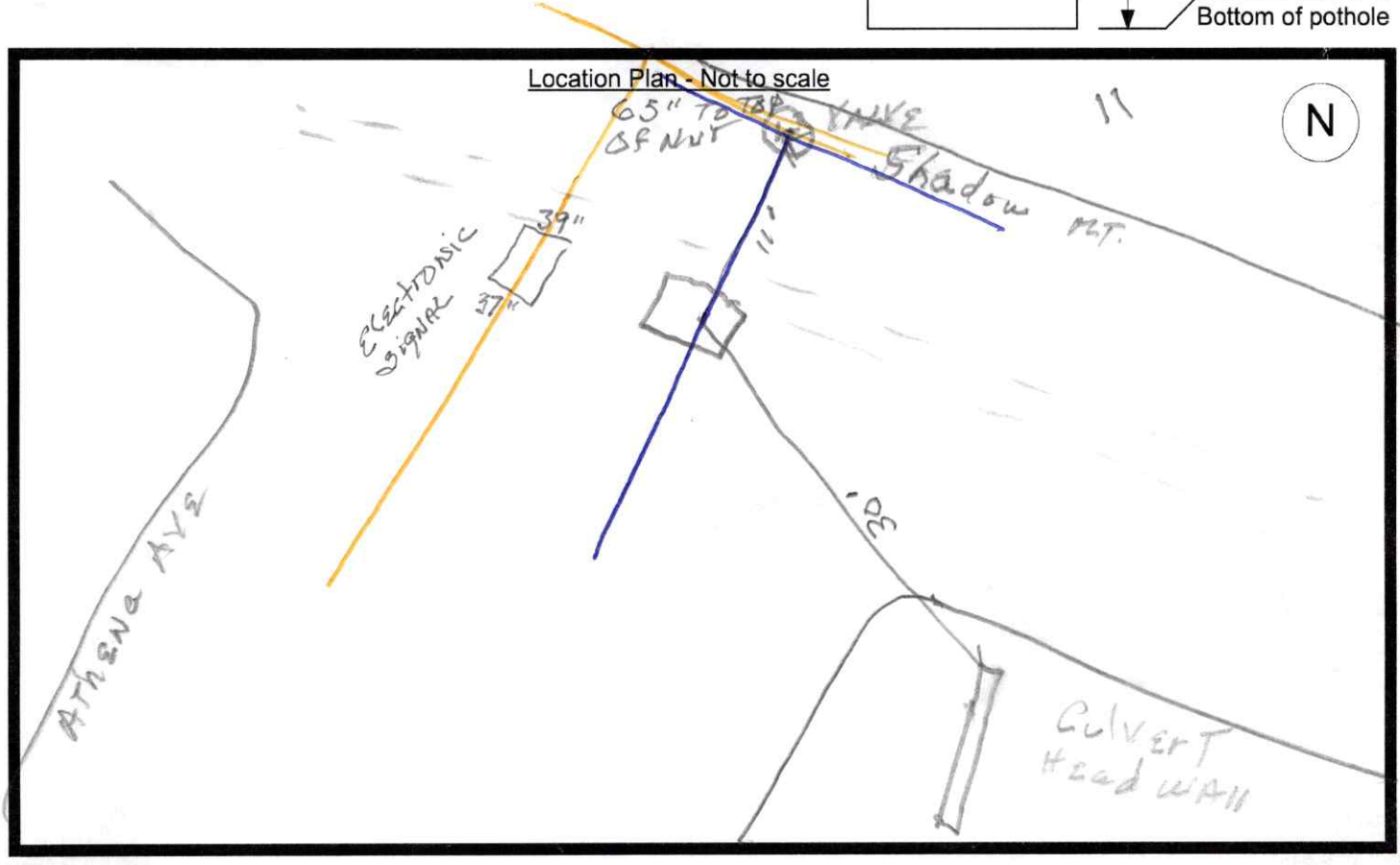
Concrete encased: ☐ Yes ☒ No Photos Attached: ☒ Yes ☐ No

Utility Cross Sectional View
Not to Scale



Ribbon Color: Facing:

Location Plan - Not to scale



Remarks:

POTHOLE REPORT

ELEVATED CIVIL

Test Hole No.: 10 Gas/ WATER NOT Date Dug: 12-6-24

Project No.: 24207 Owner Project No.:

Project Name: Shadow MTN. Dr Belmont

Crew Members: Bill, Jose, Derek, Manuel

General Location: Shadow MTN DR @ STATE MTN TRL. Coordinates: 35° 13' 59" N 111° 48' 37" W

Station & Offset

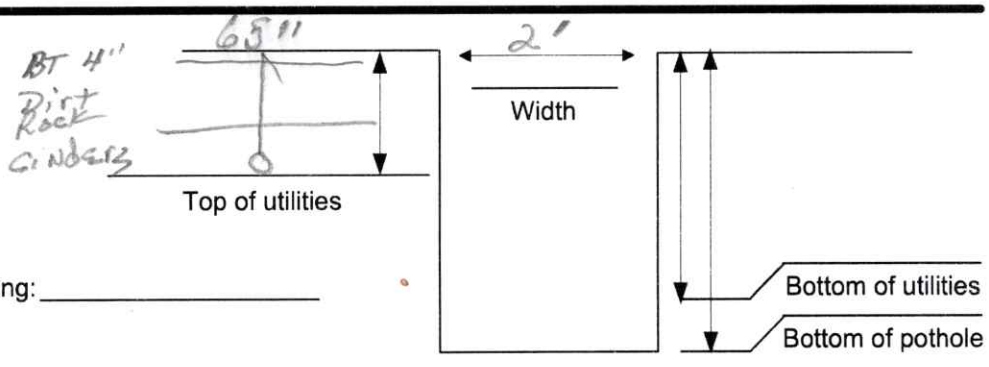
Distance from nearest back of curb (minimum two distances required): West ____ East ____ North ____ South ____

Was requested utility found? ☒ Yes ☐ No Type of Utility: Gas Cable WATER

Other utilities found:

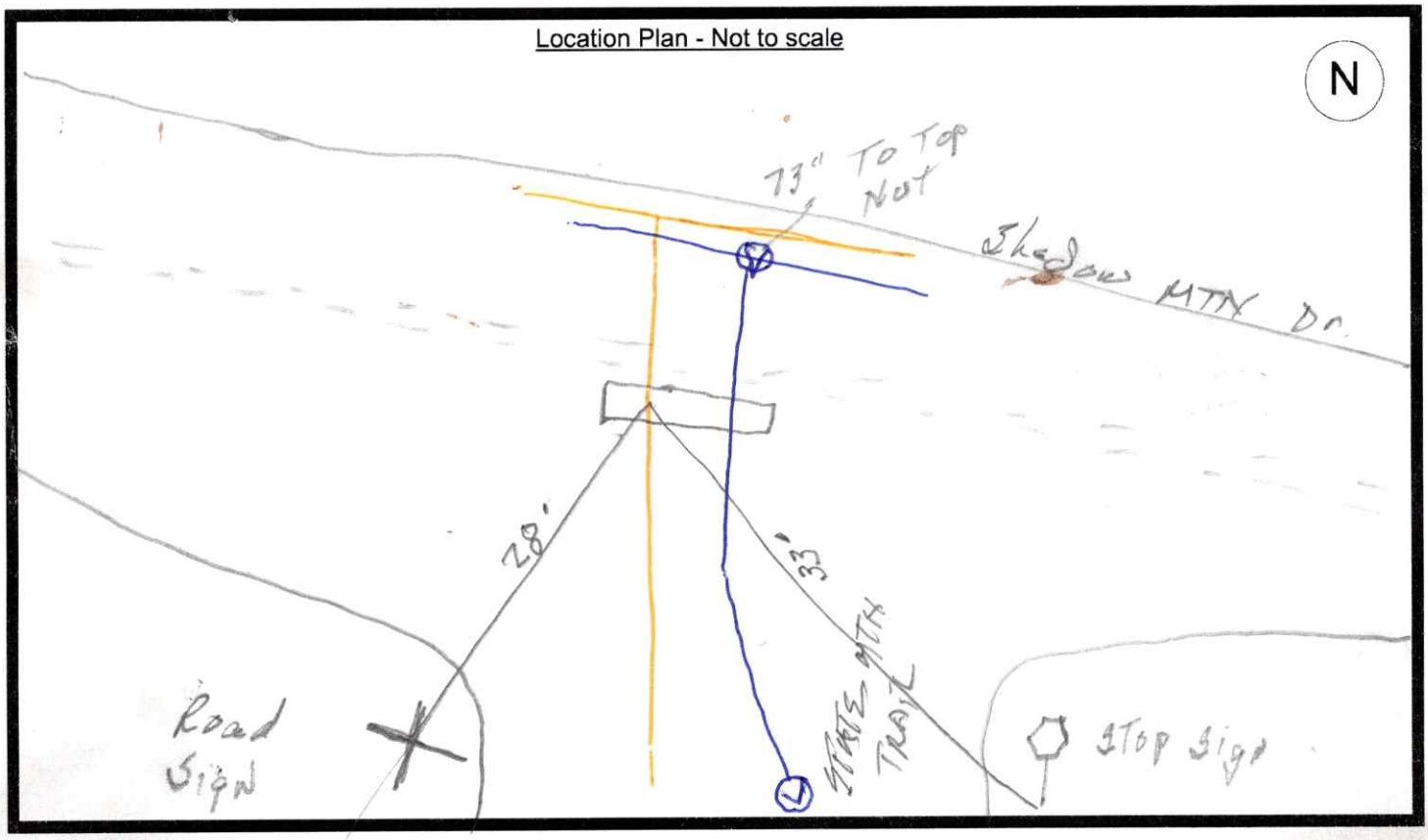
Concrete encased: ☐ Yes ☒ No Photos Attached: ☒ Yes ☐ No

Utility Cross Sectional View
Not to Scale



Ribbon Color: _____ Facing: _____

Location Plan - Not to scale



Remarks:

POTHOLE REPORT

ELEVATED CIVIL

Test Hole No.: 11 Gas / WATER NUT Date Dug: 12-6-24

Project No.: 24207 Owner Project No.:

Project Name: Shadow MTN. Dr. Basement

Crew Members: Bill, Jose, Derek, Manuel

General Location: Shadow MTN. Dr. Coordinates: 35° 13' 53" N 111° 48' 29" W

Station & Offset

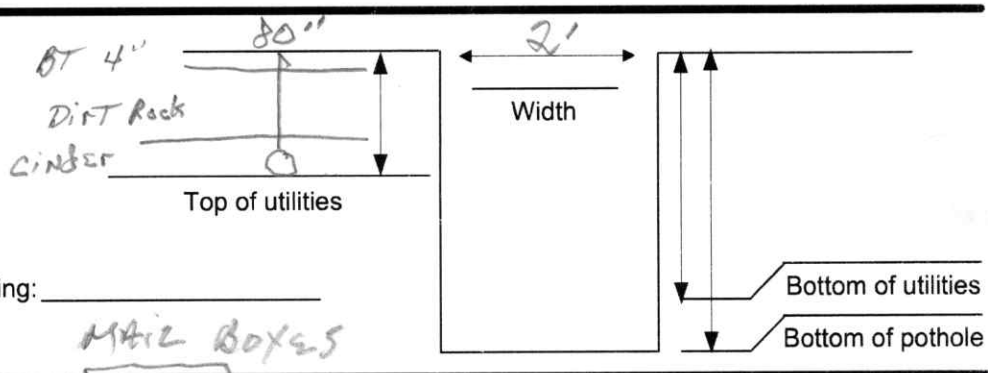
Distance from nearest back of curb (minimum two distances required): West ____ East ____ North ____ South ____

Was requested utility found? ☒ Yes ☐ No Type of Utility: Gas

Other utilities found:

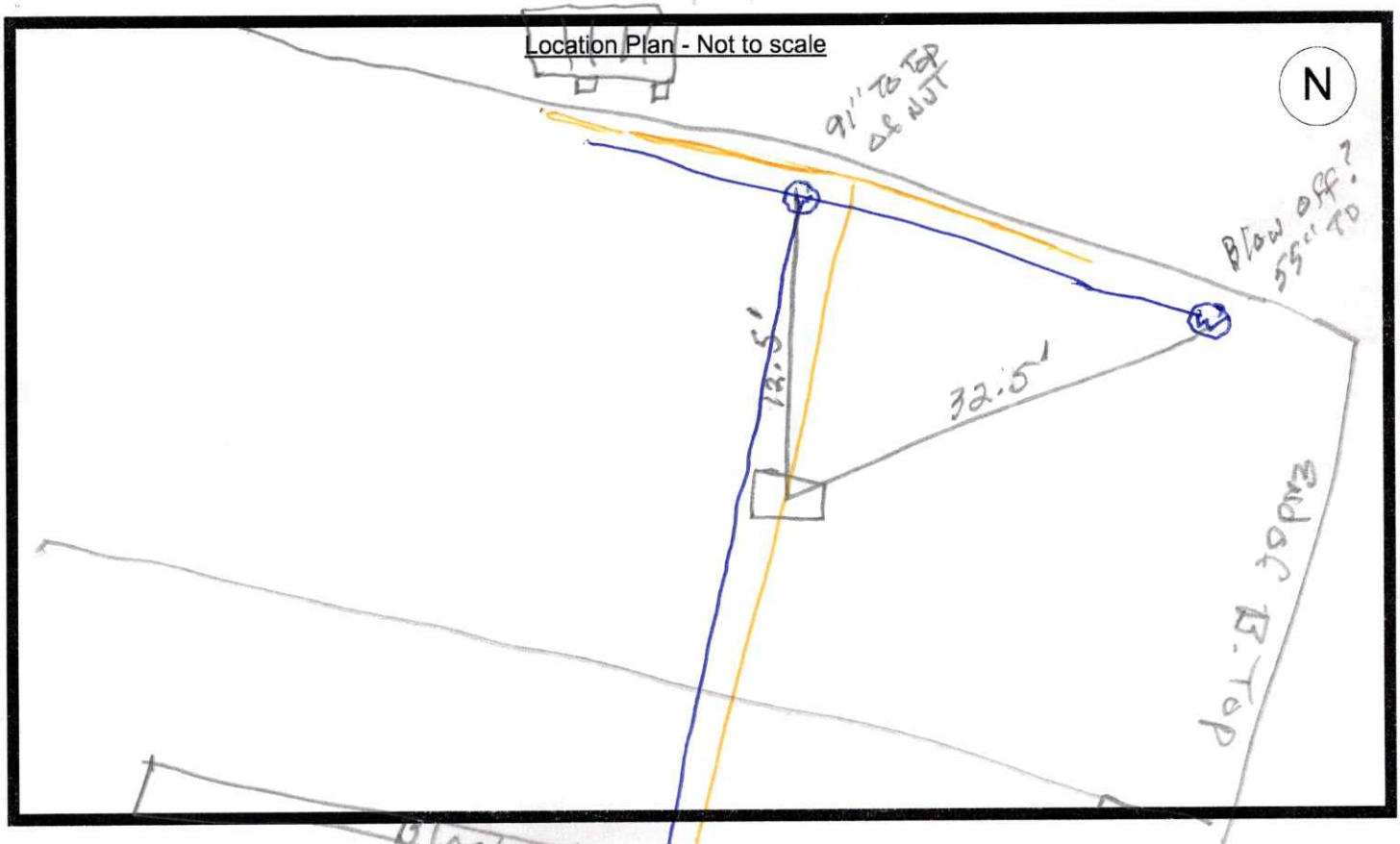
Concrete encased: ☐ Yes ☒ No Photos Attached: ☒ Yes ☐ No

Utility Cross Sectional View
Not to Scale



Ribbon Color: Facing: MAIL BOXES

Location Plan - Not to scale



Remarks: