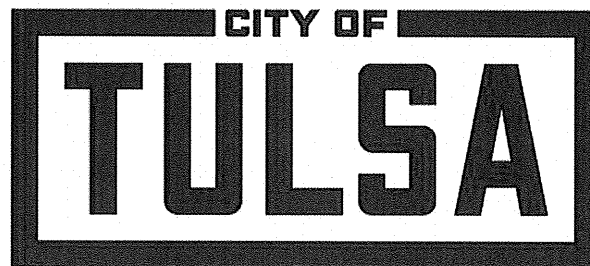


**CONTRACT DOCUMENTS
AND
SPECIFICATIONS
FOR
PROJECT NO. CIRI 2027-2028
CITYWIDE INFRASTRUCTURE
REHABILITATION AND IMPROVEMENTS**

ATTENDANCE AT PRE-BID CONFERENCE IS MANDATORY

PREPARED BY:
City of Tulsa
175 E. 2nd St. 13th Fl
Tulsa, OK 74103
918-576-5514
Chris Mashburn



PUBLIC WORKS
Engineering

TERRY BALL, DIRECTOR

Account Numbers: 2036N0001Z.Streets.CWNARP.4285.42853200-541106;
2436A0002Z.StreetRehb.ArtRhb.410.4103200-541106; 2036S0004Z.Sidewalk.BPInfra.4285.42853200-
541106; 2036S0005Z.Sidewalk.BPInfra.4285.42853243-541106;
2036D0007Z.Streets.CDBSA.4283.42833243-541106; 2436N0007Z.Streets.NArtRhb.4292.42923200-
541106; 2436B0005Z.Bridges.BridgMR.4295.42953200-541107;
2036X0006Z.Streets.TrafEng.4285.42853200-541106; 2036X0006Z.Streets.TrafEng.4286.42863200-
541106; 2036X0006Z.TrafficOps.Grdrail.410.4103200-522112; 1080-5312602-044748-743344-535104

Public Works Department
175 East 2nd Street, Suite 261
Tulsa, Oklahoma 74103
(918) 596-9637

CONTRACT DOCUMENTS
PUBLIC WORKS DEPARTMENT
STREET OPERATIONS AND INSPECTION SECTION
2027-2028 CITYWIDE INFRASTRUCTURE
REHABILITATION AND IMPROVEMENTS

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Published in the Tulsa World:
September 11, 15, 16, 17 and 18, 2026.

**NOTICE TO BIDDERS
SEALED BIDS FOR
PROJECT NO. CIRI 2027-2028**

Notice is hereby given that pursuant to an order by the Mayor of the City of Tulsa, Oklahoma, sealed bids will be received in Room 260 of the Office of the City Clerk, City of Tulsa, 175 E. 2nd Street, Tulsa, Oklahoma 74103 until **8:30 a.m. the 16th day of October, 2026** for furnishing all tools, materials and labor and performing the work necessary to be done in the construction of the following:

PROJECT NO. CIRI 2027-2028 Citywide Infrastructure Rehabilitation and Improvements

The entire cost of the improvement shall be paid from Account No.

2036N0001Z.Streets.CWNARP.4285.42853200-541106
2436A0002Z.StreetRehb.ArtRhb.410.4103200-541106
2036S0004Z.Sidewalk.BPInfra.4285.42853200-541106
2036S0005Z.Sidewalk.BPInfra.4285.42853243-541106
2036D0007Z.Streets.CDBSA.4283.42833243-541106
2436N0007Z.Streets.NArtRhb.4292.42923200-541106
2436B0005Z.Bridges.BridgMR.4295.42953200-541107
2036X0006Z.Streets.TrafEng.4285.42853200-541106
2036X0006Z.Streets.TrafEng.4286.42863200-541106
2036X0006Z.TrafficOps.Grdrail.410.4103200-522112
1080-5312602-044748-743344-535104

A **MANDATORY** Pre-Bid Conference is scheduled for **Tuesday, September 22, 2026 at 9:30 a.m.** and will be held through video conferencing with Microsoft Teams, invitation presented on the City of Tulsa's website at this link:

<https://www.cityoftulsa.org/government/departments/engineering-services/construction-bids/>

Attendance at the Pre-Bid Conference is MANDATORY. Bids will not be received from contractors who did not attend the Pre-Bid Conference.

Bids will be accepted by the City Clerk from the holders of valid pre-qualifications certificates from the City of Tulsa in one or more of the following classifications: **A or C.**

Drawings, specifications and contract documents for construction of said public improvements of the said project have been adopted by the Mayor of said City. Copies of same may be obtained at the Office of Contract Administration, 175 E. 2nd St., 13th Floor, Tulsa, OK 74103

for a non-refundable fee in the amount of \$50.00 made payable to the City of Tulsa by check or money order.

Contract requirements shall include compliance as required by law pertaining to the practice of non-discrimination in employment.

The overall aspirational Small Business Enterprise utilization goal for this project is **ten (10)** percent.

Attention is called to Resolution No. 18145 of August 23, 1988, requiring bidders to commit to the goal of employing on the project at least fifty percent bona fide residents of the City of Tulsa and/or MSA in each employment classification.

Attention is called to Resolution 7404 of November 8, 2006, requiring bidders, their subcontractors and their lower-tier subcontractors to hire only citizens of the United States.

The City of Tulsa itself is exempt from the payment of any sales or use taxes, and pursuant to Title 68 O.S. Section 1356(10), direct vendors to the City are also exempt from those taxes. A bidder may exclude from his bid appropriate sales taxes, which he will not have to pay while acting for and on behalf of the City of Tulsa.

A Certified or Cashier's Check or Bidders Surety Bond, in the sum of 5% of the amount of the bid will be required from each bidder to be retained as liquidated damages in the event the successful bidder fails, neglects or refuses to enter into said contract for the construction of said public improvements for said project and furnish the necessary bonds within thirty days from and after the date the award is made.

The bidder to whom a contract is awarded will be required to furnish public liability and workmen's compensation insurance; Performance, Statutory, and Maintenance bonds acceptable to the City of Tulsa, in conformity with the requirements of the proposed contract documents. The Performance, Statutory, and Maintenance bonds shall be for one hundred percent (100%) of the contract price.

The bidding for this project is subject to a local preference law as defined in Oklahoma Statutes, Title 61, Section 103. For purposes of Section 103 a "local bid" means a bid submitted by a business entity that is authorized to do business in the State of Oklahoma and maintains its primary office or principal place of business within the State of Oklahoma. If the conditions outlined in Title 61 are met, The City of Tulsa must select the second lowest bid if

within 5% of the lowest bid and the second lowest bid is a local bid and the lowest bid is not a local bid (i.e. non-local/out of state). Accordingly, when the local bid is required to be selected under the State law, the local bidder must agree to do the work at the lowest bid price to be awarded the project.

All bids will be opened and considered by the Bid Committee of said City at a meeting of said Committee to be held in the City Council Room of City Hall in said City at 9:00 a.m. on the 16th day of October, 2026.

Dated at Tulsa, Oklahoma, this 11th day of September, 2026.

(SEAL)

Christina Chappell
City Clerk

INSTRUCTIONS TO BIDDERS

B-1. BIDS

Each bid Proposal shall be completed, signed, and submitted. No alterations, additions, or erasures shall be made on the Proposal. Erroneous entries shall be lined out, initialed by the bidder, and the correct entry inserted. The unit price bid must cover all expense for furnishing the labor, materials, tools, equipment, and apparatus of every description to construct, erect, and furnish all work required by and in conformance with the Drawings and Specifications.

Each bid shall be enclosed in a sealed envelope addressed to the City of Tulsa, 175 E. 2nd Street, Room 260, City Hall, Tulsa, Oklahoma, identified on the outside with the words:

PROJECT NO. CIRI 2027-2028 CITYWIDE INFRASTRUCTURE REHABILITATION AND IMPROVEMENTS

Pre-qualification Certificate Number _____.

And shall be filed with the City Clerk in Room 260, City Hall.

All addenda to the contract documents should be denoted on the last page of the Proposal in the space provided.

B-2. BID SECURITY

Each bid shall be accompanied by a cashier's check, a certified check, or bidder's bond, in the amount of five percent (5%) of the total amount bid.

The bid security shall be made payable, without condition, to the City of Tulsa, Oklahoma. The bid security may be retained by and shall be forfeited to the City as liquidated damages if the bid is accepted, a contract based thereon is awarded, and the bidder fails to enter into a contract in the form prescribed, with legally responsible sureties, within thirty (30) days after such award is made by the City.

B-3 RETURN OF BID SECURITY

The bid security of each unsuccessful bidder will be returned when his bid is rejected. The bid security of the bidder to whom the contract is awarded will be returned when he executes a contract and files satisfactory bonds. The bid security of the second lowest responsible bidder may be retained for a period of time not to exceed sixty (60) days pending the execution of the contract and bonds by the successful bidder.

B-4 WITHDRAWAL OF BIDS

No bidder may withdraw his bid for sixty (60) days after the date and hour set for the opening. A bidder may withdraw his bid any time prior to expiration of the

period during which bids may be submitted by making a written request signed in the same manner and by the same person who signed the Proposal.

B-5 REJECTION OF BIDS

Bids received more than ninety-six (96) hours before the time set for opening bids, excluding Saturdays, Sundays, and holidays, as well as bids received after the time set for opening bids, will not be considered and will be returned unopened.

The City of Tulsa reserves the right to reject any and all bids when such rejection is in the best interest of the City of Tulsa. All bids are received subject to this stipulation and the City reserves the right to decide which bidder shall be deemed lowest responsible bidder.

A violation of any of the following provisions by a bidder shall be sufficient reason for rejecting bidder's bid, or shall make any contract between the City of Tulsa and the Contractor that is based on bidder's bid, null and void: divulging the information in said bid before the bids have been opened; submission of a bid which is incomplete, unbalanced, obscure, incorrect, or which has conditional clauses, additions, or irregularities of any kind not in the original proposal form, or which is not in compliance with the Instruction to Bidders and published Notice to Bidders, or which is made in collusion with another bidder. The City shall have the right to waive any immaterial defects or irregularities in any bid received.

B-6 DISQUALIFICATION OF BIDDERS

No contract will be awarded to any person or persons, firm, partnership, company, or corporation which is in arrears to the City upon any debt of contract, or in default as surety or otherwise upon any obligation to the City.

B-7 SIGNATURE OF BIDDERS

Each bid shall be properly signed with the full name of the company or individual submitting the bid, the bidder's address, and the name and title of all persons signing printed below their signature lines. Bids by partnerships shall be signed with the partnership name followed by the signature and title of one of the partners. Bids by corporations shall be signed with the name of the corporation followed by the signature and title of the president, vice president, chairman, or vice chairman of the Board of Directors with attestation by the corporate secretary or assistant corporate secretary. Bids by joint ventures shall be signed by each participant in the joint venture. Bids by limited liability companies shall be signed with the name of the limited liability company followed by the signature and title of the Manager or Managing Member. Bid by limited partnerships shall be signed with the name of the limited partnership followed by the signature of the general partner. Note: The signature requirements listed above are for Oklahoma entities; entities organized in other states must follow the law of the state in which they are organized.

A bid by a person who affixes to his signature the word "President", "Manager", "General Partner", "Agent", or other title, without disclosing the name of the company for which he is signing, may be held to be the bid of the individual signing.

B-8 INTERPRETATION OF CONTRACT DOCUMENTS

If any bidder who contemplates submitting a bid is in doubt as to the true meaning of any part of the drawing, specifications, or other proposed contract documents, bidder may submit to Contract Administration and the Engineer a written request for interpretation thereof. The person submitting the request shall be responsible for its prompt delivery. Interpretation of the proposed contract documents will be made only by addendum. The addendum will be posted on the City of Tulsa website and emailed to all the pre-bid attendees. The City will not be responsible for any other explanations or interpretations of the proposed contract documents.

B-9 LOCAL CONDITIONS AFFECTING WORK

Each bidder shall visit the site of the work and shall completely inform himself relative to construction hazards and procedure, labor, and all other conditions and factors, local and otherwise, which would affect prosecution and completion of the work and its cost. Such considerations shall include the arrangement and condition of existing structures and facilities, the procedure necessary for maintenance of uninterrupted operation of existing structures and facilities, the availability and cost for labor, and facilities for transportation, handling, and storage of materials and equipment. All such factors shall be properly investigated and considered in the preparation of the bid. There will be no subsequent financial adjustment for lack of such prior information.

B-10 TIME OF COMPLETION

The time of completion is an essential part of the contract and it will be necessary for each bidder to satisfy the City of his ability to complete the work within the allowable time set forth in the Bid Form. For all projects that will impact the public, a public meeting is required before any work is done. In this connection, attention is directed to the provisions of the General Conditions and Special Conditions relative to delays, extension of time, and liquidated damages.

B-11 QUALIFICATION OF BIDDERS

No bid will be received and filed by the City Clerk of the City of Tulsa unless the person submitting the bid has been pre-qualified as provided by ordinance, and is the holder of a current certificate of Pre-qualification in force and effect on the date such bid is to be submitted and filed.

B-12 TAXES AND PERMITS

Attention is directed to the requirements of the General Conditions regarding payment of taxes and obtaining permits. Contractor shall comply with all zoning ordinances of the City, as provided in the Tulsa Zoning Code, Title 42 Tulsa Revised Ordinances and conform with all zoning requirements established by the Tulsa Metropolitan Area Planning Commission and the Board of Adjustment.

Contractor can call the Indian Nations Council of Governments (INCOG) at (918) 584-7526, to determine if any zoning requirements must be met.

B-13 OKLAHOMA LEGAL REQUIREMENTS

The Contractor must comply with the Oklahoma Scaffolding Law, 40 Oklahoma Statutes, Sections 174 - 177, which cover erection and use of scaffolds, hoists, cranes, stays, ladders, supports, or other mechanical contrivances.

In accordance with Oklahoma Statutes, Title 68, Section 1701-1707, before commencing any work pursuant to this contract, any nonresident contractor shall give written notice by certified mail, return receipt requested, to the Oklahoma Tax Commission, the Oklahoma Employment Security Commission, the Workers Compensation Court, and the county assessor of each county in which work will be performed. The notices shall comply with the requirements set forth in said statute.

B-14 BONDS

The bidder to whom a contract is awarded will be required to furnish bonds as follows:

- a. Performance Bond – A Performance Bond to the City in an amount equal to one hundred percent (100%) of the Contract price.
- b. Statutory Bond – A Statutory Bond to the State of Oklahoma in an amount equal to one hundred percent (100%) of the contract price.
- c. Maintenance Bond – A Maintenance Bond to the City in an amount equal to one hundred percent (100%) of the contract price.

The bonds shall be executed on the forms included in the contract documents by a surety company authorized to do business in the State of Oklahoma and acceptable as Surety to the City of Tulsa.

Accompanying the bonds shall be a "Power-of-Attorney" authorizing the attorney-in-fact to bind the Surety Company and certified to include the dates of the bonds.

B-15 BOUND COPY OF CONTRACT DOCUMENTS

Bound contract documents are no longer required.

B-16 EQUAL EMPLOYMENT OPPORTUNITY REQUIREMENTS

Each bidder agrees to comply with the terms of Title 5, Chapter 1, Section 111, of the Tulsa Revised Ordinances relating to Non-Discrimination.

B-17 BASIS FOR AWARD OF CONTRACT

The basis for award of a contract shall be the total base bid submitted by the lowest responsible bidder unless otherwise directed in the form of proposal. The City of Tulsa reserves the right to withhold the awarding of a contract for a reasonable period of time from the date of opening of bids. The awarding of a contract upon a successful bid shall give the bidder no right or action or claim against the City of Tulsa upon such contract until the same shall have been reduced to writing and duly signed by the contracting parties. The award of a contract will not be completed until the contract is duly executed and the necessary bonds and insurance approved.

B-18 TIME FOR AWARDING OF CONTRACT

The awarding of a contract to the lowest responsible bidder will be made within thirty (30) days after the opening of bids unless the City of Tulsa by formal recorded action and for good cause shown, provides for a reasonable extension to that period, which extension period shall not in any event exceed fifteen (15) days where only state or local funds are involved, or not to exceed ninety (90) days on any award of contract for the construction of public improvements where funds are utilized which are furnished by an agency of the federal government.

B-19 SAFETY AND HEALTH REGULATIONS

Bidders should note that they are subject to "Safety and Health Regulations for Construction", Chapter XVII of Title 29, CFR, Part 1926 and that compliance, review and enforcement are the responsibility of the U.S. Department of Labor.

The Contractor is fully responsible for the safety of the work site and is expected to train their employees in all applicable safety issues. This should include but not be limited to: trench safety, confined space entry, head protection, etc. In accordance with construction contracts with the City, Authority, Board, or Commission, all applicable Labor and OSHA safety regulations must be followed.

Work sites must be monitored by the Contractor and safety provisions enforced. Contractors are asked to ensure that all employees are properly informed and trained in construction, work site safety.

B-20 VENDORS AND SUBCONTRACTOR IDENTIFICATION

Where Vendor and Subcontractor Identification Questionnaires are included in the bid documents, each bidder shall submit the Questionnaire directly to the Engineer no later than 5:00 p.m. on the first working day following the bid opening. Failure to submit the questionnaire may render the bid unresponsive and not eligible for award. The award of the Contract will be subject to the acceptability of the vendors and subcontractors listed. If an award is made, the vendors and subcontractors listed on the questionnaire shall be used on the project. No changes in the vendor and subcontractor list will be permitted unless prior consent is obtained from the Engineer.

B-21 U.S. ENVIRONMENTAL PROTECTION AGENCY NPDES REQUIREMENTS FOR STORMWATER DISCHARGES

The bidder's attention is directed to U.S. Environmental Protection Agency (EPA) NPDES requirements for stormwater discharges. The Contractor shall be responsible for filing a Notice of Intent and development and implementation of a Stormwater Pollution Prevention Plan (PPP).

B-22 AMERICANS WITH DISABILITIES ACT

The Contractor shall take the necessary actions to ensure its facilities are in compliance with the requirements of the Americans with Disabilities Act (ADA). It is understood that the program of the Contractor is not a program or activity of the City of Tulsa. The Contractor agrees that its program or activity will comply with the requirements of the ADA. Any costs of such compliance will be the responsibility of the Contractor. Under no circumstances will the Contractor conduct any activity, which it deems non-compliant with the ADA.

RESOLUTION NO. 18145

A RESOLUTION REQUIRING THE INCLUSION IN PLANS AND SPECIFICATIONS FOR PUBLIC IMPROVEMENT CONTRACTS OF PROVISIONS PROVIDING FOR THE EMPLOYMENT OF BONA FIDE RESIDENTS OF THE CITY OF TULSA; AND/OR THE MSA; ALSO PROVIDING THAT AT LEAST OF FIFTY PERCENT (50%) OF EACH CLASS OF EMPLOYEES USED ON A PROJECT BE BONA FIDE RESIDENTS OF THE CITY OF TULSA AND/OR THE MSA; THAT THE DIRECTOR OF THE DEPARTMENT OF HUMAN RIGHTS IS CHARGED WITH ENSURING THAT ALL BIDS FOR PUBLIC CONSTRUCTION CONTRACTS COMPLY WITH THIS RESOLUTION; AND DECLARING AN EMERGENCY.

WHEREAS, City of Tulsa, Oklahoma, desires to achieve a goal of full employment.

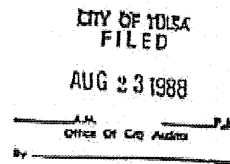
WHEREAS, it is necessary for the protection of the health, safety and welfare of all residents of the City of Tulsa, Oklahoma, to accomplish this goal.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COMMISSIONERS OF THE CITY OF TULSA, OKLAHOMA:

SECTION 1. The City of Tulsa is committed to the policy of achieving full employment of its citizens by encouraging the employment of bona fide Tulsa and MSA residents in public improvement contracts.

SECTION 2. Definitions. The definitions of certain terms used in this resolution are as follows:

- a. "Bidding Documents" or "Bid" means the bid notice, plans and specifications, bidding form, bidding instructions, special provisions and all other written instruments prepared by or on behalf of an awarding public agency for use by prospective bidders on a public construction contract.
- b. (i) "Bona Fide Residents" shall include only those persons who are either registered to vote in the City of Tulsa or who have resided within the city limits for at least six months, or who have purchased a permanent residence within the city limits or who have leased a residence for at least a six month term. Residency may be further determined by a valid Oklahoma driver's license, a current Oklahoma license tag, and a valid Oklahoma automobile inspection sticker. (ii) Bona fide residents of MSA shall include only those persons who are registered to vote in outlying MSA areas or who have resided within the outlying MSA area for at least six months, or who have purchased a permanent residence within the outlying MSA areas or who have leased a residence for at least a six month term. Residency may be further determined by a valid Oklahoma driver's license, a current Oklahoma license tag, and a valid Oklahoma automobile inspection sticker.
- c. "Public Construction Contract" or "Contract" means any contract exceeding Seven Thousand Five Hundred Dollars (\$7,500.00) in amount, awarded by the City of Tulsa for the purpose of making any public improvements or constructing any public building or making repairs to the same.
- d. "Public Improvement" means any beneficial or valuable change or addition, betterment, enhancement or amelioration of or upon any real property, or interest therein, belonging to the City of Tulsa, intended to enhance its value, beauty or utility or to adapt it to new or further purposes. The term does not include the direct purchase of materials, equipment or supplies by the City of Tulsa.



- e. "MSA". All of the land areas composed of Creek County, Osage County, Rogers County, Tulsa County and Wagoner County.

SECTION 3. Residency Requirements of Contractor's Employees. Every employee and/or agent of the City of Tulsa, Oklahoma, charged or involved with the preparation of plans and specifications for any public improvement funded in whole or in part with funds of the City of Tulsa, is hereby charged to include in said plans and specifications the following provisions which shall be binding upon the successful bidders:

- a. Each bid shall be accompanied by a sworn statement that the bidder is committed to the goal of employing at least 50% bona fide residents of the City of Tulsa and/or the MSA in each classification as determined by the Oklahoma Commissioner of Labor.
- b. The successful bidder will be responsible for having like requirements placed upon any subcontractor.
- c. The successful bidder will submit to the Director or his designated representative of the Department of Human Rights any compliance reports involving the bidder and its subcontractors required by Title 31, Chapter 1, Section 9, of the Tulsa Revised Ordinances. The reports shall include information about the residence of each employee in each laboring and trade class applicable to any City project.

SECTION 4. Unresponsive Bids. The failure to submit the documents required by Section 3 shall render a bid unresponsive. Said documents must be submitted prior to the opening of the bids. The Director of the Department of Human Rights Section of City Development is charged with ensuring that all bids comply with Section 3 prior to the bid opening date.

SECTION 5. Duty of Employees and/or Agents of the City of Tulsa. Any employee and/or agent of the City of Tulsa who fails to include the goals for residency requirements found in Section 3 in the plans and specifications for any public improvement may be subject to disciplinary action, including dismissal.

SECTION 6. Severability. The invalidity of any section, subsection, provision or clause or portion of this chapter, or the invalidity of the application thereof to any person or circumstance shall not affect the validity of the remainder of this chapter or the validity of its application to other persons or circumstances.

SECTION 7. Effect Date. This resolution shall take effect as of July 1, 1988.

SECTION 8. Emergency Clause. That an emergency exists for the preservation of the public peace, health and safety, by reason whereof this resolution shall take effect immediately upon its passage, approval and publication.

PASSED, with the emergency clause ruled upon separately and approved this 23rd day of August, 1988.

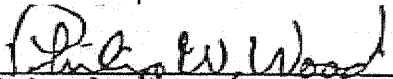
APPROVED, this 23rd day of August, 1988.

Rodger Randle



Mayor

ATTEST: Philip W. Wood



City Auditor

APPROVED: Neal E. McNeil



City Attorney

PASSED, with the emergency clause ruled upon
separately and approved this 23 day of August, 1988.

- APPROVED, this 23 day of August, 1988.



Mayor

ATTEST:



City Auditor

APPROVED:



City Attorney

CITY OF MOBILE
FILED

AUG 23 1988

Office Of City Auditor

**CITY OF TULSA, OKLAHOMA
SMALL BUSINESS ENTERPRISE (SBE) UTILIZATION INSTRUCTIONS
BID OPENING AND AWARD SYSTEM**

NOTICE FOR PROJECTS ADVERTISED (effective date 11.03.25)

The “RECIPROCITY” provisions within the City of Tulsa Small Business Enterprise (SBE) Instructions for Oklahoma Department of Transportation (ODOT) DBE firms are suspended until further notice due to changes in federal regulations issued by the USDOT.

Utilization of firms in the ODOT DBE program cannot be counted towards City of Tulsa SBE utilization goals for projects.

ODOT has been issued updated guidance by the USDOT to reassess their DBE programs effective 11.03.25. ODOT’s DBE program is suspended until final rules are established.

CITY OF TULSA, OKLAHOMA SMALL BUSINESS ENTERPRISE (SBE) UTILIZATION INSTRUCTIONS BID OPENING AND AWARD SYSTEM

05.27.25

POLICY STATEMENT

The City of Tulsa (hereinafter City) is committed to implementing the City of Tulsa Small Business Enterprise (SBE) Program of the City of Tulsa, hereinafter referred to as SBE Program. The stated objectives of the programs are:

- To ensure the employment of SBE(s) in the award and administration of City agreements and contracts;
- To create a level playing field on which SBE firms can compete fairly for City contracts;
- To ensure that only firms that fully meet the eligibility standards are permitted to participate as SBE participants;
- To help remove barriers to participation in City contracts;
- To assist in the development of SBE firms so that they may graduate from the SBE Program and ultimately compete successfully in the marketplace.

GOALS BY BUSINESS CATEGORY – SBE

There are seven (7) Business Categories for the City of Tulsa: Construction Contractors (Prime and Subcontractor), Architecture / Engineering (Consultant and Subconsultant), Professional Services, Other Services, and Goods and Supplies. A general description of each category follows:

Construction

- General building contractors engaged primarily in the construction of commercial buildings.
- Heavy construction such as airport runways, bridges, plants, grading and drainage, roadways, and other municipal infrastructure.
- Light maintenance construction services such as carpentry work; electrical work; installation of carpeting; air-conditioning repair, maintenance, and installation; plumbing; and renovation.
- Other related services such as water and sewer lines and maintenance, asbestos abatement, drainage, dredging, grading, hauling, landscaping (for large construction projects such as boulevards and highways), paving, roofing, and toxic waste clean-up.

Architecture and Engineering

- Licensed Architect
- Landscape Architect
- Professional Engineer
- Professional Land Surveyor
- Construction observation
- Other professional design / construction related services

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SMALL BUSINESS ENTERPRISE (SBE) UTILIZATION INSTRUCTIONS

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Professional Services

- Financial Services
- Legal services
- Medical services
- Educational services
- Real Estate services
- Planning services.
- Other professional services

Other Services

- Janitorial and maintenance services
- Uniformed guard services
- Computer services
- Certain job shop services
- Graphics, photographic services
- Landscaping
- Other non-technical professional services

Good and Supplies

- Office goods
- Medical supplies
- Miscellaneous building materials
- Computers

The goals are to reflect resource availability and capability. The City of Tulsa's goal is to mitigate and close the disparity between the availability/capability versus actual utilization of SBE firms in Creek, Okmulgee, Osage, Pawnee, Rogers, Tulsa, and Wagoner counties in Oklahoma.

The City enters various agreements and contracts with the private sector for services, goods and supplies, and construction activities. The agreements or contracts may have a specific or primary deliverable associated with one of the Business Categories. However, supplementary efforts may exist to fulfill the agreement or contract. Therefore, the table below is provided to show goals for all Business Categories. Good faith efforts shall first be focused on the Business Category or Categories that relate directly to the deliverables. Additional good faith efforts shall be in supplementary efforts from other categories to assist in meeting the overall project goal.

The project goals will be monitored and periodically adjusted to address the disparity between the available / capable / willing SBE firms versus actual utilization of SBE firms. The **overall project goal is 10%.**

SBE firms identified for utilization in an agreement or contract must be paid from the proceeds from that agreement or contract.

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BID OPENING AND AWARD SYSTEM**

<i>Business Category</i>	<i>SBE Goal (%)</i>
Construction (Prime Contractors)	10
Construction (Subcontractors)	10
Architecture / Engineering (Consultant)	10
Architecture / Engineering (Subconsultant)	10
Professional Services	10
Other Services	10
Goods and Supplies	10

BIDDER'S ACTIONS

For:

- A. GENERAL / PRIME CONTRACTOR Contract: When the City has established SBE contract goals (hereinafter referred to as "goals"), the City will award a contract only to a bidder who makes good faith efforts to meet the goals.
- B. GENERAL / PRIME CONTRACTOR Contract: When the City has established SBE contract goals (hereinafter referred to as "goals"), a Bidder who is an SBE by membership ~~or reciprocity~~ will be deemed as meeting the utilization goals for the project. Full value of the project bid will be credited as SBE utilization. However, the Bidder who is an SBE is not required to solicit other SBE firms but is encouraged to do so.
- C. CONSTRUCTION MANAGEMENT AT-RISK (CMAR) Contract: When the City has established SBE contract goals (hereinafter referred to as "goals"), the City will recommend award to the Construction Management (CM) firm the bidder who makes good faith efforts to meet the goals. However, Bidder(s) who are SBE(s) are not required to solicit other SBE firms but are encouraged to do so.

The following summary outlines the procedures

Summary:

- 1. RECORD OF SOLICITATION FOR SBE form:
These forms **MUST** be submitted with the bid documents. These documents establish the initial good faith, outreach efforts. In the event the bidder submitted the lowest bid, the SBE firms identified on these forms submitted with the bid are the only SBE firms that will be considered for establishing the bidder's projected utilization percentages for consideration of the award of bid.
- 2. LETTER OF INTENT TO CONTRACT WITH SBE form:
The bidder that submits the apparent lowest bid will be notified by City staff no later than the Monday following bid opening. The apparent low bidder **MUST** submit these forms and the

CITY OF TULSA, OKLAHOMA

SMALL BUSINESS ENTERPRISE (SBE) UTILIZATION INSTRUCTIONS BID OPENING AND AWARD SYSTEM

associated attachments by close of business on Thursday following bid opening. Only SBE firms documented on the RECORD(s) OF SOLICITATION FOR SBE forms submitted with the bid will be considered for establishing the bidder's projected utilization percentages for consideration of the award of bid. If Letters of Intent are not submitted, the projected utilization will be 0% and the apparent lowest bidder is subject to being deemed non-responsive.

3. ADMINISTRATIVE RECONSIDERATION:

If the City determines that a bidder failed to meet the requirements above, City staff will contact the bidder by phone to define the issue and clarify any miscommunications and/or inadvertent actions. If issue was not due to miscommunication and/or inadvertent actions, the bidder will be notified per the Administrative Reconsideration process defined below. If the apparent low bidder is deemed non-responsive, City staff will notify the next lowest bidder to submit their LETTERS OF INTENT TO CONTRACT WITH SBE by close of business of the 6th day following notification or may exercise its right to reject any and all bids.

4. CITY OF TULSA SBE UTILIZATION form:

This form is completed by the contractor (successful bidder) and submitted as part of the contract to perform the project. This form documents the "projected" utilization for the project. At the end of the project, this form is submitted with the final pay request documenting the "actual" utilization. The "actual" utilization must meet or exceed the "projected" utilization. Any change in the "projected" utilization must be documented, submitted to the City on the CHANGE REQUEST FOR SBE PARTICIPATION form, and approved by the City. Approval of the change must occur at the time of the change. If the change is a reduction and not submitted and approved per the instructions, the amount will be deducted from the contractor's final pay request.

5. CHANGE REQUEST FOR SBE PARTICIPATION form:

This form documents any change to the "projected" utilization for the project. Change in utilization includes reduction, substitution, and/or increase. Utilization shall be checked with the submission of partial pay requests, but not longer than 30 day intervals throughout the project. The contractor's acknowledgement that they have verified changes in his/her utilization is required as part of partial pay request documents. Reductions in utilization not approved prior to the final pay request will result in pay reduction to the contractor. If, at the completion of the project, the contractor has failed to meet the SBE contract goals, does not have an approved change request, and has not demonstrated good faith efforts to meet the contract goal, the contractor will be assessed liquidated damages for the difference between the contract goal and the actual SBE participation achieved.

Record of Solicitation

All bidders shall, **with the submissions of their bids**, show their RECORD(s) OF SOLICITATION FOR SBE that demonstrates the good faith outreach effort to meet or exceed the SBE goals established for the project.

If bidders cannot meet the established SBE goals, the bidders shall document and submit with their bid proposal, justification stating why they could not meet the established SBE goals. To demonstrate

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BID OPENING AND AWARD SYSTEM

good faith efforts to meet the SBE goals, the bidders shall document their efforts to obtain SBE participation. City will review and determine that the information is complete, accurate and adequately documents the bidder's good faith efforts before committing to the award of the contract to the bidder. In the event that the City awards a contract to a bidder who cannot meet the established SBE goals, the findings of the City's review shall be in written form and shall be incorporated into and become part of the contract documents.

If the bidder to whom City proposes to award the contract is able to demonstrate good faith efforts, City may accept the bidder's proposed goal. Acceptance by the City of the bidder's proposed goal does not release the bidder from its contractual obligation to continue to make efforts throughout the duration of the project to utilize SBE firms on the project.

All bidders shall submit with their bid the completed and signed RECORD OF SOLICITATION FOR SBE form.

Letter of Intent

The bidder must submit to the Engineering Contract Coordinator written confirmation from the SBE firms on the form LETTER OF INTENT TO CONTRACT WITH SBE that it is participating in the contract as provided in the contractor's bid commitment. This may be submitted with the bid, but not later than the City's close of business of the Thursday following the bid opening. The signed forms will define the contractor's final proposed utilization and will be the basis of a final evaluation. If inadequate utilization is proposed, the bid shall be considered non-responsive.

The SBE firms submitted on the LETTER OF INTENT TO CONTRACT WITH SBE forms shall be considered binding and changes of committed SBE firms may only be made after the contract is fully executed, and may only be changed through the submission, review and approval of form CHANGE REQUEST FOR SBE PARTICIPATION.

Failure to make the written assurance (City form LETTER OF INTENT TO CONTRACT WITH SBE), which includes the names of the SBE firms to be used, the work they will perform, and the price for the work, or failure to demonstrate good faith efforts that is deemed acceptable to the City to meet or exceed the SBE goals, shall render a bid non-responsive.

It is the contractor's responsibility to submit the information necessary for the City to ascertain compliance with the good faith efforts requirement. Extra cost involved in finding and utilizing SBE firms shall not be deemed adequate reason for the bidder's failure to meet the project SBE goals unless such costs are grossly excessive.

In instances where a successful bidder's SBE commitment exceeds the actual SBE contract goals, the submitted goals of the bidder become the contractual obligation.

In instances where a successful bidder's SBE commitment is below the SBE contract goals, the submitted utilization goals become the contractual obligation.

**CITY OF TULSA, OKLAHOMA
SMALL BUSINESS ENTERPRISE (SBE) UTILIZATION INSTRUCTIONS
BID OPENING AND AWARD SYSTEM**

Good Faith Efforts

The steps taken by the bidder to obtain SBE participation shall be documented in writing and shall include, but are not limited to, the following good faith efforts:

- A. Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices) in the interest of all certified SBE firms capable to perform the work of the contract. The bidder must solicit this interest within sufficient time to allow the SBE firms to respond to the solicitation. The bidder must determine with certainty if the SBE firms are interested by taking appropriate steps to follow-up on the initial solicitation.
- B. Selecting portions of the work to be performed by SBE firms in order to increase the likelihood that the SBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate SBE participation, even when the contractor might otherwise prefer to perform these work items with its own forces.
- C. Providing interested SBE firms with adequate information about the plans, specifications and requirements of the contract in a timely manner to assist them in responding to a solicitation.
- D. Negotiating in good faith with interested SBE firms:
 - (1) It is the bidder's responsibility to make a portion of the work available to SBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available SBE subcontractors and suppliers, to facilitate SBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of SBE firms that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for SBE firms to perform the work. RECORD OF SOLICITATION FOR SBE form will be submitted.
 - (2) A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including available SBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using SBE firms is not sufficient justification for a bidder's failure to meet the contract SBE goals, as long as such costs are reasonable. Also, the ability or desire of a contractor to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Contractors are not, however, required to accept higher quotes from SBE firms to fulfill the SBE contract requirements if the price difference is excessive or unreasonable. Documentation of quotes shall be submitted to the City with the bid as part of the bidder's record of solicitation.
- E. Thoroughly analyzing the capabilities of SBE firms before determining a firm's qualification for a project. The following shall not be legitimate causes for the rejection or non-solicitation of SBE quotes in the efforts of the contractor to meet the project goal: (1) the subcontractor's standing, unrelated to

CITY OF TULSA, OKLAHOMA SMALL BUSINESS ENTERPRISE (SBE) UTILIZATION INSTRUCTIONS BID OPENING AND AWARD SYSTEM

job performance, within the industry; (2) membership in specific groups or organizations; or, (3) association with certain political and/or social organizations.

Administrative Reconsideration

If City determines that a bidder fails to meet the requirements stated above, the bidder will be provided an opportunity for administrative reconsideration. City staff will contact the bidder by phone to define the issue and clarify any miscommunications or inadvertent actions. If issue was not due to miscommunication and/or inadvertent actions, the following process will be followed:

1. The bidder will be notified by fax/email within ten working days following the bid opening.
2. The bidder will have 2 working days from time of notification to schedule a meeting for the purpose of administrative reconsideration with a City of Tulsa Attorney. Reconsideration meetings will generally be held within 7 days of notification of a bidder being determined non-responsive.

As part of this administrative reconsideration, the bidder will have the opportunity to meet in person with a City of Tulsa Attorney to present arguments concerning whether it met the goal or made adequate good faith efforts to do so. Submittal of additional information documenting solicitation, which was due with the original bid submission, will not be accepted or considered.

3. The decision on reconsideration will be made by a City of Tulsa Attorney who did not take part in the original determination that the bidder failed to meet the goal or make adequate good faith efforts to do so.
4. No awards will be made until all administrative reconsiderations as outlined herein are complete. A City of Tulsa Attorney will provide a written decision on reconsideration to the bidder. This decision will explain the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so. The determination is copied to the Contract Administrator, City Engineer, and the Director of Human Rights.

CONTRACTOR ACTIONS AFTER AWARD OF THE CONTRACT:

Counting SBE Participation Toward the Goal

When an SBE participates in a contract, only the value of the work actually performed by the SBE is counted toward the contract goal.

The entire amount of that portion of a contract that is performed by the SBE firm's own forces is counted, including the cost of supplies and materials obtained by the SBE for the work on the contract, including supplies purchased or equipment leased by the SBE (except supplies and equipment the SBE purchases or leases from their Prime Contractor).

CITY OF TULSA, OKLAHOMA

SMALL BUSINESS ENTERPRISE (SBE) UTILIZATION INSTRUCTIONS

BID OPENING AND AWARD SYSTEM

When an SBE performs as a participant in a joint venture, the portion of the total dollar value of the contract is equal to the clearly defined portion of the work that the SBE performs with its own forces may be counted toward the goal.

Only expenditures to an SBE contractor who performs a commercially useful function may be counted toward an SBE goal.

Commercially Useful Function

An SBE performs a commercially useful function when it is responsible for the execution of the work of its contract and is carrying out its responsibilities by actually performing, managing and supervising the work involved. The SBE must be responsible, with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material, and installing (where applicable) and paying for the material itself.

To determine whether an SBE is performing a commercially useful function, City will evaluate the amount of work subcontracted, industry practices, whether the amount the firm is to be paid is commensurate with the work it is actually performing and the SBE credit claimed, and other relevant factors.

An SBE does not perform a commercially useful function if its role is limited to that of an extra participant in a transaction through which funds are passed in order to obtain the appearance of SBE participation. In determining whether an SBE is acting as a pass-through, City will examine similar transactions, particularly those in which SBE firms do not participate.

Manufacturers and Material Suppliers

If the materials or supplies are obtained from a certified SBE manufacturer, 100 percent of the cost of the materials or supplies will be counted toward the SBE goals. A manufacturer is a firm that operates or maintains a factory or establishment that produces, on the premises, the materials required under the contract as described by the specifications.

If the materials or supplies are purchased from a certified SBE regular dealer, 100 percent of the cost of the materials or supplies will be counted toward the SBE goals. A regular dealer is a firm that owns, operates or maintains a store, warehouse, or other establishment in which the materials, supplies, articles, or equipment described by the specification and required under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business.

To be a regular dealer, the firm must be an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question. A person may be a regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating or maintaining a place of business as provided for in the above paragraph if the person both owns and operates distribution equipment for the products. Any supplementing of regular dealers' own distribution equipment shall be by a long-term lease agreement and not on an ad-hoc or contract-by-contract basis.

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SMALL BUSINESS ENTERPRISE (SBE) UTILIZATION INSTRUCTIONS

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In order for a firm to qualify as an SBE supplier of metal and/or concrete pipe, the firm must also fabricate the pipe. Metal or concrete pipe is specialty pipe which is project specific and is inspected during the manufacturing process. This arrangement provides for no warehousing of metal or concrete pipe and essentially requires the manufacturer to be the supplier. Merely ordering pipe from the fabricator and in turn selling it to contractors is not consistent with normal industry practice. Contractors normally purchase pipe directly from the manufacturer, thus eliminating the middleman. Supplying metal or concrete pipe is viewed as brokering and is considered inconsistent with SBE program requirements.

Change Request for SBE Participation

Substitution or replacement of an SBE firm will only be permitted or allowed after award and execution of the City contract.

A contractor may not terminate for convenience an SBE listed in their contract (or an approved substitute SBE firm) and then perform the work of the terminated subcontract with its own forces or those of an affiliate, without City's prior written consent.

When an SBE is terminated or fails to complete the work of the contract for any reason, the contractor must make good faith efforts to find another SBE to substitute for the original SBE. These good faith efforts shall be directed at finding another SBE to perform at least the same amount of work (not necessarily the same work) under the contract as the SBE that was terminated, to the extent needed to meet the SBE goals established in the contract.

When the contractor obtains a substitute SBE, the contractor shall provide the Engineering Contract Coordinator with copies of the CHANGE REQUEST FOR SBE PARTICIPATION form and supporting documentation.

If the contractor is unable to replace the SBE with another SBE, then the contractor must provide City with evidence in writing that they have made a good faith effort. The contractor must submit to the Engineering Contract Coordinator a CHANGE REQUEST FOR SBE PARTICIPATION form along with documentation to support they have made a good faith effort. City may adjust the goal as appropriate.

In the case where a contractor cannot meet the SBE goals of a contract, he or she should request a change of that portion of the SBE goal, which cannot be met. The request will be subject to the following:

- A written request for change will be initiated by the contractor at the time he or she reasonably knows that despite good faith efforts the contract goal cannot be achieved. The request will be included on the CHANGE REQUEST FOR SBE PARTICIPATION form and will contain written documentation of all good faith efforts made to meet the goal as well as the reason for the change.

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- The request for change, CHANGE REQUEST FOR SBE PARTICIPATION form, will be submitted for review to the Engineering Contract Coordinator. The City will make the decision on the approval or denial of the change request and inform the contractor.
- If, at the completion of the project, the contractor has failed to meet the SBE contract goals, does not have an approved change request, and has not demonstrated good faith efforts to meet the contract goal, the contractor will be assessed liquidated damages for the difference between the contract goal and the actual SBE participation achieved. The City shall deduct the liquidated damages from the final payment. In the event insufficient earnings remain for the reduction of liquidated damages, the City may claim against the contractor's bond, suspend the contractor under performance suspension, withhold further proposals, suspend prequalification and/or other remedies available under the law.
- In those instances when the goal is not met due to a change in quantity, which occurs through no fault of the contractor, but due to City and/or changed site conditions, a change request will be recommended by Field Engineering at the time the change becomes known, but not later than the next progressive payment application from the contractor which covers the work identified for the SBE firm. The change request will include the statement of quantity change(s). The contractor shall endeavor, with good faith efforts, to mitigate underruns by utilizing other SBE firms.

Change in utilization includes reduction, substitution, and/or increase. Utilization shall be checked with the submission of each partial pay request, but not longer than 30 day intervals throughout the project. The contractor's acknowledgement that they have verified changes in his/her utilization is required as part of partial pay request documents. Reductions in utilization not approved prior to the final pay request, will result in pay reduction to the contractor.

If a contractor fails to comply with this section, appropriate administrative remedies may be taken including, but not limited to:

- No additional progressive payments may be processed
- Refusal to issue proposals
- Liquidated damages
- Suspension of work on the project
- Suspension of prequalification
- Termination of the contract

Prompt Payments

To ensure that contractors' obligations under City contracts are met, the contractor shall endeavor to pay all subcontractors for satisfactory performance of their contracts no later than fifteen (15) calendar days after receipt of each progressive payment from City. The contractor must further endeavor to make prompt release of retainage held to the SBE within thirty days after the work is satisfactorily completed, whether the contractor's work is complete or not. The term "satisfactorily completed" is defined as when; 1) City finds the work completed in accordance with the Plans and Specifications; 2)

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any required paperwork, including material certification, payrolls, etc., have been received and approved by City; 3) Field Engineering has determined the final quantities on the subcontractor's portion of the work; and 4) Contractor has received progressive payments from City which includes subcontractors' work.

In an effort to accelerate payments to subcontractors, the City may pay the Contractor for acceptable material stockpiled or delivered to the project, at other approved or designated locations, or at a plant site required for Contractor's operations as approved by the City. This is governed by Oklahoma Department of Transportation Standard Specifications for Highway Construction 2009 or latest edition.

Contractor shall endeavor to include invoices from SBE for materials on hand, partially completed work, or complete work on the earliest partial payment request submitted to the City. It is incumbent on the SBE to submit invoices to the Contractor in a timely manner.

Failure to comply with the prompt payment and return of retainage provisions of the contract may result in sanctions under the contract, as listed below:

- Refusal to issue proposals
- Liquidated damages
- Suspension of work on the project
- No additional progressive payments may be processed
- Suspension of prequalification

Any delay or postponement of payment among the parties may take place only for good cause, with City written approval. The explanation from the contractor must be made in writing to the City.

Record Keeping Requirements

The contractor shall keep such records as are necessary to determine compliance with the SBE contract obligations. The records kept by the contractor will indicate:

1. The name(s) of SBE firms or other subcontractors, the type of work being performed, and payment for work, services and business.
2. Documentation of correspondence, verbal contracts, telephone calls, etc., to obtain services of SBE firms on the project.

Upon request, the contractor shall submit all subcontracts, purchase orders, contracts, agreements, and financial transactions, including canceled checks, executed with SBE firms with the reference to records referred to in this provision, in such form, manner, content prescribed by City.

The contractor should list all SBE firms in the contract and summarize total amounts paid to SBE firms and the project goal amount for each SBE firm.

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BID OPENING AND AWARD SYSTEM**

Reciprocity

~~The City will grant reciprocity of membership in the SBE program to certified Oklahoma Department of Transportation Disadvantaged Business Enterprises which are located in the Tulsa Metropolitan Statistical Area.~~

(Must be submitted with Bid)

**CITY OF TULSA
BIDDER'S AFFIDAVIT FOR
SMALL BUSINESS ENTERPRISE (SBE) UTILIZATION GOALS**

STATE OF)
) ss:
COUNTY OF)

_____, of lawful age, being first duly sworn, says that s(he) is the agent authorized by the bidder to submit the attached bid. Affiant further states that the bidder agrees to fully comply with the City of Tulsa's Resolution requiring that a good faith effort be made to utilize small business enterprises as subcontractors.

Affiant further states that s(he) will document on pages SBE-2BID, -3BID, -4BID, and -5BID for public record, his/her good faith efforts in solicitation.

Affiant further states that s(he) is responsible for having like requirements placed upon any subcontractor of said bidder.

Affiant further states that s(he) has read and agrees to the current CITY OF TULSA, OKLAHOMA SMALL BUSINESS ENTERPRISE (SBE) UTILIZATION INSTRUCTIONS FOR BID OPENING AND AWARD SYSTEMS.

BIDDER (Company Name)

SIGNED

TITLE

SUBSCRIBED and SWORN to before me this _____ day of _____, 20_____.

NOTARY PUBLIC

MY COMMISSION EXPIRES:

SBE-1BID



RECORD OF SOLICITATION FOR SMALL BUSINESS ENTERPRISE (SBE)
(MUST BE SUBMITTED WITH BID)

- Project Name:	
- Project Number:	
- Prime Contractor:	
- Prime Contractor Representative:	
Consultants, Subcontractors, Service, Regular Dealers, Material Suppliers, & Fabricators:	
- Contact Date(s):	
- Name of Company:	
- Address (Street, City, County, State):	
- City of Tulsa SBE: ☐ Yes ☐ No	
- City of Tulsa SBE Certificate Number:	
- Other SBE Certificate Number(s):	
- Company Contact Person:	
- Phone No.:	Email:
- Description of Work:	
- Contract Documents provided to and/or reviewed by Company: ☐ Yes ☐ No	
- Will City of Tulsa SBE be utilized? ☐ Yes ☐ No	
- If Yes, Estimated Agreement Amount: \$	
- If No, description of reasons why agreement could not be reached for City of Tulsa SBE to perform work:	

SBE – 2BID



LETTER OF INTENT
TO CONTRACT WITH SMALL BUSINESS ENTERPRISE (SBE)
(Must be submitted by close of business on Thursday following bid opening)

Public Works Department, Attn: Contracts Coordinator
CITY OF TULSA
175 E. 2nd Street, Floor 13
Tulsa, OK 74103
Ph.: 918.596.9637
Fax: 918.596.1299

Project Name: _____
Project Number: _____
Submittal Date: _____

Prime Contractor

HEREBY, intends to subcontract items of work generally described as

to:

SMALL BUSINESS ENTERPRISE

Total amount of participation by City of Tulsa SBE: \$ _____
(City of Tulsa SBE, quote must be attached)

City of Tulsa SBE: ☐ Yes ☐ No

City of Tulsa SBE Certificate Number: _____

Other SBE Certificate Number(s): _____

SMALL BUSINESS ENTERPRISE

Signature: _____

Title: _____

Date: _____

PRIME CONTRACTOR

Signature: _____

Title: _____

Date: _____

Signatures of Authorized representatives of the Prime Contractor and the City of Tulsa SBE firm above represent the written commitment by the Prime Contractor to subcontract with the City of Tulsa SBE firm and a written commitment by the City of Tulsa SBE firm to subcontract for work as described in the attached quote.

This form, along with the City of Tulsa SBE firm's quote must be submitted to the City with the executed Contract documents. If this form is not received, the proposed utilization will NOT be counted as part of the Prime Contractor's agreement. This may cause the agreement to be considered non-compliant and be rejected by the City of Tulsa.

SBE – 3BID



CHANGE REQUEST
FOR SMALL BUSINESS ENTERPRISE (SBE) PARTICIPATION

Project Name: _____

Project Number: _____

Prime Contractor: _____

CHANGE: From / To (fill in both sides)
FROM:

OR

ADD: To (fill in this side only)
TO:

Name: _____

Name: _____

City of Tulsa SBE: ☐ Yes ☐ No

City of Tulsa SBE: ☐ Yes ☐ No

City of Tulsa SBE Certificate Number: _____

City of Tulsa SBE Certificate Number: _____

Other SBE Certificate Number(s): _____

Other SBE Certificate Number(s): _____

Change in service to be performed: _____

Change in amount of participation by City of Tulsa SBE: \$ _____

Reason for Change: _____

NOTE: Attach a copy of the Letter of Intent for the original City of Tulsa SBE and a new Letter of Intent for the proposed City of Tulsa SBE.

PRIME CONTRACTOR

SBE SUBCONTRACTOR

Signature: _____

Signature: _____

Date: _____

Date: _____

Title: _____

Title: _____

Approved / Disapproved: _____ Date: _____

Public Works Design Engineering Manager
(Planning, Design, or Field)

Approved / Disapproved: _____ Date: _____

Public Works Contracts Manager

Distribution: Tulsa Authority for Economic Opportunity
Public Works Design/Public Works Department (Planning, Design, or Field)



CITY OF TULSA
SMALL BUSINESS ENTERPRISE (SBE) UTILIZATION

Project No.			Contractor
Project Name			

Name	Business Category	Projected Dollars	Actual Dollars

Projected Contract % _____ Actual Contract % _____ Total _____

PROJECTED: _____ **ACTUAL (Update and Submit with Final Payment):** _____

Contractor Representative _____ Contractor Representative _____

Date _____ Date _____

NOTE: REFER TO UTILIZATION INSTRUCTIONS

SBE – 5BID

(Must be submitted at time of Bid)
CITY OF TULSA
RESOLUTION NO. 7404
AFFIDAVIT OF COMPLIANCE

_____, of lawful age, being first duly sworn, states that
s(he) is the authorized agent of the Company set forth below.

Affiant further states that the Company, in compliance with City of Tulsa Resolution No. 7404, shall not hire or knowingly allow any of its subcontractors or lower tier subcontractors to hire anyone who is not a United States citizen or legal immigrant or anyone who does not have legal status as a temporary worker to perform work on any project which is the subject of a contract between the Company and the City of Tulsa.

Affiant further states that the Company shall not fail to comply with and shall not knowingly allow any of its subcontractors or lower tier subcontractors to fail to comply with all applicable laws including, but not limited to, labor, employment and taxation laws, in the performance of any work on any project which is the subject of a contract between the Company and the City of Tulsa.

Affiant further states that the Company shall make available to the City of Tulsa, at the City's request, sufficient information and/or affirmations to allow the City to confirm Company's compliance with Resolution No. 7404 relating to the performance of any contract between the Company and the City of Tulsa.

Company: _____

Signed: _____

Title

SUBSCRIBED and SWORN to before me, this _____ day of _____, 20__.

NOTARY PUBLIC

MY COMMISSION EXPIRES:

COMMISSION NO.:

Resolution No. 7404
RAC-1

(Must be submitted at time of Bid)
CITY OF TULSA
50% RESIDENT RESOLUTION
AFFIDAVIT FOR BID

STATE OF)
) ss:
COUNTY OF)

_____, of lawful age, being first duly sworn, states that s(he) is the agent authorized by the bidder to submit the attached bid. Affiant further states that the bidder, in compliance with City of Tulsa Resolution No. 18145, is committed to the goal of employing at least 50% bona fide residents of the City of Tulsa and/or the Metropolitan Statistical Area (composed of Creek, Okmulgee, Osage, Pawnee, Rogers, Tulsa, and Wagoner counties).

Affiant further states that bidder is responsible for having like requirements placed upon any of its subcontractors.

BIDDER (Company Name)

SIGNED

Title

SUBSCRIBED and SWORN to before me this ____ day of _____, 20____.

NOTARY PUBLIC

MY COMISSION EXPIRES:

COMMISSION NO.:

(Must be submitted at time of bid)
NON-COLLUSION AFFIDAVIT

STATE OF)
) ss:
COUNTY OF)

_____, of lawful age, being first duly sworn, says that:

1. I am the duly authorized agent of the bidder submitting the competitive bid associated with this sworn statement for the purpose of certifying facts pertaining to the existence of collusion among bidders and between bidders and municipal officers or employees, as well as facts pertaining to the giving or offering of things of value to governmental personnel in return for special consideration in the letting of any contract pursuant to the bid;
2. I am fully aware of the facts and circumstances surrounding the making of the bid and have been personally and directly involved in the proceedings leading to the submission of such bid;
3. Neither the bidder nor anyone subject to the bidder's direction or control has been a party:
 - a. to any collusion among bidders in restraint of freedom of competition by agreement to bid at a fixed price or to refrain from bidding;
 - b. to any collusion with any municipal official or employee as to quantity, quality or price in the prospective contract, or as to any other terms of such prospective contract; nor
 - c. in any discussions between bidders and any municipal official concerning exchange of money or other things of value for special consideration in the letting of a contract.
4. If awarded the contract, neither the bidder nor anyone subject to the bidder's direction or control has paid, given or donated or agreed to pay, give or donate to any officer or employee of the City of Tulsa or of any public trust where the City of Tulsa is a beneficiary, any money or other thing of value, either directly or indirectly, in procuring the contract for which the bid is submitted.

BIDDER (Company Name)

Signed

Title

SUBSCRIBED and SWORN to before me this _____ day of _____, 20__.

NOTARY PUBLIC

MY COMMISSION EXPIRES:

_____, ____ .
COMMISSION NO.:

(Must be submitted at time of bid)
BUSINESS RELATIONSHIP AFFIDAVIT

STATE OF)
) ss:
 COUNTY OF)

_____, of lawful age, being first duly sworn, says that s(he) is the agent authorized by the bidder to submit the attached bid. Affiant further states that the nature of any partnership, joint venture or other business relationship presently in effect or which existed within one (1) year prior to the date of this statement with the architect, engineer, or other party to the project is as follows:

Affiant further states that any such business relationship presently in effect or which existed within one (1) year prior to the date of this statement between any officer or director of the bidding company and any officer or director of the architectural or engineering firm or other party to the project is as follows:

Affiant further states that the names of all persons having any such business relationships and the positions they hold with their respective companies or firms are as follows:

(If none of the business relationships herein above mentioned exist, affiant should so state.)

Signed: _____

 BIDDER (Company Name)

 Title:

SUBSCRIBED and SWORN to before me this _____ day of _____, 20____.

 NOTARY PUBLIC

MY COMMISSION EXPIRES:

_____, _____
 COMMISSION NO.:

(Must be submitted at time of bid)
INTEREST AFFIDAVIT

STATE OF _____)
)ss.
COUNTY OF _____)

I, _____, of lawful age, being first duly sworn, state that I am the agent authorized by Contractor, Engineer, Architect or provider of professional service ["Services Provider"] to submit the attached Agreement. Affiant further states that no officer or employee of the City of Tulsa either directly or indirectly owns a five percent (5%) interest or more in the Services Provider's business or such a percentage that constitutes a controlling interest. Affiant further states that the following officers and/or employees of the City of Tulsa own an interest in the Services Provider's business which is less than a controlling interest, either direct or indirect.

By _____
Signature

Title _____

Subscribed and sworn to before me this _____ day of _____, 20____.

Notary Public

My Commission Expires: _____

Notary Commission Number: _____

County & State Where Notarized: _____

The Affidavit must be signed by an authorized agent and notarized.

ELECTRONIC BID PROPOSAL INSTRUCTIONS - EXCEL SPREADSHEET

PROJECT NO. 2027-2028 Citywide Infrastructure Rehabilitation & Improvements

Please read the following instructions carefully.

1. After opening this file re-save it as your company's name.
2. Open the BID FORM Sheet from the tabs below.
3. Input the unit price of the appropriate pay item in the cells highlighted in blue.
4. Review all data input and check calculations to ensure accuracy of Bid.
5. Print 1hardcopy of the "PROPOSAL" tab, BID FORM and the "SIGNATURE PAGE" tab.
6. Complete and sign the "Signature Page" document.
6. Submit hardcopy and electronic disk with Contract Documents and Specifications for Bid opening date.

LEGEND

- \$ 1.00 Cells Requiring Data Input.
- \$ 1.00 Internal Data Transfer.
- \$ 2.00 Calculated Results.

AGREEMENT FOR USING ELECTRONIC BID PROPOSAL

By and Between: **City of Tulsa**, (ENGINEER) and RECIPIENT. The enclosed electronic media is provided pursuant to your request and is for your limited use in connection with your submittal of Bid Proposal for Project No. **2027-2028, Citywide Infrastructure Rehabilitation & Improvements**. In no event shall the information be used for any other purpose or be released to third parties without the written consent of the ENGINEER. In the event of a discrepancy between the hard copy and this electronic media at delivery or in the future, the hard copy shall govern. ENGINEER hereby disclaims any and all liability for the consequences from use of the electronic media and makes no warranty or guarantee of accuracy. RECIPIENT shall assume full responsibility for the uses and consequences of the electronic media. It is agreed that ENGINEER has and retains ownership of the electronic media. ENGINEER does not warrant or guarantee that the electronic data is compatible with RECIPIENT'S computer hardware or software, and ENGINEER'S responsibility for the electronic media is limited to replacement of defective media for a period of thirty (30) days after delivery to RECIPIENT. !!! By opening and using this FILE, You AGREE to these TERMS AND CONDITIONS!!!

**PROPOSAL
PROJECT NO. 2027-2028
CITYWIDE INFRASTRUCTURE
REHABILITATION AND IMPROVEMENTS**

TO: HONORABLE MAYOR
CITY OF TULSA, OKLAHOMA

THE UNDERSIGNED BIDDER, having carefully examined the drawings, specifications, and other Contract Documents of the above project presently on file in the City Clerk, City of Tulsa Oklahoma:

CERTIFIES THAT he has inspected the site of the proposed work and has full knowledge of the extent and character of the work involved, construction difficulties that may be encountered, and materials necessary for construction, class and type of excavation, and all other factors affecting or which may be affected by the specified work; and

CERTIFIES THAT he has not entered into collusion with any other bidder or prospective bidder relative to the project and/or bid: and

HEREBY PROPOSES: to enter into a contract to provide all necessary labor, materials, equipment and tools to completely construct and finish all the work required by the Contract Documents referred to therein; to complete said work within 455 calendar days after the work order is issued; and to accept in full payment therefore the amount set forth below for all work actually performed as computed by the Engineers as set forth in the Contract.

Basis of Award

IT SHOULD BE NOTED THAT THE LOWEST RESPONSIBLE BID SHALL BE DETERMINED BY THE TOTAL BASE BID.

Note: - Item numbers omitted are not a part of the Contract.

**PROPOSAL FOR
2027-2028
CITYWIDE INFRASTRUCTURE REHABILITATION AND IMPROVEMENTS**

ITEM NUMBER	SPEC NUMBER	ITEM DESCRIPTION	UNIT	QUANTITY	DATA INPUT UNIT PRICE	AMOUNT
PAVING CUTS OVER 10 SY						
1	303	TYPE "A" AGGREGATE BASE	CY	750		
2	411(B)(SP)	TYPE "S3" ASPHALT CONCRETE	CY	500		
3	411(C)(SP)	TYPE "S4" ASPHALT CONCRETE	CY	500		
4	411(D)(SP)	TYPE "S5" ASPHALT CONCRETE	CY	250		
5	414(B) (SP)	ACCELERATED SET HIGH EARLY STRENGTH CONCRETE (AHESC-1-2)	CY	200		
6	414(B) (SP)	HIGH-EARLY-STRENGTH CONCRETE PAVEMENT (HESC-1-2)	CY	750		
7	COT 202	FLOWABLE FILL, QUICK SETTING	CY	300		
PAVING CUTS 10 SY & UNDER						
8	303	TYPE "A" AGGREGATE BASE	CY	50		
9	411(B) (SP)	TYPE "S3" ASPHALT CONCRETE	CY	50		
10	411(C) (SP)	TYPE "S4" ASPHALT CONCRETE	CY	50		
11	411(D)(SP)	TYPE "S5" ASPHALT CONCRETE	CY	25		
12	414(B) (SP)	ACCELERATED SET HIGH EARLY STRENGTH CONCRETE (AHESC-1-2)	CY	50		
13	414(B) (SP)	HIGH-EARLY-STRENGTH CONCRETE PAVEMENT (HESC-1-2)	CY	100		
14	COT 202	FLOWABLE FILL, QUICK SETTING	CY	50		
SIDEWALKS						
15	610(A) (SP)	CONCRETE SIDEWALK (UNDER 10 SY) (SD-1)	SY	750		
16	610(A) (SP)	CONCRETE SIDEWALK (10 SY TO UNDER 50 SY) (SD-1)	SY	750		
17	610(A) (SP)	CONCRETE SIDEWALK (50 SY TO UNDER 100 SY) (SD-1)	SY	750		
18	610(A) (SP)	CONCRETE SIDEWALK (OVER 100 SY) (SD-1)	SY	750		
19	610(A) (SP)	SIDEWALK REMOVAL (SD-1)	SY	3000		
20	609(A)	CONCRETE CURB 2" BARRIER	LF	100		
21	SPECIAL	SIDEWALK TRIPPING HAZARD ABATEMENT (STHA-1)	IN-FT	1000		
ALL PAVING CUTS						
22	201(A) (SP)	CLEARING AND GRUBBING	SY	1000		
23	202 (C)(SP)	ROCK EXCAVATION (RE-1)	CY	75		
24	202(A)	UNCLASSIFIED EXCAVATION	CY	3000		
25	202(E)	SUITABLE BACKFILL	CY	250		
26	221 (A)	TEMPORARY SLOPE DRAINS	LF	20		
27	221 (B)	TEMPORARY SILT FENCE	LF	200		
28	228	NYLON EROSION CONTROL MAT	SY	50		
29	229	DITCH LINER PROTECTION	LF	50		
30	230(A)	SOLID-SLAB SODDING (BERMUDA)	SY	5000		
31	230(SP)	SOLID - SLAB SODDING (NON BERMUDA) (NBSS-1)	SY	1000		
32	230	SOLID SLAB SOD REMOVAL	SY	100		
33	232(SP)	SEEDING (S-1)	SY	20		
34	SPECIAL	LANDSCAPING ALLOWANCE	ALLOW	1	\$40,000.00	\$40,000.00
35	303(SP)	COARSE AGGREGATE NO. 57, IN PLACE	CY	40		
36	325	SEPARATOR FABRIC	SY	4000		
37	311(B)	SUBGRADE METHOD B	SY	500		
38	SPECIAL	CRACK SEALING (HOT RUBBER) (CSAC-1)	LF	500		
39	414	DOWEL BAR IN-PLACE	EA	4000		
40	SPECIAL	FABRIC REINFORCEMENT(FR-1-4)	SY	2000		
41	412(SP)	COLD MILLING PAVEMENT/2" THICKNESS 1-300 SY (CMBP-1-2)	SY	100		
42	412(SP)	COLD MILLING PAVEMENT/2" THICKNESS OVER 300 SY (CMBP-1-2)	SY	1000		
43	SPECIAL	NOVACHIP OVERLAY (NCO-1)	SY	500		
44	414	CONCRETE PAVEMENT EXPANSION JOINT	LF	500		
45	415(SP)	LOW MODULUS SILICON JOINT SEALER (JSC-1)	LF	5000		
46	426(SP)	PRESSURE GROUTING (PG-1-2)	CY	10		
47	510(SP)	VERSA-LOK RETAINING WALL (VRW-1)	SF	1000		
48	510(SP)	SEGMENTAL RETAINING WALL HEIGHT 0' TO 4' (SRW-1-6)	SY	10		
49	510(SP)	SEGMENTAL RETAINING WALL HEIGHT 4.1' TO 8' (SRW-1-6)	SY	10		
50	510(SP)	SEGMENTAL RETAINING WALL HEIGHT 8.1' TO 13' (SRW-1-6)	SY	10		
51	510(SP)	PRECAST WALL SYSTEM (PCW-1-9)	SY	50		
52	509(C)	CLASS "A" CONCRETE FOR SMALL STRUCTURES	CY	100		
53	509(D)	CLASS "C" CONCRETE	CY	50		
54	514(I)	STEEL SHEET PILING	SY	50		
55	514(I)	STEEL SHEET PILING REMOVAL	SY	50		
56	511(A)	REINFORCING STEEL- IN PLACE	LB	7500		
57	601(E)(SP)	LAID-UP RIP RAP	TON	50		
58	601(F)(SP)	GROUTED RIP-RAP	TON	25		
59	601(B)	FILTER FABRIC	SY	200		
60	609(A)	CONCRETE CURB 6" MOUNTABLE	LF	150		
61	609(A)	CONCRETE CURB 6" BARRIER	LF	3000		
62	609(A)	CONCRETE CURB 8" BARRIER	LF	500		
63	609(B)	COMBINED CURB & GUTTER, STD.	LF	2500		
64	609(SP)	STANDING CURB 6"X9"X18" (STC-1)	LF	50		
65	610(B)(SP)	CONCRETE DRIVEWAY (ACCELERATED SET HIGH-EARLY-STRENGTH)	CY	300		

66	610(SP)	DECORATIVE AGGREGATE CONCRETE ROADWAY(DAR-1)	CY	25		
67	610(SP)	DECORATIVE AGGREGATE CONCRETE SIDEWALK AND DRIVEWAY(DASD-1)	CY	25		
68	COT 790	SIDEWALK RAMP (TYPE "A")	EA	100		
69	COT 790	SIDEWALK RAMP (TYPE "B")	EA	100		
70	COT 790	SIDEWALK RAMP (TYPE "C")	EA	10		
71	COT 790	SIDEWALK RAMP (TYPE "D")	EA	100		
72	COT 790	SIDEWALK RAMP (COMBINATION)	EA	100		
73	611(A)	PRECAST CONCRETE MANHOLE (4' I.D.)	EA	2		
74	611(B)	ADDITIONAL DEPTH (4' I.D.)	VF	2		
75	611(A)	PRECAST CONCRETE MANHOLE (5' I.D.)	EA	2		
76	611(B)	ADDITIONAL DEPTH (5' I.D.)	VF	5		
77	611(A)	PRECAST CONCRETE MANHOLE (6' I.D.)	EA	2		
78	611(B)	ADDITIONAL DEPTH (6' I.D.) MANHOLE	VF	5		
79	611(A)	PRECAST CONCRETE MANHOLE (8' I.D.)	EA	2		
80	611(B)	ADDITIONAL DEPTH (8' I.D.) MANHOLE	VF	5		
81	611(L)	PRECAST JUNCTION BOX	EA	2		
82	611(B)	ADDITIONAL DEPTH PRECAST JUNCTION BOX	VF	5		
83	611(C)	MANHOLE FRAME & COVER TYPE "A"	EA	5		
84	611(C)	MANHOLE FRAME & COVER TYPE "B"	EA	4		
85	611(G)	SINGLE CAST IRON CURB INLET	EA	10		
86	611(G)	DOUBLE CAST IRON CURB INLET	EA	10		
87	611(G)	STANDARD INLET WITH ACCESS MANHOLE BACK OF CURB	EA	2		
88	611(G)	STANDARD DROP INLET (DESIGN #1)	EA	2		
89	611(G)	STANDARD DROP INLET (DESIGN #2)	EA	2		
90	611(G)	SPECIAL DROP INLET (DESIGN #1)	EA	2		
91	611(G)	SPECIAL DROP INLET (DESIGN #2)	EA	2		
92	611(H)	ADDITIONAL INLET DEPTH	VF	5		
93	611(G)	DOUBLE GRATE DROP INLET W/ACCESS MANHOLE	EA	2		
94	611(M)	CAST IRON HOOD	EA	50		
95	611(G)	ADDITIONAL INLET THROATS	EA	4		
96	611(I)	INLET FRAME AND GRATE	EA	50		
97	612(A)(SP)	MANHOLES ADJUST TO GRADE (ARU 1)	EA	25		
98	612(C)(SP)	INLETS ADJUST TO GRADE (ARU 1)	EA	25		
99	612(E)(SP)	VALVE BOXES ADJUST TO GRADE (ARU 1)	EA	100		
100	612(F)(SP)	METER CAN ADJUST TO GRADE (ARU 1)	EA	30		
101	SPECIAL	MASONRY BRICK & STONE REPAIR (MBSR-1)	SF	500		
102	613(A)	15" REINFORCED CONCRETE PIPE, CL III	LF	80		
103	613(A)	18" REINFORCED CONCRETE PIPE, CL III	LF	80		
104	613(A)	21" REINFORCED CONCRETE PIPE, CL III	LF	80		
105	613(A)	24" REINFORCED CONCRETE PIPE, CL III	LF	80		
106	613(A)	30" REINFORCED CONCRETE PIPE, CL III	LF	40		
107	613(A)	36" REINFORCED CONCRETE PIPE, CL III	LF	40		
108	613(A)	42" REINFORCED CONCRETE PIPE, CL III	LF	40		
109	613(A)	48" REINFORCED CONCRETE PIPE, CL III	LF	40		
110	613(A)	54" REINFORCED CONCRETE PIPE, CL III	LF	40		
111	613(A)	60" REINFORCED CONCRETE PIPE, CL III	LF	40		
112	SPECIAL	EXTERNAL PIPE SEAL (WRAP) (EPS-1)	LF	60		
113	619(B)	REMOVAL OF PAVEMENT LESS THAN 4"	SY	500		
114	619(B)	REMOVAL OF PAVEMENT 4" TO 8"	SY	3000		
115	619(B)	REMOVAL OF PAVEMENT MORE THAN 8"	SY	3000		
116	619(B)	REMOVAL OF CURB	LF	3000		
117	619(B)	REMOVAL OF COMBINED CURB AND GUTTER	LF	2000		
118	619(B)	REMOVAL OF GUARD RAIL	LF	50		
119	619(B)(SP)	REMOVAL OF FENCE (RSO-1)	LF	50		
120	619(A)(SP)	REMOVAL OF STRUCTURES AND OBSTRUCTIONS (RSO-1)	CY	50		
121	619(B)(SP)	REMOVAL OF PIPE (RSO-1)	IN-FT	2000		
122	619(C)	SAWING PAVEMENT (10" OR LESS)	LF	20000		
123	619(C)	SAWING PAVEMENT (OVER 10")	LF	4500		
124	623(A)	BEAM GUARD RAIL-W-BEAM-SINGLE	LF	100		
125	623(A)	BEAM GUARD RAIL-W-BEAM-SINGLE CURVED (SHOP CURVED, ANY RADIUS)	LF	50		
126		NOT USED				
127		NOT USED				
128		NOT USED				
129		NOT USED				
130		NOT USED				
131		NOT USED				
132		NOT USED				
133	623(G)	SKT-350 GUARD RAIL END SECTION (ODOT DETAIL T-602)	EA	4		
134	710	GUARDRAIL DELINEATOR	EA	200		
135	SPECIAL	48" HIGH CHAIN LINK FENCE (CLF-1)	LF	100		
136	SPECIAL	48" HIGH CHAIN LINK FENCE GATE (CLF-1)	EA	2		
137	SPECIAL	72" HIGH CHAIN LINK FENCE (CLF-1)	LF	100		
138	SPECIAL	72" HIGH CHAIN LINK FENCE GATE (CLF-1)	EA	2		
139	SPECIAL	48" HIGH VINYL COATED FENCE (CLF-1)	LF	100		
140	SPECIAL	48" HIGH VINYL COATED FENCE GATE (CLF-1)	EA	2		
141	SPECIAL	72" HIGH VINYL COATED FENCE (CLF-1)	LF	100		
142	SPECIAL	72" HIGH VINYL COATED FENCE GATE (CLF-1)	EA	2		
143	SPECIAL	72" HIGH WOOD FENCE (WF-1-4)	LF	100		
144	SPECIAL	72" HIGH WOOD FENCE GATE (WF-1-4)	EA	2		
145	626(SP)	TYPE 1 MONUMENT PLACEMENT (M-1)	EA	2		
146	641(SP)	EMERGENCY MOBILIZATION (EM-1)	EA	20		
147	641(SP)	MOBILIZATION FOR PRESSURE GROUTING (MPG-1)	DAY	2		
148	613(J)	EDGE DRAIN CONDUIT - PERFORATED	LF	100		
149	613(K)	EDGE DRAIN OUTLET LATERAL - NONPERFORATED	LF	100		
150	613(E)	15" CORRUGATED POLYPROPYLENE PIPE (CPP)	LF	100		
151	613(E)	18" CORRUGATED POLYPROPYLENE PIPE (CPP)	LF	100		
152	613(E)	21" CORRUGATED POLYPROPYLENE PIPE (CPP)	LF	100		
153	613(E)	24" CORRUGATED POLYPROPYLENE PIPE (CPP)	LF	100		
154	613(E)	30" CORRUGATED POLYPROPYLENE PIPE (CPP)	LF	100		
155	613(E)	36" CORRUGATED POLYPROPYLENE PIPE (CPP)	LF	100		
156	613(E)	42" CORRUGATED POLYPROPYLENE PIPE (CPP)	LF	100		

157	613(EF)	48" CORRUGATED POLYPROPYLENE PIPE (CPP)	LF	100		
158	613(EF)	54" CORRUGATED POLYPROPYLENE PIPE (CPP)	LF	100		
159	613(EF)	60" CORRUGATED POLYPROPYLENE PIPE (CPP)	LF	100		
160	SPECIAL	ANCHORED REINFORCED VEGETATION SYSTEM (ARVS) B1 ANCHORS	SY	100		
161	SPECIAL	ANCHORED REINFORCED VEGETATION SYSTEM (ARVS) B2 ANCHORS	SY	100		
162	611(G)(SP)	RECESSED CURB INLET - RCI 0648 - 6" THROAT	EA	5		
163	611(G)(SP)	RECESSED CURB INLET - RCI 1048 - 10" THROAT	EA	5		
164	611(G)(SP)	RECESSED CURB INLET - RCI 0696 - 6" THROAT	EA	5		
165	611(G)(SP)	RECESSED CURB INLET - RCI 1096 - 10" THROAT	EA	5		
166	611(H)(SP)	ADDITIONAL RECESSED CURB INLET DEPTH - RCI XX48	VF	10		
167	611(H)(SP)	ADDITIONAL RECESSED CURB INLET DEPTH - RCI XX96	VF	10		
168	855(A)	PAVEMENT STRIPING 4" THERMOPLASTIC	LF	8000		
169	854(A)	PAVEMENT STRIPING 4" PAINT	LF	4000		
170	877(SP)	PORTABLE LONGITUDINAL BARRIER	LF	600		
171	877(B)(SP)	DELIVER PORTABLE LONGITUDINAL BARRIER	LF	60		
172	877(C)(SP)	RELOCATION OF PORTABLE LONGITUDINAL BARRIER	LF	60		
173	880(A)	ARROW DISPLAY	SD	500		
174	880(B)	SIGNS 0 TO 6.25 SF	SD	500		
175	880(B)	SIGNS 6.25 TO 15.99SF	SD	2000		
176	880(B)	SIGNS 16.0 SF & OVER	SD	2000		
177	880(C)	BARRICADES (TYPE II)	SD	200		
178	880(C)	BARRICADES (TYPE III)	SD	1500		
179	880(E)	TYPE A LIGHT	SD	24000		
180	880(E)	TYPE C LIGHT	SD	5000		
181	SPECIAL	GRABBER TUBE (GT-1)	SD	10000		
182	880(F)	DRUMS	SD	25000		
183	880(I)	FLAGGER	SD	20		
184	882(A)	CHANGEABLE MESSAGE SIGN	SD	50		
185	SPECIAL	TEMPORARY PORTABLE TRAFFIC CONTROL SIGNALS TPTCS -1	SD	50		
WATER AND SANITARY SEWER						
186	COT 313	6 INCH PVC PIPE SDR26	LF	40		
187	COT 317	6" GATE VALVE	EA	5		
188	COT 313	8 INCH PVC PIPE SDR26	LF	40		
189	COT 317	8" GATE VALVE	EA	5		
190	COT 313	10 INCH PVC PIPE SDR26	LF	20		
191	COT 317	10" GATE VALVE	EA	2		
192	COT 313	12 INCH PVC PIPE SDR26	LF	40		
193	COT 317	12" GATE VALVE	EA	2		
194	COT 307	6 INCH DUCTILE IRON PIPE, CL51	LF	40		
195	COT 307	6 INCH DUCTILE IRON PIPE, CL51 (RESTRAINED)	LF	40		
196	COT 309	6 INCH PVC AWWA C900 CLASS 200	LF	40		
197	COT 309	6 INCH PVC AWWA C900 CLASS 200, RJ	LF	40		
198	COT 312	6 INCH, DIP 11 1/4 DEGREE BEND (RESTRAINED)	EA	5		
199	COT 312	6 INCH, DIP 22 1/2 DEGREE BEND (RESTRAINED)	EA	5		
200	COT 312	6 INCH, DIP 45 DEGREE BEND (RESTRAINED)	EA	5		
201	COT 307	8 INCH DUCTILE IRON PIPE, CL51	LF	20		
202	COT 307	8 INCH DUCTILE IRON PIPE, CL51 (RESTRAINED)	LF	40		
203	COT 309	8 INCH PVC AWWA C900 CLASS 200	LF	20		
204	COT 309	8 INCH PVC AWWA C900 CLASS 200, RJ	LF	20		
205	COT 312	8 INCH, DIP 11 1/4 DEGREE BEND (RESTRAINED)	EA	2		
206	COT 312	8 INCH, DIP 22 1/2 DEGREE BEND (RESTRAINED)	EA	2		
207	COT 312	8 INCH, DIP 45 DEGREE BEND (RESTRAINED)	EA	5		
208	COT 307	10 INCH DUCTILE IRON PIPE, CL51	LF	20		
209	COT 307	10 INCH DUCTILE IRON PIPE, CL51 (RESTRAINED)	LF	20		
210	COT 312	10 INCH, DIP 11 1/4 DEGREE BEND (RESTRAINED)	EA	2		
211	COT 312	10 INCH, DIP 22 1/2 DEGREE BEND (RESTRAINED)	EA	2		
212	COT 312	10 INCH, DIP 45 DEGREE BEND (RESTRAINED)	EA	2		
213	COT 307	12 INCH DUCTILE IRON PIPE, CL51	LF	40		
214	COT 307	12 INCH DUCTILE IRON PIPE, CL51 (RESTRAINED)	LF	40		
215	COT 312	12 INCH, DIP 11 1/4 DEGREE BEND (RESTRAINED)	EA	2		
216	COT 312	12 INCH, DIP 22 1/2 DEGREE BEND (RESTRAINED)	EA	2		
217	COT 312	12 INCH, DIP 45 DEGREE BEND (RESTRAINED)	EA	2		
218	COT 312	2 INCH GALV. 90 DEG BENDS, RJ	EA	2		
219	COT 314	PRECAST CONCRETE MANHOLE (SANITARY SEWER) (4'ID)	EA	2		
220	COT 314	ADDITIONAL DEPTH MANHOLE (SANITARY SEWER) (4'ID)	VF	5		
221	COT 314	PRECAST CONCRETE MANHOLE (SANITARY SEWER) (5'ID)	EA	2		
222	COT 314	ADDITIONAL DEPTH MANHOLE (SANITARY SEWER) (5'ID)	VF	5		
223	COT 314	PRECAST CONCRETE MANHOLE (SANITARY SEWER) (6'ID)	EA	2		
224	COT 314	ADDITIONAL DEPTH MANHOLE (SANITARY SEWER) (6'ID)	VF	5		
225	COT 315	3/4" X 6" SERVICE CLAMP, IN PLACE	EA	2		
226	COT 315	3/4" X 8" SERVICE CLAMP, IN PLACE	EA	2		
227	COT 315	1" X 6" SERVICE CLAMP, IN PLACE	EA	2		
228	COT 315	1-1/2" X 6" SERVICE CLAMP, IN PLACE	EA	2		
229	COT 315	2" X 8" SERVICE CLAMP, IN PLACE	EA	2		
230	COT 315	3/4" CORPORATION STOP, IN PLACE	EA	10		
231	COT 315	3/4" THREE PART UNION, IN PLACE	EA	10		
232	COT 315(SP)	3/4" TYPE K COPPER TUBING	LF	50		
233	COT 315	3/4" METER SETTER	EA	6		
234	COT 315	3/4" METER CAN, RIM, LID	EA	6		
235	COT 315	1" CORPORATION STOP, IN PLACE	EA	2		
236	COT 315	1" THREE PART UNION, IN PLACE	EA	2		
237	COT 315(SP)	1" TYPE K COPPER TUBING	LF	50		
238	COT 315	1-1/2" CORPORATION STOP, IN PLACE	EA	2		
239	COT 315	1-1/2" THREE PART UNION, IN PLACE	EA	2		
240	COT 315(SP)	1-1/2" TYPE K COPPER TUBING	LF	50		
241	COT 315	2" CORPORATION STOP, IN PLACE	EA	2		
242	COT 315	2" THREE PART UNION, IN PLACE	EA	2		
243	COT 315(SP)	2" TYPE K COPPER TUBING	LF	50		
244	COT 315	4" DIAMETER SANITARY SEWER SERVICE RECONNECTION	EA	2		
245	COT 315	6" DIAMETER SANITARY SEWER SERVICE RECONNECTION	EA	2		

246	COT 313	4", SCH 40 PVC SEWER SERVICE IN-PLACE	LF	40		
247	COT 307	4", CLASS 51 DIP SEWER SERVICE IN-PLACE	LF	40		
248	COT 315	10" X 10" X 4" SERVICE TEE, DIP-MJ	EA	1		
249	COT 315	12" X 12" X 4" SERVICE TEE, DIP-MJ	EA	1		
250	COT 315	8" X 8" X 4" IN-LINE TEE SERVICE CONNECTION (DIP)	EA	1		
251	COT 312	6" X 6" X 6" TEE, RJ (DIP)	EA	1		
252	COT 312	8" X 8" X 6" TEE, RJ (DIP)	EA	1		
253	COT 312	8" X 8" X 8" TEE, RJ (DIP)	EA	1		
254	COT 312	12" X 12" X 8" TEE, RJ (DIP)	EA	1		
255	COT 312	12" X 12" X 12" TEE, RJ (DIP)	EA	1		
256	COT 312	12" X 8" REDUCER, RJ (DIP)	EA	1		
257	COT 312	12" X 6" REDUCER, RJ (DIP)	EA	1		
258	COT 312	8" X 6" REDUCER, RJ (DIP)	EA	1		
259	COT 312	12" SLEEVE, RJ (DIP)	EA	1		
260	COT 312	8" SLEEVE, RJ (DIP)	EA	1		
261	COT 312	6" SLEEVE, RJ (DIP)	EA	1		
262	COT 312	6" PLUG W/ 2" TAP, RJ (DIP)	EA	1		
263	COT 312	12-INCH 90 DEG BEND, RJ	EA	1		
264	COT 312	8-INCH 90 DEG BEND, RJ (DIP)	EA	1		
265	COT 312	6-INCH 90 DEG BEND, RJ (DIP)	EA	1		
266	COT 312	12" PLUG, RJ (DIP)	EA	1		
267	COT 312	8" PLUG, RJ (DIP)	EA	1		
268	COT 312	6" PLUG, RJ (DIP)	EA	1		
269	COT 317	12" FIRE HYDRANT EXTENSION	EA	1		
270	COT 317	18" FIRE HYDRANT EXTENSION	EA	1		
271	COT 315	2" METER SETTER	EA	1		
272	COT 315	1-1/2" METER SETTER	EA	1		
273	COT 315	1" METER SETTER	EA	1		
274	COT 315	2" METER CAN, RIM, LID	EA	1		
275	COT 315	1-1/2" METER CAN, RIM, LID	EA	1		
276	COT 315	1" METER CAN, RIM, LID	EA	1		
277	COT 316	LAMPHOLE	EA	1		
278	COT 317	3-WAY FIRE HYDRANT, 4.5' BURY, IN PLACE	EA	1		
279	COT 317	6" FIRE HYDRANT EXTENSION, IN PLACE	EA	1		
280	COT 318	VALVE BOX	EA	10		
281	COT 318	VALVE BOX EXTENSION	EA	10		
282	COT 322	20" STEEL CONDUIT BORED	LF	50		
283	COT 322	24" STEEL CONDUIT BORED	LF	50		
284	COT 327	SAFETY FENCE	LF	1000		
285	COT 328	6-INCH BORE	LF	10		
286	COT 328	8-INCH BORE	LF	10		
287	COT 328	12-INCH BORE	LF	10		
288	COT 408	8" ID to 8" ID SANITARY SEWER PIPE BURSTING (HDPE)	LF	20		
289	COT 408	8" ID to 8" ID SANITARY SEWER PIPE BURSTING (DIP)	LF	20		
290	COT 408	10" ID to 10" ID SANITARY SEWER PIPE BURSTING (HDPE)	LF	20		
291	COT 408	10" ID to 10" ID SANITARY SEWER PIPE BURSTING (DIP)	LF	20		
292	COT 408	12" ID to 12" ID SANITARY SEWER PIPE BURSTING (HDPE)	LF	20		
293	COT 408	12" ID to 12" ID SANITARY SEWER PIPE BURSTING (DIP)	LF	20		
294	COT 408	15" ID to 15" ID SANITARY SEWER PIPE BURSTING (HDPE)	LF	20		
295	COT 409	8" ID SANITARY SEWER SLIPLINING (ALL DEPTHS)	LF	20		
296	COT 409	10" ID SANITARY SEWER SLIPLINING (ALL DEPTHS)	LF	20		
297	COT 409	12" ID SANITARY SEWER SLIPLINING (ALL DEPTHS)	LF	20		
298	COT 409	15" ID SANITARY SEWER SLIPLINING (ALL DEPTHS)	LF	20		
299	COT 412	8" ID SANITARY SEWER POINT REPAIR (ALL MATERIALS)	EA	1		
300	COT 412	8" ID SANITARY SEWER POINT REPAIR ADD. LENGTH (ALL MATERIALS)	LF	10		
301	COT 412	10" ID SANITARY SEWER POINT REPAIR (ALL MATERIALS)	EA	1		
302	COT 412	10" ID SANITARY SEWER POINT REPAIR ADD. LENGTH (ALL MATERIALS)	LF	10		
303	COT 412	12" ID SANITARY SEWER POINT REPAIR (ALL MATERIALS)	EA	1		
304	COT 412	12" ID SANITARY SEWER POINT REPAIR ADD. LENGTH (ALL MATERIALS)	LF	10		
305	COT 412	15" ID SANITARY SEWER POINT REPAIR (ALL MATERIALS)	EA	1		
306	COT 412	15" ID SANITARY SEWER POINT REPAIR ADD. LENGTH (ALL MATERIALS)	LF	10		
307	COT 423	ALL DIAMETER SANITARY SEWER OBSTRUCTION REMOVAL	EA	1		
		SPECIAL				
308	610(I)	TACTILE WARNING DEVICE	SF	500		
309	COT 602	1" SCH 40 PVC CONDUIT TRENCHED	LF	100		
310	COT 602	2" SCH 40 PVC CONDUIT TRENCHED	LF	100		
311	COT 602	3" PVC Sch 40 Plastic Conduit (Trenched)	LF	20		
312	COT 602	1" SCH 40 HDPE CONTINUOUS CONDUIT BORED (INSIDE IDL)	LF	50		
313	COT 602	1" SCH 40 HDPE CONTINUOUS CONDUIT BORED (OUTSIDE IDL)	LF	50		
314	COT 602	2" SCH 40 HDPE CONTINUOUS CONDUIT BORED (INSIDE IDL)	LF	50		
315	COT 602	2" SCH 40 HDPE CONTINUOUS CONDUIT BORED (OUTSIDE IDL)	LF	50		
316	COT 602	3" SCH 40 HDPE CONTINUOUS CONDUIT BORED (INSIDE IDL)	LF	50		
317	COT 602	3" SCH 40 HDPE CONTINUOUS CONDUIT BORED (OUTSIDE IDL)	LF	50		
318	COT 602	2 - 3" PVC Sch 40 Plastic Conduit (Trenched)	LF	20		
319	COT 602	2 - 3" HDPE Sch 40 Conduit (Directional Bore - Inside IDL)	LF	20		
320	COT 602	2 - 3" HDPE Sch 40 Conduit (Directional Bore - Outside IDL)	LF	20		
321	COT 602	1 1/2" Galvanized Steel Electrical Conduit (Exposed)	LF	20		
322	COT 602	2" Galvanized Steel Electrical Conduit (Exposed)	LF	20		
323	COT 602	3" Galvanized Steel Electrical Conduit (Exposed)	LF	20		
324	SPECIAL	PROOF OF TRAFFIC SIGNAL CONDUIT	LF	100		
325	SPECIAL	REMOVING TREES 6-12 INCH IN DIAMETER (TR-1)	EA	5		
326	SPECIAL	REMOVING TREES 13-18 INCH IN DIAMETER (TR-1)	EA	5		
327	SPECIAL	REMOVING TREES 19-24 INCH IN DIAMETER (TR-1)	EA	5		
328	SPECIAL	REMOVING TREES 25 INCH AND MORE IN DIAMETER (TR-1)	EA	5		
329	SPECIAL	INFRASTRUCTURE REHABILITATION SIGN (RIS-1)	SD	4000		
330		NOT USED				
331	SPECIAL	22' ASPHALT SPEED HUMP W/PAVEMENT MARKINGS (SH-1-2)	LF	100		
332	SPECIAL	SPEED HUMP (W17-1) SIGN & POST (SH-1-2)	EA	5		
333	SPECIAL	SPEED HUMP (W17-1) SIGN & POST W/ OPTIONAL SIGN (W16-4) (SH-1-2)	EA	5		
334	710	ROADSIDE DELINEATOR (OM2-2V) & POST (PTS-1-2)	EA	10		

335	SPECIAL	RAPID CURE JOINT SEALANT (BEJR-1-3)	LF	100		
336	SPECIAL	ELASTOMERIC MORTAR (BEJR-1-3)	CF	30		
337	SPECIAL	POLYMER-MODIFIED ASPHALT BASED PAVEMENT SEALER(PM-1-2)	SY	5000		
338	SPECIAL	ADA COMPLIANT HANDRAIL (ADA - 1-2)	LF	300		
		TRAFFIC				
339	COT 604	LOOP DETECTOR WIRE	LF	500		
340	855(B)	TRAFFIC STRIPE (PLASTIC) (ARROWS)	EA	10		
341	855(B)	TRAFFIC STRIPE (PLASTIC) (WORDS)	EA	10		
342	855(B)	TRAFFIC STRIPE (PLASTIC) (SYMBOLS)	EA	10		
343	857(F)	PAVEMENT MARKING REMOVAL (TRAFFIC STRIPE)	LF	1000		
344	COT STD 601	PULL BOX SIZE I	EA	5		
345	COT STD 601	PULL BOX SIZE II	EA	2		
346	COT STD 601	PULL BOX SIZE III	EA	2		
347	COT 603(SP)	24" Signal Footing S-18/24	EA	1		
348	COT 603(SP)	30" Signal Footing S-30/36	EA	1		
349	COT 603(SP)	36" Signal Footing S-42/50	EA	1		
350	COT 603(SP)	48" Signal Footing S-54/58	EA	1		
351	COT 603(SP)	48" Signal Footing S-62/70	EA	1		
352	COT 603(SP)	24" Pedestal Footing F-1	EA	4		
353	COT 604	6' X 6' LOOP DETECTOR	EA	2		
354	COT 604	6' X 30' LOOP DETECTOR	EA	2		
355	COT 604	6' X 50' QUADRUPOLE LOOP DETECTOR	EA	2		
356	COT 604	LOOP LEAD-IN WIRE	LF	50		
357	COT 604	Shelf Mounted Detector Unit (For Loops)	EA	1		
358	COT 606	Pre-emption Cable	LF	50		
359	COT 606	Infrared Pre-emption Detector	EA	4		
360	COT 606	GPS Pre-emption Detector	EA	1		
361	COT 606	Pre-emption Phase Selector	EA	1		
362	COT 607(SP)	Pedestal Service Installation	EA	1		
363	COT 607(SP)	Service to Signal Standard	EA	1		
364	COT 607(SP)	Overhead Service to Service Pole	EA	1		
365	COT 608	Ground Sign	SF	25		
366	COT 608	Overhead Sign	SF	25		
367	COT 608	1-1/2" Sign Post	LF	25		
368	COT 608	1-3/4" Sign Post	LF	25		
369	COT 608	2" Sign Post	LF	25		
370		NOT USED				
371	COT 610	Traffic Signal Controller Cabinet Assembly - 332S EXT RAC (2025 COT Spec)	EA	1		
372		NOT USED				
373	COT 610	Traffic Signal Controller Cabinet Assembly - 336S Junction Cabinet	EA	1		
374	COT 611	4# 14 Traffic Signal Electrical Cable	LF	50		
375	COT 611	20 # 14 Traffic Signal Electrical Cable	LF	50		
376	COT 611 (SP)	16 # 14 Traffic Signal Electrical Cable	LF	50		
377	COT 611	Green # 12 THHN Electrical Conductor	LF	50		
378	COT 611	2#12 UF Electrical Conductor with Ground	LF	50		
379	COT 611	7 # 14 Traffic Signal Electrical Cable	LF	50		
380	COT 611	10 # 14 Traffic Signal Electrical Cable	LF	50		
381	COT 611	2#14 Shielded Electrical Conductor	LF	50		
382	COT 611	Green # 6 THHN Electrical Conductor	LF	50		
383	COT 611	22 AWG Filled BJFA, BJFC, PE-39, 6 Pair	LF	50		
384	COT 611	24 AWG Filled BJFA, BJFC, PE-39, 6 Pair	LF	50		
385	COT 611	24 AWG Filled BJFA, BJFC, PE-39, 12 Pair	LF	50		
386	COT 611	24 AWG Filled BJFA, BJFC, PE-39, 24 Pair	LF	50		
387	COT 611(SP)	CAT 6 Ethernet Cable	LF	50		
388	COT 612	Cabinet Base, Apron, and Guard	EA	1		
389	COT 613 (SP)	Non-Audible Pedestrian Push Button Station and Signs	EA	1		
390	COT 613	Audible Pedestrian Push Button Station and Signs	EA	1		
391	COT 613	Audible Pedestrian Push Button Configuration/Programming Device	EA	1		
392	COT 613	Audible Pedestrian Push Button Control Card/Unit	EA	1		
393	COT 614(SP)	LED 3 Section Traffic Signal Head (#36)	EA	2		
394	COT 614(SP)	LED 3 Section Traffic Signal Head (#54L)	EA	2		
395	COT 614(SP)	LED 3 Section Traffic Signal Head (#54R)	EA	2		
396	COT 614(SP)	LED 5 Section Traffic Signal Head (#64R)	EA	2		
397	COT 614(SP)	LED 5 Section Traffic Signal Head (#64L)	EA	2		
398	COT 614(SP)	LED ICC Pedestrian Head (#33)	EA	4		
399	COT 614(SP)	Louvers for 3-Section Signal Head	EA	1		
400	COT 614(SP)	Aluminum, Louvered Backplate for 3-Section Signal Head	EA	1		
401	COT 614(SP)	Aluminum, Louvered Backplate for 5-Section Signal Head	EA	1		
402	COT 615	Base Covers	EA	1		
403	COT 617	6' Pedestrian Push Button Pole	EA	1		
404	COT 617	10' Pedestal Pole	EA	1		
405	COT 619	Temp Signal Span	EA	1		
406	COT 619	Temp Signal Pole	EA	1		
407	COT 619	Temp Signal Cabinet	EA	1		
408	COT 619	Temp Signal Service	EA	1		
409		NOT USED				
410	SPECIAL	Video Detection System - 3-Wire Broadband over Power	EA	1		
411	SPECIAL	Video Detection System - Radar	EA	1		
412	COT 620	Black and White/Color Video Detection Camera Replacement	EA	1		
413		NOT USED				
414	COT 622	Wireless Traffic Signal Communications System	EA	1		
415	COT 623	Battery Backup System - ZX2000-48 Super Capacitor and DBLMXU-48 UPS	EA	1		
416	COT 624	Remove and Reset Existing Traffic Signal Controller Cabinet Assembly	EA	1		
417	SPECIAL	Remove and Reset Existing Traffic Signal Pole (All Sizes W/Luminaire Arm)	EA	1		
418	SPECIAL	Remove and Reset Existing Traffic Signal Pole (All Sizes W/O Luminaire Arm)	EA	1		
419	SPECIAL	Remove and Reset Existing Pedestrian or Pedestal Traffic Signal Pole	EA	1		
420	COT 625(SP)	Removal of Traffic Items	EA	5		
421	SPECIAL	Sign Assembly with Flashing Beacon, Solar (SAFB-1-8)	EA	1		
422	SPECIAL	Sign Assembly with Flashing Beacon, Electric (SAFB-1-8)	EA	1		
423		NOT USED	EA	1		

424	SPECIAL	School Sign Assembly with Flashing Beacon, Solar (SAFB-1-8)	EA	1		
425	SPECIAL	Rectangular Rapid Flashing Beacon (RRFB) Single Light Bar with Push Button	EA	1		
426	SPECIAL	Rectangular Rapid Flashing Beacon (RRFB) Dual Light Bar without Push Button	EA	1		
427	SPECIAL	Rectangular Rapid Flashing Beacon (RRFB) Dual Light Bar with Push Button	EA	1		
428	SPECIAL	BIKE PATH MARKINGS (BPM-1)	EA	4		
		CONCRETE PAVING UNIT				
429	610(D)(SP)	REMOVE AND RELAY BRICK, STONE AND CONCRETE PAVERS (RRBP-1)	SY	1000		
430	SPECIAL	60 mm CONCRETE PAVING UNIT (ICP-1-7)	SY	250		
431	SPECIAL	60 mm ADA COMPLIANT CONCRETE PAVING UNIT (ICP-1-7)	SY	250		
432	SPECIAL	80 mm CONCRETE PAVING UNIT (ICP-1-7)	SY	200		
433	SPECIAL	CEMENT MODIFIED AGGREGATE BASE (ICP-1-7)	SY	250		
434	SPECIAL	JOINT SAND STABILIZER (POLYMERIC) JSSP 1-2	LB	200		
435	613 (H)	4" PERFORATED PVC PIPE	LF	200		
436	613 (I)	4" NON-PERFORATED PVC PIPE	LF	200		
437	COT STD 758	SPECIAL END SECTIONS FOR FRENCH DRAINS	EA	20		
		BRIDGE DECK REPAIRS				
438	513(A)	CLASS A BRIDGE DECK REPAIR	SY	200		
439	513(B)	CLASS B BRIDGE DECK REPAIR	SY	200		
440	513 (C)	CLASS C BRIDGE DECK REPAIR	SY	100		
441	505(A)	BRIDGE DECK CONCRETE OVERLAY	SY	250		
442	515(A)	WATER REPELLENT(VISUALLY INSPECTED)	SY	1000		
443	523(A)	SEALER CRACK PREPERATION	LF	1000		
444	523(B)	SEALER RESIN	GAL	100		
445	523 (C)	DECK AREA SEALED(FLOOD COATS)	SY	1000		
		SUPPLEMENTARY				
446	414(SP)	P.C. CONCRETE PAVEMENT WITH FIBRILLATED FIBER REINFORCEMENT(FSD-1)	CY	100		
447	613(L)	15" PREFAB CULVERT END SECTION, RD	EA	4		
448	613(L)	18" PREFAB CULVERT END SECTION, RD	EA	4		
449	613(L)	24" PREFAB CULVERT END SECTION, RD	EA	4		
450	613(L)	30" PREFAB CULVERT END SECTION, RD	EA	4		
451	613(L)	36" PREFAB CULVERT END SECTION, RD	EA	4		
452	613(L)	42" PREFAB CULVERT END SECTION, RD	EA	4		
453	613(L)	48" PREFAB CULVERT END SECTION, RD	EA	4		
454	521	PNEUMATICALLY PLACED MORTAR	SY	50		
455	SPECIAL	DEBRIS NETTING (DN-1-3)	SY	220		
456	SPECIAL	PRE-FORMED BIKE LANE MARKINGS(24" WIDE)(BLM-1)	LF	500		
457	SPECIAL	URBAN RIGHT OF WAY RESTORATION(URWR-1-3)	ALLOW	1	\$40,000.00	\$40,000.00
458	SPECIAL	MULTI-AXIAL COMPOSITE PAVING GRID(MCPG-1-7)	SY	1000		
459	870(A)	SANDFILLED IMPACT ATTENUATION MODULE	EA	25		
460	870(B)	QUADGUARD II IMPACT ATTENUATOR (IA-1-7)	EA	1		
461	870(B)	QUADGURAD ELITE IMPACT ATTENUATOR (IA-1-7)	EA	1		
462	870(B)	TAU-II IMPACT ATTENUATOR (IA-1-7)	EA	1		
463	870(B)	TRACC IMPACT ATTENUATOR (IA-1-7)	EA	1		
464	870 (C)	REMOVAL OF EXISTING IMPACT ATTENUATION MODULE	EA	5		
465	COT 614(SP)	LED 4 SECTION TRAFFIC SIGNAL HEAD(S-13L)	EA	2		
466	COT 614(SP)	ALUMINUM, LOUVERED BACKPLATE FOR 4 SECTION TRAFFIC SIGNAL HEAD	EA	2		
		NEW				
467	COT 617	TRAFFIC SIGNAL POLE- 1R	EA	1		
468	COT 617	TRAFFIC SIGNAL POLE- 2B	EA	1		
469	COT 617	TRAFFIC SIGNAL POLE- 3G	EA	1		
470	COT 617	TRAFFIC SIGNAL POLE- 4Y	EA	1		
471	COT 617	TRAFFIC SIGNAL POLE- 5W	EA	1		
472	COT 613	ALUMINUM OCTAGON BASE W/ SET SCREWS	EA	1		
473	COT 611	5# 14 TRAFFIC SIGNAL ELECTRICAL CABLE	LF	50		
474	506(A)	STRUCTURAL STEEL	LB	2500		
475	507(A)(SP)	STAINLESS STEEL FIXED BEARING ASSEMBLY	EA	5		
476	507(B)(SP)	STAINLESS STEEL EXPANSION BEARING ASSEMBLY	EA	5		
477	737 (SP)	ELASTOMETRIC COATING	SF	500		
478	520(A)	PREPARATION OF CRACKS, ABOVE WATER	LF	250		
479	520(C)	EXPOXY RESIN, ABOVE WATER	GAL	10		
480	524(A)	CARBON FIBER-REINFORCED POLYMER (ODOT SP-524-3)	SF	200		
481	535	CORROSION INHIBITOR (SURFACE APPLIED)	SY	25		
482	623(F)	GUARDRAIL BRIDGE CONNECTION - TRAIL END (ODOT DETAIL T-604)	EA	4		
483	623(F)	GUARDRAIL TRAIL END TURNDOWN (ODOT DETAIL T-604)	EA	4		
484	623(F)	GUARDRAIL SYSTEM - PIER PROTECTION (ODOT DETAIL T-604)	EA	4		
485	623(C)	GUARDRAIL BRIDGE CONNECTION - THRIE BEAM (31" SYSTEM) (ODOT DETAIL T-601)	EA	4		
486	623(F)	GUARD RAIL ANCHOR UNIT (TYPE D-BF) (ODOT DETAIL T-607, T-608)	EA	4		
487	COT 602	1-1/2" SCH 40 PVC CONDUIT TRENCHED	LF	100		
488	COT 620	VIDEO DETECTION SYSTEM - CAT 6	EA	2		
489	COT 620	VIDEO DETECTION SYSTEM - COMBINATION VIDEO AND RADAR	EA	1		
490	COT 623	BATTERY BACKUP SYSTEM - ZINBLUE2	EA	2		
491	SPECIAL	TRAFFIC SIGNAL CONTROLLER MODIFICATION - DISABLE / ENABLE TURNING MOVEM	EA	10		
492	SPECIAL	TURN SIGNAL MODIFICATION - COVER AND UNCOVER (TSM-1)	EA	10		
493	SPECIAL	INSTALL AND REMOVE R3-2 OR R3-1 MAST ARM SIGNS (TSM-1)	EA	10		
494	SPECIAL	FLARED END TERMINAL (FET-1)	EA	4		
495	SPECIAL	SURVEYING (SV-1)	ALLOW	1	\$20,000.00	\$20,000.00
496	216	15" NYLOPLAST DRAIN, COMPLETE IN PLACE	EA	4		
497	216	18" NYLOPLAST DRAIN, COMPLETE IN PLACE	EA	4		
498	216	24" NYLOPLAST DRAIN, COMPLETE IN PLACE	EA	4		
499	216	30" NYLOPLAST DRAIN, COMPLETE IN PLACE	EA	4		
500	216	36" NYLOPLAST DRAIN, COMPLETE IN PLACE	EA	4		
501	SPECIAL	15" INSERTA TEE (IT-1-2) COMPLETE IN PLACE	EA	4		
502	SPECIAL	18" INSERTA TEE (IT-1-2) COMPLETE IN PLACE	EA	4		
503	SPECIAL	24" INSERTA TEE (IT-1-2) COMPLETE IN PLACE	EA	4		
504	613(L)	60" PREFAB CULVERT END SECTION, RD	EA	4		
		TOTAL				\$100,000.00

TOTAL BASE BID

\$100,000.00
Figures

Enclosed is a () Bidder's Surety Bond, () Certified Check, () Cashier's Check for

_____ Dollars (\$ _____)
Figures

which the City of Tulsa may retain or recover as liquidated damages in the event that the undersigned fails to enter into contract for the work covered by this proposal., provided the Contract is awarded to the undersigned within thirty (30) days, or within ninety (90) days if Federal funds are utilized, from the date fixed for opening of bids and the undersigned fails to execute said Contract and furnish the required bonds and other requirements as called for in these Contract Documents within thirty (30) days after award of Contract.

Dated at Tulsa, Oklahoma, this _____ day of _____, 20__.

Respectfully submitted,

(Complete legal name of company)

(State of Organization)

By:

ATTEST:

Title:

Title: Corporate Secretary

Printed Name:

Printed Name:

(SEAL)

Address: _____

Telephone Number: _____

Fax Number: _____

By signing above bidder acknowledges receipt of the following Addenda (give number and date of each):

Certificate of Secretary

The undersigned _____ (Assistant) Secretary of _____, a _____ corporation, (the "Corporation") hereby certifies that the following is a true and correct copy of a Resolution duly adopted by the Board of Directors of the Corporation on the _____ day of _____, 20____.

RESOLVED, that _____ is authorized to execute and enter into bids, contracts, bonds, affidavits and any ancillary documents, on behalf of the Corporation.

The undersigned further certifies that this Resolution is in full force and effect as of the date of this Certificate and has not been amended, modified, revoked or rescinded.

IN WITNESS WHEREOF, I have executed this Certificate this _____ day of _____, 20____.

(Signature)

Printed Name

(Assistant) Secretary

Consent of Members

The undersigned, being all of the Members of [Name of Company], LLC, an Oklahoma Limited Liability Company, hereby authorize, consent to, approve and ratify the execution by _____ on behalf of [Name of Company], LLC of bid proposals, contracts, affidavits and related documents in connection with [Name of Project] of the City of Tulsa.

DATED, this ____ day of _____, 20__.

Name printed: _____

Name Printed: _____

[ADD ADDITIONAL LINES FOR ADDITIONAL MEMBERS]



PUBLIC WORKS
Engineering

DATE:
Month Day, Year

{Company Name}
(Address)
{City, State Zip}

RE: City of Tulsa Project No. {number and Title}

TO WHOM IT MAY CONCERN:

Please be advised that the City of Tulsa, Oklahoma, a municipal corporation, has contracted for the construction of a public improvement project as referenced above, and that pursuant to Title 68 § Section 1356 (10), sales on tangible personal property or services to be wholly consumed in the performance of such projects are exempt from Oklahoma and City of Tulsa Sales Tax when:

"...Any person making purchases on behalf of such subdivision or agency of the state shall certify, in writing, on the copy of the invoice or sales ticket to be retained by the vendor that the purchases are made for and on behalf of such subdivision or agency of this state and set out the name of such public subdivision or agency."

This letter of authorization expires {Date.}

A photostatic copy of this letter may be considered as the original.

CITY OF TULSA

Paul D. Zachary, P.E.
Deputy Director

cc: Ryan McKaskle

HAS:JR:kt

STED-1

EXTENSION OF TIME REQUEST
(to be submitted with each partial payment application)

DATE: _____

CONTRACTOR: _____

ADDRESS: _____

CONTRACT NO.: _____

PROJECT NO.: _____

DESCRIPTION: _____

ARE THERE ANY CHANGES TO YOUR SBE UTILIZATION? _____ YES _____ NO

IF YES, GIVE REASON AND ATTACH CHANGE REQUEST FORM (SBE-4): _____

EXTENSION OF CONTRACT TIME REQUIRED: _____ YES _____ NO

TOTAL OF EXTENSION TIME REQUESTED: _____

IF YES GIVE REASON: _____

SIGNATURE - CONTRACTOR

CONSULTING ENGINEER OR DEPARTMENT OF PUBLIC WORKS STAFF RECOMMENDATIONS

APPROVED: _____

REJECTED: _____

REASON: _____

SIGNATURE

DATE

ACTION WILL BE TAKEN WITHIN 30 DAYS FROM RECEIPT OF REQUEST

ETR-1

**CONTRACT FOR CONSTRUCTION OF PUBLIC IMPROVEMENTS
TULSA, OKLAHOMA**

THIS CONTRACT made and entered into the ____ day of _____, 2026, by and between ____ an (list state) _____ (Corporation or Limited Liability Company) of _____, Oklahoma, hereinafter called the "CONTRACTOR", and the CITY OF TULSA - TULSA, OKLAHOMA, a Municipal Corporation, herein called the "CITY."

WITNESSETH:

WHEREAS, the City has caused to be prepared the necessary Drawings, Specifications, and other Contract Documents for the public improvements herein described, and has invited bids for the construction thereof in accordance with the terms of this Contract, all of which is hereby designated as:

PROJECT NO. CIRI 2027-2028 CITYWIDE INFRASTRUCTURE REHABILITATION AND IMPROVEMENTS.

WHEREAS, the Contractor, in response to the Advertisement, has submitted to the City, in the manner and at the time specified, a sealed bid in accordance with the terms of this Contract; and,

WHEREAS, the City, in the manner prescribed by law, has publicly opened, examined, and canvassed the bids submitted, and has determined the above named Contractor to be the lowest responsible bidder for the work and has duly awarded to the said Contractor therefore, for the sum or sums named in the Contractor's bid, a copy of the Bid Form being attached to and made a part of this Contract;

NOW, THEREFORE, in consideration of the compensation to be paid to the Contractor and of the mutual agreements and covenants herein contained, the parties to this Contract have agreed and hereby agree, as follows:

ARTICLE I. That the Contractor shall (a) furnish all tools, equipment, supplies, superintendent, transportation, and other construction accessories, services, and facilities; (b) furnish all materials, supplies, and equipment specified and required to be incorporated in and form a permanent part of the completed work; (c) provide and perform all necessary labor; and (d) in a good, substantial, and workmanlike manner and in accordance with the requirements, stipulations, provisions, and conditions of the Contract as defined in the attached General Provisions, sometimes referred to as General Conditions in the Contract Documents, said documents forming the Contract and being as fully a part thereof as if repeated verbatim herein, perform, execute, construct, and complete all work included in and covered by the City's official award of this Contract to the said Contractor, such award being based on the acceptance by the City of the Contractor's bid, or part thereof, as follows:

PROJECT NO. CIRI 2027-2028 CITYWIDE INFRASTRUCTURE REHABILITATION AND IMPROVEMENTS.

ARTICLE II. That the City shall pay to the Contractor for performance of the work embraced in this Contract, and the Contractor will accept as full compensation therefor, the sum (subject to adjustment as provided by the Contract) of _____ AND /100 Dollars (\$_____) for all work covered by and included in the Contract award and designated in the foregoing Article I; payments therefore to be made in cash or its equivalent, in the manner provided in the General Provisions.

ARTICLE III. That the Contractor shall start work within ten (10) days following the date stipulated in a written order from the City to proceed with the work to be performed hereunder, and shall complete the work within the number of consecutive calendar days after the authorized starting date, as stipulated below:

All Work Completed: 455 calendar days

ARTICLE IV. The sworn, notarized statement below shall be signed and notarized before this Contract will become effective.

ARTICLE V. Prior to submitting a final payment request, the Contractor shall furnish a lien waiver certifying that all subcontractors and suppliers have been paid.

ARTICLE VI. If the Contractor has 10 or more full-time employees, and this contract exceeds \$100,000 in total value, Contractor acknowledges and agrees that, in accordance with and pursuant to 21 O.S. 1289.31, Contractor verifies to City that: (i) it does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association, and (ii) will not discriminate against a firearm entity or firearm trade association during the term of this Contract.

IN WITNESS WHEREOF, the parties have hereto set their hands and seals,

this _____ day of _____, 2026.

CITY OF TULSA, OKLAHOMA
a municipal corporation

By: _____

ATTEST: (SEAL)

Mayor

Date: _____

City Clerk

Date: _____

APPROVED:

APPROVED:

City Attorney

Date: _____

Director

Date: _____

CONTRACTOR

By: _____

Printed Name _____

Title

Date: _____

Title

Date: _____

ATTEST:

Corporate Secretary

(SEAL)

AFFIDAVIT

STATE OF _____)
)ss
COUNTY OF _____)

_____, of lawful age, being first duly sworn, on oath says that (s)he is the agent authorized by the Contractor to submit the above Contract to the CITY OF TULSA, Tulsa, Oklahoma.

Signature

Subscribed and sworn to before me this _____ day of _____, 2026.

NOTARY PUBLIC

My Commission Expires:

_____, _____.

City of Tulsa Construction Escalation Process

Step	Contractor Representative(s)	City of Tulsa Representative(s)	Process	Communication / Documentation	Resolution (**)	No Resolution	Typical Time Frame (***)
1.0 Superintendent		Construction Inspector	Field Meeting Request for Information (RFI) may apply	Phone, Text, Email, or RFI / Daily Report	Within Construction Documents	If not resolved Within Construction Documents, escalate to 2.0	Same day to 3 days
2.0 Superintendent		Construction Inspector Manager / Construction Inspector	Field Meeting Request for Information (RFI) may apply	Phone, Text, Email, or RFI / Daily Report	Within Construction Documents	If not resolved within Construction Documents, escalate to 3.0	1 day to 3 days
3.0 Project Manager / Superintendent		Construction Manager / Construction Inspector Manager / Construction Inspector Lead Engineer / Project Manager Design Consultant	Contractor submit RFI	Phone, Email, RFI / Daily Report, RFI Log, Progress Mtg	Additional information provided. Potential Allowance Authorization, Extension of Quantities, Change Order, or Other	If not resolved by additional information and within terms of contract, escalate to 4.0	Within 10 calendar days (as ODOT 104.06.B)
4.0 Project Manager / Superintendent		Field Engineering Manager / Construction Manager Lead Engineer / Project Manager Design Consultant	Appeal Construction Manager's Decision	Email, RFI / Daily Report, RFI Log, Progress Mtg	Field Engineering Manager makes determination on appeal. Potential Allowance Authorization, Extension of Quantities, Change Order, or Other	If not resolved by additional information and within terms of contract, escalate to 5.0	Within 10 calendar days (as ODOT 104.06.B)
5.0 Owner / Project Manager / Superintendent		PW Deputy Director and/or other Dept Design Manager / Field Engineering Manager / Construction Manager Lead Engineer / Project Manager Design Consultant	Appeal Field Engineering Manager's Decision	Email, RFI / Daily Report, RFI Log, Progress Mtg	PW Deputy Director and/or other Dept. Design Manager makes determination on appeal. Potential Allowance Authorization, Extension of Quantities, Change Order, or Other	If appeal is not resolved, escalate to 6.0	Within 10 calendar days (as ODOT 104.06.B)
6.0 Owner / Project Manager / Superintendent		Director (*) / PW Deputy Director and/or other Dept Design Manager / Field Engineering Manager / Construction Manager Lead Engineer / Project Manager Design Consultant	Appeal PW Deputy Director's and/or other Dept. Design Manager's Decision	Email, RFI / Daily Report, RFI Log, Progress Mtg	Director makes determination on appeal. Potential Allowance Authorization, Extension of Quantities, Change Order, or Other		Within 10 calendar days (as ODOT 104.06.B)

(*) Director of the Department under whose authority construction is managed by Public Works Field Engineering. Public Works Deputy Director will notify Director of Public Works.

(**) Resolution - Complete information will assist in the most timely resolution. Each escalation step should address any information deficiencies and proposed resolutions, if any, that were unsatisfactory.

(***) Time frames - It is understood that special issues will require a more rapid response and escalation.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That we, the undersigned,
 _____, (hereinafter called the Contractor"),
 duly authorized by law to do business as a construction contractor in the State of
 Oklahoma, and _____
 (hereinafter called the "Surety"), a corporation organized under the laws of the
 State of _____, and authorized to transact business in the State of
 Oklahoma, as Surety, are hereby held and firmly bound unto the City of Tulsa,
 Tulsa, Oklahoma (hereinafter called the "City"), in the penal sum of

_____ Dollars (\$) in
 lawful money of the United States, for the payment of which, well and truly to be
 made unto the said City, we bind ourselves, our heirs, executors, administrators,
 successors, and assigns, jointly and severally, firmly by these presents, as
 follows:

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH THAT,
 WHEREAS, the Contractor has on the _____ day of _____,
 entered into a written contract with the City of Tulsa, Tulsa, Oklahoma, for
 furnishing all materials, labor, tools, equipment, and transportation necessary for:

**Project No. CIRI 2027-2028 Citywide Infrastructure
 Rehabilitation and Improvements**

NOW, THEREFORE, if said Contractor shall well and truly perform and complete
 said project in accordance with said Contract, Advertisement for Bids, General
 Conditions, Instructions to Bidders, Bid Form, Plans and Specifications, and related
 documents, shall comply with all the requirements of the laws of the State of
 Oklahoma; shall pay as they become due all just claims for work or labor performed
 and materials furnished in connection with said contract, and shall defend,
 indemnify and save harmless said City against any and all liens, encumbrances,
 damages, claims, demands, expenses, costs and charges of every kind, including
 patent infringement claims except as otherwise provided in said specifications and
 other contract documents, arising out of or in relation to the performance of said
 work and the provisions of said Contract, then these presents shall be void;
 otherwise, they shall remain in full force and effect.

This obligation is made for the use of said City and also for the use and benefit of
 all persons who may perform work or labor, or furnish any material in the execution
 of said Contract, and may be sued on thereby in the name of the City.

The Surety, for value received, hereby stipulates and agrees that no change,
 extension of time, alteration or addition to the terms of the Contract, or to the work
 to be performed thereunder, or the specifications accompanying same, shall in any
 way affect its obligation on this bond; and it does hereby waive notice of any such
 change, extension of time, alteration or addition of the terms of the Contract, or to
 the work or to the specifications.

IN WITNESS WHEREOF, the said Principal has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its duly authorized officers, and the said Surety has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its attorney-in-fact, duly authorized so to do, the day and year first above written.

CONTRACTOR (Principal)

BY:

ATTEST: (S E A L)

Date: _____ Title: _____

Date: _____ Attorney In Fact ** _____
Date: _____ Surety (S E A L)

**This date shall match the notarized certificate on the Power-of-Attorney

(Accompany this Bond with Power Of Attorney)

APPROVED AS TO FORM:

Date: _____
City Attorney

Date: _____
City Clerk

STATUTORY BOND

WHEREAS, the undersigned _____
has entered into a certain contract dated the _____ day of _____,
designated as **Project No. CIRI 2027-2028** for the construction of certain public
improvements Consisting of **Citywide Infrastructure Rehabilitation and
Improvements** to be situated and constructed on and through the property
described in said Contract, including all of the work mentioned and described in
said Contract, and to be performed by the undersigned strictly and punctually in
accordance with the terms, conditions, drawings and specifications thereof, on file
in the office of the office of the City Clerk.

NOW, THEREFORE, KNOW ALL MEN BY THESE PRESENTS: That
_____, as Principal, and _____

_____, a Corporation organized under the laws of the
State of _____, and authorized to transact business in the State of
Oklahoma, as Surety, are held and firmly bound unto the State of Oklahoma in the
penal _____ sum _____ of

Dollars (\$) _____) in lawful money of the United States, for the payment
of which sum well and truly to be made, we bind ourselves, our successors, and
assigns, jointly and severally firmly by these presents.

NOW, THEREFORE, if the said Principal shall fail or neglect to pay all indebtedness
incurred by Principal or sub-contractors of said principal who perform work in the
performance of such contract, for labor and materials and repairs to and parts for
equipment used and consumed in the performance of said contract within thirty (30)
days after the same becomes due and payable, the person, firm or corporation
entitled thereto may sue and recover on this bond the amount so due and unpaid.

The Surety, for value received, hereby stipulates and agrees that no change,
extension of time, alteration, or addition to the terms of the contract or to the work to
be performed thereunder, or the specifications accompanying the same, shall in any
way affect its obligation on this bond, and it does hereby waive notice of any such
change, extension of time, alteration, or addition to the terms of the contract or to the
specifications.

5/30/06

IN WITNESS WHEREOF, the said Principal has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its duly authorized officers, and the said Surety has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its attorney-in-fact, duly authorized so to do, the day and year first above written.

CONTRACTOR (Principal)

BY:

ATTEST: (S E A L)

Date: _____
Title: _____

Date: _____
Title: _____

Date: _____
Attorney-In-Fact **

Date: _____
Surety (S E A L)

**This date shall match the date of the notarized certificate on the Power-of- Attorney.

(Accompany this Bond with Power-Of-Attorney)

APPROVED AS TO FORM:

Date: _____
City Attorney

Date: _____
City Clerk

MAINTENANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That _____, as Principal,
and _____

_____, a
corporation organized under the laws of the State of _____ and authorized to transact
business in the State of Oklahoma, as Surety, are held and firmly bound unto the City of
Tulsa in the Penal sum of

_____ Dollars (\$ _____) in lawful money of the United States of America for the
payment of which, well and truly to be made, we bind ourselves and each of us, our
heirs executors, administrators, trustees, successors, and assigns, jointly and severally,
firmly by these presents.

The condition of this obligation is such that:

WHEREAS, said Principal entered into a written contract with the City of Tulsa,
Oklahoma dated _____, _____, for

**Project No. CIRI 2027-2028 Citywide Infrastructure
Rehabilitation and Improvements.**

all in compliance with the drawings and specifications therefore, made a part of said
Contract and on file in the office of the City Clerk, Tulsa, Oklahoma.

NOW, THEREFORE, if said Principal shall pay or cause to be paid to the City of Tulsa,
Oklahoma, all damage, loss, and expense which may result by reason of defective
materials and/or workmanship in connection with said work, occurring within a period of
one (1) year for all projects, from and after acceptance of said project by the City of
Tulsa, Oklahoma; and if Principal shall pay or cause to be paid all labor and materials,
including the prime contractor and all subcontractors; and if principal shall save and
hold the City of Tulsa, Oklahoma, harmless from all damages, loss, and expense
occasioned by or resulting from any failure whatsoever of said Principal, then this
obligation shall be null and void, otherwise to be and remain in full force and effect.

It is further expressly agreed and understood by the parties hereto that no changes or
alterations in said Contract and no deviations from the plan or mode of procedure herein
fixed shall have the effect of releasing the sureties, or any of them, from the obligation
of this Bond.

06/13/06

IN WITNESS WHEREOF, the said Principal has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its duly authorized officers, and the said Surety has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its attorney-in-fact, duly authorized so to do, the day and year first above written.

CONTRACTOR (Principal)

BY:

ATTEST: (S E A L)

Date: _____
Title: _____

Date: _____
Attorney-In-Fact ** Surety (S E A L)

** This date shall match the date of the notarized certificate on the Power of Attorney

(Accompany this Bond with Power-Of-Attorney)

APPROVED AS TO FORM:

Date: _____
City Attorney

Date: _____
City Clerk

AFFIDAVIT OF CLAIMANT

STATE OF _____

COUNTY OF _____

The undersigned, of lawful age, being first duly sworn, on oath says that this contract is true and correct. Affiant further states that the work, services or materials will be completed or supplied in accordance with the contract, plans, specifications, orders or requests furnished the affiant. Affiant further states that (s)he has made no payment directly or indirectly of money or any other thing of value to any elected official, officer or employee of the City of Tulsa or any public trust of which the City is a beneficiary to obtain or procure the contract or purchase order.

By: _____

Signature

Name: _____

Company: _____

Title: _____

Subscribed and sworn to before me this _____ day of _____, 20____.

Notary Public

My Commission Expires: _____

Notary Commission Number: _____

**GENERAL
CONDITIONS**

GENERAL CONDITIONS OF CONTRACT

GC-1. SCOPE:

The Contract stipulations, which follow, are general in scope and may refer to conditions that will not be encountered in the performance of the work included in this Contract, and which are not applicable thereto. Any requirements, provisions, or other stipulations of these General Conditions, which pertain to a nonexistent condition, and are not applicable to the work to be performed hereunder, shall have no meaning in the Contract.

The specifications and drawings are intended to supplement, but not necessarily duplicate each other. Together they constitute one (1) complete set of specifications and drawings, so that any work exhibited in the one and not in the other shall be executed just as if it had been set forth in both, in order that the work shall be completed according to the complete design or designs as decided and determined by the Engineer.

Should anything be omitted from the specifications and drawings which is necessary to a clear understanding of the work, or should it appear various instructions are in conflict, then the Contractor shall request written clarification from the Engineer before proceeding with the construction affected by such omissions or discrepancies.

GC-2. CONTRACT DOCUMENTS :

It is understood and agreed that the Notice to Bidders, Instructions to Bidders, Proposal, Contract, Statutory Bond, Performance Bond, Maintenance Bond, Power of Attorney, Certificates of Insurance, General Conditions, Specifications, Drawings, Addenda, and duly authorized Change Orders, together with any and all supplementary drawings furnished by the Engineer as and when required to make clear and to define in greater detail the intent of the contract, drawings, and specifications, other drawings, specifications, and engineering data furnished by the Contractor (when accepted by the Engineer), and instructions furnished by manufacturers of equipment for the installation thereof, are each and all included in this Contract, and the work shall be done in full compliance and accord therewith.

GC-3. DEFINITIONS:

Any word, phrase, or other expression defined in this paragraph and used in these Contract Documents shall have the meaning herein given:

1. "Contract" or "Contract Documents" shall include all of the documents and drawings mentioned in Paragraph GC-2.
2. "City" shall mean the City of Tulsa, Tulsa County, Oklahoma.
3. "Contractor" shall mean the entity named and designated in the Contract who has entered into this Contract to perform the work covered thereby, and its, his, or their duly authorized agents and other legal representatives.
4. "Engineer" shall mean the Director of Engineering Services, or the Architect or Engineers who have been designated, appointed, or employed by the City for this project, or their duly authorized agents; such agents acting within the scope of the particular duties entrusted to them in each case.
5. "Inspector" shall mean the engineering or technical inspector or inspectors duly authorized by the Engineer, limited in each case to the particular duties entrusted to him or them.
6. "Surety" shall mean any entity that executes, as surety, the Contractor's performance bond, maintenance bond, and statutory bond securing the performance of this Contract.

7. "Drawings" shall mean and include all drawings prepared by the City as a basis for proposals; all drawings submitted by the successful bidder with his proposal and by the Contractor to the City, when and as accepted by the Engineer, and all drawings submitted by the City to the Contractor during the progress of the work as provided herein.

8. "Subcontractor" shall mean a person, firm or corporation to whom any portion of this work has been sublet by the Contractor.

9. "Work" shall mean the task to be performed, necessary for the fulfillment of this Contract.

10. "Unit Price" shall mean the cost per specified unit of measurement of work and/or material.

11. "Lump Sum" shall mean the price of an item of work including all things necessary to complete the item as shown on the drawings and specifications. Such an item is not measured in units but is defined by description.

GC-4. MODIFICATIONS AND ALTERATIONS:

In executing the Contract, the Contractor agrees that the City shall have the right to make such modifications, changes, and alterations as the City may see fit, in the extent, or plan of the Work agreed to be done or any part thereof, or in the materials to be used therein, either before or after the beginning of construction thereof, without affecting the validity of the Contract or the liability of the Sureties upon the performance of this Contract or the Statutory Bond.

Where any modification, change, or alteration increases the quantity of Work to be performed and is within the scope of a fair interpretation thereof, such increase shall be paid for according to the quantity of work actually done, either at Unit Prices included in the Contract, or in the absence of such unit, as extra Work. Modifications and alterations, which reduce the quantity of Work to be done, shall not constitute a claim for damages or for anticipated profits on Work involved in such reduction.

The Engineer shall determine, on an equitable basis, the amount of credit due the City for Work not performed as a result of modifications or alterations authorized hereunder; where the value of the omitted Work is not fixed by Unit Prices in the Contract; allowance to the Contractor for any actual loss incurred in connection with the purchase, delivery, and subsequent disposal of materials and equipment required for use on the Work as actually built; and any other adjustment of the Contract amount where the method to be used in making such adjustment is not clearly defined in the Contract Documents. In this respect, such determination shall be final and binding only when approved by the Director of Public Works.

GC-5. CPM SCHEDULE AND DRAWINGS TO BE FURNISHED BY CONTRACTOR:

The successful contractor shall furnish a CPM schedule per ODOT 108.03B. If at any time, in the opinion of the Engineer, proper progress is not being maintained, such changes shall be made in the schedule of operations, which will satisfy the Engineer that the work will be completed within the period stated in the Proposal. Monthly progress meeting will be conducted to maintain coordination between all project entities.

The Contractor shall furnish all shop, fabrication, assembly, foundation, and other drawings required by the specifications; drawings of equipment and devices, offered by the Contractor for review by the Engineer, shall be in sufficient detail to show adequately the construction and operation thereof; drawings of essential details of any change in design or construction proposed for consideration of the Engineer, by the Contractor in lieu of the design or arrangement required by the Contract or any item of extra work thereunder. The Contractor shall submit to the Engineer, the required number, of each copy of such drawing for the Engineer's review. After review by the Engineer, all such drawings shall become a part of the Contract Documents and the work or

equipment shown thereby shall be in conformity therewith unless otherwise required by the City.

The Engineer's check and acceptance of drawings submitted by the Contractor will be for, and will cover, only general conformity to the plans and specifications and will not constitute a blanket acceptance of all dimensions, quantities, and details of the material or equipment shown; nor shall such acceptance relieve the Contractor of his responsibility for errors contained in such drawings.

GC-6. CONTRACTOR'S BUSINESS ADDRESS:

The business address of the Contractor given in the bid or proposal upon which this Contract is founded is hereby designated as the place to which all notices, letters, and other communications to the Contractor may be mailed or delivered. The delivery at the above named address or depositing in any mailbox regularly maintained by the Post Office, of any notice, letter, or other communication to the Contractor, shall be deemed sufficient service thereof upon the Contractor and the date of said service shall be the date of such delivery or mailing. Such address may be changed at any time by a written instrument, executed by the Contractor and delivered to the Engineer. Nothing contained herein shall be deemed to preclude or render inoperative the service of any notice, letter, or communication upon the Contractor personally.

GC-7. CONTRACTOR'S RISK AND RESPONSIBILITY:

The performance of the Contract and the Work is at the risk of the Contractor until the final acceptance thereof and payment therefor. The Contractor shall take all responsibility of the Work, and shall bear all losses resulting because of the amount or character of the Work, or because the nature of the land in or on which the Work is done is different from what is assumed or expected, or on account of the weather, floods, fire, windstorm, or other actions of the elements, or any cause or causes, whatsoever, for which the City is not responsible. If the Work or any part or parts thereof is destroyed or damaged from any of the aforesaid causes, the Contractor, at his own cost or expense, shall restore the same or remedy the damage.

The Contractor shall, in a good and workmanlike manner, perform all Work and furnish all supplies and materials, machinery, equipment, facilities, and means, except as otherwise expressly specified, necessary or proper to perform and complete all Work required by the Contract within the time herein specified, in accordance with the provisions of these Contract Documents and Drawings of the Work covered by this Contract, and any and all supplemental Drawings. The Contractor shall observe, comply with, and be subject to all terms, conditions, requirements and limitations of the Contract, and shall complete the entire Work to the satisfaction of the Engineer and of the City.

GC-8. ASSIGNMENT AND SUBLETTING OF CONTRACT:

The Contractor shall give his personal attention to the fulfillment of this Contract, and shall not let, assign or transfer it or his right, title, or interest in any part thereof, by attorney or otherwise, or sublet any part of the Work to any other person without the prior consent of the City in writing.

Should any Subcontractor fail to perform his work in a satisfactory manner the Contractor upon notice from the City shall immediately terminate his subcontract. The Contractor shall be fully responsible to the City for the acts and omissions of his Subcontractor, and of persons either directly or indirectly employed by his Subcontractor. Nothing contained in these Contract Documents shall create any contractual relation between any Subcontractor and the City.

GC-9. CONTRACTOR'S REPRESENTATIVES:

The Contractor shall designate a person on the Work site to represent him when absent from the Work site.

GC-10. CONTRACTOR AND HIS EMPLOYEES:

The Contractor shall employ competent foremen, experienced mechanics, and others skilled in the Work in this Contract; and shall promptly discharge any and all incompetent or otherwise unsatisfactory employees. Contractor's employees directly employed to perform the Work shall

not be paid less than the prevailing minimum wage scale.

Necessary sanitary conveniences for the use of employees on the job site, properly secluded from public observation, shall be provided and maintained by the Contractor. The construction and location of the facility and disposal of the contents shall comply with all laws of the City and State, relating to health and sanitation regulations.

GC-11. CONTRACTOR'S RIGHT OF PROTEST:

If the Contractor considers any work demanded of him to be outside the requirements of the Contract, or considers any record or ruling of the Engineers to be unfair, he shall, immediately upon such Work being demanded or such record or ruling being made, ask for written instructions or decisions, whereupon he shall proceed without delay to perform the Work or to conform to the record or ruling; and within ten (10) days after the date of receipt of written instructions or decision, he shall file a written protest with the Engineer, stating clearly and in detail the basis of his objections. Except for such protests and objections made of record in the manner herein specified and within the time stated, the records, rulings, or decisions of the Engineer shall be final and conclusive.

GC-12. INSURANCE AND BONDS:

The CONTRACTOR (and any subcontractors) shall carry and keep in force during this Contract, policies of insurance issued by an insurer authorized to transact business in Oklahoma in minimum amounts as set forth below or as required by the laws of the State of Oklahoma. The Contractor shall also furnish an Owner's Protective Policy in the same amounts naming the City of Tulsa as the assured, issued by the same insurance company as the Contractor's liability coverage and indemnifying the City of Tulsa against any and all actions, claims, judgments or demands arising from injuries of any kind and character sustained by any person or persons because of work performed by the Contractor.

General Liability Insurance with a bodily injury and property damage combined single limit of not less than \$1,000,000.00 for each occurrence.

Employer's Liability and Workmen's Compensation in the amounts as required by law.

The Contractor shall provide proof of such coverage:

- (a) By providing Certificate(s) of Insurance prior to the execution of this contract; and
- (b) By submitting updated Certificate(s) of Insurance with each and every subsequent request for payment. The Certificate(s) should show that the policies are current and should be dated within 30 days of the payment request.

The Contractor shall not cause any required insurance policy to be cancelled or permit it to lapse. If the Contractor cancels, allows to lapse, fails to renew or in any way fails to keep any required insurance policy in effect, the City will suspend all progress and/or final payments for the project until the required insurance is obtained. Further, a Contractor who fails to keep required insurance policies in effect may be deemed by the City to be in breach of contract, ineligible to bid on future projects, and/or ineligible to engage in any new contracts.

The Contractor shall execute and furnish a Statutory Bond for the protection of laborers, mechanics, and material men in a sum equal to one hundred percent (100%) of the contract price.

The Contractor shall execute and furnish a Performance Bond in a sum equal to one

hundred percent (100%) of the contract price.

The Contractor shall execute and furnish a Maintenance Bond in a sum equal to one hundred percent (100%) of the contract price.

Prior to doing blasting, the Contractor shall furnish a Certificate of Insurance, which shall certify that any damage caused by blasting is within the coverage of the Contractor's liability insurance to the full limits thereof.

All bonds and insurance must be executed by a company licensed to do business in the State of Oklahoma and must be acceptable to the City.

GC-13. TIME FOR COMPLETION:

For all projects that will impact the public, a public meeting is required before any work is started. The City of Tulsa requires a minimum of 25 days' notice to get the public meeting scheduled and invitations mailed out.

The Work shall commence within ten (10) days from and after the date of a written work order from the City. The Contractor agrees that the Work shall be performed regularly, diligently, and uninterruptedly at a uniform rate of progress so as to ensure completion within the number of days after the day on which the work order is issued. If the Contractor fails to complete all Work within the time specified, then the Contractor agrees to pay the City, not as a penalty, but as liquidated damages for breach of contract, the Sum of **Two Thousand Five Hundred Dollars (\$2,500.00)** for each and every calendar day beyond the date on which the work was to be completed. The said amount is fixed and agreed upon because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the City would sustain in such event. It is expressly understood and agreed that the said time for completion of the work described herein is a reasonable time for the completion of same.

The Contractor shall commence work within twenty-four (24) hours of traffic control devices being established at the project location. If the Contractor fails to commence work within twenty-four (24) hours of traffic control devices being established at the project location, then the Contractor agrees to pay the City, not as a penalty, but as liquidated damages the sum of **One Thousand Dollars (\$1,000.00)** per lane for each day of failure to commence work after the specified time set forth. The amount is fixed and agreed upon because of the impracticability and extreme difficulty of fixing and ascertaining the actual damage the City would sustain in such event.

The Contractor will be required to provide a full-time, onsite English-speaking superintendent for this Work for direct contact with City and coordination of Subcontractors. A working foreman is not acceptable as a project superintendent. The superintendent shall be required to be present at the Work site whenever the Contractor or Subcontractors are performing Work. The superintendent shall be a representative of the Contractor with the authority to make decisions. If the Contractor fails to provide a non-working superintendent on a day when Work is being performed, the Contractor agrees to pay the City, not as a penalty, but as liquidated damages for such breach of contract, the sum of **One Thousand Dollars (\$1,000.00)** for each and every calendar day it fails to provide a non-working superintendent at the Work site. This amount is fixed and agreed upon because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the City would sustain in such an event.

It is further agreed that time is of the essence as to each and every portion of this Contract and the specifications wherein a definite and certain time is fixed for the performance of any act whatsoever; and where under the Contract an allowance of additional time for completion of any Work is made, the new time fixed by such extension shall be of the essence of this Contract.

Failure to complete the Work within the specified time, as set forth in the Contract, may be grounds for disqualification for future consideration for contracts with the City of Tulsa.

Final acceptance of the Work is defined as the completion of the Work and the Contractor moving off the project site. No defined or additional Work is needed.

Contract Evaluation forms will be compiled by City staff upon completion of Work to provide a record of the Contractor's performance for use in subsequent projects.

GC-14. EXTENSIONS OF TIME:

Should the Contractor be delayed in the final completion of the Work by any act or neglect of the City or Engineer, or any employee of either, or strikes, injunctions, fire, or other causes outside of and beyond the control of the Contractor and which, in the opinion of the Engineer, could have been neither anticipated nor avoided, then an extension of time sufficient to compensate for the delay, as determined by the Engineer, shall be granted by the City, provided, however, that the Contractor shall give the City and the Engineer notice in writing of the cause of each delay on the "Extension of Time Request" form enclosed in these documents, and agrees that any such claim shall be fully compensated for by an extension of time to complete performance of the Work.

The Contractor shall submit the "Extension of Time Request" form with each partial payment application. Failure to submit the Extension of Time Request with a partial payment application shall constitute a complete waiver of any claim for time extension for the period covered by the partial payment.

Extensions of time will not be granted for delays caused by unsuitable ground conditions, inadequate construction force, or the failure of the Contractor to place orders for the equipment or materials a sufficient time in advance to ensure delivery when needed. Any extension of time granted by the City shall not release the Contractor and Surety herein from the payment of liquidated damages as provided in the General Conditions of this Contract, for a period of time not included in the original Contract or the time extension, as herein provided.

In no event shall the City be liable or responsible to the Contractor, Surety, or any person for or on account of any stoppage or delay of Work herein provided for by injunction or any other kind of legal, equitable proceedings, or from or by or on account of any delay from any other cause whatsoever.

GC-15. ENGINEER'S POWERS AND DUTIES:

The Engineer will provide general administration of the Contract, including performance of the functions hereinafter described.

The Engineer will be the City's representative during construction and until final payment. The Engineer will have authority to act on behalf of the City to the extent provided herein unless otherwise modified by written instrument, which will be shown to the Contractor. The Engineer will advise and consult with the City, and all of the City's instructions to the Contractor shall be issued through the Engineer. Nothing contained in the Contract documents shall create any contractual relationship between the Engineer and the Contractor.

The Engineer shall at all times have access to the Work as provided elsewhere herein. The Engineer will make periodic visits to the Work site to familiarize himself generally with the progress and quality of the Work and to determine in general whether the Work is proceeding in accordance with the Contract. On the basis of his on-site observations as Engineer, he will keep the City informed of the progress of the Work and will endeavor to guard the City against defects and deficiencies in the Work caused by the Contractor. The Engineer will not be responsible for construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the Work and will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract. Based on such observations and the

Contractor's applications for payment, the Engineer will determine the amounts owing to the Contractor and will issue certificates for payment in amounts as provided elsewhere herein.

The Engineer may provide one or more full-time project representatives to assist the Engineer in carrying out his responsibilities at the Work site. The duties, responsibilities and limitations of authority of the Engineer as the City's representative during construction as set forth herein will not be modified or extended without written consent of the City, the Contractor and the Engineer.

The Engineer will not be responsible for the acts or omissions of the Contractor, any Subcontractors, or any of their agents or employees, or any other persons performing any of the Work.

The Engineer shall decide the meaning and intent of any portion of the specifications, and of any plans or Drawings, where the same are found to be obscure or be in dispute; he shall have the right to correct any errors or omissions therein when such corrections are necessary to further the intent of said specifications, plans or Drawings; the action of such correction shall be effective from the date that the Engineer gives due notice thereof.

Any differences or conflicts, which may arise between the Contractor and other contractors with the City in regard to their work, shall be adjusted as determined by the Engineer.

Neither the Engineer's authority to act under this article or elsewhere in the Contract nor any decision made by the Engineer in good faith either to exercise or not to exercise such authority shall give rise to any duty or responsibility of the Engineer to the Contractor, any Subcontractor, any manufacturer, fabricator, supplier or distributor, or any of their agents or employees or any other person performing any of the Work.

Whenever in the Contract the terms "as ordered", "as directed", "as required", "as allowed", or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper", or "satisfactory" or adjectives of like effect or import are used, to describe requirements, direction, review or judgement of the Engineer as to the Work, it is intended that such requirement, direction, review, or judgement will be solely to evaluate the Work for compliance with the Contract (unless there is a specific statement indicating otherwise). The use of any such term or adjective never indicates that the Engineer shall have authority to supervise or direct performance of the Work or authority to undertake responsibility contrary to the provisions of this General Condition.

GC-16. CITY'S RIGHT OF INSPECTION:

The City shall appoint or employ such engineers or inspectors as the City may deem proper to inspect the materials furnished and the work performed, and to determine whether said materials are furnished and work is performed in accordance with the Drawings and specifications therefor. The Contractor shall furnish all reasonable aid and assistance required by the Engineer, or by the Inspectors, for the proper inspection and examination of the Work and all parts thereof, even to the extent of uncovering or taking out portions of finished Work. Should the Work thus exposed or examined prove satisfactory, the uncovering or removing and the replacing of the covering or the making good of the parts removed shall be paid for by the City; however, should the Work exposed or examined prove unsatisfactory, the uncovering, taking out, replacing, and making good shall be at the expense of the Contractor.

Such inspection shall not relieve the Contractor of any obligation to perform said Work strictly in accordance with the Drawings and specifications or any modifications thereto as herein provided; and the Work not so constructed shall be removed and made good by the Contractor at his own expense; and free of all expense to the City, whenever so ordered by the Engineer, without reference to any previous oversight or error in inspection.

GC-17. SUSPENSION OF WORK ON NOTICE:

The Contractor shall delay or suspend the progress of the Work or any part thereof whenever he shall be so required by written order of the City or Engineer, and for such period of time as it or he shall require. Any such order of the City or Engineer shall not modify or invalidate in any way the provisions of this Contract.

GC-18. QUALITY OF WORKMANSHIP:

All workmanship shall be the best possible, both as to material and labor that could be demanded by these Contract Documents or if no specific description is given, it is understood that the best quality is required.

GC-19. SATURDAY, SUNDAY, HOLIDAY, AND NIGHT WORK:

No work shall be done between the hours of 7:00 p.m. and 7:00 a.m., nor on Saturday, Sunday, or legal holidays without the written approval or permission of the Engineer in each case, except such work as may be necessary for the proper care, maintenance, and protection of work already done, or of equipment, or in the case of an emergency.

GC-20. LAWS AND ORDINANCES:

The Contractor shall keep himself fully informed of all existing and current regulations of the City, county, state and national laws which in any way limit or control the actions or operations of those engaged upon the Work, or affecting the materials supplied to or by them. The Contractor shall at all times observe and comply with all applicable ordinances, laws, and regulations; and shall protect and indemnify the City and the City's employees and agents against any claims or liability arising from or based on any violations of the same.

The contractor certifies that it and all of its Subcontractors to be used in the performance of the Contract are in compliance with 25 O.S. Sec. 1313 and participate in the Status Verification System. The Status Verification System is defined in 25 O. S. Sec. 1312 and includes but is not limited to the free Employee Verification Program (E-Verify) available at www.dhs.gov/E-Verify.

The Contractor shall take the necessary actions to ensure its facilities are in compliance with the requirements of the Americans with Disabilities Act (ADA). It is understood that the program of the Contractor is not a program or activity of the City. The Contractor agrees that its program or activity will comply with the requirements of the ADA. Any costs of such compliance will be the responsibility of the Contractor. Under no circumstances will Contractor conduct any activity which it deems to not be in compliance with the ADA.

GC-21. TAXES AND PERMITS:

Unless otherwise specified in these Contract Documents, the Contractor shall pay all sales, use, and other taxes that are lawfully assessed against the City or Contractor in connection with the Work included in this Contract and shall obtain all licenses, permits, and inspections required for the Work. Contractor shall comply with all zoning ordinances of the City, as provided in the Tulsa Zoning Code, Title 42 Tulsa Revised Ordinances and conform with all zoning requirements established by the Tulsa Metropolitan Area Planning Commission and the Board of Adjustment. Contractor can call the Indian Nations Council of Governments (INCOG) at (918) 584-7526, to determine if any zoning requirements must be met.

GC-22. PROTECTION OF PROPERTY:

The protection of City, state, and government monuments, street signs, and other City property is of prime importance, and if the same be damaged, destroyed, or removed, they shall be repaired, replaced, or paid for by the Contractor.

Work occurring within secured facilities will require the Contractor to obtain City of Tulsa issued ID badges for all employees and subcontractors requiring facility gate access. The Contractor will be responsible for all coordination with City Security as necessary to process background checks and issue badges. The City of Tulsa has the right to deny access to any individual based

on evaluation of background check.

GC-23. PATENT RIGHTS:

All fees for any patented invention, article, or arrangement that is based upon, or in any manner connected with the construction, erection, or maintenance of the Work or any part thereof embraced in the Contract and these specifications, shall be included in the price stipulated in the Contract for said Work. The Contractor shall protect and hold harmless the City against any and all demands of such fees or claims.

GC-24. DEFENSE OF SUITS:

In case any action at law or suit in equity is brought against the City or any employer, officer, or agent thereof, for or on account of the failure, omission or neglect of the Contractor to do and perform any of the covenants, acts, matters, or things required by this Contract to be done or performed, or for injury or damage caused by negligence or willful act of the Contractor or his Subcontractors or his or their agents, or in connection with any claim or claims based on the lawful demands of Subcontractors, workmen, material men, or suppliers of machinery and parts thereof, equipment, power tools, and supplies incurred in the fulfillment of this Contract, the Contractor shall indemnify and save harmless the City and its employees, officers, and agents, and the Engineer and any employees, officers and agents thereof, of and from all losses, damages, costs, expenses, judgements, or decrees whatsoever arising out of such action or suit that may be brought without requiring said parties to give any notice thereof.

The City may suspend payments of any sum due or to become due for work done on this Contract until such claims, suits, actions, or proceedings are final and liability has been determined. The amount of such damages or liability shall be deducted from sums due or to become due on this Contract. The City will retain the sums mentioned above until the Contractor furnishes evidence that satisfactory settlement has been made. Any action taken by the City shall not excuse the Contractor for failure to perform this Contract or bar the City from legal action to recover from the Contractor the amount of damages or liability suffered in excess of the amount retained.

The Contractor shall furnish the City with satisfactory evidence upon demand that all persons who have done work on the Contract or furnished materials for the Contract have been paid in full. If such evidence is not furnished, the amount necessary to pay the lawful claims may be retained until such evidence is furnished, or if such evidence is not furnished, the City may apply any sums retained to valid claims and charge the amounts disbursed, including the costs of any action that may be necessary to prove or disprove the claims against the Contractor.

GC-25. REMOVAL OF CONDEMNED MATERIALS AND STRUCTURES:

The Contractor shall remove from the site of the Work, without delay, all rejected and condemned materials or structures of any kind brought to or incorporated in the Work, and upon his failure to do so, or to make satisfactory progress in so doing, within forty-eight (48) hours after the service of a written notice from the Engineer ordering such removal, the condemned material or structures may be removed by the City and the cost of such removal be taken out of the money that may be due or may become due the Contractor by virtue of this Contract. No such rejected or condemned material shall again be offered for use by the Contractor under this or any other Contract under this project.

GC-26. EXTRA WORK:

If a modification increases the amount of the Work, and the added Work or any part thereof is of a type and character which can properly and fairly be classified under one or more Unit Price items of the Bid Form, then the added Work or part thereof shall be paid for according to the amount actually done and at the applicable Unit Price. Otherwise, such work shall be paid for as hereafter provided.

Claims for extra work will not be paid unless the City authorized the work covered by such claims in writing. The Contractor shall not have the right to take action in court to recover for extra work

unless the claim is based upon a written order from the City. Payments for extra Work will be based on agreed lump sums or on agreed Unit Prices whenever the City and the Contractor agree upon such prices before the extra Work is started.

For the purpose of determining whether proposed extra work will be authorized, or for determining the payment method for extra work, the Contractor shall submit to the Engineer, upon request, a detailed cost estimate for proposed extra work. The estimate shall show itemized quantities and charges for all elements of direct cost. The cost shall include only those extra costs for labor and materials expended in direct performance of the extra work and may include:

- (a) **Labor.** For all labor and foremen in direct charge of the specific operations, the Contractor shall receive the rate of wage (or scale) agreed upon in writing before beginning work for each and every hour that said labor and foremen are actually engaged in such work. An amount equal to fifteen (15) percent of the sum of the above items will also be paid the Contractor.
- (b) **Bond, Insurance, and Tax.** For property damage, liability, and workmen's compensation insurance premiums, unemployment insurance contributions and social security taxes on the force account work, the Contractor shall receive the actual cost, to which cost no percentage will be added. The Contractor shall furnish satisfactory evidence of the rate or rates paid for such bond, insurance, and tax.
- (c) **Materials.** For materials accepted by the Engineer and used, the Contractor shall receive the actual cost of such materials delivered on the Work site, including transportation charges paid by him (exclusive of machinery rentals as hereinafter set forth), to which cost ten (10) percent will be added.
- (d) **Equipment.** For any machinery or special equipment (other than small tools), including fuel, lubricants and transportation costs, the use of which has been authorized by the Engineer, the Contractor shall receive the rental rates agreed upon in writing before such work is begun for the actual time that such equipment is in operations on the Work, as provided in the ODOT Subsection 109.04 (b3), to which rental sum no percentage will be added.
- (e) **Miscellaneous.** No additional allowance will be made for general superintendence, the use of small tools, or other costs for which no specific allowance is herein provided.

The form on which field cost records are kept, the construction methods and the type and quantity of equipment used shall be submitted to the Engineer for approval.

Construction equipment which the Contractor has on the Work site and which is of a type and size suitable for use in performing the extra Work shall be used. The hourly rental charges for equipment, including all insurance, taxes, fuel, and operating costs, shall not exceed twelve (12) percent of the latest applicable Associated Equipment Distributors published monthly rental rates and shall apply to only the actual time the equipment is used in performing the extra Work.

When extra Work requires the use of equipment which the Contractor does not have on the Work site, the Contractor shall obtain the approval of the Engineer before renting or otherwise acquiring additional equipment. The rental charges for the additional equipment shall not exceed the latest applicable Associated Equipment Distributors published rental rates.

The Contractor shall file with the Engineer, certified lists in duplicate, of any equipment and the schedule of pay rates for common and semi-skilled labor and operators of various classes which are intended to be used in performing the Work covered by this Contract. These rates shall be subject to the review of the Engineer. This information will be used by the Engineer for computation of extra work as mentioned above; however, if the Contractor fails to file these lists

with the Engineer prior to starting any Work covered by this Contract, then the Engineer's computation shall be based on average wages and rates paid on City work.

GC-27. PAYMENT FOR CONTRACTOR'S PLANT AND MISCELLANEOUS TEMPORARY WORK:

For providing plant, tools, and equipment, and for furnishing, erecting, maintaining, and removing scaffolding and construction plant, construction roads, camps, sanitary conveniences, temporary water supply, trestles, dewatering and other temporary works, the Contractor shall receive no direct payment, but compensation for them shall be considered as having been included in the prices stipulated for the appropriate items.

GC-28. BASIS OF PAYMENT FOR ITEMS OF WORK:

The Contractor shall be paid for all Work performed under the Contract based on the Engineer's computations of as-built quantities and the Contractor's Unit Price or Lump Sum bid per item. This payment shall be full compensation for furnishing all supplies, materials, tools, equipment, transportation, and labor required to do the Work; for all loss or damage, because of the nature of the work, the action of the elements or any unforeseen obstruction or difficulty which may be encountered in the performance of the Work, and for which payment is not specifically provided; for all expense incurred by or because of any suspension or discontinuance of all or any part of the Work; and for faithfully completing the Contract according to the Drawings and specifications and requirements of the Engineer.

GC-29. PAYMENTS:

(1) Partial: If the work is progressing in good and workmanlike manner and if the Contractor is faithfully carrying out the terms of this Contract, approximate estimates of the work done shall be made by the Engineers between the first and fifteenth of each calendar month, including labor actually performed and supplies or materials actually used or incorporated in the Work, and an allowance will be made for acceptable materials satisfactorily delivered, stored and secured on the site of the Work in such amount as can be incorporated in the Work within a reasonable time. The City shall have a lien as owner on any materials stored on the site of the Work.

Each partial estimate for payment shall contain or have attached an affidavit in the form found in this book of specifications, as required by law.

The Contractor shall submit with each partial pay estimate a complete list of vendors and suppliers with itemized purchases and invoices from each vendor. Each list shall contain the name of the contractor or Subcontractor ordering the materials or supplies, and the specific use or placement of each of the materials purchased by the City of Tulsa for this project in accordance with Article IIB of the Contract. At the direction of the Contractor, the City of Tulsa will withhold retainage in the amount of 5% on materials and supplies to be purchased under the terms of this Contract.

Each month that work is performed for which payment is due, the Contractor shall submit to the Engineer an application for such payment, provided said payment is not less than \$1,000.00, and, if required, receipts or other vouchers from Subcontractors showing his payments to them shall be submitted.

Each estimate shall be of the approximate value of all work performed and materials in place or delivered to the Work site, determined as aforesaid from the beginning of this contract to the date fixed for the current estimate, from which shall be deducted five percent (5%) or a lesser amount approved by the City, and, in addition thereto, all previous payments and all other sums withheld under the foregoing provisions of this Contract, the remainder to become due and payable; after the estimate has been reviewed and signed by the Engineer the City shall pay the estimate in the regular manner in the amount determined as due unless it shall be known by the City that there is good reason under the terms of this Contract for withholding same.

When the Contractor has completed Work constituting more than fifty percent (50%) of the total

Contract amount, the retainage will continue at two and one-half percent (2.5%) for the balance of the remaining work; provided, however, that the City or its duly authorized representative has determined that satisfactory progress is being made and upon approval by the Surety.

The Contractor may withdraw any part or the whole of the amount which has been retained from partial payment to the Contractor pursuant to the terms of Contract, upon depositing with or delivery to the City:

- (1) United States Treasury Bonds, United States Treasury Notes, United States Treasury bills, or
- (2) General Obligation Bonds of the State of Oklahoma, or
- (3) Certificates of Deposit from a state or national bank having its principal office in the State of Oklahoma.

No retained amount shall be withdrawn which would represent an amount in excess of the market value of the securities at the time of deposit or of the par value of such securities, whichever is lower.

All partial estimates are subject to correction in the final estimate.

(2) Final Payment:

When this contract, in the opinion of the Engineer, shall be completely performed on the part of the Contractor, the Engineer shall proceed with all reasonable diligence to measure up the Work and shall make out the final estimate for the same, and shall, except for cause herein specified, give to the Contractor, within thirty (30) days after receiving said certificate, an order on the City for the balance found to be due, excepting therefrom such sum or sums as may be lawfully retained under any of the provisions of the Contract; PROVIDED, that nothing herein contained shall be construed to affect the rights of the City hereby reserved to reject the whole or any portion of the aforesaid Work should the said estimate and certificate be found or known to be inconsistent with the terms of this Contract or otherwise improperly given; PROVIDED, that if, in case after the work hereunder has been accepted and final payment made, it shall be discovered that any part of the Contract has not been fully performed or has been done in an improper or faulty manner, the Contractor shall immediately remedy such defect, or, in case of neglect to do so within a reasonable time after notice thereof, shall be liable for and shall pay to the City the cost of remedying such defect or a sum equal to the damages sustained thereby, as the City shall elect, and the acceptance of and final payment for the Work shall be no bar to suit on any bond against any principal or principals, or Surety or Sureties, or both, given for the due performance of the Contract, or for the recovery of such cost or the equivalent of such damage.

The City will pay to the Contractor interest at the rate of three-fourths percent (3/4%) per month on the final payment due the Contractor. For lump sum contracts, the interest shall commence thirty (30) days after the Work under the Contract has been completed and accepted and all required material certifications and other documentation required by the Contract have been furnished the City by the Contractor and shall run until the date when the final payment or estimate is tendered to the Contractor. For contracts bid by Unit Prices, the interest will commence sixty (60) days after the above conditions are satisfied. When contract quantities or the final payment amount is in dispute, the interest-bearing period will be suspended until the conclusion and settlement of the dispute.

GC-30. CONTRACTOR REIMBURSEMENT FOR SURETY BOND:

For contracts of \$1,000,000.00 or more, the Contractor may receive reimbursement for the cost of the surety bonds after issuance of a work order. To receive reimbursement, the Contractor shall submit a standard partial payment form and affidavit, and a copy of the surety bond invoice. The final partial pay estimate will be reduced by the amount paid for surety bond reimbursement.

GC-31. RELEASE OF LIABILITY AND ACCEPTANCE:

The acceptance by the Contractor of the final payment shall operate as, and shall be a release to the City and every employee, officer and agent thereof, from all claims and liability to the Contractor for anything done or furnished for or relating to the Work, or for any act or neglect of the City or of any person relating to or affecting the Work, and, following such acceptance, no person, firm, or corporation other than the signer of this Contract as Contractor, will have any interest hereunder, and no claim shall be made or be valid, and neither the City nor any employees, officers, or agents thereof shall be liable or be held to pay any money, except as herein provided.

It shall be the duty of the Engineer to determine when the Work is completed and the Contract fulfilled, and to recommend its acceptance by the City. The Work herein specified to be performed shall not be considered finally accepted until the City has accepted all the Work.

GC-32. RIGHT OF CITY TO TERMINATE CONTRACT:

If the Work to be done under this Contract shall be abandoned by the Contractor, or if this Contract shall be assigned by him otherwise than as herein provided, or if the Contractor should be adjudged bankrupt, or if a general assignment of his assets be made for the benefit of his creditors, or if a receiver should be appointed for the Contractor or any of his property; or if at any time the Engineer shall certify in writing to the City that the performance of the Work under this Contract is being unnecessarily delayed, or that the Contractor is executing the same in bad faith or otherwise not in accordance with the terms of the Contract; or if the work be not substantially completed within the time named for its completion, or within the time to which such completion date may be extended, then the City may serve written notice upon the Contractor and his Surety of said City's intention to terminate this Contract, and unless within five (5) days after service of such notice upon the Contractor, a satisfactory arrangement is made for the continuance of the Contract, this

Contract shall cease and terminate. In the event of such termination, the City shall immediately serve notice upon the Surety and Contractor, and the Surety shall have the right to take over and complete the Work, provided, however, that if the Surety does not commence performance thereof within fifteen (15) days from the date of said notice of termination, the City may take over the Work and perform same to completion, by Contract or otherwise, for the account and at the expense of the Contractor, and the Contractor and his Surety shall be liable to the City for any and all excess cost sustained by the City by reason of such performance and completion. In such event the City may take possession of and utilize in completing the Work, all such materials, equipment, tools, and plants as may be on the site of the Work and necessary therefor. The Contractor shall not receive any other payment under the Contract until said Work is wholly finished, at which time, if the unpaid balance of the amount to be paid under the Contract shall exceed the expense incurred by the City in finishing the Work as aforesaid, the amount of the excess shall be paid to the Contractor, but if such expense shall exceed the unpaid balance, the Contractor shall pay the difference to the City.

GC-33. ADMINISTRATIVE COSTS AND FEES:

Cash Improvements - In the event the improvements are to be paid for in cash, the costs and fees for publication, engineering, filing, recording, abstracting, acquisition of easements, flushings, and pipe testing, shall be paid by the City unless otherwise provided for in these Contract Documents.

Assessment Improvements: In the event the improvements are to be paid for by the issuance of special assessment bonds, the costs and fees for publication, engineering, filing, recording, abstracting, acquisition of easements, flushing, pipe testing, and other authorized costs shall be added to the contract price and paid for in the same manner as the other Work included in this Contract. The Contractor shall pay the City the amount of said charges before the execution and delivery of the special assessment bonds or other payments. If the Contractor fails, neglects, or refuses to pay said charges within thirty (30) days after the bonds are ready for delivery, he shall pay the City interest at the rate of seven percent (7%) per annum and shall be liable for same in

a civil suit. The Contractor shall pay the pipe testing fees directly to the testing laboratory.

GC-34. PAYMENT OR ACCEPTANCE NOT A WAIVER BY CITY:

Neither acceptance by the City or the Engineer or any employee of either nor any order by City for the payment of money, or the payment thereof, nor any taking of possession by City, nor the granting of any extension of time, shall operate as a waiver of any rights or powers of the City hereunder, and in the event that after the Work hereunder has been accepted and final payment made, it should be discovered that any part of this Contract has not been fully performed, or has been done in a faulty or improper manner, the Contractor shall immediately remedy such defect, or in the event of neglect to do so within a reasonable time after notice thereof, shall be liable for and shall pay to City the cost of remedying such defect, or a sum equal to the damage caused thereby, as City may elect. The acceptance of the Work or final payment therefor shall be no bar to suit against the Contractor or Surety, or both.

GC-35. CONTRACTOR'S OBLIGATION AFTER ACCEPTANCE:

Contractor further agrees, without cost other than is specially provided for in this Contract, at any and all times during one (1) year next following the completion and final acceptance of the Work embraced in this Contract, without notice from City, to repair or rework any work that fails to function properly due to defective material or workmanship and to indemnify, save harmless and defend the City from any and all suits and actions of every description brought against City for, or on account of injuries or damages alleged to have been received or sustained by any party or parties by reasons of, or arising out of the failure of Contractor to repair or rework any work where such failures have occurred, which said injuries or damages are alleged to have been received or incurred within one (1) year from the final acceptance of the Work hereunder, and to pay any and all judgements that might be rendered against City in any suits and actions, together with such expenses or attorney fees expended or incurred by City in the defense thereof, and Contractor hereby expressly waives any notice that might by law be required to be given to them by City of any defect, break, settling, or failure or of any other condition that might be the cause of injury or damage to any person on account of which a claim or suit might be made or filed against City, or a judgement taken for damages against City. It is expressly agreed that the acceptance of the Work by City shall constitute no bar against any person injured or damaged by the failure of the Contractor to perform all of his covenants and agreements hereunder from maintaining an action against the Contractor, or against City from enforcing its rights against the Contractor hereunder.

GC-36. NOTICES:

Any notices or other communications hereunder may be given to Contractor at the address listed in the Proposal, to the Surety at the office of the Attorney-in-Fact signing the bond or at Surety's home office address on file with the Insurance Commissioner of the State of Oklahoma, and to City in care of the Deputy Director of Public Works, or at such other place as may be designated in writing. The delivery to such address, or depositing in any mailbox regularly maintained by the Post Office, of any notice, letter, or other communication to the Contractor, shall be deemed sufficient service thereof, and the date of said service shall be the date of such delivery or mailing.

GC-37. RELATION TO OTHER CONTRACTORS:

Nothing herein contained and nothing marked upon the Drawings shall be interpreted as giving the Contractor exclusive occupancy of the territory or right-of-way provided. The City and its employees, officers, and agents for any just purpose, and other contractors of the City for any purpose required by their respective contracts, may enter upon or cross this territory or occupy portions of it or take materials therefrom as directed or permitted. When two or more contracts are being executed at one time on the same or adjacent land in such manner that the work on one contract may interfere with the work on another, the Engineers shall decide which contractor shall cease work and which shall continue, or whether the work on both contracts shall progress at the same time and in what manner. When the territory of one contract is the necessary or convenient means of access for the transportation or movement of men, machines, or appliances for the execution of another contract, such privilege of access or any other reasonable privilege

may be granted by the Engineers to the contractor desiring it, to the extent, amount, in the manner and at the time permitted. Any decision regarding the method or time of conducting the work or the use of the territory shall not be made the basis of claims for delay or damage except as otherwise stipulated. The Contractor shall not cause any unnecessary hindrance or delay to any other contractors on the premises, and shall bear all damages done to the work of such other contractors by him or by his employees.

GC-38. PARTIAL OCCUPANCY AND USE:

The City, upon advance written notification to the Contractor, shall have the right to occupy and use any completed or partially completed portions of the Work site when such occupancy and use are in the City's best interest, notwithstanding completion of the entire project.

Such partial occupancy and use shall be upon the following terms:

- a. The Engineer shall make an inspection of the portion or portions of the Work concerned, and report to the City his findings as to the acceptability and completeness of the Work. The Engineer's report shall include a list of items to be completed or corrected before final payment.
- b. The City, upon acceptance of the Engineer's report, shall give written notice to the Contractor of the City's intention to occupy and use said portions of the Work site. The City's notice shall include a copy of the Engineer's report, shall clearly identify the portions of the Work site to be occupied and used, and shall establish the date of said occupancy and use.
- c. From the date thus established, the City shall assume all responsibilities for operation, maintenance, and the furnishing of water, gas, and electrical power for the portions of the Work site thus occupied and used. The City shall have the right to exclude the Contractor from those portions of the Work site but shall provide the Contractor reasonable access to complete or correct necessary items of Work.
- d. The one-year guarantee required by the General Conditions shall not begin until completion and final acceptance of the entire project, except as to any items of mechanical or electrical equipment such as pumps, blowers, process equipment, instrumentation, controls, metering equipment, heating, and ventilating equipment and similar items having movable or operable components, and any of which are thus used by the City. For said equipment, the one-year warranty shall start from the date established in the written notice from the City.
- e. Occupancy or use of any space in the Work site shall not constitute acceptance of Work not performed in accordance with the Contract, nor relieve the Contractor of liability to perform any Work required by the Contract but not completed at the time of said occupancy and use.
- f. The Contractor shall not be held responsible for normal wear and tear or damage resulting from said occupancy, except to the extent that such damage is covered by the one-year guarantee.
- g. The partial occupancy and use of any portions of the Work site by the City shall not constitute grounds for claims by the Contractor for release of any amounts retained from payments under the provisions of the Contract. The retained amounts will not be due until completion of the entire project for final acceptance and final payment, as set forth in the General Conditions.

SPECIFICATIONS

(Published in the Tulsa World

June 13, 2021)

Ordinance No. 24616

AN ORDINANCE AMENDING TITLE 11, TULSA REVISED ORDINANCES, ENTITLED "PUBLIC WORKS DEPARTMENT" BY AMENDING CHAPTER 10, ENTITLED "STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION" BY AMENDING SECTION 1000 AND SECTION 1001; PROVIDING FOR SEVERABILITY; REPEALING ALL ORDINANCES OR PARTS OF ORDINANCES IN CONFLICT HERewith AND ESTABLISHING AN EFFECTIVE DATE.

BE IT ORDAINED BY THE CITY OF TULSA:

Section 1. Amendment of Title 11, Chapter 10. That Title 11, Chapter 10, Tulsa Revised Ordinances, entitled "Standard Specifications for Highway Construction" be and the same is hereby amended and shall recite in its entirety as follows:

"CHAPTER 10. STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION

Section 1000. Adoption of State Standard Specifications.

Section 1001. Additions, Revisions, Deletions and Exceptions.

SECTION 1000. ADOPTION OF STATE STANDARD SPECIFICATIONS.

That certain document, a bound copy and electronic copy of which has been filed in the Office of the City Clerk of the City of Tulsa, being marked and designated as Standard Specifications for Highway Construction, 2019 Edition, as published by the Oklahoma Department of Transportation, is hereby adopted as the standard specifications for public improvement projects for the City of Tulsa with the additions, revisions, deletions and exceptions as set forth in SECTION 1001 of this chapter.

SECTION 1001. ADDITIONS, REVISIONS, DELETIONS AND EXCEPTIONS.

1001.A. The following definitions, listed as numbered in the 2019 Edition of the Standard Specifications for Highway Construction, are hereby revised and amended for all sections of this chapter as follows:

101.03. Abbreviations and Acronyms. In Table 101:1, add the following abbreviations and expressions:

- ADA - American with Disabilities Act, excluding Chapter 500
- ADA – Adjusted Daily Average, when used in Chapter 500
- ADAAG - American with Disability Act Accessibility Guidelines
- COT - City of Tulsa

- PROWAG – Public Rights-of-Way Accessibility Guidelines
- 101.05. Definitions.** Add the following subsections:
- **“101.05.CY. City of Tulsa (COT).** The City of Tulsa, Oklahoma, a municipal corporation acting by and through its duly authorized officers and agents.”
 - **“101.05.CZ. Non-Collusive Bidding Certificate.** Replace all references to ‘Non-Collusive Bidding Certificate’ with ‘Non-Collusion Affidavit’.”
 - **“101.05.DA. Qualified Products List (QPL).** All references to ‘ODOT Traffic Engineering Division Qualified Products List (QPL)’ or ‘QPL’ shall mean ‘the City of Tulsa, Traffic Engineering Division Approved Products List’.”
 - **“101.05.DB. State Construction Engineer.** The City Engineer of the City of Tulsa or authorized designee.”

101.05.A. Acceptance Date. Delete section.

101.05.V. Commission. Replace definition with “The City of Tulsa, Oklahoma, a municipal corporation acting by and through its duly authorized officers and agents.”

101.05.Y. Contract. Replace definition with “The written agreement between the City of Tulsa and the Contractor setting forth obligations of the parties thereunder, including, but not limited to, the performance of the work, the furnishing of labor and materials, and the basis of payment.

The Contract includes the Notice to Bidders, Proposal, Contract Form, all Contract Bonds, Specifications, Special Specifications, Special Provisions, all Plans, Work Orders and Change Orders that are required to complete the construction of the work in an acceptable manner, including authorized extensions.”

101.05.AG. Department. Replace definition with “The City of Tulsa, Oklahoma, a municipal corporation acting by and through its duly authorized officers and agents.”

101.05.AI. Director. Replace definition with “The Director of the Engineering Services Department or the Director of any successor department which has the responsibility for general engineering services for the City of Tulsa.”

101.05.AL. Engineer. Replace definition with “The City Engineer of the City of Tulsa or authorized designee.”

101.05.AO. FAST Guide. Replace definition and all references to “FAST Guide” with “City of Tulsa Acceptance Sampling/Testing Standard Specifications.”

101.05. AT. Holiday. Replace definition with “Days declared to be holidays for regular Civil Service employees of the City of Tulsa.”

101.05.AV. Inspector. Replace definition with “The City of Tulsa’s authorized representative assigned to inspect the work.”

101.05.BF. Materials Division. Replace definition with “The Director of the Engineering Services Department or the Director of any successor department which has the responsibility for general engineering services for the City of Tulsa.”

101.05.BG. Materials Engineer. Replace definition with “The City Engineer of the City of Tulsa or authorized designee.”

101.05.CC. Right-of-Way. Replace definition with “Right-of-Way or ROW shall mean the surface, the airspace above ground, and the area below the surface of any public street, highway, parkway, lane, path, alley, sidewalk, boulevard, drive, bridge, tunnel, stormwater drainage system, easement, park, or similar property in which the City of Tulsa now or hereafter holds a property interest and/or a maintenance responsibility which, consistent with the purposes for which it was granted or dedicated, may be used to install, operate and maintain facilities.”

101.05.CD.(16). Sidewalk/Bicycle Path. Add the following sentence to the existing definition: “Refer to the Revised Ordinances of the City of Tulsa, Title 37 – Tulsa Traffic Code, Chapter 1 and Chapter 10 for definition of bicycle.”

101.05.CH. State. Replace definition with “The City of Tulsa, Oklahoma, a municipal corporation acting by and through its duly authorized officers and agents.”

101.05.CS. Traffic Engineering Division. Replace definition with “The City of Tulsa Traffic Engineering Division or any successor division which has the responsibility for traffic engineering services for the City of Tulsa.”

1001.B. City of Tulsa exceptions and amendments to the following provisions, listed as numbered in the 2019 Edition of the Standard Specifications for Highway Construction, are hereby revised, amended and described as follows:

102.01. Pre-Qualification. Delete text of section, and replace with “The City of Tulsa requires General / Prime Contractors to be Prequalified according to Title 11, Chapter 11 of the Revised Ordinances of the City of Tulsa.”

102.04. Refusal of Proposals. At the end of the bulleted list, add the following bulleted list item: “The bidder has failed to comply with Small Business Enterprise requirements of a previous City of Tulsa contract.”

102.06. Examination of Plans, Specifications, Special Provisions, and the Work Site. Replace the fourth paragraph with “The City of Tulsa may have boring logs and subsurface reports used in determining design criteria. Bidders may request to inspect these documents, relevant to the currently advertised project, by contacting the Contract Administrator at the following address during normal business hours:

City of Tulsa
Engineering Services Department

2317 S Jackson Ave
Tulsa, OK 74107

102.08. Nonresponsive Proposals. At the end of the bulleted list, add the following bulleted statement: "The bidder does not properly comply with Small Business Enterprise requirements in accordance with the Proposal Forms."

102.10. Delivery of Proposal. Delete text of section, and replace with the following:

"Each bid Proposal shall be completed electronically on the electronic media provided, then printed, signed and submitted along with the electronic media and the complete bound copy of the contract documents or as instructed in the Notice to Bidders. In the event of a discrepancy between the pricing on the electronic media and the hard copy of a Proposal, the hard copy pricing will govern. If an electronic media is not provided, and the bid Proposal is manual, the bid Proposal shall be submitted in ink. The written words shall govern over the figures. Erroneous entries shall be lined out, initialed by the bidder, and the correct entry inserted. The unit price bid must cover all expense for furnishing the labor, materials, tools, equipment, and apparatus of every description to construct, erect, and furnish all work required by and in conformance with the Plans and Specifications.

Each bid shall be enclosed in a sealed envelope addressed to

City Clerk's Office
The City of Tulsa
One Technology Center
175 E. 2nd Street, Suite 260
Tulsa, Oklahoma 74103

or as otherwise instructed in the Notice to Bidders, and identified on the outside with the words:

'PROJECT NO. _____,

Pre-qualification Certificate Number _____.'

All addenda to the contract documents shall accompany the bid when submitted.

Any bid received more than ninety-six (96) hours excluding Saturdays, Sundays and holidays before the time set for the opening of bids, or any bid received after the time set for opening of bids, shall be considered "non-responsive" and shall be returned unopened to the bidder."

102.13. Public Opening of Proposals. Delete text of section, and replace with "Proposals shall be publicly opened and read on the date and at the hour and place set forth in the advertisement and Notice to Bidders in the manner established by the City of Tulsa."

102.16. Non-Collusive Bidding Certification.

- Replace the Non-Collusion Bidding Certification form with the following City of Tulsa Non-Collusion Affidavit form:

NON-COLLUSION AFFIDAVIT		
STATE OF _____	)	
	) ss:	
COUNTY OF _____	)	
_____, of lawful age, being first duly sworn, says that: 1. I am the duly authorized agent of the bidder submitting the competitive bid associated with this sworn statement for the purpose of certifying facts pertaining to the existence of collusion among bidders and between bidders and municipal officers or employees, as well as facts pertaining to the giving or offering of things of value to governmental personnel in return for special consideration in the letting of any contract pursuant to the bid; 2. I am fully aware of the facts and circumstances surrounding the making of the bid and have been personally and directly involved in the proceedings leading to the submission of such bid; 3. Neither the bidder nor anyone subject to the bidder's direction or control has been a party: a. to any collusion among bidders in restraint of freedom of competition by agreement to bid at a fixed price or to refrain from bidding; b. to any collusion with any municipal official or employee as to quantity, quality or price in the prospective contract, or as to any other terms of such prospective contract; nor c. in any discussions between bidders and any municipal official concerning exchange of money or other things of value for special consideration in the letting of a contract. 4. If awarded the contract, neither the bidder nor anyone subject to the bidder's direction or control has paid, given or donated or agreed to pay, give or donate to any officer or employee of the City of Tulsa or of any public trust where the City of Tulsa is a beneficiary, any money or other thing of value, either directly or indirectly, in procuring the contract for which the bid is submitted.		
_____ BIDDER (Company Name)	_____ Signed _____ Title	
SUBSCRIBED and SWORN to before me this _____ day of _____, 20____.		
MY COMMISSION EXPIRES: _____ COMMISSION NO.: _____		_____ NOTARY PUBLIC

- In the fourth paragraph, revise the phrase proceeding the bulleted list to recite, "The following do not constitute collusion within the scope of the Non-Collusion Affidavit:"

103.07. Execution of Contract. Revise the first paragraph as follows:

- Revise the first sentence to recite "The Contract shall be signed in black or blue ink by the individual, all members/partners of a general partnership or joint venture, a general partner of a limited partnership, a duly authorized officer of the corporation, or a duly authorized manager, managing member or authorized officer of the limited liability company, to whom the Contract was awarded.
- In the last sentence delete "The Department will execute the Contract", and replace with "The Department will endeavor to execute the Contract, in proper form."

103.08. Approval of Contract. Delete text of section, and replace with "The Contract shall not be binding upon the City of Tulsa until it has been executed and approved in the manner set forth in the Tulsa City Charter."

104.01. Purpose of Contract. After the first two (2) sentences, delete the rest of the section.

104.07. Maintenance of Traffic. Revise the first sentence to recite "Keep all roads, sidewalks, and bicycle paths open to all traffic as shown on the plans."

105.17. Project Completion and Acceptance. At the beginning of the section add, "This section does not apply to Infrastructure Development Projects (IPDs). For IDPs, refer to Title 35 of the Revised Ordinances of the City of Tulsa."

105.17.B. Project Completion. In the first sentence of the last paragraph, replace "The Resident Engineer will" with "The Resident Engineer may".

105.17.C. Final Acceptance. Delete text of section, and replace with " Final Acceptance is the date on which the Request for Action (RFA) for final payment has been signed by the Mayor of the City of Tulsa."

106.01.A. Material Acceptance. At the end of this section, add the following paragraph: "For conflicts among ODOT Standard Specifications, ODOT Standard Materials Test Methods, and City of Tulsa Acceptance Sampling/Testing Standard Specifications, the City of Tulsa Acceptance Sampling/Testing Standard Specifications shall take precedence."

106.01.B. Buy America. Delete Section.

106.04.D. Distribution of Certifications. Delete text of section, and replace with "The Contractor shall submit certifications to the Engineer with another copy mailed to:

Field Engineering
City of Tulsa
Engineering Services Department
2317 S Jackson Ave
Tulsa, OK 74107"

106.05. Plant Inspection. In this section, replace all references to "Oklahoma City" with "Tulsa."

106.11. Guarantees and Warranties. In the first paragraph replace "six months" with "twelve months" and "six-month" with "twelve-month".

107.01. Laws, Rules, and Regulations to be Observed. At the end of this section add the following:

"The contractor shall certify that it and all of its Subcontractors to be used in the performance of the Contract are in compliance with 25 O.S. Sec. 1313 and participate in the Status Verification System. The Status Verification System is defined in 25 O.S. Sec. 1312 and

includes but is not limited to the free Employee Verification Program (E-Verify) available at www.dhs.gov/E-Verify.

The Contractor shall take the necessary actions to ensure its facilities are in compliance with the requirements of the Americans With Disabilities Act (ADA). It is understood that the Contractor's internal ADA program is not a program or activity of the City of Tulsa. The Contractor agrees that its program or activity will comply with the requirements of the ADA. Any costs of such compliance will be the responsibility of the Contractor. Under no circumstances will Contractor conduct any activity which is not in compliance with the ADA."

107.06. Barriers, Barricades, and Warning Signs. Before the first paragraph, add "In this section, the term "traffic" includes vehicular, pedestrian and bicycle traffic."

107.14. No Waiver of Legal Rights. Delete section.

107.19. Regulated Floodways. At the end of the section, add "The Contractor shall also follow the requirements of Title 11A of the Revised Ordinances of the City of Tulsa."

107.20. Stormwater Management. After the first sentence, add "The Contractor shall also follow the requirements of Title 11A of the Revised Ordinances of the City of Tulsa."

108.01. Subletting of Contract. Delete the last sentence of the first paragraph.

108.02. Notice to Proceed and Preconstruction Conference. Delete the first sentence in the second paragraph, and replace with "After the Contractor and Resident Engineer hold a preconstruction conference, the Contractor shall receive a Notice to Proceed before the start of construction."

108.07.B.(1) Extensions for Adverse Weather. After the first sentence in the second paragraph, add "Extensions of Contract Time will not be granted if conditions exist such that the Contractor could work at least 4 hours."

108.07.B.(3). Winter Time Suspension. Delete section.

108.08. Incentive/Disincentive for Early/Late Completion. Delete section.

108.09. Failure to Complete on Time.

- In the first sentence, delete "in accordance with Table 108:1, "Schedule of Liquidated Damages.""
- Delete Table 108:1.

109.04.B.(3). Equipment.

- In first paragraph, delete the last two sentences, and replace with the following:

"The Department will determine the maximum allowable rate as listed in the most current edition of the *Heavy Construction Costs with RSMeans data*, published by The Gordian

Group. The Department will calculate the hourly rental rate in accordance with the following equation:

$$H = [(M \times R) / 176] + O$$

Where

H = Hourly rental rate,
M = Monthly rental rate,
R = City cost index / 100, and
O = Hourly operating cost.

- In the second paragraph, delete the last two sentences.

109.04.B.(4)(f). Employee Fringe Benefits. Delete text of section, and replace with “The City of Tulsa will not pay for the additional costs of employee fringe benefits incurred by the Contractor for labor during the period the disputed work was in progress.”

109.06. Progress Payments. Revise the first sentence of the second paragraph to recite “The Resident Engineer will make monthly progressive estimates.”

109.08. Final Payment. Delete last paragraph, and replace with “If the Contractor does not sign and return the Final Estimate within 90 days of receipt, the Engineer may start action to administratively close the project.”

109.10.A. Recoverable Costs. Delete section.

201.04.A. Clearing. Delete the fourth sentence of the first paragraph, and replace with “Remove branches that overhang the roadway to at least 20 ft [6 m] above the road surface and at least 35 ft [11 m] above the road surface at traffic signals.”

201.06. Basis of Payment. In this section, delete all references to “Lump Sum”, and replace with “Square Yard [Square Meter]”.

202.04. Construction Methods. In the second paragraph delete, “If the contract requires ground disturbance greater than one acre total.”

202.04.D.(2). Mandatory Sources Designated on the Plans. Delete sentence, and replace with “If the Plans show the source of selective subgrade topping, excavate the material at the specified source, haul to the specified location, and place.”

202.05.A. Unclassified Excavation. Delete the second sentence of the first paragraph.

209.04. Construction Methods. At the end of the second paragraph, add the following: “Clean inlet and outlet channels within the right-of-way.”

220.04.C. Contractor Responsibilities for SWPPP. In the first sentence of the second paragraph, replace “recommended” with “required”.

220.04.H.(3). Earthwork Operations. Delete first paragraph, and replace with “Protect excavation or embankment slopes as construction progresses with placement of temporary (e.g. seeding, mulching, soil retention blankets, or other approved soil stability), or permanent (e.g. seeding, sprigging, or sodding) erosion control measures. Obtain approval from the Resident Engineer in the preconstruction schedule for any increase or decrease in the amount of the area exposed by construction operations. No exposed area shall remain unprotected without being stabilized. Install temporary or permanent erosion or sediment control measures on excavation or embankment slopes as work progresses in vertical increments of not more than 10 ft [3 m] unless otherwise directed by the Resident Engineer.”

220.05. Method of Measurement. In the bulleted list, delete the sixth bulleted item.

221.01. Description. In the last sentence, replace “OOPDES” with “OPDES”.

221.02. D. Temporary Sediment Filter. Revise the first sentence to recite “Provide fiber log for Type I-A and I-B sediment filter in accordance with Subsection 221.02.H, ‘Temporary Fiber Log.’ Provide material for Type I-C sediment filter in accordance with Subsection 221.02.C, ‘Temporary Silt Fence.’”

228.02. Materials. For the first item listed in the table, delete “Nylon”.

230.01. Description. Delete “Bermuda”.

230.02. Materials. Delete all references to “Bermuda” from this section.

231.04.C.(1). Planting Seasons and Weather Restrictions. In the first sentence of the second paragraph, replace “suspend” with “Suspend”.

317.04.A. Mix Design and Proportioning. In the bulleted list, insert “•” before “Compressive strength at 7 days”.

317.04.F. Acceptance.

- Delete the first paragraph.
- At the end of the second paragraph add “Failure to reach strength between 600 psi [4,150 kPa] and 2,000 psi [13,800 kPa] will result in rejection of the work.”

317.06. Basis of Payment. Delete the third and fourth paragraphs and Table 317:1. Replace with the following: “ODOT Acceptance and Strength Pay Factors shall not be used. Failure to meet criteria in Subsection 317.04.F will result in rejection of the work.”

401.04.A.(1). Surface Elevation and Smoothness. Delete paragraph, and replace with “Refer to the City of Tulsa Standard Specifications for Pavement and Bridge Deck Smoothness.”

403.04.A.(2). Seasonal Limitations. Delete paragraph and Table 403:1, and replace with “The Department will evaluate claims for extension of Contract Time in accordance with Subsection 108.07, when temperature and weather limitations in Table 403:2 are not met.”

405.04.G. Spreading and Finishing. In the last paragraph, replace “ODOT Bridge Division” with “Department”.

406.04.F. Weather and Seasonal Limitations. Delete the second paragraph.

410.04.E. Aggregate Application Rate. Delete the third and fourth sentences, and replace with “The Contractor shall overlay the deficient area at no additional cost to the Department.”

410.05. Method of Measurement. Delete text of section, and replace with “The Resident Engineer will measure completed Micro Surfacing by the square yard [square meter].”

410.06. Basis of Payment. Delete all Pay Items and Pay Units in the table and replace with the following Pay Item and Pay Unit: “MICRO SURFACING, Square Yard [Square Meter]”.

411.03.C. Pavers. After the first paragraph add the following paragraph and Table 411.03.C:1. “Pavers shall be capable of placing a minimum paving width in one (1) lift as shown in Table 411.03.C:1. Longitudinal joints in the surface layer shall correspond with the locations indicated in Table 411.03.C:1.”

Table 411.03.C:1 Minimum Paving Widths		
Roadway Classification	Minimum Paving Width	Location of Longitudinal Joints
Arterials	one (1) full lane width	At edges of traffic lanes
Non-Arterials	one-half (½) road width	At centerline of road
Trails and bike lanes	full width of trail/bike lane	At edges of trail/bike lane

411.03.F. Material Transfer Vehicle.

- In the fourth paragraph, replace “Bridge Division” with “Department”.
- In the seventh paragraph, replace “500 ton [450 metric ton]” with “100 ton [90 metric ton]”.

411.04. Construction Methods. At the beginning of this section, add the following:

“Prior to paving operations, submit a paving plan indicating the sequence of paving passes, pass widths, pass thicknesses, and requested temporary street closures.

The contractor shall not drive empty or loaded trucks or equipment across newly paved areas for the construction period.”

411.04.D. Control Strip Requirements.

- Delete the first paragraph.
- In the second paragraph, replace “500 ton [450 metric ton]” with “100 ton [90 metric ton]”.
- Delete the last paragraph, and replace with “If the initial asphalt control strip produces failing results, make adjustments to production and placement procedures, and repeat the

test process for a second control strip. If required, create additional asphalt control strips on the shoulder until an acceptable mixture is produced."

411.04.I. Spreading and Finishing.

- After the second sentence in the fourth paragraph, add "Once paving begins the Contractor should have sufficient trucks available to deliver asphalt materials in a continuous operation."
- After the fourth paragraph, add the following paragraph: "A leveling or "wedge" course may be required to establish the required cross-slope for the finished overlay. Adequate transitions to side streets and driveways must be provided. Paving shall extend to the returns of all side streets. Special consideration should be given to prevent ponding at side street intersections."

411.04.J.(1). General.

- Delete the second paragraph, and replace with the following:

"Ensure longitudinal joints in the surface layer correspond with locations indicated in Table 411.03.C:1.

Transverse joints shall be kept to a minimum. At a minimum, each lane shall be continuously laid without cold joints either from intersection to intersection or a length of 500 ft."
- Delete the last sentence in the last paragraph.

411.04.K.(2). Acceptance. Delete the second sentence in the third paragraph.

411.04.K.(2).(a). Layers At Least 1½ in [38 mm] Thick.

- In the second paragraph, delete the first sentence, and replace with "Asphalt density tests for each lot will be performed at random sample locations."
- Delete Table 411:2 and the last paragraph in the section, and replace with the following:

"ODOT Pay Adjustments for Lot Density shall not be used. Failure of any sample within the lot to reach density within 92.0 to 97.0 percent of the Maximum Theoretical Density will result in rejection of the entire lot. The Contractor shall remove and replace unacceptable lots at no additional cost to the Department."

411.04.K.(2).(b). Layers Less Than 1½ in [40mm] Thick. In the second paragraph, replace "500 yd² [500 m²]" with "400 yd² [330 m²]".

411.04.N.(2).(a). Basis of Acceptance and Payment.

- In the first paragraph.
 - In the first sentence, delete "and payment";
 - After the first sentence, add the following: "The Resident Engineer may also consider other characteristics, including but not limited to, pavement smoothness."

- In the second paragraph, delete the second through the last sentence.
- Delete the fifth through the last paragraph, and replace with "ODOT pay factors for density, asphalt cement content, and air voids shall not be used. Failure to reach density of 92.0 to 97.0 percent of the Maximum Theoretical Density, asphalt cement content of +/- 0.40 of job mix formula, air voids greater than 1.5 deviation from target, or specified thickness of asphalt will result in rejection of the entire lot. The Contractor shall remove and replace unacceptable lots at no additional cost to the Department."

411.04.N.(2).(b). Resident Engineer's Acceptance Procedures. Delete the second paragraph, the bulleted list, and Table 411:4; replace with "The Resident Engineer may perform varying amounts of sampling and testing per lot in accordance with the City of Tulsa Acceptance Sampling/Testing Standard Specifications."

411.06.B.(2). Asphalt Binder Price Adjustment (ABPA). Delete the last paragraph, and replace with "ODOT will establish the Monthly Asphalt Binder Price Index each month and post the information to the ODOT website at <http://www.okladot.state.ok.us/contractadmin/pdfs/binder-index.pdf>."

414.02. Materials.

- Delete "Fly Ash" from Table.
- At the end of the section, add the following:
"Fly Ash is not allowed in any concrete mixture unless otherwise specified in the Plans or Special Provisions."

414.03.B. Placing and Finishing Equipment. After the first sentence, add the following: "If paving is not performed by a slip form paver, a hand vibrator shall be required."

414.04.R. Acceptance of Pavement. Delete text of section, and replace with the following: "ODOT pay factors shall not be used. Failure to reach the gradation specified, air content of 4.5% to 7.5%, or target strength of the mix design will result in rejection of the entire lot. Failure to provide pavement thickness equal to or greater than what is specified will result in rejection of the entire lot."

414.04.R.(a). Engineer's Acceptance Procedures. Delete text of section and Table 414:2. Replace with "Refer to City of Tulsa Acceptance Sampling/Testing Standard Specifications."

414.06. Basis of Payment. Delete the last sentence in this section.

509.06. Basis of Payment.

- Delete the second through the fifth paragraph and Table 509:7. Replace with the following: "ODOT pay factors for strength and air content shall not be used. Failure to reach the specified strength or the target air content within a deviation of 1.5% will result in rejection of the work. Check any outlying concrete cylinder breaks and air entrainment tests in accordance with ASTM E 178 Table 1, Upper 10% Significance Level."

- In the sixth paragraph, revise the first sentence to recite “If the concrete is rejected by the Engineer, the Contractor may elect to core the represented concrete at no additional cost to the Department.”

515.04.C. Sampling and Testing of Bridge Decks and Approaches. Delete the first paragraph and bulleted list. Replace with “Refer to City of Tulsa Acceptance Sampling/Testing Standard Specifications for lot size.”

515.04.D.(2). Bridge Decks and Approach Slab Surfaces.

- In the first paragraph, delete the third sentence.
- Delete sections (a), (b) and (c).
- Add the following:

“The percentage of absorption (using test results from OHD L39 shall be less than or equal to 1.0. The depth of penetration (using test results from OHD L 40) shall be greater than or equal to 0.15 inches. If absorption and penetration requirements are not met, reapply penetrating water repellent at no additional cost to the Department until requirements are met.”

516.02.C. Casings.

- In the first sentence of the third paragraph, add the word “licensed” after “Registered Professional Engineer”.
- In the fourth paragraph, delete the second sentence, and replace with “Use permanent interior casings in accordance with ASTM A760 and AASHTO M36.”

516.04.C.(7). Concrete Acceptance. Delete the second and third sentence. Replace with the following: “ODOT pay factors for concrete strength shall not be used. Failure to reach the specified strength will result in rejection of the work.”

610.04.F. Tactile Warning Device. Delete text of section, and replace with the following:

“Install tactile warning devices in accordance with the manufacturer’s specifications and the City of Tulsa Standard Drawings. Tactile Warning Devices shall consist of Cast-In-Place Tactile Panels in accordance with 733.1, “Tactile Warning Device Material”.

Tactile panels shall be cast into the wet concrete. Surface applied products shall not be allowed. The panels shall extend the full width of the ramp or landing area and shall extend a minimum of two (2) feet in the direction of pedestrian travel. Panels shall be placed perpendicular to the direction of travel unless specifically noted otherwise or approved by the Engineer prior to installation.

All construction shall meet current ADAAG and PROWAG Guidelines.”

611.01. Description. In the first sentence, delete “, brick masonry,”.

611.02.A. General.

- Delete “Clay Brick” and “Concrete Brick” from the table of materials.

- In the second paragraph, delete “brick masonry or”.

611.04.B. Clay Brick or Concrete Brick. Delete section.

615. Sanitary Sewer Pipe Conduits. Delete section.

616. Water Pipe and Fittings. Delete section.

623. Guardrail and End Treatments. Revise the section title to recite “Guardrail, End Treatments, and Impact Attenuators”.

623.01. Description.

- In bulleted list, add the item, “Guardrail Impact Attenuators”.
- In the last sentence of the last paragraph, after “Ensure the GETs”, add “and Guardrail Impact Attenuators”.

623.04. Construction Methods. Add the following subsection:

“623.04 H. Guardrail Impact Attenuators

Ensure experienced workers fabricate and install guardrail impact attenuators as shown on the Plans.

Construct guardrail impact attenuators with certified, crash tested hardware. Ensure NCHRP 350 TL-3 certification for substituted hardware and that the product appears on the Traffic Engineering Division’s Qualified Product List (QPL). Obtain the Resident Engineer’s approval of substitutions before installation.”

623.06. Basis of Payment. Add Pay Item “(J) Guardrail Impact Attenuator” with a Pay Unit of “Each”.

624.01. Description. In the bulleted list, add the bulleted item, “Fence, Other (Like Kind).”.

624.02. Materials. In the table, add the Material, “Fence, Other (Like Kind)” with Section or Subsection of “732.10”.

624.06. Basis of Payment. Add Pay Item, “(H) Fence, Other (Like Kind)” with a Pay Unit of “Linear Foot [Meter]”.

642.06. Basis of Payment. In the table, for both Pay Items, delete the Pay Unit of “Lump Sum”, and replace with “Each”.

701.01.B. Cement Substitution. Delete text of section, Table 701:2, and Table 701:3. Replace with “Cement substitutions shall not be used in concrete mixtures.”

701.19.A. General. Controlled Low-Strength Material (CLSM). In the first sentence, delete “fly ash.”.

701.19.B. Mix Design. In the table, delete the Material, “Fly Ash”.

702.01.A. General. In the second paragraph

- Delete the first sentence, and
- In the last sentence, delete “PCC from one source (power plant) and”.

702.01.B. Requirements for Portland Cement Concrete Use. Delete section.

702.02. Slag Cement. Delete section.

702.03. Cement Kiln Dust. Delete section.

702.04. Silica Fume. Delete section.

708.04. Composition of Mixtures. In Table 708:6, under “Other Mixture Requirements”, add a row as follows:

	S2	S3	S4	S5 / RIL	S6
Asphalt Cement (for Non-Arterial pavements only) % of mix mass		≥ 5.0	≥ 6.0	≥ 6.0 / NA	

711.06.D.(1). Acrylic Emulsion Polymer. In the second sentence, after “44 percent by”, delete “weight [mass]”, and replace with “total weight of the acrylic emulsion polymer.”

719.04.A. Description. In the second sentence, after “Type III” add “, Type IV, or Type IX”.

719.05.C. Material and Application. In the first sentence, delete “baking screen enamel or”.

719.05.E. Tests. In the first sentence revise “Ensure screening enamel, stencil pastes, and process inks” to recite “Ensure stencil pastes and process inks”.

726.02. Flexible Conduits. In Table 726:3, under Nonmetallic conduits—culverts, for Corrugated Polypropylene Pipe, delete the requirement for “AASHTO M330”, and replace with “COT 215”.

732. Materials for Guardrail, Guide Posts, Bridge Rail, Miscellaneous Railing, and Fences. Add the following subsection:

“732.10 Fence, Other (Like Kind)

Provide fence, other (like kind), in accordance with contract documents.”

733. Miscellaneous Materials. Add the following subsection:

“733.1 Tactile Warning Device Material

Provide cast-in-place tactile panels to be embedded into wet concrete. Surface applied products are not allowed. The panels shall meet the size and spacing requirements shown in the plans or the City of Tulsa Standard Drawings.

The tactile panels shall be composed of cast iron or vitrified polymer composite material. The color of the tactile panels shall comply with ADAAG and PROWAG color contrast requirements. Vitrified polymer composite panels shall be yellow and conform to Federal Color No. 33538. The color shall be homogeneous throughout the product. Any variations in color shall be approved by the Engineer prior to installation.

Tactile panels shall meet current ADAAG and PROWAG Guidelines."

735.01. Sodding and Sprigging Materials. Within subsections A, B and C, delete the word "Bermuda".

735.01.B.(1). Solid Slab Sod. At the end of the first paragraph add "Nylon mesh shall not be allowed in solid slab sod."

740.01. Materials.

- Delete the first three paragraphs.
- In fourth paragraph, delete "aluminum sheet material". Replace with "louvered aluminum backplates".
- At the end of the fifth paragraph, add "Retroreflective sheeting shall be 2 inches wide and attached to the front perimeter of the backplate. Retroreflective sheeting shall be fluorescent yellow."

740.02. Finish. After "Ensure the backplate is" add "flat".

801.01. Description. Delete the second paragraph. Replace with the following:

"The contractor shall obtain the necessary permits for electrical inspection on all signal and lighting work. Electrical inspections shall include all electrical equipment, enclosures, devices, cables, conductors and raceways as defined by the NEC. High or low voltage shall be installed, maintained, connected or removed by a State of Oklahoma licensed Electrical contractor. All work shall meet the requirements of the NEC. The City of Tulsa shall reserve the right to define workmanlike manner. Proof of license shall be carried on person at all times and be available to City of Tulsa personnel upon request per Title 158- Construction Industries Board Chapter -40 Subchapter 11-2(a)(9). The Contractor shall contact City of Tulsa Traffic Operations to obtain the address needed to obtain the permit."

801.04.A. General. Replace all references to "60-cycle" with "60 hertz".

802. Electrical Conduit. Delete section.

803. Pull Boxes and Ground Boxes. Delete section.

804. Concrete Footings. Delete section.

805. Removal of Traffic Items. Delete section.

806. Poles and Mast Arms. Delete section.

807.02. Materials. In the second sentence of the second paragraph, replace "plastic" with "hardened, tamper-proof".

807.06. Basis of Payment. In the last paragraph, replace "plastic" with "hardened, tamper-proof".

809. Luminaires. Delete section.

810. Power Supplies. Delete section.

811. Electrical Conductors Highway Lighting. Delete section.

813.02. Materials. In the first two sentences of the first paragraph, after "(2) hardcopies" add "and one (1) electronic (pdf) copy".

813.02.A. Structural Design.

- In the second sentence of the first paragraph, delete "corrosion-resistant (stainless or galvanized steel, or aluminum)". Replace with "galvanized steel".
- In the eighth paragraph, after "Provide the following luminaire ring suspensions as required by the Contract:", add "(Only top latching systems are allowed.)".

813.04. Construction Methods. In the first paragraph, delete the third sentence and replace with "Submit to the Resident Engineer one (1) electronic (pdf) copy and at least five (5) hardcopies per project or one (1) copy per device."

825. Traffic Signal Controller Assembly. Delete section.

827. Solid-State Flashing Controller. Delete section.

828. Vehicle Loop Detector and Loop Detector Wire. Delete section.

830. Pedestrian Push Button. Delete section.

831. Traffic Signal Heads. Delete section.

832. Optically Programmed Adjustable Traffic Signal Heads. Delete section.

833. Traffic Signal Backplates. Delete section.

834. Electrical Conductors for Traffic Signals. Delete section.

850. Signs. Delete section.

851. Galvanized Steel Sign Posts. Delete section.

855.04.B. Application of Markings. At the end of the first paragraph, add "Remove temporary markings and reflective tabs prior to installing permanent markings."

856. Traffic Stripe (Multi-Polymer). Delete section.

858.04. Construction Methods. At the end of the second sentence of the first paragraph, delete "maker", and replace with "marker".

880.02.B.(5). Warning Lights. In the first sentence, delete "6F-7OF", and replace with "6F.83".

880.05.B. Lump Sum Pay Item. At the beginning of the second paragraph, revise "If additional and compensation" to recite "If additional compensation".

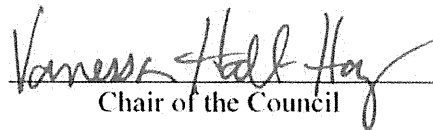
Section 2. REPEAL OF CONFLICTING ORDINANCES. *That all other ordinances or parts of ordinances in conflict herewith be and the same are now expressly repealed.*

Section 3. SEVERABILITY. *If any section, subsection, paragraph, subparagraph, sentence, clause or phrase of this ordinance shall be declared invalid for any reason whatsoever, such decision shall not affect the remaining portions of this ordinance, which shall remain in full force and effect, and to this end the provisions of this ordinance are hereby declared to be severable.*

Section 4. EFFECTIVE DATE. *This ordinance shall be effective on July 1, 2021.*

JUN 02 2021

ADOPTED by the Council: _____
Date


Chair of the Council

OFFICE OF THE MAYOR

Received by the Mayor: _____ at _____
Date Time

G.T. Bynum, Mayor

By: _____
Secretary

APPROVED by the Mayor of the City of Tulsa, Oklahoma: JUN 09 2021

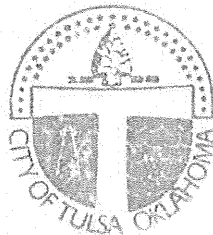
Date

at _____
Time



Mayor

ATTEST:





City Clerk

APPROVED:



City Attorney

OK-JMS

SPECIFICATIONS

- A. Oklahoma Department of Transportation Standard Specifications for Highway Construction, 2019 Edition as modified by Ordinance 24616, shall be used on this project including Section 100-General Provisions.
- B. City of Tulsa, Public Work, Engineering Division, Construction Specifications – March 2022 are incorporated herein as if fully set forth and are on file, including all revisions posted on internet prior to bid opening, with the Public Works Department, Engineering Division, 175 E. 2nd Street, Tulsa, Oklahoma or access on the internet at:
<https://www.cityoftulsa.org/government/departments/public-works/engineering-services/specifications-checklists-and-details/>

SPECIAL
PROVISIONS

SPECIAL PROVISION
SUPPLEMENTAL CONTRACT REQUIREMENTS
PROJECT NO. CIRI 2027-2028 CITYWIDE INFRASTRUCTURE
REHABILITATION AND IMPROVEMENTS.

1. Apparent lowest, responsible bidder shall return their signed contract documents (including bonds and insurance) to the City of Tulsa, Contract Administration Section 175 E. 2nd Street, 13th Floor, OK 74103 within fifteen (15) days after notification by the City.
2. If the apparent lowest, responsible bidder provides their signed contract documents (including bonds and insurance) and the contract is executed by the City, the Pre-Construction Conference for this project will be held within sixty (60) days after bid opening.
3. The Notice to Proceed or written work order (NTP) will be issued in the normal time period (approximately within ten (10) days of the Pre-Construction Conference).

The City will grant up to **Zero (0) days** for a delayed (flexed) NTP after the Pre-Construction Conference. No delayed (flexed) NTP above this amount will be granted unless approved by the City Engineer or designee.

4. There will be no additional compensation due to the use of a delayed (flexed) NTP.
5. This Special Provision does not alter the Public Meeting requirements (and public notice) defined in the General Conditions.

SPECIAL PROVISIONS
INSURANCE REQUIREMENTS

In reference to Ordinance No. 24616 Adoption of State Specification for Highway Construction, Section 107.12 shall be modified as follows:

The CONTRACTOR (and any subcontractors) shall carry and keep in force during this Contract, policies of insurance issued by an insurer authorized to transact business in Oklahoma in minimum amounts as set forth below or as required by the laws of the State of Oklahoma. The CONTRACTOR shall also furnish an Owner's Protective Policy in the same amounts naming the City of Tulsa as the assured, issued by the same insurance company as the CONTRACTOR'S liability coverage and indemnifying the City of Tulsa against any and all actions, claims, judgments or demands arising from injuries of any kind and character sustained by any person or persons because of work performed by the CONTRACTOR.

General Liability Insurance with a bodily injury and property damage combined single limit of not less than \$1,000,000.00 for each occurrence.

Employer's Liability and Workmen's Compensation in the amounts as required by law.

The CONTRACTOR shall provide proof of such coverage:

- (a) By providing Certificate(s) of Insurance prior to the execution of this contract; and
- (b) By submitting updated Certificate(s) of Insurance with each and every subsequent request for payment. The Certificate(s) should show that the policies are current and should be dated within 30 days of payment request.

The CONTRACTOR shall not cause any required insurance policy to be cancelled or permit it to lapse. If the CONTRACTOR cancels, allows to lapse, fails to renew or in any way fails to keep any required insurance policy in effect, the City will suspend all progress and/or final payments for the project until the required insurance is obtained. Further, a CONTRACTOR who fails to keep required insurance policies in effect may be deemed by the City to be in breach of contract, ineligible to bid on future projects, and/or ineligible to engage in any new contracts.

The Contractor shall execute and furnish a Statutory Bond for the protection of laborers, mechanics, and material men in a sum equal to one hundred percent (100%) of the contract price.

The Contractor shall execute and furnish a Performance Bond in a sum equal to one hundred percent (100%) of the contract price.

The Contractor shall execute and furnish a Maintenance Bond in a sum equal to one hundred percent (100%) of the contract price.

Prior to doing blasting, the Contractor shall furnish a Certificate of Insurance, which shall certify that any damage caused by blasting is within the coverage of the Contractor's liability insurance to the full limits thereof.

All bonds and insurance must be executed by a company licensed to do business in the State of Oklahoma and must be acceptable to the City.

SPECIAL PROVISIONS
FOR SPECIAL CONDITIONS

1. SCOPE OF WORK:

- A. GENERAL: It is the intent of these specifications and this contract to provide for maintenance and improvements city wide. The Contractor shall furnish all labor, materials, equipment, tools, transportation and supplies required to complete the work in accordance with the plans, specifications, and terms of the contract.
- B. PROJECT LOCATION: Within the City limits of Tulsa and all of its Surrounding facilities.
- C. LENGTH OF CONTRACT: This contract will expire after 455 days from Notice to Proceed.
- D. QUANTITIES: The City of Tulsa does not guarantee any specific quantities of items. All listed quantities are estimates only. Claims will be processed to cover work as it is completed during the contract period. Bids are to establish unit prices only.

2. ALTERATION OF PLANS OR CHARACTER OF WORK:

The City reserves the right to make at any time during the progress of the work, such increases or decreases in quantities and such alterations in the details of construction, including alterations in the grade or alignment of the road or structure or both, as may be found to be necessary or desirable. Such increases or decreases and alterations shall not invalidate the contract nor release the Surety, and the Contractor agrees to accept the work as altered, the same as if it had been a part of the original contract.

3. EXTRA WORK:

The Contractor shall perform unforeseen work, for which there is no price included in the contract, whenever it is deemed necessary or desirable to complete fully the work as contemplated. Such work shall be performed in accordance with the specifications, and when directed in writing by the City of Tulsa and will be paid for as provided under extra or force account work.

4. REMOVAL AND DISPOSAL OF STRUCTURES AND OBSTRUCTIONS:

All materials, structures, or obstructions found on the project which are not to remain in place or which are not to be used in the new construction shall be carefully dismantled and salvageable materials stored in accessible locations as directed by the City of Tulsa. Unless specified on the plans in the proposal, this work will not be paid for separately but will be included in the price bid for other items. Unless otherwise shown, materials not considered salvageable or not incorporated in the work shall become the property of the Contractor and disposed of by him.

5. FINAL CLEANING UP:

Upon completion of the work and before acceptance and final payment will be made, the Contractor shall remove from the right of way all machinery, equipment, discarded materials and trash. Material cleared from the right of way and deposited on property adjacent to the right of way will not be considered as having been disposed of satisfactorily. The Contractor shall leave any area or slope, where he performs any work in a neat and workmanlike condition. He shall repair at his own expense and to the satisfaction of the City of Tulsa, any area, sloped or turfed that has been damaged by his operations.

6. TIME AND PROGRESS:

- A. The work for said contract shall be commenced within 10 days from and after the date of a written work order from the City. The Contractor agrees that the work shall be prosecuted regularly, diligently, and uninterruptedly at a uniform rate of progress to insure completion within the number of days stated in these specifications. It is expressly understood and agreed that the said time for the completion of the work described herein is a reasonable time for the completion of the same.
- B. Work on arterial streets or areas designated by the City of Tulsa shall be completed within (5) five working days and work on non-arterial streets, green areas, and other permitted locations within (7) seven working days from the date and time of notification to complete the permit. Work on 'Special' projects including but not limited to: Storm Sewer, Utility, Striping, Landscaping, Traffic and Lighting shall be completed within the working days specified by City of Tulsa in the notification. This includes all time required for OKIE locates. A working day is defined as every day shown on the calendar, exclusive of Sundays and Holidays. The Contractor shall, upon request by the City of Tulsa, supply a construction schedule on all work required to complete the project. Completion times are established as reasonable durations to complete anticipated permits under normal weather conditions and average permit volumes. If the contractor believes the time for completion is not sufficient, the contractor shall submit in writing a request for extension within 48 hours of being notified.

The Contractor shall also provide a written request, 48 hours in advance, for permission from the City of Tulsa, prior to working Sundays or holidays. The request does not guarantee permission.

- C. Completion times may be extended during prolonged periods of inclement weather or when permit volumes significantly exceed the average volume of 20 permits per day. Extensions of completion times will be considered by the City of Tulsa when requested in writing by the Contractor for a specific number of permits. The following schedules may be used as a guide in determining the applicable extensions, but under no circumstances will the completion time be extended to more than double the normal completion time of five or seven calendar days. Time extensions will not be granted for areas/permits that are in liquidated damages.

MAXIMUM TIME EXTENSION FOR PEAK PERMIT VOLUME

AVERAGE PERMIT	TIME EXTENSION
<u>VOLUME/DAY*</u>	<u>(DAYS)</u>
≤20	0
21 - 40	1
41 - 60	2
61 - 80	3
>80	4

* Average permit volume/day based upon total weekly notifications divided by 5 working days.

- D The Contractor will be notified of the street cuts to be worked for the following day. A project schedule, describing that day's activities, shall be submitted by the Contractor to the City by 7:30 a.m. each morning. The preferred method of delivery is e-mail. Failure to do so by 8:00 a.m. each morning will subject the Contractor to a \$1000.00/day fine.
- E. The contractor shall establish traffic control devices and commence work within 24 hours of being notified. If the Contractor shall fail to commence work within 24 hours of being notified, then the Contractor agrees to pay the City, not as a penalty, but as liquidated damages the sum of One Thousand Dollars (\$1000.00) per lane for each day of failure to commence work after the specified time set forth. The amount is fixed and agreed upon because of the impracticability and extreme difficulty of fixing and ascertaining the actual damage the city would in such event sustain.

The Contractor shall always maintain one lane of traffic on two lane streets and two lanes of traffic on four lane streets. The Contractor will be assessed \$1000/day fine for any street closure without City approval.

If the Contractor shall fail to complete the work assigned within the time specified, then the contractor agrees to pay to the City, not as penalty but as liquidated damages for such Breach of Contract, the sum of \$2,500.00, for each day of failure to complete arterial streets or areas designated by the City of Tulsa and \$2,500.00 for each day of failure to complete non-arterial streets, green areas, and other permitted locations, after the specified time set forth. The amount is fixed and agreed upon because of the impracticability and extreme difficulty of fixing and ascertaining the actual damage the City would in such event sustain.

- F. Should the Contractor be delayed in the final completion of the work by any act or neglect of the City or causes outside of and beyond the control of the contractor and which, in the opinion of the City of Tulsa, could have been neither anticipated nor avoided, then an extension of time sufficient to compensation for the delay, as determined by the City of Tulsa, shall be granted by the City, provided, however, that the Contractor shall give the City of Tulsa notice in writing of the cause of the delay in each case within three days after the delay.
- G. Extensions of time will not be granted for delays caused by inadequate construction force or the failure of the Contractor to place orders for equipment or materials enough time in advance to insure delivery when needed. Any extension of time by the City shall not release the Contractor and surety herein from the payment of liquidated damages for a period not included in the original contract of the time extension as herein provided.
- H. The Contractor shall provide the City with four direct portable links to his communication system. Any unit not operating to the satisfaction of the City of Tulsa will be replaced by the Contractor within 24 hours of notification that the unit is not working satisfactorily. The units will remain the property of the Contractor and all operation and maintenance expense connected therewith will be born by the Contractor. The communication links will be considered incidental to items of work and no further compensation will be allowed.
- I. If at any time, in the opinion of the City of Tulsa proper progress is not being maintained, such changes shall be made in the Contractor's operations which will reflect the priorities set by the City of Tulsa at no additional cost to the City.
- J. If the Contractor is notified of a work area that needs minor corrections, the Contractor will make all necessary repairs to complete the work as determined by the Inspector. The Contractor will be compensated for all labor, material, etc. under the appropriate bid items to complete the work. This will be done in lieu of a turn back.

- K. Upon notification from the Contractor that the work required by the permit has been performed, the Inspector will inspect. If all work required has been completed in accordance with the contract, that inspection will be the final inspection. If, however, the inspection discloses any work, in whole or in part, not in accordance with the contract, the Inspector shall give written notice within 24 hours by email to the Contractor of the exceptions found. In which case, liquidated damages will run as stated in Item 6.E. until the final inspection is made.
- L. If the work is progressing in a good and workmanlike manner, and if the Contractor is faithfully carrying the terms of this contract, then estimates of the work completed shall be prepared by the Contractor, checked by the City of Tulsa. If the work is not progressing in a good and workmanlike manner, the City of Tulsa may hold the estimate for payment until such progress is forthcoming. The Contractor is required to bill for all work that has been completed within 90 days from the date the work was completed.
- M. Any work done, or materials used without inspection by an authorized Department representative may be ordered removed and replaced at the Contractor's expense unless the Department representative failed to inspect after having been given reasonable notice in writing that the work was to be performed.

SPECIAL PROVISIONS
GENERAL

1. Contractor shall be required to submit sufficient documentation in the form of a spreadsheet with each pay request to allow verification of individual permit quantities.
2. Areas to be patched shall be delineated in a straight-line geometric pattern. When completed, the patch shall be level and provide a smooth riding surface. Portland Cement Concrete patches will be protected from all traffic for a minimum period as required by the type of concrete used before removal of protective devices. Open excavations will not be left unprotected overnight.
3. Driveways and patches in front of driveways, which are removed, shall not be left unusable overnight. If concrete cannot be placed the same day as removal, the Contractor shall furnish screening or other suitable aggregate material to maintain temporary access until concrete can be placed. The cost of placing and removing the material for temporary access shall be included in the pay item for Concrete Driveway (High Early Strength). Failure to leave the driveway usable by the homeowner will subject the Contractor to a \$1000/day fine. The exception to this is the allowance for cure time.
4. Sod shall be transplanted within 24 hours after sod is stripped. If sod is stacked, it shall be placed roots to roots, or grass to grass. Sod shall be kept moist during delivery and protected from wind, sun dehydration, and freezing. Sod shall be cut and moved only when the soil moisture conditions are such that favorable results can be expected. Sod shall not be dumped from vehicles. Damaged sod will be rejected.
5. All areas to be sodded shall be graded to a smooth, free drainage, even surface with a uniformly loose, fine texture. Limit fine grading to areas which can be sodded immediately. Roll and rake, remove ridges, and fill depressions as required to drain.
6. Sodded lawns will be acceptable provided requirements, including maintenance, have been completed producing a healthy, uniform, close stand of specified grass is established free of weeds, bare spots, and surface irregularities.
7. From December 1 through March 1, the Contractor shall place sod in accordance with the specifications and as directed by the Engineer. If in the opinion of the Engineer satisfactory growth is not established, the Contractor shall replace the sod as directed by the Engineer. Payment will be made at the unit price bid for solid slab sodding.
8. All areas to be sodded in parks, residential areas, and other special applications shall be tilled to a depth of four inches, weather permitting, as directed by the Engineer. No additional payment will be made for said tilling.

9. Standard Drop Inlets, Double Grate Drop Inlets, and Inlets with Access Manholes Back of Curb shall be per Design Standards for 15", 18" and 24" Reinforced Concrete Pipe.
10. All Gate Valves shall be resilient-wedged in accordance with ANSI/AWWA C509.
11. The contractor certifies that it and all its Subcontractors to be used in the performance of the Contract are in compliance with 25 O.S. Sec. 1313 and participate in the Status Verification System. The Status Verification System is defined in 25 O. S. Sec. 1312 and includes but is not limited to the free Employee Verification Program (E-Verify) available at www.dhs.gov/E-Verify.
12. Not used.
13. All traffic materials shall meet the requirements of COT 627 Pre-Qualification for Traffic Operations Materials or as directed by the Traffic Engineer.
14. The Contractor and or their Sub-contractors working on COT Traffic infrastructure shall meet the requirements of COT 628 – Signal and Lighting Project Contractor Experience Requirements.
15. The Contractor shall be responsible for maintaining the traffic signal in a proper working condition during construction, repair or replacement of the traffic signal as directed by the Traffic Engineer and for following the requirements of COT 626 Traffic Signal Construction and Operation.

SPECIAL PROVISIONS
FOR ADA COMPLIANT HANDRAIL

Handrails.

- (1) Gripping surfaces shall be continuous.
- (2) Top of handrail gripping surfaces shall be mounted between 34 inches and 38 inches above walking surfaces.
- (3) Ends of handrails shall be either rounded or returned smoothly to ground, wall, or post.
- (4) Handrails shall not rotate within their fittings.

Size and Spacing of Handrails.

The diameter or width of the gripping surfaces of a handrail shall be 1-1/4 inches to 1-1/2 inches, or the shape shall provide an equivalent gripping surface. If handrails are mounted adjacent to a wall, the space between the wall and the handrail shall be 1-1/2 inches. Handrails may be in a recess if the recess is a maximum of 3 inches deep and extends at least 18 inches above the top of the rail.

Materials and Installation.

Pipe rail posts and all parts shall be galvanized per ASTM A123. Prime with a zinc rich primer and finish with EMSCO black TGIC polyester coat, 2.5 to 3.0 mils thick. Pipe rail shall be 1/4" thick square or round steel. Welds shall be 3/16" fillet weld. Grind all welds and edges smooth. Attach railing to top of concrete or asphalt surface course with 6" x 6" X 1/2" base plate and 5/8" encapsulated anchors at 6" depth min. Use Hilti adhesive anchorage or Para bound approved equal. Install per MFG. Rec. Minimum 1080 lbs. pull out strength. Weld railing to plate. Installation shall be approved by the City of Tulsa.

Basis of Payment

Construction of ADA compliant handrails will be measured by the linear foot of pipe rail required and shall be paid for the contract unit price for:

ADA COMPLIANT HANDRAIL

L.F.

Payment shall be full compensation for furnishing all materials, equipment, labor and incidentals necessary to complete the work.

SPECIAL PROVISIONS
FOR
ACCELERATED SET, HIGH EARLY STRENGTH CONCRETE
(JOB SITE DOSED WITH POZZUTEC ¹)

DESCRIPTION

This work shall consist of furnishing and placing Accelerated Set, High Early Strength Concrete.

MATERIALS

The following are approximate concrete mixture proportions for a one cubic yard batch:

<u>Material</u>	<u>Quantity</u>
Type I Portland Cement	705 lbs.
ASTM #57 Coarse Aggregate	1767 lbs.
Fine Aggregate	1092 lbs.
Water	35 gallons
Air Content	5-7 percent
Pozzutec 20 (ASTM C494, Type C and E)	420 ounces
Slump	5-7 inches

Submittal shall be delivered to the City of Tulsa at a date set by the Engineer and shall include the items outlined in ODOT Specifications 701.03.

Batching shall measure the weights of each material required within a tolerance of one percent for cement and two percent for aggregates (account for moisture content). The quantity of water used shall be within plus or minus one percent of that required by the design. Water may be measured either by volume or by weight. The above materials shall be used in strict accordance with the manufacturer's recommendations. All materials used in Accelerated Set, High Early Strength Concrete shall meet the requirements of Section 701, Portland Cement Concrete, of the ODOT Standard Specifications for Highway Construction, 2019 Edition.

1. Pozzutec 20 admixture as manufactured by Master Builders, Cleveland, Ohio

CONSTRUCTION METHODS

The Accelerated Set; High Early Strength Concrete shall be mixed between 70 to 100 revolutions of the ready-mix truck at the plant. Addition of the Pozzutech 20 shall be performed at the site of the work in accordance with manufacturer's requirements. The concrete shall be mixed for a minimum of 70 revolutions after adding the Pozzutech 20. Mixing shall be in a mechanical mixer capable of combining the aggregates, cement, and water into a thoroughly mixed and uniform mass within the manufacturer's specified mixing period. There shall be no water in the mixing drum prior to adding the aggregates.

Construction equipment and/or other traffic shall be limited to the newly constructed concrete section as discussed under Special Provisions, "Cold Weather Concrete Curing."

TESTING

Following are the testing requirements for the Accelerated Set, High Early Strength Concrete mix:

Compressive Strength:² 3,000 pounds per square inch (psi) – 12 hours

3,500 psi – 24 hours

Slump: Initial slump (prior to adding Pozzutech 20)
= 2 inches maximum

Final slump = 5 inches minimum;
7 inches maximum

BASIS OF PAYMENT

ACCELERATED SET HIGH EARLY STRENGTH CONCRETE CY

Payment shall be full compensation for furnishing all materials, equipment, labor and incidentals necessary to complete the work.

¹ During cool weather (less than 50 degrees Fahrenheit), specimens shall be cured in a fully insulated closed box.

During moderate weather (between 50°F and 80°F), specimens shall be cured in both open and fully insulated closed boxes with compressive strength tests performed on specimens from each curing box.

During warm weather (greater than 80°F), specimens shall be cured in a closed box placed in a shaded area.

SPECIAL PROVISIONS
FOR ADJUSTMENT OF ROADWAY UTILITIES

1. Contractor is to remove the rings and covers of manholes and water valves and the frames and grates of single grate drop inlets and double grate drop inlets. If these items are to be reused, the Contractor is to mark, store and protect these materials for later placement in the exact orientation existing at the beginning of the Project. After removal of these obstructions, the Contractor shall place over each hole 5/8" thick steel plate cut to the proper size as directed by the Engineer. After placement of steel plate, the hole shall be filled with compacted asphalt to the established street grade. It shall be the Contractor's responsibility to make the necessary measurements to ensure that all utilities can be easily located after overlay. After the overlay the Contractor shall raise the utilities to the new grade.
2. Manholes and inlet basins shall be raised or lowered as required by using a solid, continuous layer of bricks and mortar. The upper portion of manhole or basin shall be removed as required for correct raising or lowering adjustment. If existing basin or manhole walls are concrete, the Contractor may dowel apron into wall in lieu of removing the upper portion of wall. Dowels shall be #4, at 1' - 0" O.C. grade 60 steel.
3. All existing I-beams on double or triple grate frames shall be re-established under grates.
4. Where basins or manholes are covered for construction or other purposes, curbs shall be marked with green paint.
5. Silicone construction joint material per Public Works Standards shall be used where concrete aprons meet existing or new concrete pavement. Bituminous construction joint material per Public Works Standards shall be used where concrete aprons meet existing or new asphalt pavement.
6. The Contractor shall place a minimum 1/2" thick flexible gasket bitumastic sealant material in two concentric rings, along the inside and outside edge of the top of the manhole prior to reinstalling the frame. The gasket shall be E-Z STIK Butyl Rubber Sealant, PRO-STIK Performed Joint Sealant or equal. The material shall be able to withstand hydrogen sulfide and other corrosive gasses. After the frame has been set, a normal 1/2 coat of trowelable bitumastic joint sealant shall be applied to the entire outside circumference of the manhole. The sealant shall be applied from the top of the lower flange down a minimum of 6" below the frame connection. It shall then be wrapped with a 6 mil plastic to protect against damage from backfill. The trowelable material shall be Joint Mastic Sewer Joint Compound or equal. The cost of the material and labor associated with installing it shall be included in the price bid for manholes, adjust to grade.

**SPECIAL PROVISION
ANCHORED REINFORCED VEGETATION SYSTEM**

MATERIALS

Anchored Reinforced Vegetation System (ARVS)

Engineered armoring system consisting of High-Performance Turf Reinforcement Mat (HPTRM) and earth percussion anchors. The HPTRM shall consist of non-degradable Trilobal polypropylene synthetic fibers, monofilaments, mesh and other elements, processed in to a three-dimensional matrix. The HPTRM shall support the growth of grass roots through the material and provide adequate ground cover in times of removed vegetation. The material must have a dense closely woven homogenous matrix not composed of layers or discontinuous material held together by stitched or glued netting. Open weave is unacceptable.

Anchored Reinforced Vegetation System HPTRM Properties: (Minimum Average Roll Values (MARV) listed unless otherwise specified. Typical values are not allowed.

Earth Percussion Anchors

- a) B1 Earth Percussion Anchors – The B1 Earth Percussion Anchors consist of a die cast aluminum bullet nosed anchor head so that the anchor head shall not cut or break yarns. This shall minimize abrasion and installation damage to the HPTRM. Shall consist of a directionally-locking, self-setting wedge grip used to lock and hold the loading applied to the anchor. Ball bearing mechanisms for load locking anchors shall not be accepted. "The bullet nosed anchor head shall be attached to a zinc-aluminum coated carbon 3- foot long steel 1 x19 cable and a die cast zinc load bearing plate with openings to allow vegetative growth through the plate. The anchors shall be delivered to the jobsite fully assembled and ready for installation. All components of the anchor shall have a 50-year design life. The earth percussion anchor shall be submitted with an HPTRM sample to the Engineer for final approval to ensure they comply with the specified requirements. Depth of 36 inches to provide for permanent tie down of the HPTRM to the levee, channel, or slope in the locations specified in the drawings. The Type B1 earth percussion anchors shall meet the following requirements:

Performance Properties	Value
Anchor and Cable Assembly Ultimate Strength	1.1 kips
Anchor and Cable Assembly Working Load	0.8 kips
Anchor Head Bearing Area	1.5 in²

- b) B2 Earth Percussion Anchors – The B2 Earth Percussion Anchors are made of corrosion resistant aluminum alloy, gravity die cast and heat treated to give considerable increase in mechanical strength and durability both during installation and in service, connected to a galvanized threaded steel rod to enhance corrosion resistance particularly at the soil/air interface. Type B2 anchors are secured to the soil surface through a 4x6x1/4-inch rectangular Metal Plate and Hex Nut ratcheted onto a threaded dowel. The extra dowel extending above the plate post installation should be removed after the hex nut is ratcheted down tight. The full designed anchor drive depth of 6 feet must be achieved for all B2 Earth Percussion Anchors to maintain the stability of the slope.

Anchor Type	Load Range Cohesive through Non-Cohesive Soils	Minimum Drive Depth
B1	Up to 0.5 kips (Ultimate)	3.0 feet
B2	Up to 5 kips (Ultimate)	6.0 feet

Performance Properties shall be demonstrated by all of the following:

Flume testing at an independent facility under conditions similar to this project provided that the manufacturer can demonstrate that the material tested is functionally equivalent to the material being supplied. This may be demonstrated by providing index property test results (listed in 2.2.A.4) from a GAI-LAP accredited laboratory for both the tested and supplied materials.

Documented case histories of successful performance of 500,000 sy or greater on projects in North America.

Manufacturing Quality Control: Testing shall be performed at a laboratory accredited by GAI-LAP for tests required for the geosynthetic, at frequency exceeding ASTM D 4354, with following minimum acceptable testing frequency:

Property	Test Frequency sq m (sq yd)
Mass Per Unit Area ASTM D-6475/6566	1/20,000 (1/24,000)
Tensile Strength ASTM D-6818	1/20,000 (1/24,000)
Tensile Elongation ASTM D-6818	1/20,000 (1/24,000)
Light Penetration (% Passing)	1/20,000 (1/24,000)

ACCESSORIES

ARVS Pins

Length: (18 inches); sufficient ground penetration to resist pullout. Use longer anchors for loose soils.

Metal pins: Steel, minimum 5 mm (0.20 in) in diameter with 40 mm (1.5 in) steel washer.

SUBMITTALS

Certification:

The Contractor shall provide the Engineer a certificate stating the name of the ARVS manufacturer, product name, style, chemical compositions of filaments or yarns and other pertinent information to fully describe the geotextile.

The Manufacturer is responsible for establishing and maintaining a quality control program to assure compliance with the requirements of the specification.

Documentation describing the quality control program shall be made available

upon request.

The manufacturer's certificate shall state that the furnished ARVS meets MARV requirements of the specification as evaluated under the manufacturer's quality control program. The certificate shall be attested to by a person having legal authority to bind the Manufacturer.

The manufacturer shall provide documented design methodology for size, length, and frequency of anchors in specific locations to meet acceptable factors of safety for critical sections of the installation. Design shall be based on designed slope geometry and geotechnical information provided by the engineer, as well as soil-specific anchor pull-out testing performed by the manufacturer.

The ARVS System shall be furnished by a single "pre-approved" manufacturer and/or supplier and not be sourced from multiple manufactures/suppliers.

Manufacturing Quality Control (MQC) test results shall be provided upon request.

Independent Performance Test Results shall be provided upon request.

DELIVERY, STORAGE, AND HANDLING

Rolled Erosion Control Product (RECP) labeling, shipment and storage shall follow ASTM D 4873.

Product labels shall clearly show the manufacturer or supplier name, style name, and roll number.

Each shipping document shall include a notation certifying that the material is in accordance with the manufacturer's certificate.

Each RECP roll shall be packaged with a material that shall protect the RECP from damage due to shipment, water, sunlight, and contaminants.

The protective wrapping shall be maintained during periods of shipment and storage.

During storage, ARVS shall be elevated off the ground and adequately covered to protect them from the following: Site construction damage, extended exposure to ultraviolet (UV) radiation, precipitation, chemicals that are strong acids or strong bases, flames, sparks, temperatures more than 71 deg C (160 deg F) and any other environmental condition that might damage the ARVS.

QUALITY ASSURANCE SAMPLING, TESTING, AND ACCEPTANCE

RECP shall be subject to sampling and testing to verify conformance with this specification. Sampling for testing shall be in accordance with ASTM D 4354.

Acceptance shall be in accordance with ASTM D 4759 based on testing of either conformance samples obtained using Procedure A of ASTM D 4354 or based on manufacturer's certifications and testing of quality control samples obtained using Procedure B of ASTM D 4354.

Quality Assurance Sampling and Testing shall be waived for ISO 9002 Certified Manufacturing Facilities. Documentation of ISO 9002 Certification shall be provided upon request.

PRODUCTS

Approved Suppliers

Propex Operating Company, LLC, Chattanooga, Tennessee 37422 USA, or approved equal.

Phone (800) 621-1273 – Fax (423) 899-5005.

Joel Eisenman (913) 205-4036, joel.eisenman@propexglobal.com

Contech Construction Products, Tulsa, Oklahoma 918-504-4236

For pre-approval for alternate ARVS suppliers/manufacturers on this project, all products shall be submitted to the Engineer for review and approval no later than 10 days prior to bid date for pre-approval.

B. Alternative Suppliers

If a system other than the ArmorMax® Anchor Reinforced Vegetation System is used for construction, the Contractor shall be responsible for providing an engineered solution for slope reinforcement, considering both sliding shallow plane instabilities, as well as global rotational failure potential. The following documentation shall be provided by the Contractor to support the slope reinforcement design for the alternative engineered solution:

1. Overall ARVS Design Methodology
2. Input Parameters
3. Calculations / Model Output
4. Anchor Strength
5. Anchor Length
6. Anchor Spacing (X-Plane) & (Y-Plane)
7. Factor of Safety to support the slope reinforcement design; with a minimum of three (3) different conditions analyzed and documented for both a proposed 1H:1V slope, as well as a 1.5H:1V slope, as follows:
 - a) normal water level
 - b) steady state seepage
 - c) rapid drawdown

Contractor shall arrange for experienced representatives of the manufacturer to attend the mandatory Pre-Construction Conference and be on site for installation assistance the first day of installation. The Contractor shall arrange for experienced representatives of the alternative manufacturer to be on site for installation assistance and inspection on two additional occasions, one being scheduled mid-way during installation or when installation questions arise and the second being toward the end of installation.

EXECUTION

Preparation

Grade and compact area as directed and approved by Engineer. Subgrade shall be uniform and smooth. Remove all rocks, clods, vegetation or other objects so the

ARVS-4

installed mat shall have direct contact with soil surface.

Installation

A mandatory pre-construction conference with an Engineer representing the ARVS manufacturer, contractor, and inspector shall be held prior to installation of the mat. Contractor shall schedule the conference providing a minimum of seven (7) days' notice to all parties involved.

Contractor shall arrange for experienced representatives of the ARVS manufacturer to be on site for installation assistance the first day of ARVS installation. The Contractor shall arrange for experienced representatives of the ARVS manufacturer to be on site for installation assistance and inspection on two additional occasions, one being scheduled mid-way during installation or when installation questions arise and the second being toward the end of installation. Contractor shall provide adequate notice to all parties. Delays caused by manufacturer's representative's late arrival on site shall not be cause for additional contract time.

The following installation details are the minimums required. The installation details noted in the drawings shall control the ARVS installation.

All seam overlaps shall be a minimum of 6 inches. All seam overlaps shall be on the upstream or uphill side.

Install Initial Trench along the crest of the slope as designated in the drawings.

Anchor the HPTRM in the trench and roll the HPTRM down the slope

Beginning at the top of the slope and working down to the toe, install pins and earth percussion anchors based on frequency and spacing of tie-down devices shown on the plans.

Determine the anchor installation method necessary to achieve the anchor pullout resistance(s) specified herein or on the Plans. The Engineer may add, eliminate, or relocate anchors to accommodate actual field conditions. The cost of any redesign, additional material, or installation modifications resulting from actions of the Contractor shall be borne by the Contractor.

The installation of the anchors shall be made at the locations, orientations, and lengths shown on the Plans or as directed by the Engineer. Select installation equipment and methods suitable for the ground conditions described in the geotechnical report and shown in the boring logs. Select anchors required to develop the specified pullout resistance. Where hard drilling conditions such as rock, cobbles, boulders, or obstructions are described elsewhere in the contract documents or project Geotechnical Report, other suitable drilling equipment and anchors capable of drilling through such materials, shall be used.

If a pilot hole is to be drilled for a Gripple Earth Percussion Anchor, adhere to the following guidelines: Use a drill bit no larger than $\frac{3}{4}$ inches (6.35 mm) in diameter. Cut two slits perpendicular to each other to form an "X" in the mat for the drill bit. The length of each slit shall be no longer than 1 inch (2.54 cm).

Anchor Installation

- a) Align the drive rod into the anchor head.
- b) Drive anchor into ground either manually or using ground rod driver. Additional adapter needed for ground rod driver. Remove drive rod once anchor is fully driven.
Set anchor by attaching anchor pulling cable or threaded rod until desired load is reached.
- c) If copper ferrell anchors are being used: load lock anchor using crimpers; if wedge grip anchors are being used: load lock by sliding the wedge grip down the cable while setting anchor according to instructions above.
- d) Remove excess cable or threaded rod using bolt cutters after Engineer has inspected excess cable or threaded rod for verification and approval of depth of anchors.

Anchor head location, deviation from plan design location; if anchors meet refusal when driven into the soil, anchors on seams shall be offset along the seam first while other anchors may be offset 12 inches any direction. If anchors still cannot be driven the full, designed depth drill a pilot hole for the anchor as described in step 8 above. Location tolerances are applicable to only one anchor and not accumulative over large slope areas. Anchors which do not satisfy the specified tolerances due to the Contractor's installation methods shall be replaced at no additional cost. Price bid shall include a contingency of up to 25 percent of required anchors to replace anchors which encounter unanticipated obstructions during drilling and require relocation, as approved by the Engineer. No additional payment shall be made for driving new anchors abandoned due to unanticipated obstructions.

Install Longitudinal Edge trench on the first and the last roll of the project.

Install modified check slots as needed.

Terminate HPTRM in Terminal Trench at the toe of the slope.

The Engineer shall approve alternate installation methods prior to execution.

Turf Establishment

Soil filling and seeding the HPTRM:

Apply two inches of topsoil on the smooth and uniformly graded slopes, below the HPTRM.

Install the HPTRM.

Apply 1-inch topsoil on top of the HPTRM.

Install sodding.

When using lightweight power equipment to fill HPTRM, avoid sharp turns. The equipment shall be rubber-tired. Do not drive tracked or heavy equipment over HPTRM.

Contractor shall repair all damage to HPTRM caused by equipment at no additional cost.

PROJECT ACCEPTANCE

All areas that erode prior to project acceptance shall be repaired at the expense of the contractor including necessary re-sodding, watering, and repair of the ARVS.

METHOD OF MEASUREMENT

Anchored Reinforced Vegetation System

The area covered by the ARVS, excluding unexposed areas such as the anchor trenches and overlaps between adjacent pieces of mat, installed in place will be measured.

PAYMENT

Anchored Reinforced Vegetation System (ARVS) shall be measured by the square yard.

Such payment shall be full compensation for materials, equipment, labor and incidentals required to perform all operations in connection with installation of ARVS in reasonable accordance with the lines, design and dimensions shown on the plans and as specified herein, including, but not limited to preparation of soil base for mat, anchoring the mat with specified earth percussion anchors, constructing anchor trenches, attending pre-construction conferences and coordination with the manufacturer/supplier.

HIGH PERFORMANCE TURF REINFORCEMENT MAT			
Property	Test Method	Units	Property Requirement
Thickness	ASTM D-6525	in	0.40
Flexibility/Stiffness	ASTM D-6575	in-lbs.	0.534
Resiliency (minimum value)	ASTM D-6524	percent	80
Mass Per Unit Area	ASTM D-6566	oz/sy	13.5
Tensile Strength (Grab) (minimum value)	ASTM D-6818	lbs./ft	(4000 x 3000)
Tensile Elongation (maximum value)	ASTM D-6818	percent	65
Light Penetration (% Passing) (maximum value)	ASTM D-6567	percent	20
Maximum Roll Width	Visual	--	10.5 feet
Color	Visual	-	green
UV Resistance (minimum value)	ASTM D-4355	percent	85 at 10,000 hrs.
Estimated Design Life	Calculated	Years	≥50
Maximum Velocity	ASTM D-6460*	m/sec (ft/sec)	7.5 (25)
Maximum Shear Stress - * Manufacturer to provide a recently signed certification from the ASTM D-6460 Testing Facility stating velocity and shear values, the duration of flow for the test, and the time frame for vegetation establishment before beginning testing.	ASTM D-6460*	N/m ² (lb./ft ²)	718 (15)

Accepted ARVS, measured as provided, shall be paid for at the contract unit price as follows:

ANCHORED REINFORCED VEGETATION SYSTEM (ARVS) - SQUARE YARD

SPECIAL PROVISION
FOR SPECIAL SPECIFICATIONS OF
ASPHALT SPEED HUMPS

1.0 GENERAL

- 1.1 Intent and Scope.** Furnish all labor, materials, equipment, tools, transportation and supplies necessary to install a speed hump (singular) or a series of speed humps (multiple) (herein referred to as an Installation) for the City of Tulsa (herein referred to as City), complete and in accordance with these specifications.
- 1.2 Description of Work.** The work is as specified by the Engineer in writing on the "Work Order." Construction traffic control is required.
- 1.3 Quantities.** The City does not guarantee any specific quantities. All listed quantities are estimates only. Claims will be processed to cover work as it is completed during the contract period. Bids are to establish unit prices only.

2.0 WORK PERFORMANCE

- 2.1** Use personnel with appropriate experience for placement of construction traffic control, construction layout, forming, spreading and finishing of asphalt mixture, application of pavement marking and sign installation. Contractor is responsible to:
- 2.1.1** Place construction traffic control in accordance with the latest edition of the *Manual on Uniform Traffic Control Devices (MUTCD)* handbook.
- 2.1.2** Install materials as-specified on City of Tulsa standards,
- 12' Asphalt Speed Hump,
 - 22' Asphalt Speed Hump, and
- Oklahoma Department of Transportation standards,
- Square Sign Post Details (SSP-1-1),
 - Typical Installation of Ground Mounted Signs (GMS1-1),
 - Sheet Sign Assembly Details (SSA1-1), and
 - Sign Blank and Bracket Details (SBS1-1), and
- Oklahoma Department of Transportation 1999 Standard Specifications for Highway Construction and the *Manual on Uniform Traffic Control Devices (MUTCD)* handbook, at the location as shown on the "Work Order" and that which is specified herein.

- 2.1.3 Exercise precaution to minimize damage to existing pavement, sidewalk, landscaping, curb, utilities, guardrail, vegetation, signs, lawn sprinklers, and other appurtenances in the right-of-way. The contractor is responsible for damages in the right-of-way incurred while performing speed hump and traffic calming device installation.
- 2.1.4 Contractor shall install permanent warning signs no later than five days after the last speed hump is installed in a multiple installation, and shall upon completing sign installation, remove all warning signs, immediately.

2.2 Work Sequence and Construction Traffic Control

- 2.2.1 At the discretion of the Engineer and depending on the magnitude of the scope, Contractor may be required to submit a written work sequence and construction traffic control plan (CTCP). The plan will be required before commencing work.

2.3 Quality Assurance

- 2.3.1 Horizontal Alignment
 - 2.3.1.1 Horizontal asphalt hump layout and pavement marking layout shall not deviate more than 3" from centerlines shown on standard drawings and in "Work Order".
- 2.3.2 Vertical Alignment
 - 2.3.2.1 Vertical asphalt hump profile alignment shall not deviate more than $\frac{1}{4}" \pm$ from thickness shown on standard drawings.
- 2.3.3 Compaction
 - 2.3.3.1 Compaction acceptance will be based on the Contractor performing compaction as approved by the Engineer to obtain optimum compaction. The 1999 Oklahoma Department of Transportation Specification for Highway Construction, percent of maximum theoretical density requirements are waived. Other parts of the specification remain in effect.

3.0 PAYMENT

3.1 Method of Measurement. Accepted speed hump quantity shall be measured by the cross sectional linear foot for a 12 or 22-foot hump which includes asphalt concrete, and pavement markings. Sign quantity shall be measured per each by the combination(s) defined per speed hump Installation.

3.1 Basis of Payment. Accepted quantities shall be paid as:

SPECIAL	12' Asphalt Speed Hump w/ Pavement Markings	L.F.
SPECIAL	22' Asphalt Speed Hump w/ Pavement Markings	L.F.
SPECIAL	Speed Hump (W17-1) Sign & Post ¹	EA
SPECIAL	Speed Hump (W17-1) Sign & Post ¹ w/ Optional Sign (W16-4)	EA
SPECIAL	Roadside Delineator (OM2-2V) & Post ²	EA
¹ Square tube size: 2 1/4" (Single)(14 Ga.)		
² Manufacture post in accordance with 1999 Oklahoma Department of Transportation Standard Specifications for Highway Construction, Section 710.02. Install roadside delineator so that top of object marker panel is 4.0 ft. above the near roadway edge.		

SPECIAL PROVISIONS
FOR
BRIDGE EXPANSION JOINT REHABILITATION

DESCRIPTION. This work shall consist of the removal of existing rubber bridge expansion joint units, anchor bolt studs and hardware, asphalt or other materials placed around missing units, and the installation of joints made of elastomeric mortar and rapid cure joint sealant to form a new bridge expansion joint.

MATERIAL. New expansion joints shall be constructed of elastomeric mortar and rapid cure joint sealant per ODOT specification 701.08(G), "Rapid Cure Joint Sealant and Elastomeric Mortar." One-part silicone shall meet ODOT specification 701.08(F), "Low Modulus Silicone Joint Sealant (Self-Leveling)." The above-referenced specifications are per the Oklahoma Department of Transportation 2019 Standard Specification for Highway Construction. Placement shall be as specified in Subsection 504.04(c)2, "Joints Made of Elastomeric Mortar and Rapid Cure Joint Sealant."

CONSTRUCTION METHODS. Placement shall be as specified in Subsection 504.04(c)2, "Joints Made of Elastomeric Mortar and Rapid Cure Joint Sealant" and according to the details contained in these contract documents.

For existing joint openings greater than 2 inches, the Engineer shall be notified to determine the correct repair detail to be specified. Where it is determined by the Engineer that the opening will be greater than desirable, the Type 2 Joint Repair, with a new nosing on one side, shall be used.

Prior to installation of the Elastomeric Mortar and Rapid Cure Joint Sealant, the Manufacturer's representative shall be present, onsite, to verify satisfactory conditions exist to provide a desirable finished repair, to ensure adequate workmanship, and for inspection of the sealing operation.

METHOD OF MEASUREMENT. Elastomeric Mortar shall be measured by the cubic foot of material placed and accepted. Rapid Cure Joint Sealant shall be measured by the linear foot of sealant placed and accepted.

BASIS OF PAYMENT. Elastomeric Mortar and Rapid Cure Joint Sealant, measured as provided above, will be paid for at the contract unit price as follows:

SPECIAL	RAPID CURE JOINT SEALANT	LINEAR FOOT
SPECIAL	ELASTOMERIC MORTAR	CUBIC FOOT

Such payment shall be full compensation for removal of existing joints and material, preparation of surfaces, forming, furnishing all materials, equipment, labor and incidentals to complete the work as specified.

TABLE 1: SEALANT DIMENSIONS (inches)

Joint Opening	Sealant Thickness	Sealant Recess	Joint Opening Compression	Joint Opening Extension	Total Movement Range
1	1/2	1/2*	1/2	1 1/2	1
1 1/2	1/2	1/2*	3/4	2 1/4	1 1/2
2	1/2	1/2*	1	3	2
2 1/2	1/2	1/2*	1 1/4	3 3/4	2 1/2
3	1/2	5/8*	1 1/2	4 1/2	3

All dimensions shown in Table 1 are inches.

*Exceptions: No recess at shoulders.

TABLE 1 NOTES:

1. Table based on temperatures of 77°F +/- 2° and 50% RH +/- 5%.
2. Width at time of sealing.
For joints less than 1" or those greater than 3" at time of sealing, contact the Bridge of ODOT for recommendations.
3. Installation temperatures shall be in accordance with Subsection 504.04(c)2 of the 2019 Standard Specifications.

Rev. 9/27/99

Table 2: Expansion Openings

Steel Girders				
(1) Avg. Temperature Degrees F	L=100 ft. Opening (in.)	L=200 ft. Opening (in.)	L=300 ft. Opening (in.)	L=400 ft. Opening (in.)
30	2.23	2.47	2.70	3.44
40	2.16	2.31	2.47	3.12
50	2.08	2.16	2.23	2.81
60	2.00	2.00	2.00	2.50
70	1.92	1.84	1.77	2.19
80	1.84	1.69	1.53	1.88
90	1.77	1.53	1.30	1.56
(2) Max. Joint Movement	0.936	1.872	2.808	3.744

Concrete Girders				
(1) Avg. Temperature Degrees F	L=100 ft. Opening (in.)	L=200 ft. Opening (in.)	L=300 ft. Opening (in.)	L=400 ft. Opening (in.)
30	2.22	2.43	2.65	2.86
40	2.14	2.29	2.43	2.58
50	2.07	2.14	2.22	2.29
60	2.00	2.00	2.00	2.00
70	1.93	1.86	1.78	1.71
80	1.86	1.71	1.57	1.42
90	1.78	1.57	1.35	1.14
(2) Max. Joint Movement	0.504	1.008	1.512	2.016

(1) Note: The average temperature shall be taken as the actual air temperature averaged over the 24-hour period immediately preceding the event.

(2) Note: The maximum thermal movement for steel components shall be taken as a range of 120° F and for concrete components as a range of 70° F.

SPECIAL PROVISIONS
FOR
PRE-FORMED BIKE LANE MARKINGS

This work shall consist of the construction of 24-inch green pre-formed bike lane markings in reasonably close conformity with the Plan Details, or as established by the City of Tulsa.

Materials:

All bicycle markings shall include traction resistance to minimize the loss of traction for bicyclists and shall be retro-reflective, unless otherwise specified by the Traffic Engineer. Where green markings are required, the materials shall meet the latest requirements as set by the Federal Highway Administration (FHWA) for bike lane markings and materials.

Basis of Payment:

Pre-formed bike lane markings shall be 24-inch green bars and shall be paid per LF to accommodate varying widths of bike lanes.

24" PRE-FORMED BIKE LANE MARKINGS

LF

Such payment shall be full compensation for furnishing all materials, equipment, labor and incidentals to complete the work as specified.

WARRANTY:

All pavement markings installed under this contract shall be under warranty for one (1) year from date of acceptance by the City of Tulsa to cover any defects other than normal fading, discoloration, or wear and tear by traffic found in the markings or retro-reflectivity. The contractor shall be responsible for full removal and replacement of the defective pavement markings.

03/31/22

SPECIAL PROVISIONS
FOR BIKE PATH MARKINGS

This work shall consist of the construction of bike path symbols in reasonably close conformity with the Plan Details for "Bike Path Symbol", "Bike Path Callout", or as established by the Engineer.

Materials shall be 3M, Series 380 High Performance Tape and Epoxy, Stamark Contact Cement E-44-T. Methods of Construction shall meet ODOT specifications 711.05, 711.07, and 858.04 of the standard specifications.

Construction of bike path symbols will be measured by each complete symbol and shall be paid at the Contract unit price for:

BIKE PATH MARKINGS

EA

Which will be full compensation for performing the work specified and the furnishing of all materials, labor, tools, equipment, and incidentals necessary to complete the work as specified.

BPM-1

SPECIAL PROVISIONS
CHAIN LINK FENCE

This work consists of furnishing all labor, equipment and appliances necessary to complete all chain link fencing and gates required in accordance with Oklahoma Department of Transportation 2019 Standard Specifications for Highway Construction Section 624 "Fences".

MATERIALS

Provide materials in accordance with Oklahoma Department of Transportation 2019 Standard Specifications for Highway Construction Subsection 732.07, "Fence, Style CLF".

CONSTRUCTION METHODS

Construction methods in accordance with Oklahoma Department of Transportation 2019 Standard Specifications for Highway Construction Subsection 624.04D and 2019 Specification R-68 included.

METHODS OF MEASUREMENT

Methods of measurement in accordance with Oklahoma Department of Transportation 2019 Standard Specifications for Highway Construction Subsection 624.05.

BASIS OF PAYMENT

Accepted fence and gates, measured as provided above, will be paid for at the contract unit price as follows:

48" HIGH CHAIN LINK FENCE LINEAR FOOT
48" HIGH CHAIN LINK FENCE GATE....EACH

72" HIGH CHAIN LINK FENCE LINEAR FOOT
72" HIGH CHAIN LINK FENCE GATE EACH

48" HIGH VINYL COATED FENCE LINEAR FOOT
48" HIGH VINYL COATED FENCE GATE. EACH

72" HIGH VINYL COATED FENCE LINEAR FOOT
72" HIGH VINYL COATED FENCE GATE. EACH

Such payment shall be full compensation for furnishing all materials, equipment, labor and incidentals to complete the work as specified.

SPECIAL PROVISIONS
FOR COLD MILLING BITUMINOUS PAVEMENT

1. Contractor will perform milling operation in accordance with ODOT Specifications as stated in Section 417.
2. Contractor will be required to perform the following as a minimum:
3. Milling of Asphalt Pavement per Specifications and Special Provision.
4. Provide all Traffic Control per Specifications and Special Provision.
5. Load and haul milled material are the ownership of the contractor.
6. Clean-up Milling Operation as directed by Engineer. This will include removal of unbonded asphalt overlays and sweeping.
7. All streets designated for milling shall be milled as shown on typical sections. If street is full depth Asphalt the depth of cut shall be as specified for each segment. If street is concrete with an Asphalt Overlay then all existing asphalt shall be removed. Boring logs are included as Appendix A. No payment will be made for any additional passes necessary to remove asphalt to the required cross section. Care should be exercised not to mill into the underlying concrete pavement. The Contractor will be responsible for damage to concrete caused by excessive milling.
8. The Contractor shall provide a power operated milling machine capable of planing a minimum depth of three inches in a single pass. The equipment shall be self-propelled with sufficient power, traction and stability to maintain accurate depth of cut and slope. The equipment shall be capable of accurately and automatically establishing profile grades along each edge of the machine by referencing the existing pavement by means of a ski, or matching shoe or from an independent grade control, and shall have an automatic system for controlling cross slope at a given rate. The machine shall be equipped with an integral loading means to remove the material being cut from the pavement surface and to discharge the cuttings into a truck, all in a single operation.
9. Milled material to become property of City of Tulsa.
10. The Contractor shall provide butt joints as directed by the Engineer. Wherever the planned overlay of an asphalt street meets existing pavement, or at the end of a paving run, butt joints shall be provided to a depth matching the planned overlay thickness. The transition shall extend a minimum of 10 feet longitudinally from the joint for residential streets and a sufficient length to provide a smooth riding surface for arterial streets. Butt joints will not be paid for directly, but the cost shall be included in the price bid for milling.

11. Entrance and Exit Areas to projects:

12. After an entrance or exit area has been milled, the Contractor shall construct access ramps. These ramps shall be a minimum of 20' in length and shall be placed across full width of street. These ramps shall be maintained by Contractor and shall remain in place until lanes are closed for overlay. Ramps will be provided at driveways and non-arterial streets as needed to maintain a smooth transition for abutting properties during construction. Ramps will not be paid for directly, but the cost shall be included in the price bid for milling.

13. The existing pavement shall be uniformly milled to provide a uniform texture, true to line, grade and cross section; it shall have no deviations in excess of 3/16 inch in ten feet. Any portion of the planed surface not meeting this requirement shall be corrected in a manner approved by the Engineer.

CMBP-2

11/13/2024

SPECIAL PROVISIONS
FOR CRACK SEALING OF AC STREETS
WITH RUBBERIZED ASPHALT

All cracks from ¼" wide to 1" wide shall be routed, blown and filled with rubberized asphalt by use of a melter-applicator as described in ASTM D3405 XI.1. If the manufacturer of the sealant has specifications that exceed those of ASTM D6690 Type 2, then the manufacturer's specifications will be used.

Fill cracks to within 1/8 inch below pavement surface and blot any excess with approved material (no ridges).

Sealant material shall meet the requirements of ODOT 701.08 "Joint Fillers and Sealers" and meet or exceed ASTM D6690 Type 2.

Asphalt crack seal will be measured by the linear feet of cracks that are sealed, excluding the areas that are patched.

The accepted quantities measured as provided above will be paid for at the Contract unit price as asphalt crack seal by the linear feet of cracks that are sealed, excluding the areas that are patched, which shall be full compensation for furnishing all materials, equipment, labor and incidentals to complete the work specified.

Approval of Joints: At the City of Tulsa's request, a representative of the sealant supplier will be on site at the beginning of the final cleaning and sealing of the joint to demonstrate to the Contractor and to Inspection the acceptable standard for installation of the sealant. No sealing shall commence until the manufacturer's representative has approved the joints. Failure of the sealant to bond to the joint/crack surfaces will be cause for rejection and repair shall be at the Contractor's expense.

Submittals: No work shall begin until the Contractor has submitted the following to the City as a minimum:

- A. Manufacturer's Material Specifications
- B. Manufacturer's Installation Specifications
- C. Manufacturer's Joint/Crack Dimension Specifications.

Concrete curb: Concrete curb and combined curb and gutter to be removed and replaced shall receive joints per ODOT Specification 609.04(e) and be sealed with silicone. Costs for joints and sealer to be included in the unit price bid for either concrete curb or combined curb and gutter.

All sawing necessary for sealing shall be included in the cost of the sealant where used.

SPECIAL PROVISIONS
FOR COLD WEATHER CONCRETE CURING

Placement of asphalt on street cut repair sections of cold weather concrete or opening of street cut repair sections of cold weather concrete to traffic shall be allowed when the concrete achieves a compressive strength of 3,000 pounds per square inch (psi). Construction equipment loads shall not be applied to the concrete repair section until the 3,000-psi compressive strength is achieved.

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SPECIAL PROVISIONS
FOR COLD WEATHER CONCRETE PLACEMENT

1. When early traffic placement on a repair is required, the following guidelines are provided as a minimum to assure required strength during cold weather. The Contractor is responsible for the protection and quality of concrete placed during all weather conditions. If circumstances occur which preclude following these guidelines, lower early strength may result in delays in opening areas to traffic as desired.
2. Ice, snow, and frost must be removed from the cut prior to placement of concrete. Concrete should not be placed on frozen subgrade. Removal of frozen subgrade will be paid as unclassified excavation.
3. Fresh concrete temperatures shall be a minimum of 50°F and a maximum of 90°F at time of placement. Hot mix water and preheated aggregate may be necessary to accomplish the minimum temperature during extremely cold weather. The minimum ambient temperature at time of placement should be at least 30°F.
4. Insulated blankets should be placed immediately when average daily temperatures are below 50°F or when minimum ambient temperatures are anticipated below 40°F during the curing period and left in place until opening to traffic. Insulated blankets shall be MA KA closed cell insulated blankets or approved equal. The insulated blankets shall have a minimum R-value of 2. Cost of insulated blankets shall be included in the price bid for the concrete where they are used.
5. Strict compliance with mix design slumps must be achieved to reach early strengths. "Drying out" of excessive slump mixes will not be allowed to reduce the slump.
6. All cold weather practices also apply to cementitious backfill material, except that blankets will not be required.

SPECIAL PROVISIONS
FOR
DECORATIVE AGGREGATE CONCRETE
ROADWAY

Under this item, the Contractor shall furnish and place a Decorative Aggregate Concrete to replace any roadway or alleyway with exposed aggregate, colored concrete or brick or stone surface treatment. The concrete roadway or alleyway constructed shall match the existing sidewalk or driveway's surface treatment in every way.

The concrete will be placed in accordance with Section 610 of the ODOT Standard Specifications for Highway Construction, 2019 edition, with the following special provisions.

- 1) Payment shall be by cubic yard, not square yard.
- 2) Payment shall be full compensation for furnishing all materials, equipment, labor and incidentals necessary to complete the work.

SPECIAL PROVISIONS
FOR
DECORATIVE AGGREGATE CONCRETE
SIDEWALK AND DRIVEWAY

Under this item, the Contractor shall furnish and place a Decorative Aggregate Concrete to replace any concrete sidewalk or driveway with exposed aggregate, colored concrete or brick or stone surface treatment. The concrete sidewalk or driveway constructed shall match the existing sidewalk or driveway's surface treatment in every way.

The concrete will be placed in accordance with Section 610 of the ODOT Standard Specifications for Highway Construction, 2019 edition, with the following special provisions.

- 1) Payment shall be by cubic yard, not square yard.
- 2) Payment shall be full compensation for furnishing all materials, equipment, labor and incidentals necessary to complete the work.

**CITY OF TULSA
SPECIAL PROVISION
FOR
DEBRIS NETTING**

1. DESCRIPTION

This work consists of installation of heavy debris nets on bridges or other structures to prevent debris from falling below. The nets shall be installed as close to the work area as practical. Heavy debris nets may be suspended or attached to concrete or stone as a skin, tight to the surface and fastened directly with bolt anchors. For an installation at any distance below the work area, the maximum impact from falling debris must be calculated as a dynamic load. The maximum calculated impact must not exceed the net rating.

Anchor Installation

Mounting anchors for suspension cables must be secured to a suitable working surface. Anchoring hardware shall be as recommended by the netting manufacturer, with a 1/2-inch minimum anchor diameter. Install cable anchors according to the layout sheets supplied with the system. Hanger-Cables should be used to support wire grid at intersecting points and as recommended by the manufacturer. An installed cable system should not sag more than two feet between two support points.

Cable Installation

Install 1/2" diameter minimum turnbuckles at one end of each cable run. Longer runs may require two turnbuckles chained together eye to jaw end. Install the 3/8" minimum diameter suspension cable through the anchors of each cable run. Pull hand taught, and then secure each cable end with a thimble and three wire rope clips. Trim excess cable. Use vertical hanger-cables at grid intersections to support long horizontal cable runs. Tension the support cables by adjusting the turnbuckles for minimal sag in each cable. Do not over-tighten as the strength of the cable will be reduced.

System installation must comply with manufacturer recommendations, local codes, and the debris containment system function must comply with applicable safety standards for overall system performance.

For bridge use, the net panels shall be hung with enough ground clearance to prevent contact with any surface below the safety net during full impact load.

2. MATERIALS

Heavy Debris Nets shall be Type 2 rated barrier net with a design load rating of 2000 lb. meeting Test Standard MPS-002. Netting panels shall be fabricated using a two-ply construction method to join a 2" structural net underlay to a 3/8" debris net liner. The two net panels shall be layered and joined together at the border. Debris nets shall be abrasion and UV resistant. Debris nets shall have stainless steel grommets installed at two feet on center minimum.

Structural Netting shall meet the following minimum requirements.

FiberHigh Tenacity Polypropylene (HTPP)
Cord Diameter.....1/8 inch (3 mm)
Mesh Size.....2 inch (50 mm) square opening
Mesh Break280 lbf (1.25 kN)
Weight.....0.0303 lb./ft² (148 g/m²)
Melting Point320°F (160°C)
UV.....Extra UV Stabilizers added
ColorBlack

Debris net liners shall meet the following minimum requirements.

FiberKnit Polyester
Mesh Size.....3/8 inch (9 mm) square opening
Burst Strength.100 psi (ASTM D3787)
ColorBlack

Installation hardware shall meet the following minimum requirements.

1/2" x 6" Eye Bolt Anchors

Construction.....Drop Forge Hot Galvanized Steel
Working Load2200 lb. (1000 kg)
Net Weight.....63.0 lb./100 pieces (28.6 kg/100 pieces)
Specifications.....ASME B30.26

3/8" Galvanized Steel Cable

Construction.....7x19 Galvanized Steel Wire
Working Load7000 lb. (3180 kg)
Net Weight.....24.3 lb./100 ft (36.2 kg/100 m)
SpecificationFederal Specification RR-W-410E

1/2" Turnbuckle, Jaw/Eye

Construction.....Dropped Forge Carbon Steel, Hot Galvanized Finish
Working Load2200 lb. (1000 kg)
Net Weight.....1.68 lb. (0.76 kg)
SpecificationFF-T791b, Type 1, Form 1 - Class 8, and ASTM F-1145

3/8" Malleable Wire Rope Clip

Construction.....Malleable Iron Saddle, Steel U-Bolt, Zinc Plate
Net Weight.....21.0 lb./100 pieces (9.5 kg/100 pieces)
Specification.....FF-C-450 TYPE 1 CLASS 1

3/8" Wire Rope Thimbles

Construction.....Zinc Plated Rolled Steel

Snap Hooks

Construction.....Zinc Plated Steel
Working Load500 lb. (230 kg)
Concrete Adhesive Anchoring Kit
TypeTwo component epoxy
Strength.....ASTM D695: 10,300 psi minimum

3. BASIS OF PAYMENT

The City will pay for each pay item at the contract unit price per the specified pay unit as follows:

Pay Item:	Pay Unit:
<i>DEBRIS NETTING</i>	Square Yard

The City will consider all costs for materials, equipment, labor, and any other incidentals required for the installation of netting to be included in the contract unit price for *Debris Netting*. Payment is considered full compensation for this work.

SPECIAL PROVISIONS
FOR
EMERGENCY MOBILIZATION

This work shall consist of the performance of construction preparatory operations by the contractor, including the movement of personnel and equipment to the project site and for the establishment of facilities necessary to begin work on a street cut repair, within three (3) hours of notification by the Engineer. The Contractor shall make the work top priority until completion.

Emergency Mobilization measured by each incident shall be paid for at the contract price for:

EMERGENCY MOBILIZATION

EACH

which shall be full compensation for performing the work specified and the furnishing of all materials, labor, tools, equipment and incidentals necessary to mobilize and subsequently demobilize the construction preparatory operations. If all the work and cleanup is not completed with a maximum of three (3) working days, the emergency mobilization cost will not be paid.

Emergency Mobilization shall include liquidated damages in the amount of \$200.00 per hour for every hour beginning at three (3) hours and five (5) minutes after the call to begin.

SPECIAL SPECIFICATION
FOR EXTERNAL PIPE SEAL (WRAP)

Butyl Joint Sealants

The joints and/or joint surfaces of the pipe shall be sealed with a butyl-rubber-based preformed flexible sealant conforming to ASTM C-990-96. The external joint wrap is to be:

- 1) ConSeal CS-202 Butyl Rubber external joint wrap, or ConWrap CS-212 External Joint Wrap, as manufactured by Concrete Sealants, Inc. New Castle, Ohio, or
- 2) Cadilloc External Pipe Joint, as manufactured by Cadillac Inc., Escanaba, Michigan, or
- 3) EZ-WRAP Rubber Butyl adhesive tape as manufacture by Press-Seal Gasket Corporation, Fort Wayne, Indiana, or
- 4) Rub-R-Nek external concrete joint wrap as manufactured by Henry Company, Houston, Texas, or
- 5) Approved equal.

Testing of joints and compliance with construction requirements shall be conducted in strict conformance with the requirements of the sealant supplier.

Payment for this item shall be by the Linear Foot of pipe wrap in place. Calculated as the circumference of the pipe times the number of joints wrapped.

SPECIAL PROVISION
FABRIC REINFORCEMENT

PART 1-GENERAL

1.01 Description

This work shall consist of furnishing and placing an engineered, pre-coated paving mat within the pavement structure as shown on the plans or directed by the engineer. The paving mat shall provide a moisture barrier/stress relieving membrane and shall be placed beneath a specified asphalt concrete (AC) mix overlay of either, hot-mix asphalt (HMA), warm-mix asphalt (WMA) or rubber hot-mix asphalt (RHMA).

1.02 Quality Control

- A. Pre-Construction Conference: Prior to the installation of the interlayer, the Contractor shall arrange a meeting at the site with the manufacturer representative and the paving mat installer. The engineer shall be notified at least 3 days in advance of the time of the meeting. Paving mat installer to provide manufacturer written confirmation that they have been trained on the proper installation of high tensile fiberglass paving mat specified with a minimum of 5 years' experience installing these paving mats.
- B. A manufacturer representative shall be present, at minimum, for the first day of installation of the engineered paving mat and available thereafter upon request by the engineer.

1.03 Measurement and Payment:

- A. Paving mat shall be measured by the square yard of paving mat placed.
- B. Payment for the paving mat will be made at the contract unit price for square yard or as specified in the Special Provisions.

PART 2-PRODUCT

2.01 Material

The engineered, reinforcing, elastomer polymer pre-coated paving mat interlayer with continuous strand 140 Lbs. high strength fiberglass/polyester scrim Paving Mat, such as GlasPave 25 or equal meeting the following physical properties table (modification of the ASTM test methods prohibited) plus all the additional "In-asphalt" performance requirements. Fiberglass Polyester Paving Mat submitted as "or equals" shall demonstrate that the product – as installed - meets all requirements in the properties table and shall be submitted a minimum of two weeks prior to bid opening. The Engineer may vary the product requirements to a higher performance specification, such as GlasPave 50 (or equivalent), as directed by the plans.

PHYSICAL PROPERTIES OF FIBERGLASS POLYESTER REINFORCING PAVING MAT			
Property	Test Method	Units	MARV*
Index Properties for Quality Control			
Asphalt Retention	ASTM D6140	(gal./yd ²)	0.47 (0.10)
Mass per unit area	ASTM D5261	g (oz/yd ²)	136 (4.0)
Tensile strength, MD	ASTM D5035	kN/m (lb/in)	25 min (140)
Tensile Strength, CD	ASTM D5035	kN/m (lb/in)	25 min (140)
CBR Puncture**	ASTM D6241	N	1779 (400)
Elongation at maximum load, MD	ASTM D5035	percent	<5
Elongation at maximum load, CD	ASTM D5035	percent	<5
Melting point	ASTM D276	°C (°F)	>232 (>450)
Fiberglass reinforcement strand	Max. spacing	Inch	<0.25
In Asphalt Performance Requirements			
Stress Improvement Factor	TTI Overlay Tester	Vs. Control	≥ 3.2 ♠
Permeability	FM 5-565	cm/sec	< 6x10 ⁻⁰⁸ ☉
Recyclability without screening	AASHTO T283-07	Moisture/Rutting Susceptibility	Pass ■
Recyclability without screening	AASHTO T322-07	Low Temp. Cracking	Pass ■

* MARV=Minimum Average Roll Value: Many international manufacturers report average physical property values, which only provides a 50% level of confidence that the material delivered to the project site meets their product data sheet requirements. Whereas Minimum Average Roll Values (MARV) provides a 97.7% level of confidence the material will meet the published data sheet

** Assess 360° tensile strength symmetry

♠ Using a PG64 hot mix AC with a 12.5mm nominal maximum aggregate size at 32 degrees

☉ Using a 2" thick hot mix AC with a permeability > 6 x 10⁻⁰⁶ cm/sec

■ 30% by weight of RAP was used for both the control RAP and GlasPave RAP

2.02 Millability and Recyclability

The material supplier shall provide proof that the paving mat can be milled and the resulting RAP containing the milled paving mat can be recycled (without screening) back into a new mix. Proof of millability and recyclability for this RAP shall consist of written documentation from an independent asphalt recycling plant and/or testing lab., and samples made with 30% RAP containing the recycled paving mat shall pass the AASHTO testing as listed above. Composite interlayers with paving fabrics and interlayers that are not pre-coated with elastomeric polymer are not eligible for consideration

2.03 Storage and Handling

The paving mat shall be stored as per the manufacturer's recommendations in a dry covered condition free from dust, dirt and moisture. The paving mat shall be installed in accordance with the manufacturer's installation guidelines and this specification. Where a conflict exists between the specifications, the more stringent specification will apply. A copy of the manufacturer's specifications shall be provided to the engineer at the pre-construction meeting, for submittal consideration and approval prior to installation.

2.04 Asphalt Bonding Application

- A. Asphalt binder for application of the mat shall be PG 64 (-10 to -34) or PG 70 (-10 to -34). Higher ambient installation temperatures will require PG 70(-10 to -34) asphalt binder to reduce the chances of movement and improve stability of the mat under construction traffic. Higher performing "trackless" tack asphalts may be substituted for use in these conditions, upon engineers' direction.
- B. The application rate shall be 0.15 Gal/SY to 0.17 Gal/SY on a new pavement surface, 0.17 Gal/SY to 0.19 Gal/SY on an aged oxidized surface and 0.2 Gal/SY to 0.22 Gal/SY on a milled surface.

PART 3 - EXECUTION

3.01 Placement

- A. The surface on which the paving mat is to be placed shall be free of dirt, water, vegetation or other debris.
- B. When installing on an existing surface, paving mat shall be placed on a drainable surface, and any rutting or low spots in the pavement shall be removed by milling or by adding a leveling course, as directed by the engineer. Cracks shall be filled with suitable crack filler, as directed by the Field Engineer. Crack, pop-out and pothole fillers shall be allowed to cure.
- C. When placing on a smooth milled surface, it is critical to have a pneumatic tire roller to facilitate full adhesion. Smooth milled surface is defined as a surface that has no excessive grooves or sharp vertical surfaces. It is suggested that the milling equipment have no missing "teeth" and that they are properly spaced. The equipment is operated at a speed slow enough to achieve the smooth mill as defined. If this cannot be achieved than a leveling course shall be required.
- D. When placement of the paving mat is on a leveling course the surface shall be allowed to cool sufficiently and stabilize, prior to placement of the engineered paving mat, to prevent lift-up of paving mat.

- E. Neither the asphalt binder nor the paving mat shall be placed when weather conditions, in the judgment of the engineer or manufacturer's representative, are not suitable. Air and pavement temperature shall be sufficient to allow the tack coat to hold the paving mat in place. The air temperature shall be 50°F (10°C) and rising for placement of the hot asphalt tack coat. When air temperatures exceed 85°F (29.4°C) it is suggested that a 70 (-10 to -34) hot asphalt tack or a trackless tack be used.
- F. Application of the tack coat shall be by a calibrated distributor truck spray bar. Emulsified Asphalt shall not be allowed. Temperature of the tack coat shall be sufficiently high enough to permit uniform spray pattern and shall be above 325° F (163°C).
- G. The target width of the tack coat application shall be the width of the paving mat, plus 4 inches and wide enough to cover the entire width of paving mat overlaps. The tack coat shall be applied only as far in advance of the paving mat installation as is appropriate to ensure a tacky surface at the time of the paving mat placement. Traffic shall not be allowed on the tack coat.
- H. The paving mat shall be placed onto the tack coat with minimum folds or wrinkles and before the tack coat has cooled and lost tackiness. As directed by the engineer or manufacturer's representative, wrinkles or folds greater than 1 inch (25mm) shall be slit and laid flat or pulled out and replaced. In these repaired areas, additional tack coat shall be applied as needed to achieve a sound bond to the substrate. Damaged paving mat shall be removed and replaced, with same per the manufacturer's recommendations, at the contractor's expense.
- I. During hot temperature applications or when excess tack coat bleeds through the paving mat under normal construction traffic causing excessive movement of mat or "pick-up", a trackless tack is preferred way to mitigate this. A pneumatic tire roller with a water/soap spray to cool or broadcasting clean sand or hot mix to create a bond break between the excess tack and the construction equipment tires have been used. If sand is applied, any excess sand shall be removed from the interlayer, using methods other than power brooming, prior to placing the specified AC mix overlay. No other material, such as asphalt release agents or diesel, shall be used for this purpose.
- J. Transverse joint in the paving mat shall be overlapped in the direction of paving 3-5 inches (75 -127 mm) and longitudinal joints shall be overlapped 1-2 inches (25 -50 mm) or as recommended by the manufacturer. Paving mat shall be shingled in around the curve to achieve complete coverage in a curved area as diagramed here:

- On curves with tight radii, cut the GlasGrid product in short sections to reduce or eliminate ripples (Figure 3)

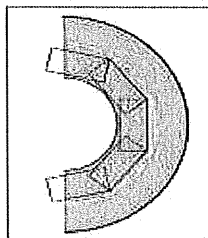


FIGURE 3: Cutting and overlapping GlasGrid around a curve

- K. Brooming, squeegee or pneumatic tire rolling shall be used to remove any air bubbles and to maximize paving mat contact with the pavement surface and shall be done in accordance with the manufacturer's specifications and to the satisfaction of the engineer. When there is difficulty getting adhesion such as windy conditions, placement shall be closer behind the tack application as the wind can create a skim on the asphalt surface quickly. It is also recommended that a pneumatic tire roller (do not use a steel roller) be used to aid in full adhesion of the interlayer into the hot asphalt tack.

- L. No traffic, except necessary construction traffic or emergency vehicles, shall be driven on the paving mat, unless approved by the engineer. If traffic on the interlayer is approved by the engineer, clean sand shall be lightly broadcasted over the paving mat interlayer or any exposed uncovered tack coat. Any loose sand shall be removed prior to paving. Care shall be taken to insure no sudden stops, sharp turning of wheels to prevent damage to the paving mat.
- M. After installing the paving mat, placement of the first lift of the specified AC mix overlay shall closely follow. All areas in which the paving mat has been placed shall be paved during the same day, unless approved otherwise by the engineer or manufacturer's representative.
- N. In the event of rainfall on the paving mat prior to the placement of the first specified AC mix overlay lift, the paving mat shall be allowed to dry before the specified AC mix is placed.
- O. The compacted thickness of the first lift of the specified AC mix overlay on the paving mat shall not be less than 1.5 inches (40mm)

End of Section
Vers. 02-01-19

SPECIAL PROVISIONS

FLARED END TERMINAL

DESCRIPTION:

The work under this item shall consist of furnishing all labor, equipment, and components necessary for complete installation of a flared end terminal. Flared end terminal shall meet the requirements and guidelines of National Cooperative Highway Research Program (NCHRP) Report 350 for test level 3 (TL-3). Flared end terminal shall be Valtir SRT 31 or approved equal.

PAYMENT:

Accepted quantities of items will be paid for at the contract unit price as follows:

FLARED END TERMINAL

EACH

Such payment shall be full compensation for all equipment, tools, labor, and incidentals necessary to complete the work as specified.

SPECIAL PROVISIONS
FOR
GRABBER TUBES

Grabber tubes shall be 42" Navigator All-In-One Channelizer Cone or approved Equal.

Grabber tubes can only be used by the Contractor in lieu of Drums with the approval of the Engineer.

Grabber Tubes shall be measured as provided in Oklahoma Department of Transportation 2019 Standards Specifications for Highway Construction Section 880.05 and will be paid at the contract unit price as follows:

Grabber Tubes.....SD

SPECIAL PROVISIONS
FOR SPECIAL SPECIFICATION
OF HIGH EARLY STRENGTH CONCRETE

DESCRIPTION

This work shall consist of furnishing and placing, High Early Strength Concrete.

MATERIALS

High Early Strength Concrete shall conform to Section 701, Portland Cement Concrete, of the Oklahoma Department of Transportation (ODOT) Standard Specification for Highway Construction, Current Edition, with the following modifications:

Air Content	-	5-7 percent
Maximum Water - Cement Ratio	-	0.41
Slump	-	1-3 inches

Batching shall measure the weights of each material required within a tolerance of one percent for cement and two percent for aggregates (account for moisture content). The quantity of water used shall be within plus or minus one percent of that required by the design. Water may be measured either by volume or by weight. All materials shall be used in strict accordance with the manufacturer's recommendations.

Submittals shall be delivered to the City of Tulsa at a date set by the Engineer. Submittals shall include the items outlined in ODOT Specification 701.03.

CONSTRUCTION METHODS

The concrete shall be mixed between 70 to 100 revolutions of the ready-mix truck. Mixing shall be in a mechanical mixer capable of combining the aggregates, cement, and water into a thoroughly mixed and uniform mass within the manufacturer's specified mixing period. There shall be no water in the mixing drum prior to adding the aggregates.

TESTING

Following are the testing requirements for the High Early Strength Concrete mix:

Compressive Strength: ¹	2,500 pounds per square inch (psi) – 12 hours 3,000 psi – 24 hours
Slump:	1 inch minimum 3 inches maximum
Air Content:	5-7 percent

¹ During cool weather (less than 50 degrees Fahrenheit), specimens shall be cured in a fully insulated closed box.

During moderate weather (between 50°F and 80°F), specimens shall be cured in both open and fully insulated closed boxes with compressive strength tests performed on specimens from each curing box.

During warm weather (greater than 80°F), specimens shall be cured in a closed box placed in a shaded area.

**SPECIAL PROVISIONS
FOR
INTERLOCKING CONCRETE PAVERS**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Interlocking Concrete Paver Units (manually installed).
 - 2. Bedding and Joint Sand.
 - 3. Edge Restraints.
- B. Related Sections:
 - Section: 02224 Cement Modified Aggregate Base.
 - Oklahoma Department of Transportation (ODOT) Standard Specification for Highway Construction, 2019 Edition, Section 317

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM C 33, Standard Specification for Concrete Aggregates.
 - 2. ASTM C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - 3. ASTM C 140, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
 - 4. ASTM C 144, Standard Specification for Aggregate for Masonry Mortar.
 - 5. ASTM C 936, Standard Specification for Solid Concrete Interlocking Paving Units.
 - 6. ASTM C 979, Pigments for Integrally Colored Concrete.
 - 7. ASTM D 698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,000 ft-lb/ft³ (600 kN-m/m³)).
 - 8. ASTM D 1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb/ft³ (2,700 kN-m/m³)).
 - 9. ASTM D 2940, Specification for Graded Aggregate Material for Bases or Subbases for Highways or Airports.

1.03 SUBMITTALS

- A. In accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.
- B. Manufacturer's drawings and details: Indicate perimeter conditions, relationship to adjoining materials and assemblies, concrete paver installation and setting details.
- C. Sieve analysis per ASTM C 136 for grading of bedding and joint sand.
- D. Concrete pavers:
 - 1. Four representative full-size samples of each paver type, thickness, color, finish that indicate the range of color variation and texture expected in the finished installation. Color(s) to match adjacent paver colors.

2. Accepted samples become the standard of acceptance for the work.
3. Test results from an independent testing laboratory for compliance of paving unit requirements to ASTM C 936.
4. Manufacturer's certification of concrete pavers by ICPI as having met applicable ASTM standards.
5. Manufacturer's catalog product data, installation instructions, and material safety data sheets for the safe handling of the specified materials and products.

1.04 QUALITY ASSURANCE

A. Paving Subcontractor Qualifications:

1. Utilize an installer having successfully completed concrete paver installation similar in design, material, and extent indicated on this project.
2. Utilize an installer holding a current certificate from the Interlocking Concrete Pavement Institute Concrete Paver Installer Certification program.

B. Mock-Ups:

1. Install a 7 ft x 7 ft (2 x 2 m) paver area.
2. Use this area to determine surcharge of the bedding sand layer, joint sizes, lines, laying pattern(s), color(s) and texture of the job.
3. Evaluate the need for protective pads when compacting paving units with architectural finishes.
4. This area will be used as the standard by which the work will be judged.
5. Subject to acceptance by owner, mock-up may be retained as part of finished work.
6. If mock-up is not retained, remove and properly dispose of mock-up.

1.05 DELIVERY, STORAGE & HANDLING

A. Refer to manufacturer's ordering instructions and lead-time requirements to avoid construction delays.

B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers packaging with identification labels intact.

1. Coordinate delivery and paving schedule to minimize interference with normal use of buildings adjacent to paving.
2. Deliver concrete pavers to the site in steel banded, plastic banded or plastic wrapped packaging capable of transfer by fork lift or clamp lift.
3. Unload pavers at job site in such a manner that no damage occurs to the product.

C. Storage and Protection: Store materials protected such that they are kept free from mud, dirt, and other foreign materials.

1.06 PROJECT/SITE CONDITIONS

A. Environmental Requirements:

1. Do not install sand or pavers during heavy rain or snowfall.
2. Do not install sand and pavers over frozen base materials.

3. Do not install frozen sand or saturated sand.
4. Do not install concrete pavers on frozen or saturated sand.

1.07 MAINTENANCE

- A. Extra Materials: None required.

PART 2 PRODUCTS

2.01 INTERLOCKING CONCRETE PAVERS

- A. Manufacturer:
1. Concrete pavers shall be equal to those supplied by Pavestone Company
 - a. D/FW, TX: 817/481-5802
 - b. Houston, TX: 281/391-7283
 - c. Kansas City, MO: 816/524-7283
 - d. San Antonio/Austin, TX: 512/558-7283
 - e. Dallas Service Center: 972/404-0400
 - f. Cape Girardeau, MO: 573/264-1500
 2. Hanover Prest-Paving Company, 240 Bender Road, Hanover, PA 17331
800/426-4212.
 3. Belgard Pavers from Bonner Springs, Kansas.
- B. Interlocking Concrete Paver Units, including the following:
1. Paver Type: As indicated on plan.
 - a. Material Standard: Comply with material standards set forth in ASTM C 936.
 - b. Color: As indicated on plan.
 - c. Color Pigment Material Standard: Comply with ASTM C 979.
 - d. Average Compressive Strength: 8,000 psi (55 MPa) with no individual unit under 7,200 psi (50 MPa).
 - e. Average Water Absorption (ASTM C 140): 5% with no unit greater than 7%.
 - f. Freeze/Thaw Resistance (ASTM C 67): Resistant to 50 freeze-thaw cycles with no greater than 1% loss of material. Freeze-thaw testing requirements shall be waived for applications not exposed to freezing conditions.

2.02 EXTRA STOCK

- A. None required.

2.03 PRODUCT SUBSTITUTIONS

- A. Interlocking concrete pavers: as specified or approved equal.

2.04 BEDDING AND JOINT SAND

- A. Provide bedding and joint sand as follows:
1. Clean, non-plastic, free from deleterious or foreign matter, symmetrically shaped, natural or manufactured from crushed rock.

2. Do not use stone dust.
3. Do not use limestone screenings or sand for the bedding that does not conform to the grading requirements of ASTM C 33.
4. Do not use mason sand, or sand conforming to ASTM C 144 for the bedding sand.
5. Where concrete pavers are subject to vehicular traffic, utilize sands that are as hard as practically available.
6. Sieve according to ASTM C 136.

Table 1

Grading Requirements for Bedding Sand

ASTM C 33		CSA A23.1-FA1	
Sieve Size	Percent Passing	Sieve Size	Percent Passing
3/8 in. (9.5 mm)	100	10 mm	100
No. 4 (4.75 mm)	95 to 100	5 mm	95 to 100
No. 8 (2.36 mm)	80 to 100	2.5 mm	80 to 100
No. 16 (1.18 mm)	50 to 85	1.24 mm	50 to 90
No. 30 (0.600 mm)	25 to 60	0.630 mm	25 to 65
No. 50 (0.300 mm)	10 to 30	0.315 mm	10 to 35
No. 100 (0.150 mm)	2 to 10	0.160 mm	2 to 10
No. 200 (0.075 mm)	1	0.075 mm	1

Table 2

Grading Requirements for Joint Sand

ASTM C 144		ASTM C 144		CSA A179	
Natural Sand		Manufactured Sand			
Sieve Size	Percent Passing	Percent Passing	Sieve Size	Percent Passing	
No. 4 (4.75 mm)	100	100	5 mm	100	
No. 8 (2.36 mm)	95 to 100	95 to 100	2.5 mm	90 to 100	
No. 16 (1.18 mm)	70 to 100	70 to 100	1.25 mm	85 to 100	
No. 30 (0.600 mm)	40 to 75	40 to 100	0.630 mm	65 to 95	
No. 50 (0.300 mm)	10 to 35	20 to 40	0.315 mm	15 to 80	
No. 100 (0.150 mm)	2 to 15	10 to 25	0.160 mm	0 to 35	
No. 200 (0.075 mm)	0 to 1	0 to 10	0.075 mm	0 to 1	

7. Bedding Sand Material Requirements: Conform to the grading requirements of ASTM C 33 with modifications as shown in Table 1.
8. Joint Sand Material Requirements: Conform to the grading requirements of ASTM C 144 as shown with modifications in Table 2 or meet the requirements for bedding sand in Table 1.

2.05 EDGE RESTRAINTS

- A. Where not otherwise retained, provide edge restraints installed around the perimeter of all interlocking concrete paving unit areas as follows:
 1. Manufacturer: As specified in Tree Well areas. All other areas to be concrete bordered.

2.06 ACCESSORIES

- A. Provide accessory materials as follows:
 1. Geotextile Fabric:
 - a. Material Type and Description: Equal to AEF Geotextile no. 680 by American Excelsior Company or Supac (6oz.) by Phillips Petroleum.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Acceptance of Site Verification of Conditions:
 - 1. General Contractor shall inspect, accept and certify in writing to the paver installation subcontractor that site conditions meet specifications for the following items prior to installation of interlocking concrete pavers.
 - a. Compact subgrade surfaces to at least 98% standard Proctor density per ASTM D698 for pedestrian areas and at least 98% modified Proctor density per ASTM D 1557 for areas subject to heavy vehicular traffic. Stabilize the subgrade and/or base material if subgrade or base is weak or saturated.
 - b. Verify that geotextiles, if applicable, have been placed smooth and according to drawings and specifications.
 - c. Verify that Aggregate base materials, thickness, compacted density, surface tolerances (+ 3/8" over a 10-foot straight edge) and elevations conform to specified requirements.
 - d. Provide written density test results for soil subgrade, aggregate, and cement-treated base materials to the Owner, General Contractor and paver installation subcontractor.
 - e. Verify location, type, and elevations of edge restraints, concrete collars around utility structures, and drainage inlets.
 - 2. Do not proceed with installation of bedding sand and interlocking concrete pavers until subgrade soil and base conditions are corrected by the General Contractor or designated subcontractor.

3.02 PREPARATION

- A. Verify base is dry, certified by General Contractor as meeting material, installation and grade specifications.
- B. Verify that base and geotextile is ready to support sand, edge restraints, pavers and imposed loads.
- C. Edge Restraint Preparation:
 - 1. Install edge restraints per the drawings at the indicated elevations.

3.03 INSTALLATION

- A. Spread bedding sand evenly over the base course and screed to a nominal 1 in. (25 mm) thickness. Spread bedding sand evenly over the base course and screed rails, using the rails and/or edge restraints to produce a nominal 1 in. (25 mm) thickness, allowing for specified variation in the base surface.
 - 1. Do not disturb screeded sand.
 - 2. Screeded area shall not substantially exceed that which is covered by pavers in one day.
 - 3. Do not use bedding sand to fill depressions in the base surface.

- B. Lay pavers in pattern(s) to match adjacent areas. Make horizontal adjustments to laid pavers as required.
- C. Provide joints between pavers 1 / 16 in. wide. No more than 5% of the joints shall exceed 1 / 8 in. (6 mm) wide to achieve straight bond lines.
- D. Joint (bond) lines shall not deviate more than $\pm 1 / 2$ in. (15 mm) over 50 ft. (15 m) from string lines.
- E. Fill gaps at the edges of the paved area with cut pavers or edge units.
- F. Cut pavers to be placed along the edge with a masonry saw.
- G. All cut pavers exposed to vehicular tires shall be no smaller than one-third of a whole paver.
- H. Keep skid steer and forklift equipment off newly laid pavers that have not received initial compaction and joint sand.
- I. Use a low-amplitude plate compactor capable of at least minimum of 5,000 lbf (22 kN) at a frequency of 75 to 100 Hhz to vibrate the pavers into the sand. Remove any cracked or damaged pavers and replace with new units.
- J. Simultaneously spread, sweep and compact dry joint sand into joints continuously until full. This will require at least 4 to 6 passes with a plate compactor. Do not compact within 6 ft (2 m) of unrestrained edges of paving units.
- K. All work within 6 ft. (2 m) of the laying face shall be left fully compacted with sand-filled joints at the end of each day or compacted upon with plastic sheets overnight if not closed with cut and compacted pavers with joint sand to prevent exposed bedding sand from becoming saturated from rainfall.
- L. Remove excess sand from surface when installation is complete.
- M. Allow excess joint sand to remain on surface to protect pavers from damage from other trades. Remove excess sand when directed by Owner's Representative.
- N. Surface shall be broom clean after removal of excess joint sand.
- O. Re-sanding of the paver joints, as necessary, shall be accomplished by the Contractor for a period of 90 days after completion of the work.

3.04 FIELD QUALITY CONTROL

- A. The final surface tolerance from grade elevations shall not deviate more than $\pm 3 / 8$ in. (10 mm) over 10 ft (3 m). Use a straightedge, flexible straightedge or transit depending on surface slope and contours.

- B. Check final surface elevations for conformance to drawings.
- C. The surface elevation of pavers shall be 1 / 8 in. to 1 / 4 in. (3 to 10 mm) above adjacent drainage inlets, concrete collars or channels.
- D. Lippage: No greater than 1 / 8 in. (3 mm) difference in height between adjacent pavers.

3.05 PROTECTION

- A. After work in this section is complete, the General Contractor shall be responsible for protecting work from damage due to subsequent construction activity on the site.

BASIS OF PAYMENT

60mm Concrete Paving Unit	SY
60mm ADA Compliant Concrete Paving Unit	SY
80mm Concrete Paving Unit	SY
**Cement Modified Aggregate Base	SY

Such payment shall be full compensation for excavation of subgrade material necessary for installation of hardscape, edge restraints equal to "Pave Edge" by Pavetech for securing pavers adjacent to turf or landscape, furnishing all materials including sand setting bed and polymer joint sand, equipment, labor, and incidentals necessary to complete the work.

**The cost of cement modified aggregate base to be paid separately.

**SPECIAL PROVISIONS
FOR
INSERTA TEE CONNECTION & DETAIL**

INSERTA TEE® SERVICE CONNECTION SPECIFICATION

Scope

This specification describes Inserta Tee service connections for use in gravity-flow sewer and storm drainage applications.

Product Requirements

Inserta Tee service connections, as manufactured by Inserta Tee, shall consist of a PVC hub, rubber sleeve, and stainless steel band. Connection shall be a compression fit into the cored wall of a mainline pipe. Hub shall be made from heavy-duty PVC material. Stainless steel clamping assembly shall be of SS #301 for the band and housing and SS #305 for screws. Rubber sleeve and gasket, when applicable, shall meet the requirements of ASTM F477. Gaskets shall be installed by the manufacturer. A water-based solution provided by the manufacturer shall be used during assembly.

The Inserta Tee can be installed into any mainline pipe or structure. Connection hubs are available to connect to corrugated polyethylene, corrugated polypropylene, PVC C900, SDR 26 HWS, SDR 35 (gasketed bell), IPS/Sch 40 (gasketed bell & solvent weld bell). Availability of connection diameters is based on the service pipe material.

Joint Performance

Inserta Tee® product shall provide a watertight connection according to the requirements of ASTM D3212 or ASTM F2946-12 (additional specifications listed below)*

Field Pipe and Joint Performance

To assure watertightness, field performance verification may be accomplished by testing in accordance with ASTM F2487. Appropriate safety precautions must be used when field-testing any pipe material. Contact the manufacturer for recommended leakage rates.

Installation

Installation shall be in accordance with manufacturer's recommended installation guidelines (reference detail STD-1100A for step-by-step installation instructions). The use of installation methods or hole saws not purchased from Inserta Fittings will void the performance warranty of the product. Backfill around the Inserta Tee service connection shall be of the same material type and compaction level as specified for the mainline pipe installation. For shallow H-20 traffic applications (< 2' of cover) or deep burial applications (>= 25' in burial depth), Inserta Tee shall be encased in concrete. Actual dimensions of concrete must be designed (by others) taking into consideration local soil conditions & other applicable design factors, but shall extend no less than 12" in any direction from the fitting. Contact your local representative or visit the website at www.adspipe.com for a copy of the latest installation guidelines.



Scan QR code for installation video

* Inserta Tee® fittings have been tested to the following specifications: ASTM F2946-12, ASTM D3212, ASTM F2487, paragraph 10.2 of ASTM F1336-07 Impact resistance test, ASTM D2412-77, ASTM F1336 Section 10.3, ASTM F477, ASTM C-443, ASTM C1103.

CSA Standard B182.4M, NQ 3624-135, (Updated versions: CSA B182.2, BNO3624-135)

ADVANCED DRAINAGE SYSTEMS, INC. (ADS) HAS PREPARED THIS DETAIL BASED ON INFORMATION PROVIDED TO ADS. THIS DRAWING IS INTENDED TO DEPICT THE COMPONENTS AS REQUESTED. ADS HAS NOT PERFORMED ANY ENGINEERING OR DESIGN SERVICES FOR THIS PROJECT, NOR HAS ADS INDEPENDENTLY VERIFIED THE INFORMATION PROVIDED. ADS WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS IN THIS DETAIL. THE DESIGNER SHALL BE RESPONSIBLE FOR ENSURING THAT THE DETAILS PROVIDED HEREIN MEET OR EXCEEDS THE APPLICABLE NATIONAL, STATE, OR LOCAL REQUIREMENTS AND TO ENSURE THAT THE DETAILS PROVIDED HEREIN ARE ACCEPTABLE FOR THIS PROJECT.

**INSERTA TEE SERVICE
CONNECTION SPECIFICATION**

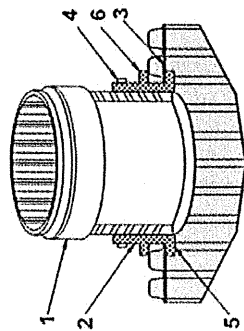
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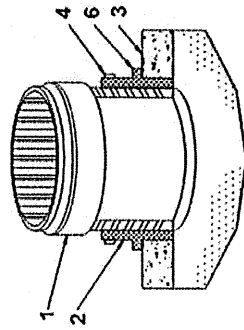
4640 TRUEMAN BLVD
HILLIARD, OH 43026

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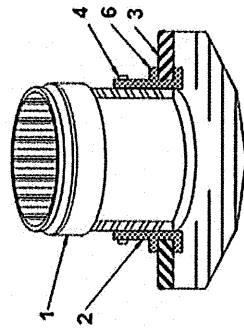
INSERTA TEE® CONNECTION DETAILS



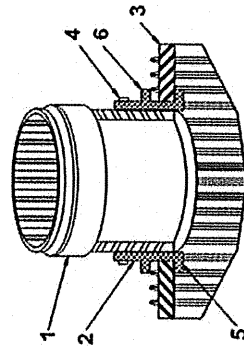
ADS PIPE



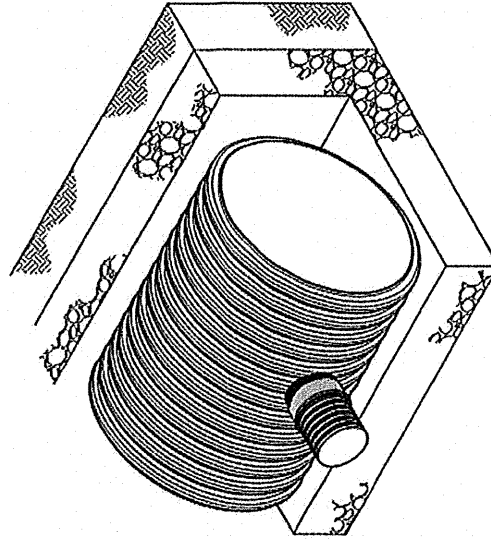
CONCRETE OR CLAY



SOLID WALL



PROFILE WALL



PART #	DESCRIPTION
1	PVC hub adapter which is driven into the center of the rubber sleeve after the rubber sleeve is in the hole.
2	Complete rubber sleeve consisting of ASTM F 477 specifications.
3	Mainline pipe wall where branch line is connected.
4	Stainless steel band, put on above rubber segment as an added precaution.
5	Rubber segment which is molded into the rubber sleeve. This prevents snap out on the inside of the drilled hole (plastic pipe only) and helps hold the fitting in place, not creating the seal.
6	Rubber segment which is molded into the rubber sleeve. This prevents the rubber sleeve from going through the drilled hole when PVC hub is being driven into the rubber sleeve.

Note: Watertight seal is accomplished when PVC hub is driven into rubber sleeve causing the rubber sleeve to compress between pipe wall and PVC hub.

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INSERTA TEE CONNECTION DETAILS

4640 TRUEMAN BLVD
HILLIARD, OH 43026

ADS

DRAWING NUMBER STD-1123

DATE 12/4/23
BY ENG
CHECKED NTS
SCALE 1

SPECIAL PROVISIONS
FOR JOINT/CRACK SEAL OF PCC STREETS
WITH LOW MODULUS SILICONE JOINT SEALER

1. **SEALING INSTRUCTIONS:** When material covered by this specification is used for maintenance or resealing of joints that have previously contained either similar or dissimilar sealing material, it is required that the joint be dry and cleaned thoroughly with a plow, wire brush, concrete saw, or other suitable tool or tools that are designed to neatly clean pavement joints. Loose material shall be blown out. The sidewalls of the joint space to be sealed shall be thoroughly sandblasted, blown free of loose sand with high-pressure air and then sealed.
2. **JOINT SHAPE REQUIREMENTS:** Specifications for the dimensions of joints and crack shall be the same as those recommended by the sealant manufacturer.
3. **SEALANT MATERIAL:** The construction of concrete joint rehabilitation shall meet the requirements of ODOT 701.08(e), "Joint Fillers and Sealers".
4. **METHOD OF MEASUREMENT:** Concrete joint rehabilitation and concrete crack seal will be measured by the linear foot after the joint sealant is in place.
5. **BASIS OF PAYMENT:** The accepted quantities measured as provided above will be paid for at the contract unit price for (LOW MODULUS SILICONE JOINT SEALER) by the linear foot which shall be full compensation for furnishing all materials, equipment, labor, and incidentals to complete the work specified.
6. Joint Sealing shall include all sawing and sealing of all expansion and contraction joints as well as random cracks greater than or equal to 3/8" in width as directed by the Engineer.
7. Concrete curb and combined curb and gutter to be removed and replaced shall receive joints per ODOT specification 609.04(e) and be sealed with silicone. Cost for joints and sealer to be included in the unit price for either Concrete Curb or Combined Curb and Gutter.

SPECIAL SPECIFICATIONS FOR JOINT SAND STABILIZER – POLYERIC

General

Environmental Conditions

- A. Do not use polymeric sand, during wet or rainy conditions.
- B. Do not install when temperatures are expected to drop below 32 degrees F during the drying period (minimum 48 hours).
- C. Ground Moisture damp or dew can cause material to emulsify.
- D. Do not store sand material on any surface without protection against moisture.

Safety and Handling

- A. Always wear dust mask while spreading polymeric sand material.
- B. Treat dust as you would silica dust.
- C. Will wash off skin and tools with water and scrubbing.
- D. Protect the appearance and integrity of the pavers by treating the surface with a protectant specifically designed to for use with polymeric sand.

Warning: Will cause damage to asphalt. Avoid mixing, staging or contact with asphalt. When using bituminous set paving and polymeric sand, it is important that no sand contaminates the asphalt or adhesive before paving are set. Using polymeric sand for joints on a bituminous set job will not cause problems. Always refer to manufacturer for the latest in installation information, specifications and MSDS information.

Product:

Acceptable Manufacturers

- A. Techniseal
- B. Sakcrete
- C. Quikcrete
- D. Surebond

Properties

- A. Joint Sand properties and gradations conform to ASTM-C144 Bedding Sand properties and gradation.
- B. Coverage – Approximately 50 lbs of polymeric Sand are used per 100 sq ft. for joint of nominal 200mm x 100mm x 60mm block paving. Coverage will vary with the size and shape of the paver as well as the width of the joint.

Execution

Installation

- A. Before placement of the polymeric sand and before allowing traffic, a protectant must be applied. This product should prevent any residue adhering to the paving.
- B. Surface must be completely dry. Spread sand uniformly over the surface. Using a push broom, sweep the product as to fill the joints completely, down to the full depth. Avoid sweeping the product over long distances, so that the integrity of polymeric joint is preserved.

- C. Pass a plate vibrator over the entire surface to fully firm up the joints. Repeat steps B and C until the joints are completely packed. Joints must be filled up to the bottom of the pavers chamfer, or at least up to 1/8" below the top of pavers.
- D. Reference requirements and specifications of product manufacture before activation.

Activation

- A. Carefully sweep entire pavement clean. Remove polymeric sand mixture from the paving surface and chamfered areas. Power brooms and blowers are recommended for large areas. NOTE: Excess material remaining on surface after the mixture has been activated can be difficult to remove.
- B. The polymeric sand in the entire paved area should be activated per the manufacture requirements. Care must be taken to avoid washing sand from the joints.
- C. After activation the surface area should be allowed to dry, prior to allowing traffic onto the paved area. Allow a minimum of 24-48 hours in areas where motor-vehicles will have access.

Cleanup

- A. NEVER LEAVE POLYMERIC SAND RESIDUE ON SURFACES. If polymeric is left on surface, it may emulsify. Depending on severity it may come off with water and brushing or may require pressure washing.
- B. WARNING-DO NOT use polymeric sand material in the bedding layer. DO NOT stage or come into contact with asphalt. Polymeric sand may wick out the oils in asphalt and will cause damage.
- C. Read manufactures instructions completely before using.

Payment

Measurement for payment will be by the Pound (lb) of Joint Sand Stabilizer (Polymeric) placed. Payment shall be full compensation for furnishing all material, equipment, labor, and incidentals necessary to complete the work.

Concrete for bedding or foundations and Masonry Bricks will be paid separately.

SPECIAL PROVISIONS
LANDSCAPE ALLOWANCE

The "Landscape Allowance" may be used for various work and miscellaneous items not specifically identified in the Contract Documents with the following provisions:

- A. The allowance shall be used for cost of design and construction, including all materials, labor, equipment, profit and overhead, of Landscape work items not specifically identified in the Construction Documents, or included in original pay items bid for the contract.
- B. The allowance shall be utilized only at the discretion of the City of Tulsa. Any balance remaining at the completion of the Project will be retained by the City of Tulsa.
- C. The Contractor shall provide, to the City of Tulsa, a written request for the use of any allowance, including a schedule of values and associated backup information, including validity of need, materials, labor, equipment, and time required to perform the associated work.

Contractor shall proceed with the allowance work only after receiving written permission from the City of Tulsa. Proceeding with associated allowance work without written permission from the City of Tulsa will be at the Contractor's sole expense.

02/08/16

SPECIAL PROVISIONS
FOR SPECIAL SPECIFICATION
OF TYPE I MONUMENT PAYMENTS

Under this item, the Contractor shall furnish and place for the payment requested for each monument, all materials, labor, equipment, and incidentals necessary to complete the work as shown on the sketch on the following page. The brass marker shall be provided by the City. The 5/8 inch rebar shall be a minimum of 36 inches in length. The locations will be as ordered by the Engineer.

Materials will be in accordance with Section 626.02 of ODOT's Standard Specifications for Highway Construction, current addition, with Accelerated High Early Strength Concrete substituted for Portland Cement Concrete.

M-1

SPECIAL PROVISIONS
FOR
MASONRY BRICK AND STONE REPAIR

1. This work shall consist of furnishing and placing masonry bricks or stone to replace existing paving or walls which must be repaired in conjunction with a paving cut. The brick and mortar shall match the existing materials to the extent possible.
2. Measurement for payment will be by the square feet of surface area covered by the paving or wall. Concrete for bedding or foundations will be paid separately. Payment shall be full compensation for furnishing all materials, equipment, labor and incidentals necessary to complete the work.

SPECIAL PROVISION
MULTI-AXIAL COMPOSITE PAVING GRID

PART 1 – GENERAL

1.01 DESCRIPTION

This Section includes specifications for placing the composite paving grid at the locations and to the dimensions shown on the Plans and as directed by the Engineer. The composite paving grid shall be placed on existing asphalt or concrete pavement to be overlaid with either hot mix or warm mix asphalt concrete.

As installed, Interlayer must meet the following performance objectives:

1. Form a moisture barrier to protect against moisture intrusion from top down into base.
2. Provide multi-axial tensile reinforcement which limits elongation in all directions to maximize the delay and reduced severity of reflective cracks.
3. Must be available in up to 12.5-foot widths to reduce longitudinal laps.
4. Must result in a compatible, laminated, bonded structure between lifts of HMA.

PART 2 – PRODUCT

2.01 MATERIALS

- A. Shall be an engineered multi-axial composite paving grid interlayer constructed of uncoated, multi-directional, continuous strand, high strength fiberglass fibers, bound to a carrier that when properly saturated with hot asphalt binder forms a moisture barrier and provides multi-directional tensile conforming to the following test methods and physical properties:

Table 2.01 A – Multi-Axial Composite Paving Grid Nominal Properties

Property	ASTM Test Method	Units	Avg. Roll Value
Tensile Strength @ 0° Tensile Strength @ 90° *Tensile Strength @ 45° *Tensile Strength @ -45°	D6637 Method A modified ¹	lbs./in (kN/m)	459(80)
Elongation at Max Load		%	< 3.0
Melting Point (glass)	D276	°F (°C)	752° (400°)
Asphalt Retention	D6140	gal/yd ² (liters/m ²)	.17 (0.8)
Mass per Unit Area	D5261	oz/yd ² (g/m ²)	16 (452)
Glass by Weight		%	85

¹In paving applications, bias angle tensile strength can be a factor in mitigating multi-directional crack propagation. Tested per ASTM D6637 to determine Tensile Strength values of the continuous strand fiberglass filaments.

- B. The paving grid shall conform to all design and nominal performance properties of TenCate Mirafi MPG4 paving grid, manufactured in USA as listed above. All other submittals will be rejected unless received along with independent confirmation of the material values and approved by project engineer at least 2 weeks prior to bid date.

2.02 STORAGE

- A. The paving interlayer rolls shall be protected from dust, dirt and the elements. A durable label, indicating manufacturer, product name or style number, roll and lot number, and roll dimensions shall be attached to each roll.
- B. The paving interlayer rolls shall be delivered, stored and handled in a manner to prevent damage and shall be inspected for defects and damage prior to use.
- C. The paving interlayer shall be stored as manufacturer recommends: in a dry covered condition, free from dust, dirt, off the ground, protected from precipitation, ultraviolet radiation, strong chemicals, sparks and flames, temperatures in excess 71 °C (160 °F) and other environmental condition that could cause damage.

PART 3 – EXECUTION

3.01 SURFACE PREPARATION

- A. All areas of base failure shall be removed and replaced to acceptable industry standards for the specific traffic loads and condition of the project.
- B. In an overlay or milled surface application repair all failed pavement areas prior to installation of the paving interlayer. Fill all cracks ¼" or greater with approved material.
- C. Immediately prior to placement of paving interlayer, the pavement surface shall be dry, cleaned of anything that would interfere with adhesion, for E.g., vegetation, dirt, gravel or water.
- D. A leveling or "scratch" course is recommended when road surface is not acceptable and shall be of proper gradation and sufficient thickness to achieve a smooth, level surface with no gaps greater than ¼" depth and width or be acceptable to the project engineer.
- E. A finish grind may be used as an alternative to an asphalt leveling course being placed, when you can achieve the final surface texture has no cracks, gaps or vertical angles greater the ¼" depth and width or be acceptable to the project engineer. In all cases the surface must be clean and dry, and the application rate of the Hot PG grade asphalt binder shall be increased to insure complete interlayer saturation and bonding. Suggest review of Asphalt Interlayer Association input: "Other Industry Resources" below.

3.02 INSTALLATION

- A. Over a new asphalt section or where a leveling course has been installed, apply the paving interlayer grid in a hot PG graded asphalt binder. Asphalt Emulsion is NOT acceptable for placing paving interlayer due to time delay for it to break and the difficulty in insuring quality as installed.
- B. Asphalt Binder
 - 1. A hot asphalt binder shall be applied to saturate the paving interlayer (min. to be the asphalt retention rate) plus amount needed to bond to existing surface and the new overlay. The asphalt binder to be used shall be PG 58 or higher. Sustained ambient temperatures (above 90°) may require a stiffer binder gradation like PG70 or higher to improve set time and reduce risk of grid pick-up under construction traffic.
 - 2. The hot asphalt binder shall be applied at a rate of 0.18 to 0.20 gal./SY on a new HMA leveling surface. On an old smooth surface or a clean fine milled surface apply hot asphalt binder at a rate of 0.19 and 0.21 gal./SY or as recommended by the paving interlayer manufacturer or as directed by the Engineer.
 - 3. The hot asphalt binder shall be applied by a distributor truck in a smooth uniform manner at as low a temperature as is possible to achieve the right application rate, depending on ambient and road surface temperatures and type of PG asphalt binder used. Target 177 °C (350 °F) or below in most cases. Spray application shall extend four (4) inches wider than width of paving interlayer on lap side.
- C. The paving interlayer shall be installed with equipment in good working order that can install the grid without wrinkles or manually as needed and recommended by manufacturer.
 - 1. If manual lay-down methods are used, the composite paving grid shall be unrolled, aligned, and placed in increments of approximately thirty (30) feet or as project engineer suggest.
 - 2. The material shall be placed flat and wrinkle-free. The paving interlayer installation may require hand sweeping as necessary to eliminate ripples that may occur during installation.
 - 3. To ease installations around curves, the paving grid can be placed in shortened lengths by mechanical equipment or by hand.
 - 4. Paving interlayer shall be lapped two (2) to four (4) inches longitudinally and two (2) to four (4) inches transversely. Transverse laps shall be in the direction of the asphalt concrete overlay placement insuring hot asphalt binder is placed under the overlap.
 - 5. Sweeping of paving interlayer is required to insure adequate adhesion into the hot asphalt binder. If the interlayer wrinkles more than 1" height during installation, the wrinkle shall be cut and lapped in the direction of paving.

6. Paving interlayer to be installed with the glass grid facing down to existing surface.
7. Turning of construction equipment and other vehicles shall be gradual and kept to a minimum to avoid damage to the paving interlayer. If excessive heat, overspray, or turning cannot be eliminated then spreading small quantities of HMA or clean blotting sand onto the interlayer may be required in the affected area. Excess blotting sand shall be removed before installing HMAC over the interlayer.
8. After installing the paving interlayer, the pavement may be opened to traffic at the contractors/engineer's discretion. Caution: Parking on the installed paving grid prior to final overlay for extended periods could cause damage to the grid.
9. Paving interlayer should never be installed when it or the pavement surface is wet.
10. Minimum HMAC overlay thickness recommended is 2", but in no case, less than 1.5" thick and should be in accordance with the Asphalt Institute (AI) guidelines. (See "Other Industry Resources" below)

NOTE: Minimum lift thickness should be at least 3 times the nominal maximum aggregate size to ensure aggregate can align themselves during compaction to achieve required density and to ensure mix is impermeable.

3.03 WORKMANSHIP AND QUALITY CONTROL

A. PAVING INTERLAYER INSTALLATION QUALITY CONTROL

The project engineer shall confirm the proper installation of the paving interlayer by, at their discretion:

1. Daily, contractor to certify that interlayer was installed per plans and specifications and confirm, by weight tickets and measuring asphalt used, that the hot asphalt binder usage equates to the specified amount for proper interlayer saturation and bonding.
2. Hot asphalt binder application rate shall not be reduced without Project Engineer approval.
3. Certification of compliance from the binder supplier shall be provided for each load of hot asphalt binder delivered to the jobsite, showing the type and quality of material delivered.
4. Installing contractor shall be provided satisfactory confirmation to the Project Engineer showing the total quantity of asphalt binder was installed, at the proper application rate as published by the manufacturer on the entire project. Suggest weight tickets just prior to arrival to and exit from jobsite from an independent weight station.

5. QA/QC inspection is at the discretion of the Project Engineer. The Project Engineer can choose to implement any or all the following:
 - a. Self-inspecting
 - b. Requesting the interlayer Manufacturer's Technical Representative be present
 - c. Using an independent 3rd party, approved by the project engineer to inspect installation and paid for by the installing contractor as a separate line item.
6. The installing contractor shall give enough notice of planned work schedule such that proper inspection of workmanship is accomplished.
7. Contractor to schedule with inspector and no work shall be done without the QA/QC inspector on-site or as determined by the project engineer.

B. MEASUREMENT AND PAYMENT

Payment for the paving interlayer shall be measured and paid for at the contract unit bid price per square yard, and shall include full compensation for furnishing all labor, tools equipment and incidentals for doing all the work involved in placement of the paving interlayer.

Payment for the hot asphalt binder application shall be by the ton and shall include all labor, materials and equipment necessary to apply the hot asphalt binder.

OTHER CONSIDERATIONS:

At the project engineer's discretion, consider adding the following:

Under Section 1.01 DESCRIPTION:

As installed, Interlayer must meet the following performance objectives:

5. Form a moisture barrier to protect against moisture intrusion from top down into base.
6. Provide multi-axial tensile reinforcement which limits elongation in all directions to maximize the delay and reduced severity of reflective cracks.
7. Must be available in up to 12.5-foot widths to reduce longitudinal laps.
8. Must result in a compatible, laminated, bonded structure between lifts of HMA.

Under Section 2.01 MATERIALS:

To achieve #2 above, include specific testing to determine the materials Multi-Axial capability.

1. In addition to machine direction and cross machine direction, material must be tested on the bias angle per ASTM D6637 modified to confirm limited elongation in all directions to engage tensile for maximum delay and reduced severity of reflective cracks.

Under Section 3.03 WORKMANSHIP AND QUALITY CONTROL:

A. PAVING MAT INSTALLATION QUALITY CONTROL

1. QA/QC inspection is at the discretion of the project engineer.
 - a. Self-inspecting
 - b. Requesting the interlayer Manufacturer's Technical Representative be present
 - c. Using an independent 3rd party, approved by the project engineer to inspect installation and paid for by the installing contractor as a separate line item.
2. The installing contractor shall give enough notice of planned work schedule such that proper inspection of workmanship is accomplished.
3. Contractor to schedule with inspector and no work shall be done without the QA/QC inspector on-site or as determined by the project engineer.
4. Daily, contractor to certify that interlayer was installed per plans and specifications and confirm, by weight tickets and measuring asphalt used, that the hot asphalt binder usage equates to the specified amount for proper interlayer saturation and bonding.

INDUSTRY RESOURCES:

Asphalt Interlayer Association: Grinding Specification:

When Finish, Grinding is used as an alternative to an asphalt leveling course being placed over conventional grinding prior to the placement of an Interlayer product, the following specifications shall apply:

The cold milling equipment and operation shall have the capability to;

- 1) Remove asphalt concrete a minimum depth of 6mm (1/4 inch)
- 2) Provide a surface relief (distance between ridges) of no more than 6mm (1/4 inch)
- 3) Maintain a 6mm (1/4 inch) grade tolerance (transverse and longitudinally)

The equipment shall include the following features;

- A.) Minimum of 3 riding tracks
- B.) An automatic grade control system with an electronic averaging system having 3 sensors on each side of the machine
- C.) A drum that operates in the up-milling direction
- D.) Bullet tooth tools with tungsten carbide steel cutting tips
- E.) A 6mm (1/4 inch) tool spacing

The contractor shall select which sensors are activated during the milling operation to produce the profile required as shown on the plans. The cold milling equipment shall have a complete set of new tooth tools at the beginning of the job. The tooth tools shall be replaced as necessary to maintain the tolerances listed above. All removed materials shall become the property of the Contractor. Removed asphalt concrete surfacing will be measured by the square meter. The contract price paid per square meter for removal of asphalt concrete surfacing shall include full compensation for furnishing all labor, materials, tools, and incidentals and for doing all work involved in removing asphalt concrete surfacing as specified and shown on the plans. All areas that have been ground shall be swept with power equipment which will remove all grinding and debris prior to placement of the Interlayer.

Asphalt Institute: Hot Mix Asphalt Thickness:

Nominal aggregate size dictates lift thickness. Minimum lift thickness should be at least 3 times the nominal maximum aggregate size to ensure aggregate can align themselves during compaction to achieve required density and to ensure mix is impermeable. Therefore, the desired lift thickness can direct the decision on nominal aggregate size to use.

The maximum lift thickness is dependent also upon the type of compaction equipment that is being used. When static steel-wheeled rollers are used, the maximum lift thickness that can be properly compacted is 3 inches. When pneumatic or vibratory rollers are used, the maximum thickness of lift that can be compacted is almost unlimited. Generally, lift thicknesses are limited to 6 or 8 inches. Proper placement becomes a problem in lifts thicker than 6 or 8 inches.

For open-graded mixes, compaction is not an issue since it is intended that these types of mixes remain very open. Therefore, the maximum size aggregate can be as much as 80 percent of the lift thickness.

SPECIAL PROVISIONS
FOR
MOBILIZATION FOR PRESSURE GROUTING

This work shall consist of the performance of construction preparatory operations by the contractor, including the movement of personnel and equipment to the project site and for the establishment of facilities necessary to begin pressure grouting work. Six hours of pressure grouting work must be performed on the day of mobilization, or the pressure grouting work must be completed at the job site for payment of mobilization to be made. Only one mobilization payment per day per pressure grouting machine shall be allowed.

Mobilization for Pressure Grouting will be measured by each day work is performed as describe above and shall be paid for at the contract price for:

MOBILIZATION FOR PRESSURE GROUTING DAY

which shall be full compensation for performing the work specified and the furnishing of all materials, labor, tools, equipment, and incidentals necessary to mobilize and subsequently demobilize the construction preparatory operations.

SPECIAL PROVISIONS
FOR
NON-BERMUDA SLAB SODDING

Under this item, the Contractor shall furnish and plant viable grass sod including Fescue, Bluegrass, Zoysia, or Tiff Green (#419) in accordance with Section 230 of the ODOT Standard Specifications for Highway Construction, 2019 edition. The locations shall be established by the Engineer.

Watering, fertilizing and mowing referenced in Section 230.04 will be included in the price bid per square yard of Non-Bermuda Slab Sodding. They shall not be paid for separately.

SPECIAL PROVISIONS
FOR NOVACHIP OVERLAY

DESCRIPTION. This work shall consist of laying Novachip Overlay.

MATERIAL. The material used shall be in accordance with the manufactures recommendations and meet all requirements for Novachip Overlay as sold by SemMaterials or an approved equal.

CONSTRUCTION METHODS. The methods of construction shall be in accordance with the requirements and recommendations of Koch Pavement Solutions for Novachip or the recommendations of the manufacture of an approved equal. This shall include but is not limited to the paving machine and paving train, the temperature requirements, rate of application of emulsion, the speed of the paving train, or other factors as required or recommended by the manufacture. During the initial lay down operations, a manufacture's representative shall be onsite to ensure that all requirements for a proper installation have been met.

METHOD OF MEASUREMENT. Novachip Overlay will be measured by the square yard of material placed.

BASIS OF PAYMENT. Accepted panels, measured as provided above, will be paid for at the contract unit price as follows:

NOVACHIP OVERLAY

SQUARE YARD

Such payment shall be full compensation for furnishing all materials, equipment, labor and incidentals to complete the work as specified.

SPECIAL PROVISIONS
FOR PATCHING OF CONCRETE AND ASPHALT STREETS

The City of Tulsa Standards for street cut and repair shall be followed for materials and procedures except as modified here.

Patching

Instructions: Portland Cement concrete patches will be protected from all traffic for a period of 24 hours before removal of protective devices. Sawing of the patches is required. The area to be removed shall be marked by the Contractor under the direction of the Resident Inspector. The Contractor will provide personnel and equipment for making of patches as directed by Resident Inspector. When completed, the patch shall be level and provide a smooth riding surface. All asphalt patch work will require that asphalt rollers and an asphalt laydown machine be available for use on the job as directed by the engineer. The minimum size of any patch shall be 3' x 3'.

Testing of

Materials: The frequency of testing shall be as follows:

Subgrade Compaction: A minimum of one (1) density test of the subgrade shall be done per patch.

Concrete: Three cylinders shall be taken from every 50 cubic yards of concrete and tested for compressive strength.

Asphalt: Compaction and extraction tests shall be taken a minimum of every 50 tons of asphalt.

Weather

Limitations: The minimum temperature of the foundation course on which asphalt concrete may be laid shall be as shown in the following table:

Compacted Lift Thickness (inches)	Surface Temperature (minimum)
3 or more	40° F
1 ½ to 3	45° F
less than 1 ½	50° F

Asphalt

Materials: All asphaltic concrete used for this Project shall meet the specifications of ODOT Section 708. Under the paragraph, "Course Aggregates", the following sentence shall be added: When tested for soundness, the number of cycles shall be five (5), the solution shall be Na₂ SO, the maximum loss shall be 10%.

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**Type I Patch
Subgrade**

Replacement: Shall consist of the removal of subgrade material as measured from the bottom of the existing pavement. The removed subgrade material shall be replaced with separator fabric meeting the requirement of ODOT Section 325 and aggregate material meeting the requirement of ODOT Section 703.01 Type "A". The existing subgrade shall be compacted to 95% standard proctor density per AASHTO T-99 and the aggregate material shall be compacted to 98% modified proctor density per AASHTO T-180-86 Method as measured by the Nuclear Density Method. Compaction shall be done with a roller or vibratory hand tamper. Certain situations may require substitution of Quick-set Fill Concrete for aggregate material. Fill concrete specifications are shown on the Standards for Pavement Cut and Repair. Separator fabric shall be used at all full depth pavement patches where aggregate base is required, as directed by the Engineer. The fabric shall be cut or overlapped to fit the size of the patch. These items will be paid separately from the bid item for patching.

Type A Aggregate

Base: This material shall have the following gradation, which is ODOT Section 703-01 Type "A".

<u>Sieve (mm)</u>	<u>% Passing</u>
1 ½ in. (37.5)	100
¾ in. (19.0)	40 – 100
3/8 in. (9.5)	30 – 75
No. 4 (4.75)	25 – 60
No. 10 (2.00)	20 – 43
No. 40 (0.425)	8 – 26
No. 200 (0.075)	4 – 12

**Type I Patch
in PCC**

Pavement: When the patch is made in PCC, the pavement shall be cut with a concrete saw full depth before removal of existing pavement. The area to be patched shall be delineated in a straight-line geometric pattern. Placement of the subgrade stabilization material shall be in accordance with the paragraph; "Type I Patch Subgrade Replacement". After placement of the subgrade stabilization, the pavement shall be replaced with Class A High Early Strength concrete containing 4 to 6 percent air entrainment. The concrete shall have a maximum 3" slump. The concrete shall be placed in accordance with the detail in the drawings titled "Type I PCC Patch". The new concrete shall have a flat finish and match the grade of the adjacent pavement.

Existing joint patterns shall be reestablished and sealed as specified. The concrete shall be sprayed with curing compound and protected from traffic a minimum of 24 hours. Cold Joints around the perimeter of the patch shall be sawed and sealed with silicone in accordance with ODOT specification 701.08(E). All sawing, pavement removal, and sealing costs shall be included in the bid item for patching, H.E.S. concrete.

Type I Patch in Asphalt

Pavement: When the patch is made in asphalt, the pavement shall be cut with a concrete saw full depth before removal of existing pavement. The area to be patched shall be delineated in a straight-line geometric pattern. Placement of the subgrade stabilization material shall be in accordance with the paragraph; "Type I Patch Subgrade Replacement". After placement of the subgrade stabilization material, the pavement shall be replaced in accordance with the detail in the drawings titled "Type I AC Patch", a minimum of 8" or existing paving thickness, whichever is greater. All asphalt materials shall meet the specifications of ODOT 708 Plant Mix Bituminous Bases and Surface. The asphalt shall be placed and compacted in maximum 3" lifts. The edges of the patch shall be tacked prior to the placement of asphalt. The asphalt shall be compacted to 92% minimum density as determined by AASHTO T-209 Method. The patch shall be stringlined as required and all areas not matching the adjacent grade shall be immediately corrected. Cold joints around the perimeter of the patch shall be sawed and sealed with rubberized asphalt. All sawing, pavement removal, replacement, and sealing costs shall be included in the bid item for patching, AC.

Type I Patch in APC

Pavements: Patching of PCC pavements with an asphalt overlay shall be performed as follows: Placement of the asphalt portion of the patch shall be in accordance with the paragraph "Type I Patch in Asphalt Pavements". Placement of the PCC portion of the patch shall be in accordance with the paragraph "Type I Patch in PCC Pavements". Placement of the subgrade stabilization material shall be in accordance with the paragraph "Type I Patch Subgrade Replacement". After placement of the subgrade stabilization material, the pavement shall be replaced in accordance with the detail in the drawings titled "Type I APC Patch". Payment will be made separately for each of the three materials: Type "B" AC, H.E.S. PCC and Aggregate Base. Initial sawing,

pavement removal and sealing costs shall be included in the bid items for patching as listed above. Additional sawing required to go from a Type "III" to a Type "I" patch shall be included in the bid items for H.E.S. PCC.

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Type II Patch
In APC

text here

Pavement: The asphalt overlay shall be removed prior to sawing through the PCC Pavement to determine if only the asphalt needs to be patched. Sawing of The asphalt is required, but should not penetrate the PCC pavement. If the PCC pavement needs to be replaced, a Type "I" APC patch shall be made. Payment will me made for Type "B" or Type "C" AC only. If only the asphalt is removed, initial sawing, pavement removal, and sealing costs shall be included in the bid items for asphalt concrete.

**SPECIAL PROVISIONS
PRECAST WALL SYSTEM**

These special provisions revise, amend and where in conflict, supersede section 510 of the Oklahoma Department of Transportation Standard Specifications for Highway Construction (2019).

510.01 DESCRIPTION

A. GENERAL

This specification defines the requirements for precast concrete screening walls and installation instructions as required for complete, high quality and long-lasting walls. Requirements for furnishing and installing new walls and initial mock up section of wall are included.

(1) MANUFACTURER

- (a) Materials for the precast screening walls have been pre-qualified and shall be supplied by the following manufacturers:

1. Arrowhead Precast, LLC.
2135 North Elm Street
Jenks, Oklahoma 74037
(918) 995-2227
2. Approved alternate precast screening wall manufacturer.

(2) QUALITY ASSURANCE

- (a) **INSTALLER QUALIFICATIONS:** Engage an experienced installer who has experience with architectural precast concrete screening wall projects with similar material and of similar scope to that indicated for this project with a successful construction record of in-service performance. Installer must submit names, location, and phone number of three references as well as description of the project successfully completed for each reference.

1. Installer shall be registered and/or licensed and approved by authorities having jurisdiction.

- (b) **SINGLE SOURCE RESPONSIBILITY:**

1. Obtain concrete fence materials manufactured in the United States from a single source duly licensed or authorized to manufacture or distribute Verti-Crete™ precast wall panels, columns and caps, or approved equal.

- (c) **MANUFACTURER QUALIFICATION:** Engage a firm experienced in producing precast concrete screening wall or noise barrier units in accordance with those indicated for the Project and with a record of successful in-service performance, as well as enough production capacity to produce required units without delaying the work.

1. Manufacturer must be licensed by Verti-Crete, LLC as a Producer of Verti-Crete™ precast wall panels, columns and caps, or approved equal.
2. Manufacturer shall be registered and approved by authorities having jurisdiction.
3. Manufacturer shall be in the State of Oklahoma.

(3) SUBMITTALS

GENERAL: Submit the following according to the Conditions of the Project and Specification Sections.

- (a) **Product Data:** Furnish manufacturer's literature for each architectural precast concrete screening wall or noise barrier.
- (b) **Approval Data:** Product shall be approved by Oklahoma Department of Transportation.
- (c) **Color Chart:** Show full range of available base and accent colors
- (d) **Shop Drawings:** Provide working drawings indicating all information necessary for pre-casting screening wall or noise barrier elements. Drawings shall illustrate the shape and dimension of precast components; the size, quantity and details of the reinforcing steel; the quantity, type, size and details of connection and lifting hardware.

(4) REQUEST FOR APPROVED EQUALS

Bidders and suppliers may submit requests for approved equals. Requests shall be supported by evidence such as technical data, test results, or other pertinent information that demonstrates that the substitute offered is equal to or better than the specification's requirements.

The City of Tulsa reserves the right to determine equivalency. All requests for approved equals shall be submitted in writing.

510.02 MATERIALS

A. PROPERTIES

(1) WALL SYSTEM (PANELS AND COLUMNS)

- (a) Panels shall have a form molded stone or masonry pattern on both sides.
- (b) Columns shall have a form molded stone pattern on all four sides except where the notch appears to receive the connecting panel.
- (c) Panels shall be monolithic up to 8' tall. For wall sections greater than 8' tall two panel sections may be stacked on top of each other such that the wall has only one seam between them.
- (d) Columns shall be monolithic up to 8' tall. For wall sections greater than 8' tall two columns may be stacked on top of each other such that the column has only one seam between them. To facilitate installation and strengthen the wall section, the seam between two columns and two adjacent panels shall not match up horizontally with one another.

- (e) Columns shall have a concrete cap.
- (f) Panels, columns and caps shall be constructed from normal weight concrete having sand and gravel or crushed stone aggregates mixed with ASTM-C150, Type 1 or Type III Portland Cement and shall have a minimum compressive strength of 4,000 psi @ 28 days.
- (g) Color: Concrete shall be colored after installation with a 100% acrylic/polysiloxane structural concrete stain. All concrete surfaces shall be stained with Stone-FX™ Stain (Kwal Paint #727XXX Stone-FX™ 100% Acrylic/Polysiloxane Stain) or approved equal.
- (h) Column footings: 13' 2" on-center (maximum), unless noted otherwise on the plans; depth and width and steel reinforcing as per approved shop drawings in accordance with local building code requirements. Footings may be closer, and panels cut to accommodate changes in direction to fit property lines and/or project requirements.
- (i) Panel Reinforcing: Minimum perimeter rectangle of #4 steel rebar 6" from all four edges of each panel. Additional reinforcing (if required) as per approved shop drawings in accordance with local building code requirements.
- (j) Column Reinforcing: Reinforcing (if required) as per approved shop drawings in accordance with local building code requirements.
- (k) Footing/Column Connection: Each column shall be installed on top of a pier footing. The connection between the column and the footing will be made by imbedding two 6' long #4 rebars (minimum) 3' down into the center of each footings. 3' shall be imbedded into footing leaving 3' exposed to then protrude through the center of each column (each column shall be cast with a hollow center). To secure the connection, the hollow core of each column shall be filled high enough to cover the rebar (approximately half way to the top)
- (l) Loading: Wind loading and surcharge loads, will be applied to the panels, columns and foundations components per local building code requirements.
- (m) Columns shall have a typical width of 20" x 20" square with 3" minimum depth notch to receive the tapered ends of each panel. Each column shall have a tapered hollow center, 8" x 8" at the top down to 6" x 6" at the bottom.
- (n) Panels shall have a typical dimension of 12' long by 8' tall by 4" thick (4" minimum thickness, 7" maximum thickness at the false cap)
- (o) Caps shall have a typical dimension of 22" x 22"
- (p) Columns shall be installed on top of pier footings previously poured in place as per engineer's drawings. Column shall be secured by a rebar anchor embedded into the footing that protrudes through the hollow center of the column. After a section of fence is installed each column shall be filled with concrete to a minimum level 6" above the height of the rebar anchor.
- (q) Panel/Column connection shall be tongue and groove construction.

(2) Texture

- (a) The wall shall have a form molded stone texture on both sides of each wall panel and on all four sides of each column. The texture shall be a combination of Ledgestone Panels and Ashlar Columns as seen below or as approved by the engineer.



- (b) Wall panels shall have a Ledgestone Texture (Verti-Crete Ledge Stone #510, see Exhibit 1)
- (c) Columns shall have an Ashlar Texture (Verti-Crete Ashlar #509, see Exhibit 2)
- (d) The texture shall be a form molded texture to achieve the relief and appearance required. Stamped, rolled, or other texture methods will not be accepted.

(3) Color

- (a) Fence shall be colored after installation where possible with a 100% acrylic/polysiloxane concrete stain. (i.e. Kwal Paint Stone-FX Acrylic/Polysiloxane Stain #727)
- (b) When coloring the fence after installation is not possible (i.e. because of weather, interference with traffic, accessibility or concern from overspray onto adjacent structures or property), the concrete elements may be pre-stained by coloring them in the manufacturer's facility. The fence shall then be touched up after installation to ensure a consistent, natural looking and complete finish.
- (c) Base color shall be applied with an airless sprayer; accent colors shall be applied with sponges
- (d) Colors selected from manufacturer's color chart.

(4) Column Footings

- (a) 13' 2" on center (maximum) unless noted otherwise on the plans.
- (b) Diameter: 24" typical.
- (c) Depth: As shown on the drawings.
- (d) Reinforcing: Reinforcing (if required) as per approved shop drawings in accordance with local building code requirements.
- (e) Concrete shall be normal weight concrete having sand and gravel or crushed stone aggregates mixed with ASTM-C150, Type 1 or Type III Portland Cement and shall have a minimum compression strength of 3,000 psi @ 28 days.

(5) Mow Strip (not required structurally)

- (a) Continues with fence line.
- (b) Width: 32" (typical).
- (c) Depth: 4" (typical).
- (d) Concrete shall be normal weight concrete having sand and gravel or crushed stone aggregates mixed with ASTM-C150, Type 1 or Type III Portland Cement and shall have a minimum compression strength of 3,000 psi @ 28 days.

B. LOAD CRITERIA

(1) Load Criteria shall be based on the following:

- (a) Design wind speed 90-120 MPH

C. CONCRETE

(1) Concrete Material

- (a) Concrete shall be normal weight concrete having sand and gravel or crushed stone aggregates mixed with ASTM-C150, Type 1 or Type III Portland Cement and shall have a minimum compression strength as follows:

- 1) Panels/Columns/Caps: 4,000 psi @ 28 days
- 2) Footings: 3,000 psi @ 28 days
- 3) Column Centers 3,000 psi @ 28 days

- (b) Water used for concrete shall be clean water and free from injurious amounts of oils, alkalis, organic or other deleterious substances.

- (c) All concrete for panels, columns or footings shall contain an air-entraining admixture resulting in 5% (+/- 1%) entrained air or as per local building code requirements.

(2) Reinforcing Materials:

- (a) Reinforcing materials may consist of steel, polypropylene fiber or a combination of both.
- (b) All reinforcing steel shall be deformed type bars or welded wire mesh. All deformed type bars shall conform to ASTM – A615, Grade 60, placed as show on approved drawings. All welded wire mesh shall conform to ASTM – A185, Grade 60, placed as shown on approved drawings (if required).
- (c) All reinforcing polypropylene fibers shall be Monofilament, at least 2 inches in length and have a tensile strength between 83-96 ksi. (570-660 MPa). Reinforcing polypropylene fibers shall conform to ASTM C1116 standards for fiber reinforced concrete.
- (d) All ties and stirrups shall conform to the requirements of ASTM – A615, Grade 60.

- (3) Testing of concrete shall be in accordance with City of Tulsa Standard Specifications, Concrete Sampling and Testing.

510.03 EQUIPMENT

Furnish all materials, tools, equipment, transportation, necessary storage, access, labor and supervision required for the proper installation of the precast wall system.

510.04 CONSTRUCTION METHODS

A. INSTALLATION

- (1) General: Installation shall be as per manufacturer's recommendations.
 - (a) Utility Lines. Contact local "Utility Locator" to have all underground power lines marked BEFORE installation begins.
 - (b) Grade. The ground shall be prepared to a grade 4" below the final grade. This allows for a 3" tall footing form to square off top of footing and then 1" of backfill to cover bottom of wall for final grade or mow strip.
 - (c) Soil. Excavation for footings to undisturbed soil shall be as shown in the plans. Leave bottom-bearing surface clean and smooth. If footing excavations are made deeper than intended, only concrete shall be used for fill.
 - (d) Reinforcing. Reinforcing steel for footings shall be installed as per shop drawings with the minimum clearance of 6" from all sides
 - (e) Form Footings. The top of each footing shall be formed to a square and level surface 2' x 2' with the square pad having a minimum thickness of 3".
 - (f) Footing Elevations. Wall panels will span from footing to footing and shall rest on two level points. When the relative heights of the top of two adjacent footings differ, the downhill side of the uphill footing shall be notched out to allow the panel to rest on two level surfaces. This notch may be formed as part of the footing form or may be created by removing a portion of the concrete footing with a square nose shovel while the concrete is still green. Alternately, the bottom corner of the panel may be cut to allow the panel to rest level. Notch shall be no more than 8" long by 8" wide by required depth.
 - (g) Rebar Anchors. Footings shall have rebar anchors cast into each center as per shop drawings.
 - (h) Level. Panels and Columns shall be plumb and level. Plastic or other non-organic shims may be used where necessary to ensure that each panel and post is square and level.
 - (i) Fill Posts. Columns shall be filled with concrete to a minimum height 6" above the top of the rebar anchor. If a gate or any other structure will be mounted to a column, the column shall be filled to the top. Columns shall not be left unattended or without bracing until filled with concrete (with or without panels installed).
 - (j) Set Caps. Caps shall be set on top of each column after column is filled with concrete. Cap may be set with masonry adhesive or a standard masonry grout. If masonry adhesive is used the seam shall be caulked between the column and the cap to ensure a solid cosmetic seal.

- (k) Stain. Wall shall be colored with a 100% acrylic/polysiloxane concrete stain. (i.e. Kwal Paint Stone-FX™ Acrylic/Polysiloxane Stain #727) Base color shall be applied in two coats using an airless spray gun. Accent colors may be applied after base color dries using a sponge, brush or roller. Before staining, concrete surface shall be clean and free from any dirt or debris.

510.05 METHOD OF MEASUREMENT

The measurement will be the area of precast wall panel.

510.06 BASIS OF PAYMENT

The City of Tulsa will pay for each pay item at the contract unit price per the specified pay unit as follows:

<u>Pay Item:</u>	<u>Pay Unit:</u>
<u>(B) WALL</u>	<u>SQUARE YARDS (SY)*</u>

* One face side

The City of Tulsa will consider the cost of the following to be included in the contract unit price for the relevant wall pay item:

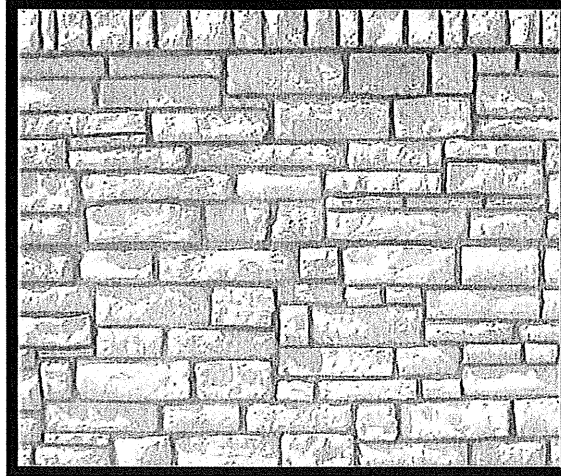
- Design, shop drawings and associated costs
- Engineering and associated costs
- Concrete
- Reinforcing Steel
- Form Liners
- Concrete Surface Finish

The Authority will pay for the drilled shafts required by the contract separately under other items of work.

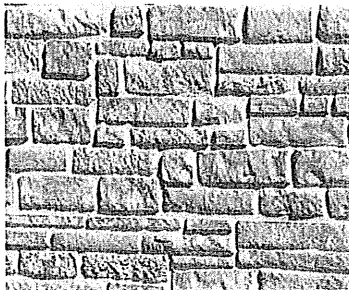
Pattern: Ledge Stone #510

Key Features

Beautiful stacked Ledge Stone texture with sanded grout joints. Available also with integral Soldier Row Wall Cap. Stones along Soldier Row add an additional $\frac{1}{2}$ " of relief for a maximum total relief at the cap of $1\frac{1}{4}$ ".

Specifications

Maximum relief:	$\frac{3}{4}$ "
Average relief:	$\frac{5}{8}$ "
Liner Thickness (No Backing)	$1\frac{1}{8}$ "
Liner Thickness (Plywood Backed)	$1\frac{7}{8}$ "
Maximum Part Size	138"w x 120"h

**Verti-Crete, LLC**

Mail: PO Box 2347, Sandy, UT 84091

Plant: 16500 S. 500 West, Bluffdale, UT 84065

Ph 801-571-2028 Fax 801-606-7786 www.verti-crete.com

VERTI-CRETE FORMLINERS

EXHIBIT 2

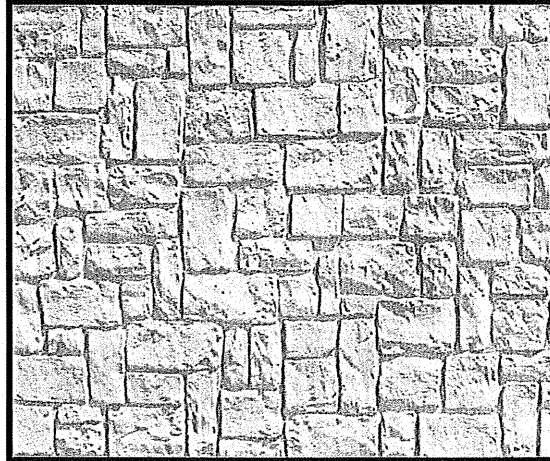
Pattern: Ashlar #509



VERTI-CRETE FORMLINERS

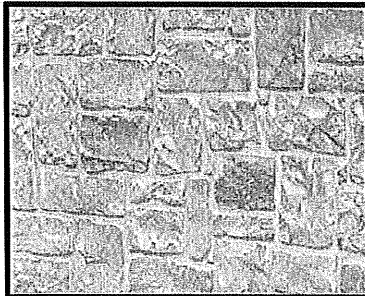
Key Features

This random Ashlar Pattern features a hand laid tumbled stone texture. Available in sizes up to 9' tall by 18' long. Also available with a 5' smooth border.



Specifications

Maximum relief:	1 1/4"
Average relief:	3/4"
Grout Joint Ave Width:	3/4"
Max Stone Size:	12 1/2" x 7 1/2"
Min Stone Size:	3 1/2" x 1 1/2"
Liner Thickness (No Backing)	1 1/2"
Liner Thickness (Plywood Backed)	2 1/4"
Maximum Part Size	216"w x 108"h



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END OF SECTION

SPECIAL PROVISIONS **FOR PRESSURE GROUTING**

Under this item, the Contractor shall furnish and place pressure grouting with sand-Portland cement grout as specified by the Engineer. The requirement for this work will not be known until construction is in progress and the estimated quantity shown in the Proposal may or may not be used or may be exceeded depending on conditions revealed during construction. The drilling of holes in the concrete for use in pressure grouting is included in this pay item. All drilled holes shall be filled with non-shrink grout as approved by the Engineer.

All pressure grouting operations shall be performed in the presence of the Engineer or his authorized representative, and all materials, methods and procedures shall be submitted to the Engineer for acceptance prior to beginning of work.

The dry materials for the grout shall consist of a 2:1 mixture by weight of sand to Portland cement with water mixed in the proper proportions. The proportioned materials shall be combined and mixed until thoroughly blended before using. Water shall be added in increments until the desired consistency is obtained. A plasticizer shall be used to minimize the water requirements and to increase flowability of the mixture.

Portland cement for the grout shall conform to the requirements of AASHTO M85, Type II. Up to 1/2 of the cement requirement may be made by the replacement with fly-ash mixture.

Gradation requirements of the sand aggregate shall be as follows:

<u>Sieve Size</u>	<u>mm</u>	<u>Percent Passing</u>
No. 16	(1.18)	100
No. 50	(0.30)	20 - 50
No. 200	(0.075)	0 - 10

The apparatus for mixing and placing grout shall be of a suitable type, shall be capable of effectively mixing and stirring the grout and forcing it into holes in a continuous uninterrupted flow at any pressure that shall not damage the concrete slab, and shall be provided with means for accurately controlling the amount of water used in the grout. The exact pressure to be used in grouting shall be acceptable to the Engineer. Pressure as high as practicable but which, as determined by trial, will not cause displacement of the concrete due to carelessness on the part of the Contractor shall be made as directed by the Engineer. Any damage to the existing Portland cement concrete pavement due to carelessness on the part of the Contractor shall be repaired as directed by the Engineer. No additional payment will be made for these repairs.

If during the grouting of a hole, grout is found to flow from adjacent holes in sufficient quantity to interfere seriously with the grouting operation or to cause appreciable loss of grout, such holes may be temporarily capped. Where such capping is not essential, un-grouted holes shall be left open to facilitate the escape of air and water as the grout is forced into the holes. The grout pump shall be connected to adjacent capped holes and to other holes from which grout flow has been observed, before the grout has set, and all holes shall be grouted to refusal at the accepted pressure.

The grouting of any hole shall not be considered complete until the hole maintains a back pressure, measured at the collar, of at least two-thirds of the maximum pressure used in grouting such a hole.

Should grout leaks develop, the Contractor shall caulk such leaks. So far as practicable, the full grouting pressure shall be maintained constantly during grout injections, unless the Engineer requires the reduction of the pumping or stalling pressure or the discontinuance of pumping while grout leaks are being caulked. After the grouting of the hole is completed, the pressure shall be maintained by means of a stopcock or other suitable device until the grout has sufficiently set to be retained in the hole.

Testing: Contractor shall drill such additional holes in the slab as directed by the Engineer, for verification that the voids have been filled completely. No additional payment will be made.

Measurement: Measurement for payment for pressure grouting will be made based on the number of cubic yards forced into the holes at locations determined by the Engineer. In measuring grout for payment, the volume on one (1) 94-pound sack of cement will be considered as yielding two cubic feet of grout.

Payment: Payment will be made at the unit price bid per cubic yard as stated in the Proposal, and the price bid shall include all costs of labor, equipment, and material required to complete the work as specified here.

SPECIAL PROVISIONS
FOR POLYMER-MODIFIED ASPHALT BASED PAVEMENT SEALER

DESCRIPTION

This work consists of preparing and treating an existing bituminous surface with Polymer-Modified Masterseal (PPM) or approved equal pavement sealer.

SURFACE PREPARATIONS

Surface must be clean and free from loose material and dirt. Cracks should be filled with Hot-Applied Rubberized Asphalt Crack Filler. Oil stains should be cleaned and primed.

MIXING PROCEDURES

Mix PMM or approved equal in accordance with the following mix design (based on 100 gallons of PMM for ease of calculation):

PMM (or approved equal)100 gallons

Sand (40-70 mesh)200-400 lbs.

APPLICATION RATE OF MIXED MATERIALS

Apply properly mixed PMM (PMM or approved equal and sand) and at a rate of 70-82 square feet (7.77 to 9.11 square yards) per gallon. Application rates may vary due to pavement porosity and method of application.

APPLICATION EQUIPMENT

Properly mixed PMM or approved equal shall be applied by mechanical squeegee/brush equipment or spray equipment capable of spraying coatings with sand. Equipment shall have continuous agitation or mixing capabilities to maintain homogenous consistency of mixed material throughout the application process. Truck mount or self-propelled squeegee/brush equipment shall have at least 2 squeegee or brush devices (one behind the other) to assure adequate distribution and penetration of mixed Polymer-Modified Sealer into bituminous pavement. Hand squeegees and brushes shall be acceptable in areas where practicality prohibits the use of mechanized equipment.

APPLICATION PROCEDURES

For optimum performance and durability apply a minimum of two coats of properly mixed PMM or approved equal. A third coat of mixed PMM or approved equal may be applied to high traffic areas such as entrances, exits, and drive lanes for added durability. Allow each coat to dry thoroughly before applying successive coats. Allow final coat of PMM or approved equal to dry for 24 hours prior to opening to vehicle traffic.

APPLICATION CONDITIONS

Both surface and ambient temperature shall be a minimum of 50°F and rising during PMM or approved equal application. Do not apply if temperature is expected to drop below 50°F within a 24-hour period after PMM or approved equal application.

METHODS OF MEASUREMENT

POLYMER-MODIFIED ASPHALT BASED PAVEMENT SEALER will be measured by the Square Yard of coverage area, not including multiple coats or overlaps. Coverage must be uniform, completely cover the pavement and adhere to manufacturers recommendations.

BASIS OF PAYMENT

POLYMER-MODIFIED ASPHALT BASED PAVEMENT SEALERSY

Payment shall be full compensation for furnishing all material, equipment, labor and incidentals necessary to complete the work.

SPECIAL PROVISIONS
FOR PAVING OPERATIONS

1. If the width of a street is such that it exceeds the paver's ability to pave one-half the street width another paver will be required and shall be operated to lay asphalt on at least one-half of the street width at a time.
2. The longitudinal joint shall run parallel to the approximate center of the street. Transverse joints shall be kept to a minimum. If it becomes necessary to stop the paving operation short of the end of the job, then the two transverse joints shall be no closer together than 6'.
3. If for any reason the Contractor is unable to pave one-half the width of the street with one paver, paving operations shall cease.
4. A paving plan, indicating sequence of paving passes, pass widths, pass thickness, and requested temporary street closures, will be submitted prior to paving.
5. Once paving begins the Contractor should have enough trucks available to deliver asphalt materials in a continuous operation.
6. Adequate transitions to side streets and driveways must be provided. In general, paving shall extend to the returns of all side streets. Special consideration should be given to preventing ponding in side street intersections.
7. The contractor shall provide butt joints as directed by the Engineer. Wherever the planned overlay of an existing street meets existing pavement, or at the end of a paving run, butt joints shall be provided to a depth matching the planned overlay thickness. The transition shall extend a minimum of 10 feet longitudinally from the joint to provide a smooth riding surface. Butt joints will not be paid for directly, but the cost shall be included in the cost of the paving operations where they are used.
8. Contractor shall not drive empty or loaded trucks or equipment across newly paved areas for the construction period.
9. A leveling, or "wedge" course may be required to establish the required cross-slope for the finished overlay. This item of work will be paid for separately under the bid item designated as Asphalt Concrete Type S5 in tons.

SPECIAL PROVISIONS
FOR ROCK EXCAVATION

Rock Excavation shall consist of igneous, metamorphic and sedimentary rock which cannot be excavated without blasting or the use of rippers, and all boulders or other detached stones each having a volume of 0.5 cubic yard or more. Shales that can be graded or ripped will be considered as unclassified excavation.

ROCK EXCAVATION

CY

Which will be full compensation for performing the work specified and the furnishing of all materials, labor, tools, equipment, and incidentals necessary to complete the work as specified.

SPECIAL PROVISIONS
FOR CITYWIDE INFRASTRUCTURE
REHABILITATION AND IMPROVEMENT SIGN

The Citywide Infrastructure Rehabilitation and Improvement Sign shall be required at every permit location where Traffic Control Devices are required. The sign shall be displayed for the entire length of the permit. The Engineer shall determine the need for more than one sign per permit.

MATERIALS

The Citywide Infrastructure Rehabilitation and Improvement Sign shall be in accordance with the Oklahoma Department of Transportation Standard Specifications for Highway Construction, 2019 Edition. Section 880. The sign shall be ODOT Standard Sign CW21-1 except the sign shall be Florescent Yellow-Green as defined in the 2001 MUTCD.

BASIS OF PAYMENT

INFRASTRUCTURE REHABILITATION SIGN..... SIGN DAY

SPECIAL PROVISIONS
FOR REMOVING AND RELAYING BRICK, STONE AND CONCRETE PAVERS

DESCRIPTION

This work shall consist of removing and resetting brick, stone and concrete pavers.

MATERIALS

Separator fabric

Bedding Sand

Polymeric Joint Sand

Masonry Adhesive

CONSTRUCTION METHODS

This work consists of removing and resetting brick and/or concrete pavers. Pavers shall be reset to ensure the proper grade, pattern and configuration. The contractor shall be liable for proper handling and storage of brick paver until repair is complete.

BASIS OF PAYMENT

REMOVE AND RELAY BRICK, STONE AND CONCRETE PAVERS SY

Payment shall be full compensation for furnishing all equipment, labor and materials necessary to complete work.

SPECIAL PROVISIONS
RECTANGULAR RAPID FLASHING BEACON (RRFB)

General. This work shall consist of furnishing and installing solar powered rectangular rapid flashing beacons (RRFB) at the locations indicated on the plans or where directed by the Traffic Engineer.

Approved Products List. All materials provided shall be supplied per the approved materials listed on the City of Tulsa Traffic Operations Approved Products List (APL) or by approved submittals.

Specifications. Each RRFB should meet the specifications of Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons (IA-11) (FHWA) and Interpretation Letter 4(09)-5(I) - RRFB

Signs. Use with W11-2 (FYG) sign for crosswalks, S1-1 (FYG) sign for school crosswalks and W11-15 sign for shared use paths or other locations where bikes are permitted to cross. All signs shall be 30"x30" and shall meet the requirements of City of Tulsa Specification 608 for Traffic Signs.

Assembly. Each RRFB full assembly shall be a complete assembly, consisting of supporting structure (pole, all mounting brackets for all components of the assembly, and foundation), indications, signage, and electrical components (wiring, solid-state circuit boards, etc.).

Support Structure. The supporting structure of the RRFB shall consist of a 2" perforated square-tube post, meeting the requirements of the latest version of the City of Tulsa Specification 608 for Traffic Signs. Signs shall be placed into a concrete footing, unless otherwise indicated by the Traffic Engineer. The footing shall be included as a part of the assembly.

Power. Each RRFB shall be powered by solar panels.

Hardware. Each RRFB to be supplied with all required hardware to install assembly. Hardware for mounting the sign to the pole shall meet the requirements of City of Tulsa Specification 608 for Traffic Signs.

Push Buttons. Each RRFB shall be activated by a push button unless otherwise specified. Supplemental RRFB signs used in coordination with other push button activated RRFBs at a crosswalk may not have push buttons, as determined by the Traffic Engineer.

The push buttons shall be ADA and MUTCD compliant and shall meet the applicable requirements of City of Tulsa Specification 613 for Pedestrian Push Buttons. When specified, the push buttons shall be audible push button systems (APBS) to allow for both factory and manually programmed speech-walk messages. If an APBS system is utilized, the standard verbal message will be "flashing yellow lights are on" unless otherwise specified by the Traffic Engineer. This message shall be repeated for the duration of flashing.

Construct the pedestrian push button so that it is tamper proof. Design it to prevent an electrical shock under any weather conditions.

Installation. The Contractor shall provide all installation services, equipment and materials as necessary to install a fully operational RRFB assembly in the locations indicated by the plans or as directed by the Traffic Engineer. This is to include all set-up and installation equipment, pole mounts, brackets, foundations, hardware, and any other appurtenances necessary to make the RRFB operational.

SPECIAL PROVISIONS
FOR REMOVAL OF STRUCTURES AND OBSTRUCTIONS

Under this item, the Contractor shall remove all structures and obstructions in accordance with Section 619 of the ODOT Standard Specifications for Highway Construction, 2019 edition except that the basis of payment will be as follows:

BASIS OF PAYMENT. Accepted quantities of items, measured as provided above, will be paid for at the contract unit price as follows:

REMOVAL OF PIPE	IN-FT (inches of diameter per LF of pipe)
REMOVAL OF STRUCTURES	CY
REMOVAL OF FENCE	LF

Such payment shall be full compensation for furnishing all materials, equipment, labor and incidentals to complete the work as specified. The price shall also include salvage of materials removed, their custody, preservation, storage on the right-of-way, and disposal as directed by the Engineer. Separate payment will be made for the backfilling and compacting of the cavity created by the removal of these items.

SPECIAL PROVISIONS
FOR SEEDING

This item shall be constructed under the same conditions of ODOT Standard Specifications for Highway Construction, 2019 edition section 232 except that the Hand Broadcasting Method will be the construction method and the method of payment will be square yards. Watering shall be applied as determined by the Engineer and will be included in the cost of seeding. Fertilizer shall be 10-20-10 applied at the rate of 1.5 pounds per 10 square yards and shall be applied per section 232.04(E).

SPECIAL PROVISION
SIGN ASSEMBLIES WITH FLASHING BEACONS

PART 1. GENERAL

This work shall consist of furnishing materials and installing poles, signs, controllers, confirmation lights and all other equipment for all types of sign assemblies with flashing beacons, including school zone flashing signs, in accordance with these Specifications and in reasonably close conformity with the locations and dimensions shown on the Plans or established by the Traffic Engineer. Standard sign assemblies with flashing beacons are intended for 24/7 operations. School sign assemblies with flashing beacons are intended for intermittent operation during school hours only.

PART 2. MATERIALS

2.1 GENERAL - Provide regulatory or warning sign assemblies that consist of a sheet aluminum sign with the message, traffic signal heads, sign post, foundation, wiring, and conduit as shown on the Plans or as directed by the Traffic Engineer.

All flashing beacon sign assemblies shall include the following items: aluminum pedestal pole, octagonal pedestal pole base, pole and base collar assembly for the octagonal base, signal housings and visors, two yellow ball LED indications, controller cabinet, sign as directed by the Traffic Engineer, sign mounting brackets and hardware, wiring, bonding and all other appurtenances to make the sign flasher assembly stable and functional in-place.

Power shall be supplied either via electrical service or solar panels.

All hardware shall be stainless steel. All fittings shall be aluminum with no coating.

2.2 SOLAR POWERED FLASHERS - Solar powered flashers shall also include mounting hardware, battery, 55-Watt solar module (including solar panels, 1/2-inch Carflex electrical tubing or approved equal to protect panel wiring, and 1/2-inch Carflex threaded connection or approved equal) with top of pole mounting, and cabinet mounting bracket.

2.3 ELECTRICAL SERVICE POWERED FLASHERS - Services for electrical powered flashing signs shall be installed and paid for per City of Tulsa Specification 607.

2.4 SCHOOL FLASHERS - School zone flashers shall include school controller cabinet either AC powered or solar powered as specified by the Traffic Engineer, with a pager programmable time switch, antenna, and confirmation light assembly.

2.5 STANDARDS - Materials shall meet the requirements specified in AASHTO Standard Specifications for Structural Supports of Highway Signs 2019 - Luminaries and Traffic Signals, ODOT Specifications - Section 836, and City of Tulsa Standards and Specifications.

2.6 APPROVED PRODUCTS LIST - All materials provided shall be supplied per the approved materials listed on the City of Tulsa Traffic Operations Approved Products List (APL).

2.7 FLASHER BEACON SIGN POLE - Sign poles shall be 4 inches in diameter (4-1/2-inch O.D.), 13 feet tall, schedule 40 spun aluminum with 8 NPT tapers (Pelco 5100-13 with Pelican ID or approved equal) with no coatings and an aluminum dome type pole cap (Pelco PB-5402 or approved equal). For signs taller than 48 inches, a pole longer than 13 feet may be allowed with the approval of the Traffic Engineer.

2.8 FLASHER BEACON SIGN POLE BASE - The base for the sign pole shall be an aluminum octagonal pedestal pole base assembly (Pelco PB-5349-GL or approved equal) with an aluminum pole and base collar assembly for an octagonal base (Pelco PB-5326 or approved equal).

2.9 FLASHER BEACON SIGN ANCHOR BOLTS - Anchor bolts for flashing beacon sign pole bases shall be stainless steel wedge anchor bolts or approved equal and shall include the following hardware:

- 1) Quantity 4 of 3/4" x 8 1/2" stainless steel wedge anchors,
- 2) Quantity 4 of 2 1/2" O.D. x 1 1/16" stainless steel flat washers,
- 3) Quantity 4 of 1 7/8" O.D. x 3/4" stainless steel flat washers,
- 4) Quantity 4 of 3/4" stainless steel lock washers, and
- 5) Quantity 4 of 3/4" stainless steel hex nuts.

2.10 FLASHING BEACON SIGN POLE FOOTING - Pole footings shall be a standard F-1 pedestal footing furnished and installed in accordance with City of Tulsa Specification 603

2.11 FLASHING BEACON SIGN POLE CONDUIT - A 2-inch conduit shall be installed in the footing for electrical service powered flashing beacon signs. A City of Tulsa Pull Box Size I, meeting the requirements of City of Tulsa Specification 601 shall be installed within ten feet of the footing for electrical service powered flashing beacon signs.

2.12 FLASHING BEACON SIGN POLE BONDING - There shall be #6 green THHN stranded copper connected to the bonding point of the aluminum base of each flashing beacon sign pole and the service disconnect ground buss. Bonding wire shall be connected using LA-6A Ideal Part #87-002 aluminum lug and 1/4 inch X 20 stainless steel bolt and nut or approved equal.

2.13 SIGNS - Provide signs in accordance with City of Tulsa Specification 608. Signs shall be attached to the pole using at least two stainless steel U-bolt clamps (Pelco SH-0209-SS or approved equal). Signs shall meet requirements of the Manual on Uniform Traffic Control Devices (MUTCD). School signs shall be 24 inches X 48 inches in size and, unless otherwise directed by the Traffic Engineer, shall read as follows: SCHOOL SPEED LIMIT 25 WHEN FLASHING. All other signs will be installed as directed by the Traffic Engineer.

2.14 U-BOLTS CLAMP MOUNTING HARDWARE - Hardware for mounting the sign and controller cabinet shall be stainless steel and shall include the following per sign or cabinet:

- 1) Quantity 2 of 5/16" x 1 1/2" stainless steel flat washers,
- 2) Quantity 2 of 5/16" stainless steel lock washers,
- 3) Quantity 2 of 5/16" stainless steel hex nuts.

2.15 WIRING - All wire shall meet the requirements of City of Tulsa Specification 611 for Electrical Conductors for Traffic Signals.

2.16 FLASHING BEACONS - Flashing beacon assemblies shall consist of two polycarbonate signal heads with amber LED indications mounted in a side-by-side configuration. For flashing beacon signs powered by an electrical service connect, use two 120-volt AC amber LED indications. For flashing beacon signs powered by solar panels, use two 12-volt DC amber LED indications.

Heads shall be wired so they will bounce flash using 4#14 Traffic Signal Electrical Cable as specified in City of Tulsa Standard 629 between the signal heads and the cabinet. A 2#14 shielded electrical conductor shall be used between the two amber LED indications and run through a shoe.

Flashing beacons shall be mounted using a gusseted tube (Pelco AB-0300-18 inch or approved equal), two-way upper arm assembly (Pelco AB-0296-SS or approved equal), two-way lower arm assembly (Pelco AB-0297-SS or approved equal), and neoprene gaskets (Pelco SE-0354 or approved equal) as shown in City of Tulsa Standard Drawing 629.

The flashing beacon assembly shall be mounted to the pole using a 62-inch cable mount clamp kit (Pelco Astro-Brac Stellar Series Clamp Kit, AS-3009-62-SS, or approved equal).

The signal housing, visor, and 12-inch amber LED indications shall meet the requirements of City of Tulsa Specification 614 except that they shall be considered part of the assembly and shall not be paid for separately.

2.17 CONFIRMATION LIGHT ASSEMBLY - Confirmation light assemblies shall be LED clear globe, Pelco SM-0284-CL-PNC, attached to a mounting hub, Pelco SE-0384, or approved equals. A 2#14 shielded electrical cable shall be used for the confirmation light and shall be terminated at the signal head terminal block. No splices shall be made inside the 4" pole. Solar powered school flashers designed to turn on and off during the day at specific times shall come with a confirmation light with a 12V LED 4W medium base bulb or approved equal.

2.18 SCHOOL CONTROLLER CABINET - Cabinet shall be an RTC Model #502607-T model or approved equal. The cabinet shall use NEMA flasher and transfer relay. Cabinet dimensions shall be 15 inches high, 15 inches wide and 12 inches deep. The cabinet shall not be pre-drilled for conduit connection. The cabinet shall come with an RTC CPR 2102G pager programmable time switch, or approved equal, with the latest software and hardware.

If a solar powered flashing beacon assembly is being used along with a school zone controller cabinet, then the cabinet shall be an RTC Model #502598SW cabinet or approved equal. The cabinet shall contain one DCF2, two circuit 12-volt DC battery. Cabinet dimensions shall be 17 inches high, 18 inches wide and 14 inches deep. The cabinet shall come with an RTC CPR 2102G pager programmable time switch, or approved equal, with the latest software and hardware.

If cabinet is mounted on the flashing beacon sign pole, 120-volt cabinet shall be mounted using two stainless steel U-bolt clamps (Pelco SH-0206-SS or approved equal). For the 120-volt cabinet mounted with U-bolt clamps, the connection from the base of the cabinet to the pole shall consist of one 1-1/2 inch case nipple, one 1-1/2 inch aluminum L.B. gasket and cover, one 1-1/2 inch X 2 inch aluminum all thread nipple (Pelco SE-0309-2 or approved equal) and one mounting hub for a 4-1/2 inch O.D. pole (Pelco SE-3093-SS or approved equal).

Solar powered cabinet shall be mounted using two stainless steel 4-inch mounting kits (Pelco SE-1100-SS-PNC or approved equal).

If cabinet is mounted to wooden service pole, cabinet shall be mounted using stainless steel banding. Conduit shall be 1-1/2-inch galvanized steel electrical conduit as specified in City of Tulsa Specification 602 and shall be strapped to the pole using 2-hole straps. From the cabinet to the disconnect, 1" Sealtight, or approved equal, shall be used.

2.19 FLASHER CONTROLLER CABINET - If a school controller cabinet is not used, flasher controller cabinet assembly shall be the same as for the school controller cabinet but shall not include a time clock.

2.20 SCHOOL CONTROLLER PROGRAMMABLE TIME SWITCH - Pager programmable time switch shall be fully compatible with the school zone pager network currently in use (RTC CPR 2102G or approved equal).

2.21 SCHOOL CONTROLLER ANTENNA -

Antennas shall include fifteen feet of coaxial cable and shall be secured with UV rated tie wraps.

2.22 INSPECTION All materials shall be inspected by an authorized agent of the City of Tulsa Traffic Operations Division (TOD) to insure compliance with the specifications.

PART 3. CONSTRUCTION METHODS

- 3.1 All hardware and fittings shall be installed wrench tight.
- 3.2 Controller cabinets for electrical service powered flashers shall be mounted to the wooden service pole. If a pedestal service is being used, the controller cabinet may be mounted on the flashing beacon pole.
- 3.3 Poles shall be installed plumb in two perpendicular directions. The pole must be wrench tight before the collar is installed. Pins must be installed.
- 3.4 Flashing beacons and signs shall be aimed and leveled properly to insure maximum visibility prior to acceptance of the sign assembly.
- 3.5 Excess cable must be tied down using UV rated tie wraps.
- 3.6 All unused, drilled holes in the poles shall be resealed by non-ferrous rain-tight materials and methods as approved by the Traffic Engineer.
- 3.7 All holes in the top of the signal heads shall be permanently sealed with aluminum, stainless or nylon hardware or approved equal. No silicone shall be allowed.
- 3.8 Antenna for pager programmable time switch shall be mounted on the pole cap or to the wooden service pole if 120-volt service is used. For antennas installed on the pole cap, a 7/8-inch hole shall be drilled into the pole cap and filed smooth for antenna installation. For antennas installed on a wooden service pole, the antenna riser shall be 3/4-inch EMT and strapped to the pole using 3/4-inch straps.

- 3.9 Antenna for pager programmable time switch shall be mounted to the top end of the solar panel frame with self-tapping screws if solar flashing beacon is used. For antennas installed on a solar panel, drill a 7/8-inch hole for a 1/2-inch case nipple and locknut to prevent coaxial cable from chafing. Coaxial cable for the antenna shall be installed to limit exposure to sunlight.
- 3.10 Antennas shall be installed plumb.
- 3.11 A 1-3/8-inch hole for cable access for the confirmation light assembly shall be drilled through the pole and filed smooth, located thirty-two (32) inches from the top of the pole as shown on the attached drawing.
- 3.12 A 1-3/8-inch hole shall be drilled for cable access for the controller cabinet and filed smooth as shown on the attached drawing.
- 3.13 For solar powered flashing beacon sign assemblies, no splices shall be allowed between the panel junction box and the control cabinet.
- 3.14 Electrical flashing beacon signs shall be installed no farther than 500 feet from the service, unless directed otherwise by the Traffic Engineer.
- 3.15 All flashing beacons should be installed no farther than 100 feet from the crosswalk, unless directed otherwise by the Traffic Engineer.

METHOD OF MEASUREMENT

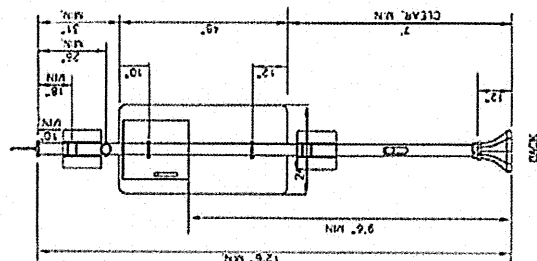
Sign assemblies with flashing beacons will be measured by each assembled unit installed.

BASIS OF PAYMENT

The accepted sign assemblies with flashing beacons, measured as provided above, will be paid for at the contract unit price as follows:

SIGN ASSEMBLY WITH FLASHING BEACON, ELECTRIC	EACH
SIGN ASSEMBLY WITH FLASHING BEACON, SOLAR.....	EACH
SCHOOL SIGN ASSEMBLY WITH FLASHING BEACON, ELECTRIC	EACH
SCHOOL SIGN ASSEMBLY WITH FLASHING BEACON, SOLAR.....	EACH

Such payment shall be full compensation for furnishing materials, labor, equipment, and incidentals necessary to complete the work as shown on the Plans and this Special Provision.



CITY OF TULSA, OKLAHOMA	
ENGINEERING SERVICES DEPARTMENT	
Solar Powered School Flasher	
Detail	
DATE: 6-29-2022	SID: HO 629 A

- NOTE:
WIRE HEADS SO THEY WILL BOUNCE FLASH
- 4 #14 - RED-FLASH #1
WHT-AC-
BLK-FLASH #2
GRN-SP

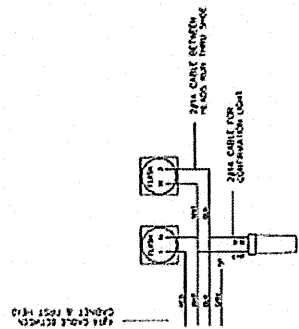
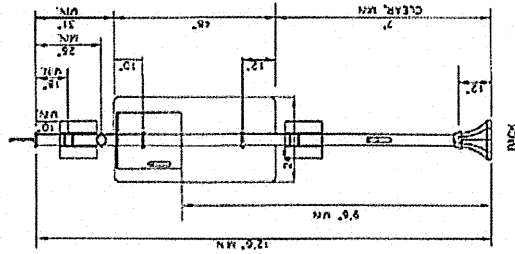
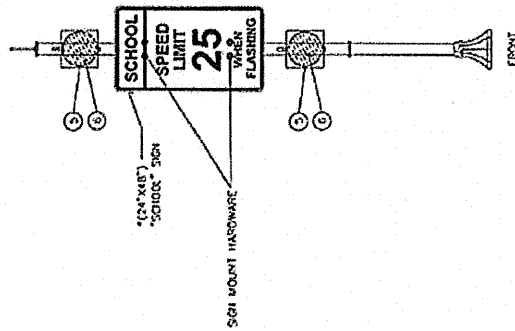
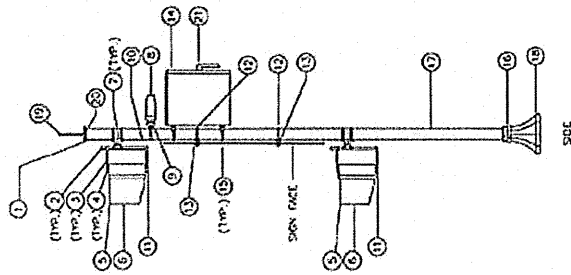
CONSTRUCTION NOTES:

1. ALUMINUM POLE CAP DOGIES
2. ALUMINUM COSSIFIED TUBE.
3. 2-WAY UPPER ARM
4. INSTALL NEOPRENE GASKET
5. POLYCARBONATE YELLOW SIGNAL HEAD (4"-4"-4") TUNNEL WOOD
6. 120V AC AMBER LED'S
7. SIGNAL CLAMP
8. CONFIRMATION LIGHT ASSEMBLY WITH CLEAR GLOBE.
9. 1-WAY LED ASSEMBLY, DRILL 1-3/8" HOLE FOR CABLE ACCESS THRU POLE AND FILE SMOOTH 20" MINIMUM FROM TOP OF POLE
10. DRILL 1-1/8" HOLE FOR CABLE ACCESS AND FILE SMOOTH 24" MINIMUM FROM TOP OF POLE
11. 2-WAY LOWER ARM.
12. U-BOLT SIGN CLAMP.
13. INSTALL MOUNTING HARDWARE, 1-5/16" X 1-1/2" STAINLESS STEEL FLAT WASHER, 1-5/16" STAINLESS STEEL LOCK WASHER AND 1-5/16" STAINLESS STEEL HEX NUT.
14. CONTROLLER CABINET
15. MOUNTING KIT FOR CONTROLLER CABINET
16. POLE & BASE COLLAR ASSEMBLY.
17. 4" SIGN ALUMINUM POLE (NO COATING)
18. ALUMINUM OCTAGONAL BASE ASSEMBLY.
19. ANTENNA.
20. DRILL 3/8" HOLE INTO POLE CAP FOR ANTENNA INSTALLATION
21. CABINET DOOR SHALL LOCK USING A 3-POINT LOCKING SYSTEM. ENSURE TO THE 3-POINT LOCKING SYSTEM USED IN 333 TRAFFIC SIGNAL CABINETS.
22. REFERENCE STANDARD DETAIL 807A FOR ELECTRICAL SERVICE AT WOOD POLE, METER CAN, DISCONNECT, CONDUIT, AND GROUNDING REQUIREMENTS.

NOTE:

WIRE HEADS SO THEY WILL EXPOSE FLASH

- 4 #14 - WED-FLASH P1
- WED-AC
- REL-FLASH #2
- GRN-SI



REVISION	BY	DATE
1	WJ	8-13
2	WJ	8-13
3	WJ	8-13
4	WJ	8-13
5	WJ	8-13
6	WJ	8-13
7	WJ	8-13
8	WJ	8-13
9	WJ	8-13
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22	WJ	8-13

CITY OF TULSA, OKLAHOMA
ENGINEERING SERVICES DEPARTMENT
Electric Powered School Flasher
Detail
DATE: 8-23-2022 SJD NO. 23-18

SPECIAL PROVISIONS
FOR SIDEWALKS

1. This work shall consist of furnishing a 4-inch thick concrete sidewalk located on relatively level terrain in accordance with Section 610.04 of ODOT's Standard Specifications for Highway Construction, 2019 addition.
2. The contract unit price shall be full compensation for performing the work specified and the furnishing of all materials, labor, tools, equipment and incidentals. This shall include concrete, forming, excavation, backfill, saw cuts, and expansion joints to complete the work as specified.
3. Removal of existing sidewalk will be paid separately and shall be paid for as sidewalk removal.
4. Sodding will be paid separately and shall be paid for as solid slab sodding.

BASIS OF PAYMENT.

SIDEWALK	SY
SIDEWALK REMOVAL	SY

SPECIAL PROVISIONS FOR SEGMENTAL RETAINING WALL

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Furnishing materials and labor required for the design and construction of a ReCon "Series 50" precast modular block retaining wall.
- B. Related Sections:
 - Section 312000 Earth Moving

1.2 REFERENCES

- A. Concrete Segmental Retaining Wall Units – American Society for Testing and Materials (ASTM):
 - 1. ASTM C-1372 Specifications for Segmental Retaining Wall Units (Section 7)
- B. Drain Pipe – American Society for Testing Materials (ASTM):
 - 1. ASTM D-3034 Specifications for Polyvinyl Chloride Pipe (PVC)
 - 2. ASTM D-1248 Specification for Corrugated Plastic Pipe
- C. Engineering Design – National Concrete Masonry Association (NCMA):
 - 1. NCMA Design Manual for Segmental Retaining Walls, 3rd Edition
 - 2. NCMA SRWU-1 Test Method for Determining Connection Strength of SRW
 - 3. NCMA SRWU-2 Test Method for Determining Shear Strength of SRW
- D. Soils – American Society for Testing and Materials (ASTM):
 - 1. ASTM D-698 Laboratory Compaction Characteristics of Soil – Standard Effort
 - 2. ASTM D-4318 Liquid Limit, Plastic Limit and Plasticity Index of Soils
 - 3. ASTM D-422 Gradation of Soils
 - 4. ASTM D-424 Atterberg Limits of Soils
 - 5. ASTM D-G51 Soil pH
- E. ReCon Construction Detail Drawings: www.reconwalls.com
 - 1. #100 Block Types
 - 2. #101 Typical Base Block Placement
 - 3. #102 Typical Maximum Gravity Walls Heights
 - 4. #105 Typical Inside Radius – Full Block
 - 5. #106 Typical Outside Radius – Full Block
 - 6. #107 Typical Base Row Step Up
 - 7. #108 Typical Top of Wall Step Up
 - 8. #109 Typical Top of Wall Step Up – Alternative Placement
 - 9. #110 Typical Outside Corner Detail
 - 10. #111 Typical Inside Corner Detail
 - 11. #112 Outside Corner Details – Double & Single 90° Corners Abutting to Vertical Structures
 - 12. #113 Typical Guard Rail Detail
 - 13. #114 Typical Fence Detail
 - 14. #115 Typical Water Wall Detail
 - 15. #116 Typical Drain Tile Detail

1.3 DEFINITIONS

- A. ReCon Retaining Wall Unit: Concrete, segmental facing block provided by an authorized manufacturer under license to ReCon Retaining Wall Systems, Inc.
- B. Drainage Aggregate: Clean, crushed rock located within and immediately behind ReCon units to facilitate drainage and avoid compaction near ReCon wall units.
- C. Foundation Soil: Soil zone immediately beneath the retaining wall facing units, the wall leveling pad and the reinforced soil zone.

- D. Retained Soil: Soil immediately behind retaining wall facing and drainage aggregate or reinforced backfill if present.
- E. Construction Drawings: Approved final plan for construction prepared and stamped by the wall design engineer licensed to practice in the state where the retaining wall is located.

1.4 Submittals

- A. Contractor shall submit Manufacturer's product data and installation instructions for approval.
- B. Contractor shall submit Manufacturer's test reports certifying that the ReCon units manufactured at their production facility meet the requirements of this specification and the requirements of the Construction Drawings.
- C. Unless provided within these project documents and/or the project drawings, contractor shall submit two sets of the Construction Drawings for all ReCon retaining walls on the project.
 - 1. The design shall be prepared by a Professional Engineer licensed to practice in the state where the retaining wall is located.
 - 2. The design shall be per NCMA Design Guidelines for Segmental Retaining Walls, or the AASHTO Standard Specifications for Highway Bridges, whichever is applicable as determined by the retaining wall design engineer.
 - 3. Construction Drawings shall include:
 - a. The retaining wall layout and retaining wall heights.
 - b. Typical wall sections.
 - c. Types, locations and properties of all drainage materials, appurtenances and special installation requirements not covered in this specification.
 - d. Retaining wall elevation views.
 - e. Any soil reports or testing conducted in addition to that included within the project drawings and specifications.
 - f. Design assumptions.
- D. Submit gradation reports for aggregates used for the wall leveling pad, unit / drainage fill and for select reinforced fill if required in the final engineered wall design.
- E. All submittals must be provided and reviewed prior to the start of retaining wall construction.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall inspect all products at delivery to determine that the proper materials have been delivered and are usable. Damaged material shall not be incorporated into the work.
- B. ReCon retaining wall units shall be stored in a location and manner that protects against excessive weathering and damage.
- C. Contractor shall prevent ReCon units from excessive soiling and coming in contact with substances which may stain or adhere to the finished visual surfaces of the unit.
- D. Faces of the ReCon Block shall be free of excessive chipping, cracking and stains.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Contractor shall have successfully installed at least three projects similar to that of this project within the last two years. Contractor shall always maintain at least one mechanic on site that worked on one or more of these previous installations.
- B. Owner shall employ the services of an independent geotechnical or materials engineering firm to provide soil testing and quality assurance inspection for wall construction and soils work. Contractor shall provide any quality control testing or inspection not provided by the Owner.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Precast Modular Block Wall shall be manufactured by Arrowhead Precast, LLC in Jenks, OK. Contact: Ryan Davis – (918) 857-3460 or rdavis@arrowheadprecast.com.
- B. Approved equals. Proposed equals must be approved by the Engineer a minimum of fifteen (15) days prior to bid date. The owner or his engineer reserves the right to accept or reject any proposed equal system for reasons including, but not limited to, previous performance record, appropriate and applicable testing, and qualified technical support. Minimum information required for approved equivalent is specified in Section 1.4.

2.2 MATERIALS

- A. ReCon "Series 50" retaining wall units.
 - 1. The block unit shall consist of concrete with the average 28-day compressive strength of no less than 4000 PSI.
 - 2. Concrete shall have air entrainment by volume (as measured in the plastic state in accordance with ASTM C172) of:
 - a. 5.5 – 8.5 percent, or
 - b. In conformity with ASTM C94 (Table 1 and Section 7), latest revision.
 - 3. Exterior dimensions of the face shall be 48" by 16" for full and corner unit, and 24" by 16" for half unit.
 - 4. Depth of unit should be as per Construction Drawings and is available in depths from 24" up to 84" (24", 39", 45", 60", 66", 72", 78", 84").
 - 5. ReCon Units used shall maintain tolerances of:
 - a. Height: +/- 3/16"
 - b. Width: +/- 1/2" unless field cut for fitting purposes.
 - c. Depth: No less than the unit design depth (i.e. 24", 39", 45", 60", 66", 72", 78" or 84") with the textured face portion of the block is considered as 4"
 - 6. Special shape units should be obtained and used where indicated on the final engineered construction drawings. Reference ReCon Drawing #100 for overview of standard unit types.
 - a. ReCon Unit Face Texture shall be "North Shore Granite" or approved equal by the City of Tulsa Engineer.
- B. Base Leveling Pad: The wall base leveling pad material shall consist of a compacted crushed stone base or non-reinforced concrete as indicated in the Construction Drawings.
- C. Drainage Aggregate: Drainage aggregate shall consist of clean 1" minus crushed stone or gravel meeting the requirements of the Construction Drawings.
- D. Backfill Material: All backfill material, borrow or imported, shall meet all requirements of the Construction Drawings.
- E. Drainage Pipe: If required in Construction Drawings, drainage pipe shall be perforated, or slotted PVC pipe manufactured in accordance with ASTM D-3034 or corrugated HDPE pipe manufactured in accordance with ASTM D-1248. Drainage pipe may also be covered with a geotextile filter fabric.
- F. Unit Adhesive: Adhesive shall be a premium, construction grade suitable for concrete and exterior applications.

2.3 FINISHES

- A. ReCon retaining wall color
 - 1. Finished wall shall be left in natural (as-cast) color.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify locations of utilities and existing structures prior to excavation.
- B. Examine the Project site and evaluate conditions where the ReCon retaining wall will be constructed. Notify the proper supervising authority in writing of any conditions that may interfere with the proper construction of the ReCon wall or delay completion.
- C. Promptly notify the wall design engineer of site conditions which may affect wall performance, soil conditions observed other than those assumed, or other conditions that may require a reevaluation of the wall design.

3.2 EXCAVATION

- A. Contractor shall excavate to the lines and grades shown on the construction drawings. The contractor shall be careful not to disturb the base beyond the lines indicated.
- B. Foundation soils shall be excavated as required for footing base / leveling pad dimensions shown on the construction drawings, or as directed by the wall engineer.
- C. Over-excavated areas shall be filled with suitable base or backfill material and compacted to 95% standard proctor.

3.3 FOUNDATION SOILS PREPARATION

- A. Foundation soils shall be evaluated by a Geotechnical Engineer or Owners Representative to ensure that the bearing soils meet or exceed the design conditions or assumptions.
- B. Compact foundation soil zone to 95% standard proctor prior to installing base / leveling pad.

3.4 BASE / LEVELING PAD

- A. Base shall be located as indicated on the Construction Drawings and shall have a minimum thickness of 6 inches. Base materials are to be as specified by the wall engineer (generally crushed stone, $\frac{3}{4}$ " minus, or similar).
- B. Width of the base pad must extend a minimum of 6 inches in front and 6 inches behind the ReCon Base Block footprint.
- C. Base material shall be compacted to provide a smooth, hard surface on which to place the first course of units.
- D. Compact base material to 95% of standard proctor.
- E. Base shall be prepared to ensure full contact of the wall unit with base material. Spacing or gaps between units shall not exceed $\frac{1}{2}$ ".
- F. Contractor may elect to substitute a portion of the specified granular base materials with a lean, unreinforced concrete topping.
- G. When a reinforced footing is required by the Construction Drawings, it shall be located below the frost line.

3.5 UNIT INSTALLATION

- A. First course of units shall be Base Block units and shall be placed in full contact with the base material.
- B. Check units for level from side-to-side, front to back, and check to maintain unit batter front-to-back.
- C. Place unit faces in contact side to side and avoid any gaps greater than $\frac{1}{2}$ ".
- D. Fill and compact fill to grade in front of embedded units prior to compaction behind the wall units.
- E. Fill voids between ReCon units with $\frac{3}{4}$ " clean crushed rock to one foot behind the unit depth unless otherwise instructed in the Construction Drawings.

- F. Sweep and clean the top of each course before setting additional courses.
- G. Lay each successive course making sure that the bottom recess is in full contact with the unit locators of the course below. Pull unit forward as far as possible. Backfill and compact soil behind the units.
- H. Check and maintain level and wall batter by use of shims when necessary.
- I. Follow ReCon recommended procedures to maintain acceptable running bond when constructing curved walls and / or corners. Build in accordance with Construction Drawings or ReCon Construction Detail Drawings.
- J. Handle units with proper lifting devices that have been certified for the loads associated with the weights of the units. Avoid applying forces to the lifting loops more than the normal force associated with the weight of the unit (i.e., avoid applying "shear forces" or "dynamic loads" from bouncing or swinging of a unit). If the unit is to be transported over a significant distance in the field, it is recommended that a CABLE be used, NOT A CHAIN. The cable has some "stretch" in it that will absorb some of the dynamic loads.

3.6 CAP UNIT INSTALLATION

- A. Clean and apply exterior concrete cap adhesive to top course of ReCon wall unit prior to placement of ReCon cap unit.
- B. Trim sides of interior cap units to insure proper fit of wall cap. Do not leave cut surfaces exposed to view in the finished wall.
- C. Fill and compact soil to top of ReCon cap unit.

3.7 SITE TOLERANCES

- A. Straight walls
 - 1. Vertical Alignment: $\pm 1.5"$ over any 12 ft. distance and no more than $\pm 3"$ over the entire length of wall.
- B. Horizontal Alignment Control:
 - 2. Corners and radius location: ± 1 foot to theoretical location indicated on the Grading Plan.
 - 3. Radii: ± 2 ft. from theoretical lines indicated on the Grading Plan.
- C. Wall Batter at Completion of Work: ± 2 degrees from the design batter and no batter less than 2 degrees.

3.8 FIELD QUALITY CONTROL

- A. Contractor shall be responsible for proper installation and quality control of all ReCon wall components and appurtenant materials.
- B. Owner shall, at their expense, retain a qualified professional to monitor and perform quality assurance checks of the installer's work.
- C. Quality Assurance should include foundation soil inspection, frequent backfill compaction testing, verification of geotechnical design parameters and compliance with Construction Drawings and Project Specifications.

3.9 CLEANING

- A. After completion of wall installation, remove construction debris and restore any adjacent finished areas affected by wall construction to their pre-construction state.
- B. Wash wall face to remove soiling and stains. Do not use acid or detergents that may "burn" or discolor face.

PART 4 BASIS OF PAYMENT

The CITY will pay for each pay item at the contract unit price per the specified pay units as follows:

Pay Item:		Pay Unit:
510(SP-A)	Wall Height 0' to 4'	SY
510(SP-B)	Wall Height 4.1' to 8' (block manufacturer required to do engineered design signed and sealed by engineer in Oklahoma)	SY
510(SP-C)	Wall Height 8.1' to 13' (block manufacturer required to do engineered design signed and sealed by engineer in Oklahoma)	SY

For Quantities, the CITY will consider the Wall Height as measured from top of leveling pad to top of wall. The City will consider the cost of the following to be included in the contract unit price for relevant wall pay items:

- Engineering and associated costs,
- Excavation,
- Backfill,
- Backfill Material,
- Perforated Pipe Underdrain, Filter Fabric,
- Pipe Underdrain Cover Material,
- Freight.

SPECIAL PROVISIONS
FOR STANDING (VERTICAL) CURB FOR 6" X 9" X 18" CURB

This item shall be constructed under the same conditions of Oklahoma Department of Transportation (ODOT) Standard Specification for Highway Construction, 2019 Edition, sections 609 except that the geometrics shall be as shown on City of Tulsa Standard No. 703 "Residential Asphalt Driveway Concrete Street" for Vertical Curb.

BASIS OF PAYMENT.

STANDING CURB 6" X 9" X 18"

LF

Special Provision for Sidewalk Tripping Hazard Abatement

Contractor must repair all sidewalk trip hazards from ¼" and up to 1 ½" at identified locations.

Contractor must remove hazard completely, from one end of the raised sidewalk joint to the other, if applicable, leaving no height differential between sidewalk panels. Contractor may not use any type of "fill" material on the sidewalk that can deteriorate or break apart over time.

Contractor must not cause any damage to landscape, retaining walls, curbs, sprinkler heads, utility covers or other objects adjacent to the sidewalk. If the contractor and /or the contractor's equipment does cause damage to the above, the contractor must notify the City immediately and the damages must be repaired at the contractor's expense. Contractor must completely and immediately clean up all debris after each tripping hazard is removed. All costs incurred for the disposal of waste material shall be included in the cost of the abatement and shall not be paid for separately.

If water-cooling is used in the trip abatement process, all slurry and water run-off shall be contained, removed and disposed of in accordance with City, State and Federal guidelines. If water is not used in the trip abatement process the contractor must use a dust abatement system, which captures the dust emitted from the equipment used in the abatement process.

Contractor shall remove the tripping hazard and restore the sidewalk to a maximum slope in accordance with the requirements outlined by the Americans with Disabilities Act. After completing the tripping hazard abatement, the repair shall have a uniform appearance and the texture of the surface shall comply with the American with Disabilities Act regarding roughness. The repairs shall not leave ridges or grooves that could hold water or prevent drainage of rain or irrigation water.

The equipment and all other items incidental to the tripping abatement shall not be left or stored on the sidewalk or on private property while not in use. All mobilization to the site shall be included in the cost of the abatement process. The City shall endeavor to group tripping hazard abatement locations together whenever possible.

Basis of Payment:

SIDEWALK TRIPPING HAZARD ABATEMENT

IN-FT

Sidewalk Tripping Hazard Abatement will be measured by the Inch-Foot.

Inch-Foot shall be calculated by multiplying the average depth of the removal by the width of the removal. *Example:* If a tripping hazard is 1 inch above the abutting panel on one end of the sidewalk panel and tapers to 0 inches above the abutting panel on the other end of the sidewalk panel and the sidewalk is 4 feet wide, it shall be calculated as follows:

$$\frac{1" + 0"}{2} \times 4' = 2 \text{ inch-feet}$$

SPECIAL PROVISIONS
SURVEYING ALLOWANCE

The "Surveying Allowance" may be used for various work and miscellaneous items not specifically identified in the Contract Documents with the following provisions:

- A. The allowance shall be used for performing surveying tasks and providing survey data as requested by the City of Tulsa and shall include all materials, labor, equipment, profit and overhead, of Surveying work items not specifically identified in the Construction Documents or included in original pay items bid for the contract.
- B. The allowance shall be utilized only at the discretion of the City of Tulsa. Any balance remaining at the completion of the Project will be retained by the City of Tulsa.
- C. The Contractor shall provide, to the City of Tulsa, a written request for the use of any allowance, including a schedule of values and associated backup information, including validity of need, materials, labor, equipment, and time required to perform the associated work.

Contractor shall proceed with the allowance work only after receiving written permission from the City of Tulsa. Proceeding with associated allowance work without written permission from the City of Tulsa will be at the Contractor's sole expense.

SPECIAL PROVISIONS
TEMPORARY PORTABLE TRAFFIC CONTROL SIGNALS

Description: Furnish, operate and maintain Temporary Portable Traffic Control Signals (TPTCS) units.

Materials: TPTCS units shall be in good working condition and approved prior to use.

Construction: Place the TPTCS units as shown in the U.S. Department of Transportation Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD) 2000, figure 6H-12 or as directed. Maintain the TPTCS units in good working condition. Repair/replace damaged or malfunctioning TPTCS units.

Measurement: The item will be measured by the sign day. A day shall be measured for one TPTCS unit set and operating in each direction on the worksite.

Payment: The work performed, and materials furnished in accordance with this item and measured as provided under "Measurement will be paid for at the unit price bid for "Temporary Portable Traffic Control Signals". This price is full compensation for TPTCS unit, set up, relocating, removing, replacing parts, batteries, fuel, oil and all incidentals.

SPECIAL PROVISIONS
FOR TREE REMOVAL

DESCRIPTION. This work shall consist of removing trees where called for on the Plans and shall include cutting such trees, removing their stumps and roots, and properly disposing of the material.

CONSTRUCTION METHODS. Trees shall be removed and disposed of in a manner approved by the Engineer. All stumps and roots shall be removed to a depth of not less than 12 inches below the finished subgrade elevation.

METHOD OF MEASUREMENT. The size of trees will be determined by the average diameter of the tree trunk taken at a point measured four feet above the base of the tree at the ground line. The diameter will be measured to the nearest full inch.

BASIS OF PAYMENT. Trees to be removed under this item will be measured as provided above and will be paid for at the contract unit price per each tree in accordance with the following schedule of size:

(A)	REMOVING TREES 6-12 INCH IN DIAMETER	EA.
(B)	REMOVING TREES 13-18 INCH IN DIAMETER	EA.
(C)	REMOVING TREES 19-24 INCH IN DIAMETER	EA.
(D)	REMOVING TREES 25 INCH AND MORE IN DIAMETER	EA.

which shall be full compensation for furnishing all materials, equipment, labor and incidentals to complete the work as specified.

Removing trees less than 6 inches in diameter will be considered as incidental work and will not be paid for directly but the cost will be included in other items.

SPECIAL PROVISIONS
TRAFFIC SIGNAL CONTROLLER CABINETS ASSEMBLY AND COMPONENTS

Description: This special provision describes the minimum acceptable requirements for the components of a fully-actuated traffic signal controller cabinet assembly. The controller cabinet assembly shall include the ground rod, conduit, aluminum base, base anchor bolts, caulking, cabinet, controller unit, switch packs, flasher, conflict monitor, all auxiliary equipment required to control the system, and pertinent documentation. All components of the cabinet assembly shall meet the requirements of the City of Tulsa Standards and Specifications except as detailed herein.

Serial Numbers: Each individual piece of equipment including the cabinet unit shall have a unique serial number that is permanently and neatly displayed on the unit. A printed list of all serial numbers for the equipment provided for the controller cabinet assembly shall be provided by the contractor or supplier.

Approved Products List (APL). Where possible, all materials provided shall be supplied per the approved materials listed on the City of Tulsa Traffic Operations APL. For items not already on the APL, submittals shall be provided for the Traffic Engineer's approval both for components in COT Specification 610 and described in this special provision, prior to purchase of equipment.

All Traffic Signal Controller Cabinet Assemblies. All assembly materials and services shall meet the requirements of COT Specification 610 unless specified otherwise in this special provision.

All Signal and Junction Cabinets. The Contractor shall deliver the signal cabinet to the COT Traffic Operations Division for wiring and setup. COT will notify the contractor when the cabinet is ready for installation. All cabinets shall not have a functional police panel.

332 Signal Cabinet Requirements. 332 Signal Cabinets shall meet the requirements of COT 610.

332S (Stretch) Signal Cabinet Requirements. 332 Stretch Cabinets shall meet the cabinet and door height specifications of a McCain 332S cabinet. All other dimensions shall meet current COT standards and specifications as specified in COT Specification 610.

336S Signal Cabinet Requirements. 336S Cabinets shall meet the requirements of COT 610.

Junction Cabinets. Junction cabinets shall be 336 G-Type junction cabinets. Junction cabinets shall be installed on 18" riser bases as specified for 336S cabinets in COT Specification 610.

Controllers. The controllers shall be 170/E controllers meeting the requirements of COT Specification 610.

SPECIAL PROVISIONS
TRAFFIC SIGNAL MODIFICATIONS

DESCRIPTION:

The work under this item shall consist of furnishing all labor, equipment, and components necessary to perform the following traffic signal modifications as requested:

TRAFFIC SIGNAL CONTROLLER MODIFICATION - DISABLE / ENABLE
TURNING MOVEMENTS

TURN SIGNAL MODIFICATION - COVER AND UNCOVER

INSTALL AND REMOVE R3-2 OR R3-1 MAST ARM SIGNS

CONSTRUCTION REQUIREMENTS:

TRAFFIC SIGNAL CONTROLLER MODIFICATION - DISABLE / ENABLE TURNING
MOVEMENTS

When a left turn or a right turn is being restricted at an intersection due to construction and/or temporary traffic control, the traffic signal contractor shall disable the corresponding left turn or right turn in the traffic signal controller. Once the turning lane is being reopened to traffic, the traffic signal contractor shall re-enable the turning movement(s) in the traffic signal controller.

TURN SIGNAL MODIFICATION - COVER AND UNCOVER

When a left turn or a right turn is being restricted at an intersection due to construction and/or temporary traffic control, the traffic signal contractor shall cover the respective left turn or right turn signal heads. Once the turning lane is being reopened to traffic, the traffic signal contractor shall uncover the left turn or right turn signal heads.

INSTALL AND REMOVE R3-2 OR R3-1 MAST ARM SIGNS

When a left turn or a right turn is being restricted at an intersection due to construction and/or temporary traffic control, the traffic signal contractor shall install an MUTCD compliant R3-2 No Left Turn sign, or R3-1 No Right Turn sign, on the mast arm nearest the signal head that is being covered to restrict the turning movement. Once the turning lane is being reopened to traffic, and the signal head is being uncovered, the traffic signal contractor shall remove the mast arm sign.

PAYMENT:

Accepted quantities of items will be paid for at the contract unit price as follows:

TRAFFIC SIGNAL CONTROLLER MODIFICATION – DISABLE / ENABLE TURNING MOVEMENTS	EACH
TURN SIGNAL MODIFICATION - COVER AND UNCOVER	EACH
INSTALL AND REMOVE R3-2 OR R3-1 MAST ARM SIGNS	EACH

Such payment shall be full compensation for all equipment, tools, labor, and incidentals necessary to complete the work as specified.

**OKLAHOMA DEPARTMENT OF
TRANSPORTATION SPECIAL PROVISIONS
FOR
TRAFFIC STRIPE (PLURAL-COMPONENT)**

These Special Provisions revise, amend, and where in conflict, supersede applicable sections of the 2019 Standard Specifications for Highway Construction.

(Add the following:)

856.01 DESCRIPTION

This work consists of providing and placing reflectorized and non-reflectorized plural-component pavement markings on asphalt concrete (AC) and portland cement concrete (PCC) pavement surfaces.

Plural-component pavement markings includes multiple varieties of both fast setting and slow setting hybridized epoxies, modified urethanes/polyacrylates, methylmethacrylates (MMA), polyurea, or any other applicable plural-component materials approved by the Department.

856.02 MATERIALS

A. Physical Properties of the Mixed Compound

Provide a plural-component material that contains a homogeneous blend of liquid resins, pigments, and fillers and is also free of lead and other toxic heavy metals.

When heating to the application temperature, ensure the material does not emit toxic fumes.

Formulate and test the materials to ensure performance as a pavement marking material with glass beads applied to the surface.

Provide materials that are currently listed on the Department's Approved Products List (APL). Prior to product installation, supply the Engineer with a copy of all material certifications, product approval documentation, and any other documents requested by the Engineer.

Ensure the material has been evaluated by the Department, or another state Department of Transportation, using a performance test of at least 12 months. Alternatively, all products may be tested by AASHTO Product Evaluation & Audit Solution (*formerly NTPEP*). If the formula of the material is changed, the manufacturer must resubmit documentation for reapproval.

(1) Color

Provide material that complies with the requirements of ASTM D6628. Provide material that complies with the following minimum Daylight Reflectance Values at 45 degrees for white and 0 degrees for yellow:

- 75 % minimum for white
- 45 % minimum for yellow

(2) Hardness

Provide material with a minimum Shore D hardness of 75.

(3) Bond Strength of Concrete

Provide material that when catalyzed, has such a high degree of adhesion to the specified concrete surface that there is a 100% concrete failure. Apply the material at a film thickness of 0.01

± 0.001 inch to concrete, with a minimum compressive strength of 4000 psi. Allow the material to cure for 72 hours at 77°F before performing the test in accordance with AASHTO T237.

(4) Yellowness Index

Ensure the value after 72 hours in QUV is a maximum of 30 when tested at 0.01 ± 0.001 inch and after allowing 72 hours to cure. This is applicable to white markings only, and should be tested in accordance with ASTM E313.

(5) Drop on Glass Beads

Provide glass beads in accordance with Special Provision 711-3, Subsection 711.05.B, "Glass Beads for Traffic Stripe Thermoplastic or Plural Component." Provide a material certification from the glass bead manufacturer to the Engineer, for any glass beads prior to installation, including a document verifying that the provided glass have the appropriate coating for the plural-component material being installed. Additionally, provide a camSizer calibration for blended beads in addition to the material certification.

Provide a sample of all types of glass beads being utilized to the Engineer prior to installation. Test the glass beads in accordance with AASHTO T346 in order to verify that the material meets the certification provided by the manufacture. Install beads in accordance with Subsection 856.04.C(2) of this provision.

(6) Non-Reflectorized Contrast or Shadow Markings

Install non-reflectorized contrast or shadow markings on all portland cement concrete (PCC) pavement surfaces, regardless of the length. Ensure the marking material used for the contrast or shadow marking conforms to the same formulation, material, and pre-approved sampling requirements, except for the following items: color pigments used, color requirements listed, and anti-skid material. Install anti-skid material in accordance with Subsection 856.04.C(2) of this provision.

(7) Sampling and Certification

Submit a Type D certification to the Engineer for each batch of stripe used on every project. The Engineer may require a one (1) quart sample of both the plural-component resin, as well as a one (1) quart sample of the material hardener to be submitted to the Department's Materials Division. This is for testing purposes of the material as well as to ensure the product is present on the Approved Products List (APL).

If the manufacturer makes any formulation changes to the plural-component striping material, ensure the manufacturer submits a written explanation of the changes to the formulation, the new physical and chemical properties for the resin, and a new safety data sheet (SDS) for the stripe to the Department's Traffic Engineering Division. The material will be re-evaluated, re-approval, and relisted on the APL at least thirty (30) days prior to its use.

(8) Other Available Colors

If a plural-component material is utilized on a project that is of a color other than white, yellow, or black, install this material per the project plans. It is preferred that Methylmethacrylate (MMA) plural-component material be used in these cases.

856.03 EQUIPMENT

Use equipment that sprays the plural-component materials in the manufacturer recommended proportions. Mount the equipment on a truck capable of applying uniformly dimensioned markings as required by the Contract.

Provide equipment with an automatic bead dispenser that also continuously mixes and agitates the pavement marking material.

Provide equipment capable of placing at least 40,000 ft of the following types of markings per day to the alignment, spacing, and thickness shown on the Plans:

- Solid or skipped stripes 6 in wide;
- Markings other than solid or skipped lines; and
- A centerline and no-passing barrier stripe configuration consisting of one skip stripe with two solid stripes, simultaneously.

Ensure the equipment places markings with clean edges of uniform cross section and thicknesses, with square ends, and with an approximate stripe-to-gap ratio of 1:3.

Ensure the equipment uniformly and instantly places the beads on the markings. When placing beads on two adjacent stripes, ensure each stripe has an equivalent bead coverage rate and embedment.

Provide equipment that heats and places each component within the component mix tolerances in accordance with the manufacturer recommendations.

Use equipment fitted with a functional data logging system. Ensure the data logging system is operational, calibrated, and in use before striping operations. Provide the Engineer with a certification that the data logging system equipment meets the manufacturer's recommended calibration, along with the manufacturer's recommendations for equipment calibration frequency.

Install materials that have the ability to be placed without the use of specific equipment discussed in this section (such as a roller) in accordance with the manufacturer's recommendations and to the satisfaction of the Engineer.

856.04 CONSTRUCTION METHODS

A. Surface Preparation

Remove foreign material from the road surface before applying the plural-component material.

Ensure the pavement surface is dry.

Use abrasive blasting, grinding, or high-pressure water jet to remove existing, temporary, or permanent traffic markings until at least 95 percent of the underlying pavement is visible. Use these methods when removing existing material to apply a new material that is not of the same type, such as removing hot applied thermoplastic markings to install a plural-component marking material, or removing a type of plural-component material that will not bond to the existing material, unless otherwise specified by the manufacturer that the quantity of removal is not necessary for proper adhesion and longevity.

Remove the curing compound at least 1 inch beyond the width of the marking. After removing the curing compound, sweep and use a high-pressure air spray.

When removing a material to replace it with the same type of material and to minimize damage to the pavement surface while still providing a clean surface for new materials to bond to, use abrasive blasting, grinding, or a method approved by the Engineer to remove existing, temporary, or permanent traffic markings until 80 percent of the underlying pavement is visible, or to the inspector's preference. Unless otherwise specified by the manufacturer, this reduced removal option is only allowed when the existing and new materials will bond to each other without cracking or loss of cohesion.

Minimize interference between temporary pavement markings and the permanent plural-component pavement marking materials.

Disposal of materials generated by the removal of existing pavement marking materials is the responsibility of the Contractor and must be disposed of in a manner approved by the Engineer.

B. Pavement Temperature and Condition

Apply plural-component pavement markings to PCC pavement surfaces at least thirty (30) calendar days after paving, and new AC pavement a minimum of five (5) calendar days after paving under the following conditions:

- On a dry roadway (no standing water or significant dampness),
- At a pavement surface temperature of at least 40°F and rising, and
- At wind chill temperature of at least 35 °F [1.7 °C].

Measure the pavement surface temperatures 30 minutes before beginning the striping installation. If critical temperatures exist, measure the pavement surface temperature a maximum of every 2 hours, or at shorter intervals directed by the Engineer, or until the end of the day. Measure the pavement surface temperature with a standard surface thermometer, infrared non- contact thermometer, or approved data logging system.

In the event that temperatures and conditions are not conducive to the installation of permanent pavement markings within the specified time frame, including time for curing of PCC pavement, the engineer may allow and accept the installation of temporary pavement markings instead of permanent markings until the permanent markings can be installed, at no additional cost to the Department. Maintain the temporary markings until temperatures and conditions are conducive for permanent striping. Furthermore, the Engineer may suspend the contract and/or milestone time until temperatures and/or conditions improve to allow for the placement of permanent markings. In order for time suspension to be considered, all contract work which is unaffected by the inability to place the permanent paving markings must be completed.

C. Application

(1) Marking Material Selection

Install all pavement marking material, regardless of type, in accordance with Special Provision 711-3, Table 711:7 "Long Line Pavement Marking Material Selection."

For hand applied markings, ensure the material chosen matches the long line material being utilized, with the exception of Methylmethacrylate (MMA) plural-component marking materials, MMA materials are preferred for transverse markings, including stop bars, continental crosswalks, and turn arrows. Methylmethacrylate (MMA) may also be used for epoxy coated or silane treated bridge decks.

(2) Plural-Component Material Application

Apply large glass beads at a coverage rate of at least 8 lbs per 100 ft² before applying standard beads. Apply standard glass beads at a coverage rate of at least 8 lbs per 100 ft². For hand-machine applied markings, apply large glass beads at a coverage rate of at least 8 lbs per 100 ft² before applying standard beads. Apply standard glass beads at a coverage rate of at least 8 lbs per 100 ft².

Should a hand machine be utilized that is not capable of a double drop application, use a single application rate of at least 8 lbs per 100 ft². For blended beads that are not installed with a double drop application, apply at a coverage rate of at least 8 lbs per 100 ft². Application rates may exceed the described minimum of 8 lbs per 100 ft² if in accordance with manufacture recommendations.

Alternatively, for all PCC pavement surfaces apply a non-reflectorized contrast marking, of the same dimensions as the white skip lines shown on the plans, immediately after each upstream white skip line. Use contrast markings at a minimum coverage rate of 24 lbs per 100 ft² of a black, color-fast, medium mesh, anti-skid material.

The application of glass beads by hand throwing is not allowed under any circumstance. Use either a bead gun or a device that provides an even distribution of glass beads.

Use a computerized data logging system for monitoring the application of plural-component stripe to measure the thickness of the plural-component stripe. Collect data for any pavement marking application of 1,000 linear feet or greater. Report the following data as an average for each 1,000 feet:

- Application speed to the nearest 0.1 mph
- Weight (lbs) and/or volume (gallons as measured through a piston displacement pump mechanism) amount of material used by color
- Weight (lbs) of glass beads/elements used
- Pavement surface temperature (°F)
- Air temperature (°F)
- Dew point (°F)
- Humidity (%)
- Material application rates and film thickness over the section painted

Table 856:4A Contract Unit Price Adjustments for Workmanship			
Length of Discrepancies (per 1,000 ft)	Contract Unit Price Adjustments	Length of Discrepancies (per 1,000 ft)	Contract Unit Price Adjustments
100 Feet	10%	600 Feet	60%
200 Feet	20%	700 Feet	70%
300 Feet	30%	800 Feet	80%
400 Feet	40%	900 Feet	90%
500 Feet	50%	1,000 Feet	100%

In addition to the above data, record the highway number with the beginning and ending reference point rounded to the nearest hundredth of a mile, project number, and job piece number.

Provide an electronic or printed record of the data to the Engineer daily. The Engineer may determine that more frequent submission is necessary, particularly if equipment malfunctions occur. Produce either the printed or electronic records in their final form prior to the records being removed from the striping equipment (i.e. the Contractor presents this to the Engineer in the field). If only one record is produced at the striping equipment, the other may be produced in an office. However, present the first record to the Engineer prior to any of the data entering an office environment. Ensure the electronic record is a comma or space delimited text file, adequate for insertion into a computerized spreadsheet software package, or a spreadsheet format acceptable to the Engineer.

Prior to the start of striping operations, travel a distance of at least 1,000 ft, or the manufacturer recommended distance, to verify the consistency of physical and electronic measurements of distance traveled.

Markings not installed to the satisfaction of the Engineer, including markings that are incomplete, lack sharp edges, have uneven thickness, track marking material on the roadway, have abrupt unintended changes in alignment, or an otherwise unsatisfactory appearance, are subject to contract unit price adjustments for workmanship in accordance with Table 856:4A.

Price adjustments for workmanship will apply for each 1,000 ft section of long line pavement markings, in addition to each hand applied marking, unless the Contractor can bring all markings into compliance and to the satisfaction of the Engineer, at no additional cost to the Department.

Ensure longitudinal and edge line markings meet the minimum and maximum mil thickness values in accordance with Table 856:5A for all pavement types. If non-epoxy, fast or slow setting materials need to be installed at a thickness greater than described in Table 856:5A, apply the material in accordance with the manufacturer recommendation.

Table 856:5A Minimum and Maximum Mil Thickness (All Pavement Types)	
mils	Contract Unit Price Adjustment
23 (±2)	100%
21 - 18	75%
18 - 15	50%
< 15	Remove and Replace

D. Performance Period

Ensure markings and replacement markings meet the Contract requirements for at least thirty (30) calendar days. Within 30 calendar days of notification by the Resident Engineer, remove and replace non-compliant pavement markings, at no additional cost to the Department.

E. Retro-reflectivity

Measure stripes with a portable or mobile retroreflectometer that uses 30 m geometry, in accordance with ASTM E1710 and the manufacturer recommendations. Ensure the manufacturer calibrates the retroreflectometer annually. Keep the annual calibration certification with the retroreflectometer. All retroreflectometer readings must be in conjunction with line thickness gauge measurements.

(1) Minimum Retro-reflectivity

Ensure longitudinal markings on all pavement surfaces meet the minimum retro-reflectivity values in accordance with Table 856:7A.

(2) Measurement

Measure retro-reflectivity of markings within thirty (30) calendar days of placement, but not prior to fourteen (14) days after installation, to allow for the removal of loose beads.

The following lot sizes will apply to both portable and mobile retroreflectometer methods. For portable retroreflectometer, the random locations will be determined and then readings taken at those spots. For mobile retroreflectometers the average value of reflectivity will be taken for the full length of each lot and used to compute that lot's acceptance.

Measure marking retro-reflectivity in the direction of traffic, except where the Department will allow yellow skip stripes to be measured in either direction of travel. One measurement (multiple readings) will represent each 1,000 ft lot of single-color longitudinal stripe. The Department will not allow readings for adjacent lots to be taken closer than 500 ft from each other. Use the same 1,000 ft sections for mil thickness and contract unit price adjustments for work quality, if necessary.

For solid longitudinal stripes, one measurement represents the average of five readings per lot, taken at 3 ft intervals along a randomly selected 15 ft section of solid stripe.

For longitudinal skip stripes, one measurement represents the average of six readings per lot, two readings taken from each of three adjacent skip stripes. The Department will not allow readings taken within the first or last 1 ft of skip stripes.

For non-compliant measurements, the Engineer will require additional measurements to determine the extent of non-compliance.

The Department will not require measurements of the following, however, these markings may be subject to contract unit price adjustments for work quality:

- Stop-bars, crosswalks, gores, words, symbols;
- Longitudinal striping installed using hand line machines; and
- Projects less than 2,500 ft, or less than the striping quantity installed

Obtain the Engineer's approval in writing before using a mobile retro-reflectometer system as an alternative measurement method.

(3) Acceptance

Submit final retroreflectivity measurements to the Resident Engineer for acceptance. Include the date and time of retroreflectometer calibration, location (GPS coordinates), line color, and date of each measurement. Ensure the retroreflectometer is updated and calibrated, with calibration reports and the manufacturer's period of calibration provided to the Engineer, prior to the taking of readings. These requirements also apply if the Engineer allows the use of a mobile retroreflectometer. The Department will consider unmeasured stripes non-compliant. The Resident Engineer will provide notification of non-compliance with the minimum retroreflectivity values. Remove and replace non-compliant stripe sections at no additional cost to the Department.

For quality assurance, the Department will measure retroreflectivity with an updated and calibrated retroreflectometer. If the Department's and the Contractor's measurements differ by greater than 10 percent, the Department will use its measurements for acceptance.

The Resident Engineer may accept striping quantities less than 2,500 ft by visual inspection.

Table 856.7A Minimum Retro-Reflectivity (All Pavement Types)			
White		Yellow	
mcd/m ² /lx	Contract Unit Price Adjustment	mcd/m ² /lx	Contract Unit Price Adjustment
≥ 450 *	100%	≥ 300 *	100%
400 - 439 *	75%	275 - 289 *	75%
250 - 399 *	50%	226 - 274 *	50%
< 250	Remove and replace	< 226	Remove and replace

* The Contractor has the option to replace the stripe at no additional cost to the Department, or take the deduction.

F. Installation of Recessed Plural-component Pavement Markings

Install recessed plural-component pavement markings and provide guidance for the installation on PCC and newly constructed AC surfaces, when specified in the project plan set.

Material requirements for the plural-component markings will be provided in accordance with Subsection 856.02 of this provision, however, for the application of recessed plural-component pavement markings, hybridized fast setting epoxy, modified urethanes/polyacrylates, methylmethacrylates (MMA), or polyurea will be the only acceptable options. Additionally, the selected material must be currently listed on the Department's APL, or approved by the State Pavement Marking Program Manager at the request of the Engineer.

Provide material requirements for drop on glass beads in accordance with Subsection 856.02.A(5) of this provision and Subsection 711.05.A. The glass bead material may meet or exceed these standard requirements, however, provide glass beads that do not have a refractive index that exceeds 1.75. For PCC surfaces, install a non-reflectorized contrast, or shadow marking, in accordance with Subsection 856.02.A(6) and 856.04.C(2) of this provision.

G. Installation of Pavement Groove

Installation of the pavement marking groove will consist of cutting a long, narrow, shallow depression to apply the plural-component pavement marking material. Install the groove in accordance with the following requirements:

- Remove all foreign material from the pavement surface prior to the beginning of grinding operations, including road kill, tire and vehicle debris, and large pieces of pavement material.
- All grooving equipment, manufacture's recommended practices and specifications are subject to the Engineer's approval. Additionally, provide the Engineer with the proposed method of installation for approval. The manufacturer's recommendation can be used without the approval of the Engineer, if an alternative method is needed.

Prior to beginning grooving operations, verify all equipment is in working order and is capable of installing the grooves at the appropriate widths, lengths, and with the appropriate spacings.

- Establish control points prior to beginning the grinding operation to account for offsets. Additionally, pre-mark the entire distance of the project to be grooved. Both the control points and pre-marks must be approved by the Engineer prior to beginning grinding operations.
- Ensure the groove depth is a constant 60 mils with a tolerance of ± 10 mils.
- Provide groove length and width dimensions to create a maximum tolerance of 0.75 inch on either side of the marking, including the black contrast marking.
- The groove will be considered defective if it is outside of any of the above tolerances and the alignment of the groove is outside of what is appropriate for the lane lines of the applied roadway. The groove may also be considered defective if substantial damage to the pavement surface occurs as a result of grinding operations. If during grinding operations the Contractor notices pavement failure, cease grinding operations as soon as the failures are identified and notify the Engineer. Do not continue grinding operations until the Engineer allows the Contractor to proceed. The Contractor will not be penalized for delays while waiting on a response from the Engineer regarding the continuation of grinding operations.
- Repair all defective grooves to the satisfaction of, and in a manner, approved by the Engineer. The cost of all work to repair defective grooves will be performed at no additional cost to the Department.
- Ensure the pavement surface is free of any waste material following grinding operations. Any material generated as a result of grinding operations will become the property of the Contractor and must be disposed of in a manner approved by the Engineer.
- Do not install the groove continuously for dotted or dashed markings, such as centerline skips. Install a continuous groove for continuous long line markings, such as pavement edge lines.
- Do not install grooves on bridge decks and bridge joints, at grade drainage structures, on ultra-thin asphalt overlays, and any other location specified in project plans, without written approval from the Engineer.
- At the request of the Engineer, provide two gauges that are easily readable and accurate to verify groove depth. Provide these gauges to the Engineer at least two weeks prior to the estimated start date of grinding operations. Along with the gauges, provide the manufacturer instructions for their use, as well as documentation showing the devices have been calibrated in accordance with the manufacturers' requirements. Following the completion of the project, these gauges will be returned to the Contractor.

H. Installation of Plural-Component Pavement Marking Material Within the Groove

With the exception of the requirements stated in this provision, install the plural-component pavement marking material in accordance with Subsection 856.03 and 856.04.

Prior to the installation of any plural-component material, ensure the surface is completely dry and free of any foreign material. Immediately before the use of plural-component installation equipment, use a high-pressure air spray or sweeper device to ensure a clean groove and pavement surface that will allow for optimal adhesion to the pavement surface.

Install hand applied recessed plural-component markings in accordance with Subsection 856.04.C(1) of this provision.

Apply glass beads in accordance with Subsection 856.04.C(2). All markings will be subject to contract unit price adjustments for work quality, in addition to any penalties resulting from defective groove application. If blended beads are utilized, install using a double drop or single drop application. The Department will not charge double or compounding penalties as stated in Subsection 856.06 of this provision.

Ensure the glass beads are imbedded in the pavement marking material to at least 50% of the bead diameter, or to the manufacturers' recommendations, with the top of the beads being flush to, or slightly below, the pavement surface.

All recessed plural-component pavement markings will have a performance period of at least ninety (90) days while meeting all contract requirements. Within 90 days of notification by the Engineer, remove and replace non-compliant pavement markings at no additional cost to the Department.

Provide longitudinal recessed pavement markings on all pavement surfaces with minimum retro-reflectivity values in accordance with Table 856:7B.

Table 856:7B Minimum Retro-Reflectivity (All Recessed Pavement Types)			
White		Yellow	
mcd/m ² /lx	Contract Unit Price Adjustment	mcd/m ² /lx	Contract Unit Price Adjustment
≥ 650	100%	≥ 325	100%
600 - 639 *	75%	295 - 314 *	75%
500 - 599 *	50%	275 - 294 *	50%
< 500	Remove and replace	< 275	Remove and replace

The Contractor has the option to replace the stripe at no additional cost to the Department, or take the deduction.

856.05 METHOD OF MEASUREMENT

The Resident Engineer will measure the length of traffic stripe using a 6 inch standard width. For traffic stripes narrower or wider than 6 inches, the Resident Engineer will make a proportional adjustment based on the 6 inch standard width.

The Resident Engineer will count arrows by each arrow head.

856.06 BASIS OF PAYMENT

The Department will pay for each pay item at the contract unit price per the specified pay unit as follows:

Pay Item:	Pay Unit:
(A) TRAFFIC STRIPE (PLURAL-COMPONENT) (6" WIDE)	Linear Foot
(A) TRAFFIC STRIPE (PLURAL-COMPONENT) (8" WIDE)	Linear Foot
(A) TRAFFIC STRIPE (PLURAL-COMPONENT) (12" WIDE)	Linear Foot
(A) TRAFFIC STRIPE (PLURAL-COMPONENT) (24" WIDE)	Linear Foot
(A) RECESSED TRAFFIC STRIPE (PLURAL-COMPONENT) (6" WIDE)	Linear Foot
(B) TRAFFIC STRIPE (PLURAL-COMPONENT) (SYMBOLS, WORDS, ETC.)	Each

Include the cost of preparing the pavement in the contract unit price for the relevant pay item.

The Department will pay for the replacement of pavement markings damaged by snow and ice removal. If there are deductions for line thickness, retroreflectivity, and application discrepancies, the Department will only charge whichever deduction is highest. Additionally, this includes any deductions that may result from pavement groove application, when applicable. There will be no double or compounding deductions per 1,000 ft section.

The Department will pay for stripe removal in accordance with Section 857, "Construction Zone Pavement Markings."

SPECIAL PROVISIONS
URBAN RIGHT OF WAY RESTORATION

DESCRIPTION:

The work under this item shall consist of restoring Rights-of-Way. Contractor shall be responsible for the removal and replacement of mailboxes, drains, traffic signs, and curb street address number, sprinkler system or any other improvement within the right of way that is not paid for in other items of work.

CONSTRUCTION REQUIREMENTS:

All existing improvements as called for in this special provision to be replaced or reconstructed shall be restored to substantially the same condition as existed prior to the construction. Contractor shall document by photographing all obstructions and improvements prior to the start of construction.

As the work progresses, all streets shall be thoroughly cleaned of all rubbish, excess earth, rock, and other debris resulting from such work. All clean-up operations at the location of such work shall be accomplished at the expense of the contractor and shall be completed to the satisfaction of the engineer.

IRRIGATION SYSTEMS

DESCRIPTION:

The work shall consist of repairing any irrigation systems inside or outside the street Right of Ways as a result of damages or adjustments needed during the course of the construction to the satisfaction of the engineer.

CONSTRUCTION REQUIREMENT:

Contractor shall repair irrigation systems using like materials and shall include all materials necessary for the proper installation and function of the system. Materials such as valves, controllers, pop up spray and rotary heads, risers, seals, backflow preventer and main line pipe damaged during the course of the construction shall be re installed to its original condition. Excavation, placement, testing, back filling and compacting shall be done as required by the city of Tulsa standard specifications.

STREET ADDRESS AT CURB

DESCRIPTION:

The street address of the building, structure or lot served by the reconstructed driveway shall be painted on the curb of the driveway. Location to be approved by the Engineer. The street address shall face traffic flow.

CONSTRUCTION REQUIREMENTS:

The Street Address to be painted shall conform to city specifications as to size and form, and the quality of paint to be used, as determined by the City of Tulsa Public Works Department.

Street Address placed on the curb shall be done using a vinyl numbers stencils; letters shall be in black paint in figures of the size of three inches in height, and impressed upon a white background of the size of five by eleven inches. Standard stencil lettering with height, color and style shall be as approved by the engineer or in accordance with the most current City of Tulsa Standards.

MAILBOX REMOVAL AND RELOCATION

DESCRIPTION:

Contractor shall remove, reset and/or reconstruct any and all mailboxes within the street right of way.

CONSTRUCTION REQUIREMENTS:

The removal, resetting and/or reconstruction of mail boxes in street right of way shall be coordinated with the local postmaster as required. Mailboxes shall be located no closer than 1' behind the face of curb to face of box.

Where Special mailboxes such as Stone, masonry brick, or non standard mail boxes exist, contractor shall replace all mailboxes in like kind. The kind and quality of materials in which mailboxes shall be reconstructed shall be to the satisfaction of the property owner and approved by the engineer.

The replaced mailbox shall be capable of withstanding wind loading and lateral load associated with the delivery of the mail.

DRAINS

DESCRIPTION:

Contractor shall reestablish drains, roof drains, and other drainage through the curb.

CONSTRUCTION REQUIREMENTS:

Removal, replacement, salvage of drains in street right of way shall be done during road construction phase.

Contractor shall replace all drains in like kind. The kind and quality of materials in which drains shall be reconstructed shall be to the satisfaction of the property owner and approved by the engineer.

All re-established drains shall include a storm water curb opening as described in City of Tulsa Standard Drawing 758.

TRAFFIC SIGNS

DESCRIPTION:

Unless otherwise directed by plans and specifications, this item shall consist of removing, storing, and resetting all existing traffic signs. Contractor shall remove, store, and reset all traffic signage as required for construction of this project.

CONSTRUCTION REQUIREMENTS:

Roadside signs shall be placed at locations shown on the plans or at existing locations and shall be installed in compliance with the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD).

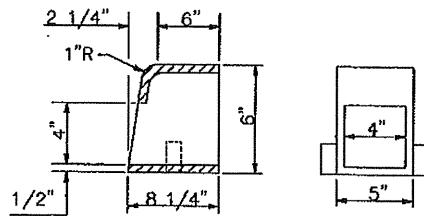
METHOD OF MEASUREMENT:

Irrigation Systems, Street Address at the Curb, Mailbox Removal and Relocation, Drains, and Traffic Signs will be measured by EACH for the project.

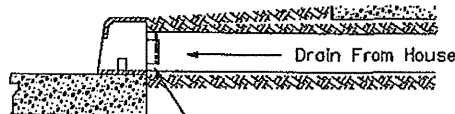
PAYMENT:

Special (C) Urban Right-Of Way Restoration (measured as provided above) will be paid for at the contract unit price by EACH. Such payment shall be full compensation for all equipment, tools, labor, and incidentals necessary to complete the work as specified.

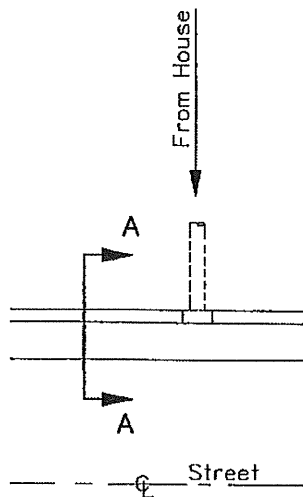
Special (C) Urban Right-Of-Way RestorationEACH



STORM WATER CURB OPENING



ATTACH DRAIN FROM HOUSE WITH
COUPLER AND WATER TIGHT BAND CLAMP
PER MFGR RECOMMENDATION.

SECTION A-ARESIDENTIAL CURB INLET

1. CONTRACTOR SHALL RECONNECT ANY SIDE DRAINS FROM ADJACENT PROPERTY THROUGH THE CURB.
2. INSTALL R-3262-3 SERIES HEAVY DUTY STORM WATER CURB OPENING BY NEENAH OR APPROVED EQUAL.
3. FIELD VERIFY SIZE AND LOCATION PRIOR TO PAVING OPERATIONS.
4. CONTRACTOR SHALL CAST INLETS IN PLACE DURING CURB PRODUCTION "CUT IN" NOT ACCEPTED.

RESIDENTIAL STORM WATER CURB OPENING	
CITY OF TULSA, OKLAHOMA PUBLIC WORKS DEPARTMENT ENGINEERING SERVICES DIVISION	
DRAWN BY: JAB.	APPROVED
CHECKED BY:	
DATE: OCT. 2011	
NOT TO SCALE	STANDARD NO. 758

SPECIAL PROVISIONS
VIDEO DETECTION SYSTEMS AND VIDEO CAMERA REPLACEMENTS

Description: This special provision describes the minimum acceptable requirements for the components and installation services for video detection systems. Video detection systems shall include all materials including video cameras, video cards, communication cards, cabling, and other materials and labor as necessary to make video detection fully operational at a signalized intersection. All components of the video detection system shall meet the requirements of the City of Tulsa Standards and Specifications, Part 620 for Video Detection Systems, except as detailed herein.

Approved Products List (APL). Where possible, all materials provided shall be supplied per the approved materials listed on the City of Tulsa Traffic Operations APL. For items not already on the APL, submittals shall be provided for the Traffic Engineer's approval both for components in COT Specification 620 and described in this special provision, prior to purchase of equipment.

Coaxial Video Detection Systems. Coaxial video detection systems shall meet the requirements of COT Part 620.

Three-wire, Broadband Over Power Video Detection Systems. Video detection cameras shall use a three-wire system, not coaxial, utilizing Broadband over Power Lines (BPL) to reduce interference in the system. Video detection cameras shall be IP addressable.

Thermal Video Detection Systems. For thermal video detection, the video cameras provided shall meet the specifications for the FC-Series of FLIR thermal cameras or approved equal with a minimum of a 34-degree field of view. The video detection system shall work with the thermal cameras to detect vehicles utilizing the thermal sensing capabilities of the cameras.

Video Camera Replacements. All cameras for the replacement of video cameras shall meet the same requirements as the cameras for full video detection systems as specified in this special provision. Camera replacement for video detection systems shall include full installation of a new camera, mount, bracket, and pole extension, including installation services and all necessary appurtenances to make it fully operational with the existing system. This work shall also include removal of existing cameras and mounts if necessary. All existing equipment shall be returned to the City of Tulsa Traffic Operations Division.

SPECIAL PROVISIONS 508(SP)
FOR VERSA-LOK RETAINING WALL OR APPROVED EQUAL

The work shall consist of the construction of Versa-Lok retaining walls in reasonably close conformity with the location, lines and grades as shown on the drawing for "Versa-Lok Retaining Wall" or as established by the Engineer.

The materials and methods of construction shall meet the requirements as described and recommended on the drawing for "Versa-Lok Retaining Wall"

Construction of Versa-Lok Retaining Walls will be measured by the square foot of wall and shall be paid for the contract unit price for:

VERSA-LOK RETAINING WALL OR APPROVED EQUAL

S.F.

Which shall be full compensation backfill, drainage fill material, filter fabric, drain pipe and connections, geogrid system (if required), compaction, concrete, reinforcing steel, surveying, layout and grade control shall be included in the unit price bid for Versa-Lok Retaining Wall.

SPECIAL PROVISIONS
WIRELESS, BATTERY-POWERED MAGNETOMETER
VEHICLE DETECTION SYSTEM AND SENSOR REPLACEMENTS

1. GENERAL

This special provision sets forth the minimum requirements for a wireless magnetometer vehicle detection system (WMVDS) that detects vehicles on a roadway via changes to the earth's magnetic field. The system shall use battery-powered magnetometer-type sensors that communicate their detection data wirelessly to a local traffic controller or similar device and to a central software system or a data server.

2. MATERIAL REQUIREMENTS

This WMVDS shall consist of the following components: battery-powered sensors installed in the pavement in each traffic lane, wireless communications equipment needed to establish communication links to the controller cabinet, interface modules that can be installed in 332, 336 and NEMA style cabinets including any mounting racks or hardware necessary for installation, surge protection for the WMVDS, and system software for set-up and monitoring of the WMVDS and control from a central system.

The Materials Bidder or Contractor must supply all system software and materials necessary for installation and maintenance of the WMVDS. The Materials Bidder or Contractor must also supply all documentation for the use of software, installation instructions, and maintenance of the system.

2.1. Functional Capabilities

The WMVDS shall meet the following functional requirements:

- A. Capable of detecting a variety of vehicle types including bicycles, motorcycles, automobiles, large trucks, and light rail trains
- B. Provide accurate roadway information as needed to support traffic signal control including real-time vehicle detection.
- C. Allow the user to select sensitivity levels that adjust the amount of hysteresis to the magnetic field needed to achieve contact closure to the assigned detector channel to set different levels of vehicle detection using magnetometer sensitivity level adjustments.
- D. Allow for sensitivity level settings to the magnetometer to be adjusted using WMVDS software via wireless communication.
- E. Perform presence or passage detection and delay and extension timing.

Equipment failure such as: the sensor, communications link, access point radio, repeater radio (if used) or interface module, shall result in a constant vehicle call "fault state" on the affected detector channel to the traffic controller.

Detection accuracy must be comparable to properly operating inductance loops. Detection accuracy shall include the WMVDS ability to detect the presence of any vehicle within the sensor's magnetic field and to communicate contact closure to the appropriate detector channel. If the WMVDS "false detects," (system applies contact closure when a vehicle is not present in the sensor's magnetic field), this will count against the accuracy measured during performance testing. A minimum of 97% detection accuracy must be achieved by the WMVDS when measured in a 24-hour period.

The detection system must have at a minimum industry standard support for security including password access, database encryption, and authentication of data. All actions performed by the detection system and by individual users must be logged and available as a report. Activity logs must be able to be kept for at least one year, preferably up to three to five years. Passwords shall be stored in the database in an encrypted format.

2.2. Sensors

Each sensor shall detect a vehicle by measuring changes in the earth's magnetic field near the sensor as caused by a stopped or passing vehicle (i.e., magnetometer-type detection) and shall meet the following requirements:

2.2.1.Detection

- A. A single sensor shall be capable of being configured with a sensitivity level that approximates the detection zone of a standard 6' x 6' / 1.8m x 1.8m inductive loop.
- B. Sensors must be able to create at a minimum a 6' long X 4' wide accurate detection zone when the sensors are set back from the intersection to be used for passage detection.
- C. Up to two sensors properly configured shall be capable of detecting motorcycles in a standard traffic lane and bicycles in a designated bicycle lane.
- D. The sensor shall communicate time-stamped ON and OFF vehicle detection events.
- E. Each sensor shall automatically recalibrate in the event of a detector lock.

2.2.2.Design and Operation

Sensors must at a minimum use a 3-axis magnetometer in the design and operation of the unit. The sensor must monitor the earth's magnetic field through the course of the day and establish a baseline reference value for the X, Y, and Z axis. As a minimum the refresh rate on the magnetometer's processor shall be 128 Hz, providing a sampling rate of 8ms to the earth's magnetic field. During periods of no detection, the X, Y, and Z axis shall refresh the baseline reference value every 8ms. The sensor must be able to detect a change in the magnetic field as referenced to the sensitivity setting selected by the user and the size of the vehicle passing over its detection zone.

2.2.3.Sensitivity

Each sensor in an installation shall be capable of being individually configured with its own sensitivity level and shall be capable of being configured with relatively higher or lower sensitivity levels as may be required to detect bicycles, motorcycles, or light rail.

2.2.4.Power

Sensors must operate on batteries without the need for underground power or communication cable connections to the unit. The average operating life span of the sensor under battery power must be a minimum of 10 years.

2.2.5.Sensor Communications

Each sensor shall communicate by radio to a nearby Access Points (APs) mounted on the side of the roadway, serving as the communications hub for the installation, or to optional wireless Repeaters (RPs) mounted on the side of the roadway, serving to extend the radio range of an AP.

Communications between a sensor and AP can be direct, via a single RP, or via two RPs operating in tandem. Communications between the sensors and the AP or RP and between the RP and AP or another RP shall be via radio and shall meet the following requirements:

- A. Each sensor shall transmit its detection data within 150 milliseconds (MS) of a detected event.
- B. Once detection is achieved by the sensor, the traffic controller must receive contact closure to the assigned detector channel within the 150ms time frame.
- C. Each sensor shall automatically re-transmit a detected event if no acknowledgement is received from the AP.
- D. Each sensor may stop retransmission after 8 attempts.
- E. Each sensor shall transmit a unique identifying code.
- F. Each sensor shall respond within 180 seconds when the AP is powered on and a correct RF path is present.
- G. After losing radio contact because of stopped vehicles over or near the sensor, each sensor shall be capable of re-establishing the radio link with its supporting AP or RP in less than 2 seconds.

2.2.6.Sensor Hardware

- A. All sensor components shall be contained within a single housing.
- B. The sensor housing shall conform to NEMA Type 6P and IEC IP68 standards.
- C. The sensor components shall be fully encapsulated within the housing to prevent moisture from degrading the components.
- D. The sensor housing shall be capable of being installed in a 4-inch / 10-cm diameter hole with a minimum 2 ¼ inches / 5.7 cm deep.
- E. Sensors shall be designed to operate reliably in adverse weather conditions and rated to operate at temperatures from -37 °F / -38.3 °C to +176 °F / +80 °C.
- F. A sensor shall be battery-powered with an average lifetime of ten (10) years when the sensor is configured for and operating under normal traffic conditions.

2.3. Contact Closure Interface (CCI) Card Hardware

- A. The interface module shall be designed to operate in a NEMA TS-1 detector rack, NEMA TS-2 detector rack or 170/2070 cabinet input file. The interface module must be capable of operating on 12- or 24-volts DC (detector racks may be wired for 12 volts or 24 volts DC).
- B. Each CCI card shall provide detector data as contact closure signals to the traffic controller. They shall be capable of being installed in standard contact closure input shelves, where the following controller types shall be supported: Type 170, Type 2070 and ATC, NEMA TS1, and NEMA TS2. A CCI card shall directly plug in to standard 170/2070 input files or NEMA detector racks.
- C. One or more CCI cards shall provide up to 256 channels of detection data from a single AP's supported sensors, where each channel comprises an optically isolated contact closure relay and, if configured for TS2 operation, an additional contact closure relay to indicate the channel status.
- D. The interface module as a minimum must make available two channels on the module.
- E. The front face of the module shall identify detector channel 1 and detector channel 2. Each must use an LED to indicate contact closure on the channel. When vehicle detection is achieved, the LED will be on and contact closure applied to the detector channel. During periods of no vehicle detection the LEDs will be in an off state and no contact closure will be applied to the detector channel.

- F. Each CCI card shall be configurable via software or via front panel switches to provide contact closure signals in either presence or pulse mode.
- G. A link light will be used to indicate a valid communications link is established between the interface module and access point. If no link is established between the two devices, the interface module will apply contact closure to all detector channels.
- H. The CCI card front panel shall provide status LEDs to monitor detection channel status, line quality, and fault status.
- I. When the fault state is active contact closure will be applied to the appropriate detector channel.
- J. A CCI card shall be surge protected to GR-1089 standards.
- K. The interface module shall be designed to operate reliably in adverse weather conditions and rated to operate at temperatures from -37 °F / -38.3 °C to +176 °F / +80 °C.
- L. A CCI card shall operate in humidity up to 95% (non-condensing).

2.4. Wireless Communications

2.4.1. Standards

- A. All communications equipment must meet all applicable IEEE standards and FCC standards as required for the frequency range used by the WMVDS.
- B. Surge protection meeting GR 1089 standards must be used for devices receiving power over Ethernet.

2.4.2. Frequency

- A. The center frequencies, bandwidths, and transmit power levels of all communications equipment shall operate in an unlicensed frequency range permitted by the FCC.
- B. Frequency channels shall be employed by the sensors, APs, and RPs to avoid interference with other devices operating in the unlicensed band.
- C. Frequency channels shall be user-configurable.
- D. The communications system must have alternative frequency channels selectable by the user. Should interference occur on a frequency channel the user must be capable of switching to an alternative channel free of interference. At least 16 frequency channels shall be supported.

2.4.3. Access Points and Repeaters

- A. As a minimum, access points must be capable of handling data communications for up to 48 sensors. The access points must be able to communicate to sensors from 150 feet when mounted 20 feet above the road surface. As a minimum access points must be able to communicate to repeaters from 1,000 feet.
- B. The radio links between each sensor and AP or RP and between each RP and AP or each RP and RP shall conform to the following:
 - 1) The physical layer of the radio links (i.e., the over-the-air data rate(s), modulation type(s), forward error correction, bit interleaving, channel coding, and other aspects of the transmitted signal) shall conform to published standards (e.g., IEEE, ITU-T, etc.).
 - 2) The link budget (i.e., transmit power plus transmit antenna gain plus receive antenna gain minus receive sensitivity, where receive sensitivity shall assume a 1% packet error rate) for all radio links shall be 93 dB or greater.

- C. Data shall be capable of being relayed from each AP to a central software system or central server over standard IP (Internet Protocol) networks.
- D. An AP shall support the relay of sensor detection data through several interfaces as required by the application:
 - 1) Detection data shall be communicated to a standard local traffic controller for real-time vehicle presence detection via Contact Closure Interface (CCI) cards to support the interface between an AP and a standard traffic controller using contact closure signals.
 - 2) Detection data shall be communicated over TCP/IP via an integrated 10Base-T Ethernet interface.
 - 3) The AP shall be capable of simultaneously communicating detection data via the contact closure interface and Ethernet interface.

2.4.4. Access Point Hardware

- A. Access points and repeaters must be rated for outdoor use and housed in an appropriate NEMA enclosure. The operating temperature range of these devices, as a minimum, must be from -37 °F / -38.3 °C to +176 °F / +80 °C.
- B. An AP shall support at least 48 sensors.
- C. Access points must be able to operate from power over Ethernet (48volts DC) or under battery power with an average life span of 5 years. When operating from battery power, the use of a solar array to trickle charge batteries is optional if the design life of the system is 5 years.
- D. All AP components shall be contained within a single housing, meeting the following requirements:
 - 1) The AP housing shall conform to NEMA Type 4X and IEC IP67 standards.
 - 2) An AP shall be no larger than 12" H x 8" W x 4" D / 30 cm H x 20 cm W x 10 cm D.
 - 3) An AP shall weigh no more than 4 pounds / 1.8 kg.

2.4.5. Repeater (RP) Hardware

- A. An RP communicating directly to an AP shall support at least 10 sensors.
- B. An RP communicating to an AP via an intermediate RP (i.e., tandem operation) shall support at least 6 sensors.
- C. An RP shall be battery-powered.
- D. The RP battery shall be field replaceable.
- E. An RP shall operate at temperatures from -37 °F / -38.3 °C to +176 °F / +80 °C.
- F. All RP components shall be contained within a single housing, meeting the following requirements:
 - 1) The RP housing shall conform to NEMA Type 4X and IEC IP67 standards.
 - 2) An RP shall be no larger than 5" H x 4" W x 4" D / 12.7 cm H x 10 cm W x 10 cm D.
 - 3) An RP shall weigh no more than 4 pounds / 1.8 kg.

2.4.6. Software

- G. Each sensor, AP, and RP shall be capable of accepting software and firmware upgrades via a wireless connection to the device.

- E. The Wireless Battery-Powered Magnetometer Vehicle Detection System shall provide software, operating on conventional notebook/portable PCs:
- 1) To support control and configuration of a sensor
 - 2) To support control and configuration of an AP
 - 3) To support control and configuration of an RP
 - 4) To store and retrieve detection data
- H. The software must allow for sensitivity adjustments to the sensor detection algorithms used by the WMVDS. As a minimum the system will use 16 different sensitivity levels ranging from 0.12 to 25.6 change in milli-gauss of the measured magnetic field. The sensitivity adjustments must be selectable by the user. Contact closure will be transmitted to the interface module when a change to the magnetic field is equal to or greater than the selected sensitivity setting.
- I. The software must allow the user to program delay time as defined in this specification. As a minimum, the software must allow for a range of at least 0 to 30 seconds of delay time.
- J. The software must allow the user to program extension time as defined in this specification. As a minimum, software must allow for a range of at least 0 to 7 seconds of extension time.
- K. The software will allow the user to assign selected sensors to specific detector channels. In-pavement sensors must be assignable to detector channels via system software.

3. INSTALLATION REQUIREMENTS

3.1. Sensors

- A. When requested by the Traffic Engineer, the Materials Bidder or Manufacturer of the WMVDS shall supervise and assist in the installation and set-up of the equipment. A factory certified representative from the manufacturer shall be on-site during installation of the WMVDS.
- B. Each sensor shall be installed in the roadway using the following procedure:
- 1) For a sensor installed just below the roadway surface:
 - a) The roadway shall be core drilled to provide a 4" diameter hole, a minimum 2.25" / 5.7 cm deep
 - b) The sensor shall be placed inside a small, clear plastic shell formed to provide a tight fit around the sensor.
 - c) A small layer of epoxy approximately 1.25" / 3.2 cm shall be applied to the bottom of the cored hole.
 - d) The sensor shall then be placed on top of this layer of epoxy in the correct orientation as clearly marked on the sensor
 - e) The sensor shall be fully encapsulated with the epoxy to the lip of the cored hole
 - 2) For a sensor installed at deeper than just below the roadway surface:
 - a) The roadway shall be core drilled to provide a 4" diameter hole, a minimum 2.25" / 5.7 cm deep, but not deeper than 6" / 15.2 cm deep
 - b) The sensor shall be placed inside a small, clear plastic shell formed to provide a tight fit around the sensor.
 - c) A small layer of epoxy approximately 1.25" / 3.2 cm shall be applied to the bottom of the cored hole.
 - d) The sensor shall then be placed on top of this layer of epoxy in the correct orientation as clearly marked on the sensor

- e) The sensor shall be fully encapsulated with the epoxy to approximately $\frac{3}{4}$ " / 1.9 cm over the sensor assembly
 - f) A fill material (cold patch, gravel or other manufacture approved equal) shall be used to fill the hole to approximately $\frac{3}{4}$ " / 1.9 cm from the surface of the road
 - g) Epoxy shall be used to fill the hole to the top of the roadway surface
 - h) If the sensor is installed at depth, an additional 1 foot / 30.5 cm of mounting height must be added to the AP or RP the sensor is communicating with.A.8)
- C. Each installation of the Wireless Battery-Powered Magnetometer Vehicle Detection System shall consist of one or more sensors installed in each traffic lane where presence detection is required, avoiding sources of magnetic noise such as underground power cables, overhead high-tension power cables, light rail or subway tracks, and power generation stations and sub-stations.
 - D. The sensors shall be located as specified by the Work Request, with each sensor's supporting AP or RP installed no farther than the maximum range indicated in Section 2.4.3
 - E. AP or Repeater front of the housing shall be aimed directly at the device (AP, RP or Sensor) it is communicating with.

3.2. Sensor Replacements

Wireless battery powered sensor replacement shall include full installation of a new sensor in the pavement including all work and appurtenances to make it fully operational with the existing system. Sensors shall meet all the requirements for materials and installation as outlined in this special provision. This work shall also include removal of existing sensors out of the pavement and filling of the void created by removal with materials approved by the Traffic Engineer, if necessary. All existing equipment shall be returned to the City of Tulsa Traffic Operations Division.

4. MAINTENANCE AND SUPPORT

4.1. Inventory

The Materials Bidder shall maintain enough inventory of parts to provide support and maintenance of the system, where these parts shall be available for delivery within 30 days of receipt of a purchase order or Materials Request by the Materials Bidder at the bid price in this contract.

4.2. Limited Warranty

The Materials Bidder, Manufacturer, or Contractor shall provide a limited five-year warranty for the Wireless Battery-Powered Magnetometer Vehicle Detection System starting on the date of receipt of the equipment from the Materials Bidder or the date of installation of the equipment by the Contractor.

During the warranty period, the Materials Bidder or Contractor shall repair with new or refurbished materials, or replace at no charge, any product containing a warranty defect provided the product is returned FOB to the supplier's factory or authorized repair site. Product repair or replaced under warranty by the supplier will be returned with transportation prepaid. This warranty does not apply to products damaged by accident, improper operation, abused, serviced by unauthorized personnel or unauthorized modification. The warranty does not cover the labor required to remove and replace components of the WMVDS in the field.

4.3. Software Support

Standard updates to the software shall be available from the Materials Bidder or Manufacturer for the life of the product without additional charge to the City of Tulsa.

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For Contractor supplied materials, proof must be provided in writing of this support by the Manufacturer or Vendor supplying the materials to the Contractor prior to ordering materials.

4.4. Technical Support

- A. During the warranty period, technical support shall be available from the Materials Bidder or Manufacturer via telephone within 24 hours of the time a call is made by a user, where this support shall be provided by factory-authorized personnel or factory-authorized installers. Any charges related to technical support shall be paid by the Materials Bidder or Contractor. For Contractor supplied materials, proof must be provided in writing of this support by the Manufacturer or Vendor supplying the materials to the Contractor prior to ordering materials.
- B. The Materials Bidder or Manufacturer shall maintain an ongoing program for customer support for the system via telephone, email, or trained personnel sent to the installation upon receipt of a Materials or Work Request. For Contractor supplied materials, proof must be provided in writing of this support by the Manufacturer or Vendor supplying the materials to the Contractor prior to ordering materials. Any additional charges for ongoing support must be provided in writing to the City of Tulsa in the form of a separate agreement for continuing support.
- C. Installation and/or training support shall be provided by a factory-authorized representative.

4.5. Documentation

At least two copies of all documentation shall be provided in English.

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SPECIAL PROVISIONS
FOR WOOD FENCES

PART 1 GENERAL

1.01 DESCRIPTION

- A. Provide wood fencing as directed and specified. The work includes:
 - 1. Site fabrication wood fencing.
 - 2. Gates and related hardware.
- B. Related work:
 - 1. Section 03300: Cast-In-Place Concrete.
 - 2. Section 02444: Chain Link Fencing

1.02 QUALITY ASSURANCE

- A. Comply with Section 02000 requirements.
- B. Lumber: Comply with American Softwood Lumber Standard PS-20-70. Provide species complying with grading rules of the following associations:
 - 1. Southern Pine: Standard Grading Rules for Southern Pine Lumber, published by Southern Pine Inspection Bureau.
- C. Sample panel: Before starting wood, fencing provide a sample panel using materials indicated for the project work. Build panel using materials indicated for the project 8' -0" in length. Correct and rebuild sample panel until Owner's acceptance of the work. Retain panel during construction as a standard for completed wood fencing work.
 - 1. The approved sample panel may be a portion of the work and remain in place. Location as directed by the owner.
 - 2. Provide a sample panel for each type of wood fencing required.

1.03 SUBMITTAL

- A. Submit manufacturer's product data and specifications for factory fabricated wood fencing. Include hardware schedule and catalog cuts for gate hardware.
- B. Submit shop drawings. Indicate shop fabrication and erection details for factory fabricated wood fencing, including; layout and details of height, post locations, panel, sizes, and anchorage.
- C. Submit the following materials samples:
 - 1. Posts brackets, railings, 12" lengths.
 - 2. Wood fencing, 12" lengths.
 - 3. Gate hardware, 1 each.
- D. Submit lumber certificates of grade compliance.

- E. Wood treatment: Submit certification by treating plant indicating processes and chemicals used and compliance with specified requirements.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Keep wood fencing materials dry during delivery. Stack materials to ensure proper drainage and ventilation. Protect from weather damage, soiling, and staining.
- B. Store and protect gate hardware from damage and deterioration.

1.05 PROJECT CONDITIONS

- A. Do not begin wood fencing installation before completion of final grading and survey staking for boundaries.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Wood Fencing:
 - 1. Type and design:
 - a. Three-rail/high galvanized metal post and 2 x 4 rail fencing for 6 feet high or less.
 - b. Four -rail high galvanized post and 2 x 4 rail fencing for over 6 feet in height
 - 2.
 - a. Lumber specie, grade, and finish:
 - b. Southern Pine: #1 grade, moisture content 19% maximum, S4S surfaced
 - c. Fasteners: Hot-dip galvanized steel, aluminum, or stainless steel. Provide nails, screws, and bolts of size and type indicated.
 - d. Plates, straps, and angles; ASTM A36 steel, shop primed with rust inhibitive primer/hot-dip galvanized finish
 - e. Gate hardware: Heavy exterior duty gate hardware.
 - 1. Manufacturer: Stanley or Equal.
 - f. Concrete: ASTM C94 ready-mixed concrete minimum 28 day compressive strength of 3,000 psi, air entrained 2% to 4%.
 - g. Drainage fill: AASHTO M43 #6 (3/8" to 3/4") clean uniformly graded stone or gravel.

2.02 WOOD PRESERVATIVE TREATMENT

- A. Posts: Provide all posts pressure preservative treated with water-borne preservative for ground contact use in accordance with American Wood Preservers Association (AWPA) Standard C14. Each piece shall bear American Wood Preservers Bureau (AWPB) quality made designation LP-22.

- 1. Net retention: * * 0.40 Lbs. Per cu. ft.

- B. Rails and Fencing: Provide all rails and fencing pressure preservative treated with water-borne preservative for above ground use in accordance with American Wood Preservers Association (AWPA Standard C2. Submit treatment certification.
- C. Treatment shall provide a clean, printable wood surface, free of objectionable odors.
- D. Air or kiln dry all materials after treatment to maximum 19% moisture content.

PART 3 EXECUTION

3.01 INSPECTION

- A. Examine final grades and installation conditions. Do not start wood fencing work until unsatisfactory conditions Do not start wood fencing work until unsatisfactory conditions are corrected.

3.02 PREPARATION

- A. Layout complete fence line. Locate and mark post positions. Space line posts equally and maximum 8'-0" on center spacing.

3.03 INSTALLATION

- A. Install wood fencing of the type, design, and height indicated.
- B. Drill post holes into firm undisturbed or compacted earth.
 - 1. Hole diameter: Minimum 3 times post diameter.
 - 2. Hole depth: Minimum 4" deeper than post setting depth.
 - 3. Post depth: Minimum 2'-0" deep for fences up to 5'-0" high, minimum 3'-6" for fences up to 8'-0 high.
 - 4. Gate and corner posts: Set posts in 6" depth of granular drainage fill to assure proper drainage. Fill remaining foundation void with concrete. Slope top surface away from post.
 - 5. Line posts: Set posts in 6" depth of granular drainage fill to assure proper drainage. Fill remaining foundation void with concrete fill. Slope top surface away from post.
 - 6. Remove excavated posthole soil from the site.
 - 7. Excavated posthole soil may be spread uniformly adjacent to fence line.
- C. Align each post both vertically and laterally. Secure in position during concrete and earth fill placement.

- D. Install railings and fencing materials as indicated. Fasten securely in place.
1. Use only sound, thoroughly seasoned materials of the longest practical lengths and sizes to minimize jointing. Use materials free from warp which cannot be easily corrected by anchoring and attachment.
 2. Securely attach work to substrates by anchoring and fastening as required to provide a rigid finished fence structure.
 3. Set work accurately to required levels and lines, with members plumb and true, and accurately cut and fit.
 4. Brush apply 2 coats of wood preservative to surfaces of preservative treated materials which have been field cut, dressed, or drilled.
- E. Install gates and gate hardware to provide heavy duty extended exterior use. Adjust hardware and lubricate to provide proper operation.

3.04 CLEANING

- A. Perform cleaning during installation of work and upon completion of the work. Remove from site all debris and equipment. Repair all damage resulting from wood fencing installation.

METHODS OF MEASUREMENT

Methods of measurement in accordance with Oklahoma Department of Transportation 2019 Standard Specifications for Highway Construction Subsection 624.05.

BASIS OF PAYMENT

Accepted fence and gates, measured as provided above, will be paid for at the contract unit price as follows:

72" HIGH WOOD FENCE LINEAR FOOT
72" HIGH WOOD FENCE GATE. EACH

Such payment shall be full compensation for furnishing all materials, equipment, labor and incidentals to complete the work as specified.

