



CITY OF GALLUP

City of Gallup, New Mexico
Purchasing Division
P.O. Box 1270
Gallup, New Mexico 87305-1270
Office: (505) 863-1232
Fax: (505) 722-5133
gallupnm.gov/purchasing

INVITATION TO BID FORMAL BID NO NO. 1512

REDI-MIX CONCRETE
(Multi-Term Contract)

ISSUE DATE: June 20, 2015
BID OPENING DATE: July 7, 2015
BID OPENING TIME: 2:00 p.m. Local Time

Vendor:

Address:

Notes:

F.O.B. Point: Destination

Payment Terms: NET 30, unless otherwise stated

Quantities may be increased or decreased within reasonable amounts

ACKNOWLEDGMENT OF RECEIPT OF BID
Formal Bid No. 1512
Redi-Mix Concrete (Multi-Term Contract)

In acknowledgment of receipt of this Formal Bid the undersigned agrees that they have received a complete copy of the bid consisting of 19 pages.

The acknowledgment of receipt should be signed and returned to the Purchasing Office as soon as possible but no later than 5:00 P.M. local time on June 30, 2015. **Only potential bidders who elect to return this form completed with the indicated intention of submitting a proposal will receive copies of all written questions and the City's written responses to those questions, as well as copies of Amendments, if any are issued.**

FIRM: **DOES** **DOES NOT** (Circle one) intend to respond to this Formal Bid.

FIRM NAME: _____

REPRESENTED BY: _____

TITLE: _____ PHONE NO.: _____

FAX NO.: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP CODE : _____

SIGNATURE: _____

DATE: _____

EMAIL: _____

The above name and address will be used for all correspondence related to this Formal Bid.

Return this form to: City of Gallup Purchasing Department
Frances Rodriguez
P.O. Box 1270
Gallup, New Mexico 87305
(505) 863-1334
(505) 722-5133 Fax
Email: frodriguez@gallupnm.gov

Please return this form via fax, email or regular mail by: June 30, 2015

**CITY OF GALLUP
GENERAL CONDITIONS
FORMAL BID NO. 1512**

SEALED BIDS: All bids must be submitted in a sealed envelope and shall not be opened and considered if they are not received at the City of Gallup Purchasing Department, Municipal Building, 110 West Aztec, Gallup, New Mexico 87301 (mailing address: City of Gallup Purchasing Department; Municipal Building; P.O. Box 1270; Gallup, New Mexico 87305) prior to the time specified for the Bid Opening. All sealed bids must be submitted on the Bid Document Originals or Forms, or reasonable facsimile, furnished by the City of Gallup. All bids must be signed by a responsible and authorized person for the bidding firm. Each bidder must also fill-in areas for Delivery Date and Payment Terms; failure to do so may result in disqualification of their respective bid. NOTE: Fax or electronically transmitted Bids are NOT accepted on the City of Gallup **Formal Bids**. Bids submitted after the Bid Opening date and time will not be considered and will be returned unopened. Bids will be opened in the Purchasing Department Conference Room.

Physical Address

City of Gallup Municipal Building
Purchasing Department
110 West Aztec
Gallup, NM 87301

Mailing Address

City of Gallup Municipal Building
Purchasing Department
P.O. Box 1270
Gallup, NM 87305

BID OPENING DATE AND TIME: Bids shall be received until July 7, 2015 at 2:00 P.M. Local Time

MAILING: Bidder to utilize the City's self-addressed label on their return mailing envelope or package. If sent by overnight method (Federal-Express, UPS Next Day Air etc.) please **note bid number on exterior of envelope**. Failure to do so will not constitute a liability on the City if the Bid is misplaced or lost.

Please return two sets of the Invitation to Bid packages to the Purchasing Department, the original and a photo copy.

INDEFINITE QUANTITY CONTRACT: This is an Indefinite Quantity Contract. Quantities listed are estimates of the City's needs for the term of the contract. The City does not guarantee the purchase of any specific minimum quantities and actual usage may increase or decrease. The City reserves the right to solicit bids for any quantities when it is in the best interests of the City to do so, and to add or delete items from the contract.

SPECIFICATIONS/SCOPE OF WORK: Specifications or Scope of Work, as included in this bid, are intended to indicate the requirements of the City of Gallup and give an accurate description of minimum standards acceptable. All services equal or equivalent to these requirements and standards will be considered, except where otherwise noted.

BUSINESS LICENSE: Bidder's are advised that they must have or obtain a Current City of Gallup

Business License for the type of material or services required under this contract before work commences or a Purchase Order issued.

MINOR MODIFICATIONS, DEVIATIONS OR IRREGULARITIES: The City reserves the right to accept **minor** modifications to or deviations from any specification, except where otherwise noted, as long as the proposed material meets the intent of the specifications. The City will be the sole entity to determine the acceptance or non-acceptance of any such modifications or deviations.

Therefore, exceptions may be accepted if they are minor, equal, or superior to that which is specified, and provided that they are listed and fully explained on a separate page entitled, "Exceptions to Specifications". The exceptions shall refer to the specification page and paragraph number. The Purchaser shall determine which (if any) exceptions are acceptable and this determination shall be final.

F.O.B. POINT: All material shall be quoted F.O.B. **DESTINATION/JOBSITE to locations within the Gallup City Limits**, Freight Prepaid. Bidders are cautioned that quoting material other than F.O.B. Destination/Jobsite may result in a finding of their bids as Non-responsive. City of Gallup Ordinances and State Law do not allow the City to own tangible goods or for services prior to receiving if said good or prior to service being rendered. All price(s) bid shall be Freight Prepaid. The City of Gallup will not pay freight charges.

Where delivery is to be made outside the City Limits, mileage (which include related charges, e.g. driver labor, travel tons) shall be paid at the bid rate. Contractor's plant shall be located within a thirty-five (35) mile radius of the City of Gallup City Limits.

COMPETENCY OF BIDDER: Bids will be considered only from firms which are regularly engaged in providing the type of materials described in the bid and who can provide evidence that they have established a satisfactory record of performance to insure they can execute the requirements as stated herein. Any determination as to competency shall be made by appropriate City staff.

PAYMENT OR ACCEPTANCE NOT CONCLUSIVE: Vendor will supply the City with invoice for payment. No payment under this contract shall be conclusive evidence of the performance of this contract, either wholly or in part, and that no payment made for the delivery of the items or performance of work, in whole or in part shall be construed as an acceptance of defective work or improper materials, nor relieve the bidder from corrections of the defects. The final acceptance shall not be binding upon the City, nor conclusive, should it subsequently develop the bidder has furnished inferior items or had departed from the specifications and/or the terms of the contract. Should such conditions become evident, the City shall have the right, notwithstanding final acceptance and payment, to cause the item(s) to be properly furnished in accordance with the specifications (and drawings, if any) at the cost and expense of the bidder.

PRICE TERMS: Bidder agrees that the prices bid shall remain in effect for 45 days from the date of the Bid Opening and subject to acceptance by the City of Gallup within that period. Acceptance period may be extended with the mutual agreement of the City and the Bidder.

CANCELLATION: The City reserves the right to cancel any contract resulting from this request for

convenience by giving written notice to the vendor. The City shall be liable to the vendor for any services provided or material ordered and accepted prior to termination.

If the vendor fails to fulfill any obligation resulting from this contract in a timely and responsive manner, or if the vendor violates any of the terms of this contract, the City shall have the right to cancel the contract by giving written notice of cancellation to the vendor and recover from the vendor any damages resulting from vendor's failure to perform

NON-CONFORMING MATERIAL: If the City of Gallup issues a Purchase Order and upon receipt the material does not meet the specifications, the City will return the material freight collect, and at its option cancel the order and recover from the vendor any damages suffered.

TOTAL ALL OR NONE: Services on this bid will be awarded on a "TOTAL ALL OR NONE" basis where indicated. If no responsive all or none offers are received, the City reserves the right to award the bid in whatever it deems to be in its best interest.

TAXES: Taxes shall not be included in Contractor's Bid Proposal. Contractor will tax the City on each invoice submitted.

PAYMENTS TO CONTRACTORS: Payments for the work to be done under this contract will be not less than fifteen days (15) days after receipt of invoice. Prompt payment discounts will not be a factor in the award of this bid, but may be taken into account after award.

TICKETS: Each load of concrete shall indicate the address of the load/loads where delivered or indicate if load/loads are picked up at plant. In additions, **EACH TICKET MUST** have the signature of a City employee, and a Purchase Order Number. The City **will not** process payment for any ticket that does not comply with the procedures.

AWARD OF CONTRACT - MULTIPLE AWARDS: The City reserves the right to make multiple awards as a result of this request if doing so may be advantageous to the City. Multiple awards may be given to Bidders based on lowest responsive bids.

If an awarded Bidder is unable to fulfill an order the City reserves the right to cancel the request and order from the best available source.

PERMITS AND LICENSES: Contractor shall be licensed for the work required, and shall obtain all necessary permits and additional licenses required, and pay any fees. Bidders are notified that a City of Gallup Business License is required.

EXPERIENCE: Bidder must be a firm with not less than three (3) years experience in the type of service called for in this project.

APPROPRIATIONS: The terms of this Agreement are contingent upon sufficient monies being made available by the City of Gallup for the performance of this Agreement. If sufficient appropriations and

authorizations are not made by the City of Gallup, this Agreement shall terminate upon written notice being given by the City to the Contractor. The City's decision as to whether sufficient appropriations are available shall be accepted by the Contractor and shall be final.

PURCHASE ORDER REQUIRED: Material listed on this Bid will be ordered on an as needed basis. No material may be shipped without a valid City of Gallup Purchase Order.

LOCAL AND RESIDENT PREFERENCE: In accordance with City Ordinance, a local preference may be afforded a bidder who qualifies as a City of Gallup resident business as defined by the City of Gallup Procurement Ordinance. Preference factors can be accessed at:
<http://www.sterlingcodifiers.com/NM/Gallup/index.htm>

The State of New Mexico and the City of Gallup also grant a preference for qualified New Mexico Resident Businesses or Resident Veterans Businesses certified by the State of New Mexico Department of Taxation and Revenue, in accordance with Sections 13-1-21 to 13-1-22 NMSA 1978. **You must furnish a copy of your State of New Mexico Resident Business or Resident Veterans Business Certificate with your bid to be considered for the in-state preference.** For information on State of New Mexico resident business or Resident Veterans Business certification call 505-827-0951 or to download applications, go to: www.tax.newmexico.gov , select "BUSINESSES" and click on "IN-STATE PREFERENCE CERTIFICATION" located under "POPULAR INFORMATION" caption.

The applicable City of Gallup Resident Business preference or State of New Mexico Resident Business or Resident Veteran's Business Preference will be factored into bid prices where applicable. However, the preferences are not cumulative and bidders will only be entitled to receive one preference.

AMENDMENTS: If any questions or responses require revision to the solicitation as originally published, such revisions will be by Formal Amendment Only. If the solicitation includes a contact person for technical information, Offerors are cautioned that any oral or written representation made by this or any person that appear to change materially any portion of the solicitation shall not be relied upon unless subsequently ratified by a written amendment to this solicitation issued by the Purchasing Office. For a determination as to whether any representation made requires that an amendment be issued, contact Debbie Soto, Contracts Manager, at the Purchasing Office.

CONTACT INFORMATION: Questions or clarifications regarding any phase of this solicitation, including specifications, shall be directed to Frances Rodriguez, Purchasing Director, P.O. Box 1270, Gallup, New Mexico 87305; Telephone: (505)863-1334; Facsimile: (505)722-5133; Email: frdriguez@gallupnm.gov who shall be the sole point of contact of this bid. Questions submitted after June 30, 2015 may not be addressed.

PROTESTS: Any bidder or offeror who is aggrieved in connection with a solicitation or award of a contract may protest to the central purchasing office. The protest must be submitted in writing within seven (7) calendar days after knowledge of the facts or occurrences giving rise thereto.

AWARD: The award, if made, shall be made to the lowest responsible Bidder submitting a responsive Bid

that is most advantageous to the public.

The City reserves the right to reject any or all Bids in whole or in part, to waive technicalities and to accept the proposal it deems to be in the best interests of the City. Bids may be rejected for, among other reasons:

- Bids containing any irregularities.
- Unbalanced value of any items.
- Reason for believing collusion exists among the Bidders.
- The Bidder being interested in any litigation against the City.
- The Bidder being in arrears on any existing contract or having defaulted on a previous contract; or within the past three years been formally debarred in the State of New Mexico or any other jurisdiction; or whose license has been suspended or revoked by the appropriate licensing authority
- Lack of responsibility as may be revealed by a financial statement, experience and equipment, questionnaires, etc.
- Uncompleted work which in the judgment of the City will prevent or hinder the prompt completion of additional work if awarded.

The City may make such investigations it deems necessary to determine the ability of the BIDDER to perform the services and/or supply the items of tangible personal property specified herein. BIDDER shall, within seven (7) calendar days, furnish to the City all such information and data for this purpose as the City may request.

PROCUREMENT CODE: The City of Gallup and State of New Mexico Procurement Code shall apply.

PROCUREMENT CODE VIOLATIONS: The Procurement Code imposes civil and criminal penalties for its violation. In addition, the New Mexico Criminal Statutes impose felony penalties for illegal bribes, gratuities, and kick-backs.

THE CITY RESERVES THE RIGHT TO REJECT ANY OR ALL BIDS IN WHOLE OR IN PART, TO WAIVE TECHNICALITIES AND TO ACCEPT THE PROPOSAL IT DEEMS TO BE IN THE BEST INTEREST OF THE CITY.

**CITY OF GALLUP
SUPPLEMENTAL CONDITIONS**

FORMAL BID NO. 1512

ELECTRONIC COMMUNICATIONS: Communications regarding this procurement, including issuance of any amendments, may be conducted by electronic means (e-mail or fax). However, electronic submittals of the proposal whether by fax or other electronic means are not acceptable as noted in the General Conditions.

UNIT PRICES: Typographical errors, errors in extending unit prices, arithmetic errors or errors clearly evident on the face of the bid document may be corrected in accordance with the Procurement Ordinance and Procurement Regulations. Discrepancies involving the incorrect extension of unit prices shall be resolved in favor of unit prices as unit prices cannot be corrected.

CONTRACT TYPE: The purpose of this solicitation is to establish an Indefinite Quantity Contract with Firm Fixed Pricing and delivery from which the City may place orders as needed.

CONTRACT TERM: The term of this Agreement shall be for an initial two (2) year term from Date of Award through June 30, 2017. This contract may be renewed by the City for an additional two (2) year term through June 30, 2019 at the same terms and conditions.

QUANTITIES: This is an indefinite quantity contract from which the City may place orders on an as needed basis. Quantities listed are estimates of the City's need on an annual basis. Actual usage may vary. The City does not guarantee the purchase of any specific minimum quantities, **nor may any material be shipped or delivered without a valid purchase order number issued by the City.**

Concrete will be ordered as needed. When ordered, delivery shall be made within a reasonable amount of time. If a delivery cannot be made within the requested time frame, the City reserves the right to utilize the next best source available for that particular need.

WAITING TIMES:

1. Item No. 4 is based on a less than two (2) cubic yard minimum small load charge. This amount **may not be increased above the less than two (2) cubic yard** small load charges. Modification beyond the limit may result in disqualification of the vendor's bid.
2. Vendors **shall allow a minimum waiting period of ten (10) minutes per yard.** Vendor may choose to allow a longer waiting period, or to not charge at all, but in no case may the minimum be reduced. Modification below the minimum may result in disqualification of vendor's bid.
3. Waiting charge shall be based on 1/4 hour past the allowed waiting time. This shall be regarded as minimum and may not be reduced.

TERMINATION:

1. This contract may be terminated for convenience on the part of the City upon Fifteen (15) days written notice to the vendor.
2. In the even the vendor should fail to perform any of the terms or conditions of the contract and should fail to rectify the fault or deficiency within ten (10) days after receipt of written notice from the City of such failure, the City shall have the right to terminate the contract immediately.

ESCALATION CLAUSE: An Escalation Clause is used as part of the Bid Proposal in accordance with the terms of the Escalation Clause on Page 10 of this bid.

EXISTING AGREEMENT: Under the terms and conditions of this Bid all public bodies allowed by law may procure the goods, supplies or services under this Bid as described herein. The terms and conditions of this Bid shall form a part of each order issued herein, but each public body shall be responsible for their own orders.

ACKNOWLEDGMENT OF RECEIPT OF BID: The Acknowledgment of Receipt should be signed and returned to the Purchasing Office as soon as possible but no later than 5:00 P.M. local time on June 30, 2015. **Only potential bidders who elect to return this form completed with the indicated intention of submitting a bid will receive copies of all written questions and the City's written responses to those questions as well as copies of Amendments, if any are issued.**

BID DOCUMENTS: Bid documents may be retrieved by accessing the Purchasing page of the City of Gallup website, www.gallupnm.gov/bids, by calling (505) 863-1232 or visiting the Central Purchasing Office at 110 West Aztec, Gallup, NM 87301.

The City of Gallup will notify vendors of record of amendments/addenda that are issued. Vendors of record are those vendors that are currently on bid list therefore, if not a vendor of record or if bid is downloaded from City of Gallup website, it shall be the responsibility of the vendor to check website frequently for any addenda/amendments or correspondence concerning solicitation. Failure to acknowledge all addenda could result in a non-responsive bid/proposal. In the case of an inconsistency between information on this site and the Purchasing file document, the file document shall prevail.

ESCALATION CLAUSE:

Price escalations may be considered only under the following conditions:

- A. Offered prices must be firm for at least ninety (90) calendar days after written notification of contract.
- B. All requests for price increases shall be in writing and accompanied by:
 - 1.) A letter from the Contractor's supplier certifying the price increase to the Contractor; or
 - 2.) Evidence of verifiable market conditions resulting in increased costs such as mandated labor rate increases and significant fuel or energy cost increases.
- C. All invoices of the offered items, from suppliers to the Offeror, shall be subject to auditing by the City and furnished without delay upon request.
- D. The City reserves the right to purchase on the open market, or cancel a contract resulting from this request and solicit a new contract, if the escalated price is above the current open market price for the same material. Cancellation of the contract shall not affect any outstanding orders.
- E. All revisions of the price list shall become effective when they are accepted by the Purchasing Office of the City, provided that they do not conflict with paragraph (F) or (G).
- F. All approved price changes resulting from this escalation clause shall be firm for a period of ninety (90) calendar days after acceptance in writing from the City.
- G. The Offeror shall be limited to a maximum of one (1) price escalations per contract period unless otherwise specified in this request.
- H. The Offeror shall provide to the City written notice of any requested price changes, which shall become effective upon acceptance by the City of Gallup Purchasing Office.
- I. If the Offeror receives any price de-escalations from the supplier of goods sold to the City through a contract resulting from this request, the Offeror is responsible for notifying the City of such de-escalations, and passing those price changes on to the City immediately.

NOTICE TO BIDDERS

As of October 5, 2011 applications for Resident New Mexico in-state bidders will no longer be processed through the State Purchasing Division. All resident business and contractors will have to obtain a new preference number with the New Mexico Department of Taxation and Revenue as of January 1, 2012.

It will be the sole responsibility of the Bidders requesting consideration for the New Mexico Resident Business Preference to obtain approval and a certification from the New Mexico Department of Taxation & Revenue prior to the bid opening date. You must furnish a copy of the Resident Business Certificate with each bid in order to be considered for the in-state preference as per Sections 13-1-21 and 13-1-22 NMSA 1978.

As of July 1, 2012 a New Mexico Resident Veteran's Business preference number may be obtained from the New Mexico Department Taxation and Revenue Department. In order to be considered for the New Mexico Veteran's Contractor preference a copy of the Certificate must be included with each bid as per Sections 13-1-21 and 13-1-22 NMSA 1978.

For additional information please call 505-827-0951, or to download applications log on at: WWW.TAX.NEWMEXICO.GOV, select "BUSINESSES" and click on "IN-STATE PREFERENCE CERTIFICATION" located under "POPULAR INFORMATION" caption.

(This Form Must be submitted with your bid if you are certified as a New Mexico Resident Veterans business)

_____ (NAME OF CONTRACTOR) hereby certifies the following in regard to application of the resident veterans' preference to this procurement:

Please check one box only

- I declare under penalty of perjury that my business prior year revenue starting January 1 ending December 31 is less than \$1M allowing me the 10% preference discount on this solicitation. I understand that knowingly giving false or misleading information about this fact constitutes a crime.
- I declare under penalty of perjury that my business prior year revenue starting January 1 ending December 31 is more than \$1M but less than \$5M allowing me the 8% preference discount on this bid or proposal. I understand that knowingly giving false or misleading information about this fact constitutes a crime.
- I declare under penalty of perjury that my business prior year revenue starting January 1 ending December 31 is more than \$5M allowing me the 7% preference discount on this bid or proposal. I understand that giving false or misleading information about this fact constitutes a crime.

“I agree to submit a report, or reports, to the State Purchasing Division of the General Services Department declaring under penalty of perjury that during the last calendar year starting January 1 and ending on December 31, the following to be true and accurate:

“In conjunction with this procurement and the requirements of this business’ application for a Resident Veteran Business Preference/Resident Veteran Contractor Preference under Sections 13-1-21 or 13-1-22, NMSA 1978, when awarded a contract which was on the basis of having such veterans preference, I agree to report to the State Purchasing Division of the General Services Department the awarded amount involved. I will indicate in the report the award amount as a purchase from a public body or as a public works contract from a public body as the case may be.

“I understand that knowingly giving false or misleading information on this report constitutes a crime.”

I declare under penalty of perjury that this statement is true to the best of my knowledge. I understand that giving false or misleading statements about material fact regarding this matter constitutes a crime.

(Signature of Business Representative)*

Date

*Must be an authorized signatory for the Business

The representations made in checking the boxes constitutes a material representation by the business that is subject to protest and may result in denial of an award or unaward of the procurement involved if the statements are proven to be incorrect.

**CITY OF GALLUP
SPECIFICATIONS**

FORMAL BID NO. 1512

SPECIFICATIONS: Materials and applicable Construction Requirements as defined in the New Mexico Department Of Transportation, Standard Specifications for Highway and Bridge Construction, (SSHBC) 2014 Edition, shall be adhered to. All reference to "District Engineer", "District Construction Engineer", "Project Manager", "Central Materials Laboratory", shall be replaced by "City Engineer or his designee".

PLANT LOCATION: Contractor's plant where materials are produced shall be located within a thirty-five (35) mile radius of the City of Gallup Limits.

SUBMITTAL: Concrete mix design submittal for each Portland Cement Concrete mix will be required sixty (60) days after "Notice of Award" and annually thereafter. The submittals shall be provided to the City Engineer for approval.

BATCH CERTIFICATE:

Before unloading concrete, furnish the City employee with a legible Weigh-Master's Certificate (Delivery Ticket) containing the following information:

1. Name of batch plant
2. Ticket serial number
3. Date and truck number
4. Job name and location (in the case of deliveries to multiple locations, driver shall note each delivery location on the ticket).
5. Amount of concrete (cubic yards)
6. Time loaded at Batch Plant
7. Water added by the receiver and his initials
8. Amount of cement & fly ash - lb./cu. yd.
9. Total water content by producer
10. Air entertainment, oz./cu. yd. & Brand Name
11. Water reducing admixture, oz./cu. yd. & Brand Name
12. Air temperature at the time of batching

13. A moisture correction sheet will be provided for each days placement over ten (10) cu. yds. To show the corrections in the aggregate due to moisture and the ability to keep the water cementious ratio less than specified when using 4000 PSI concrete.
14. Batch weights of all components.

ADDITIONAL SPECIFICATIONS

1. Upon "NOTICE OF AWARD" receipt, Vendor shall provide five (5) copies of proposed PCC mixed designs per New Mexico Department Of Transportation, Standard Specifications for Highway and Bridge Construction (SSHBC), 2014 Edition, Section 509 and provide same to City Engineer for review and approval within sixty (60) calendar days and annually thereafter.
2. Supplied product, including all components (materials and applicable construction requirements) shall conform to the New Mexico Department Of Transportation, Standard Specifications for Highway and Bridge Construction (SSHBC), 2014 Edition, by reference with certain portions presented herein.
3. All references to "District Engineer", "District Construction Engineer", "Project Manager", "Central Materials Laboratory" shall be replaced by "City Engineer or designee".
4. Revisions to the specifications by NMDOT will be incorporated into this contract by change order.

Item No.	Description	Unit	Quantity	Unit Price	Amount
1.	Portland Cement Concrete, SSHBC Section 509, Class AA, 1" or 3/4" Aggregate Size	Cubic Yard	4,000	_____	\$ _____
2.	Portland Cement Concrete, SSHBC Section 509, Class F, 1" or 3/4" Aggregate Size	Cubic Yard	200	_____	\$ _____
3.	Flowable Fill, SSHBC Section 516 with No Air Entertainment	Cubic Yard	3,000	_____	\$ _____
4.	Hauling: within Gallup City Limits Less than Two (2) Cubic Yards, Small Load Charge	Loads	50	_____	\$ _____
5.	Waiting Time: Allowed Ten (10) Minutes per Yard, thereafter add charge per 1/4 hour after allowed time	1/4 Hour	100	_____	\$ _____
6.	Overtime: Unit Price per Hour Until Driver Clocks Out, if Truck has not unloaded by 4:00 P.M.	Hours	20	_____	\$ _____
TOTAL ALL OR NONE ITEMS 1 - 6					\$ _____

Note: SSHBC means New Mexico Department Of Transportation (NMDOT), Standard Specifications for Highway and Bridge Construction, 2014 Edition.

THIS BID WILL BE BASED ON A "**TOTAL ALL OR NONE**" BASIS FOR ITEMS 1 THRU 6.
DO NOT INCLUDE TAXES IN YOUR BID PROPOSAL

**CITY OF GALLUP
 BID PROPOSAL
 FORMAL BID NO. 1512
 Page 2 of 2 of Bid Proposal**

ADDITIONAL PRICING:

DELIVERY CHARGE PER MILE TO LOCATIONS

OUTSIDE THE CITY LIMITS BUT WITHIN MCKINLEY COUNTY \$ _____ PER MILE

Contractor Name: _____

Address: _____

F.O.B.: **DESTINATION**

Delivery Date ARO: _____

Payment Terms: _____

Signed By: _____

Name Printed or Typed

Signature

Fax No.: _____

Email: _____

Telephone No.: _____

AMENDMENTS: BIDDER ACKNOWLEDGES RECEIPT OF THE FOLLOWING AMMENDMENTS:

AMENDMENT No. ____ Date _____ Initials: _____

Failure to acknowledge receipt as provided above may be sufficient grounds for disqualification of the bidder and rejection of his proposal. It shall be the contractor's responsibility to become fully advised of all addenda prior to submitting a bid.

Bidder's Checklist of Submittal Documents

-Resident Veterans Certification form (if Applicable), Page 12

-Bid (Cost) Proposal, Pages 14-15

-Acknowledge Receipt of Amendments (if any), Page 16

-Specification Pages, Page(s) 17-37

-Exceptions to Specifications, Page 38

-Bidders MUST include a Copy of their New Mexico Resident Business or New Mexico Resident Veteran's Business Certificate issued by the State Taxation and Revenue Dept. (if applicable), to qualify for application of the State Preference to the bid

-A current IRS Form W-9

SECTION 509: PORTLAND CEMENT CONCRETE MIX DESIGNS

509.1 DESCRIPTION

This Work consists of developing, submitting and getting approval to use PCC mix

designs on Department Projects.

509.2 MATERIALS

Test Materials in accordance with AASHTO and ASTM methods or other test procedures designated by the Department. The State Materials Bureau will decide questions about test procedure interpretation. Correct or remove and dispose of improperly graded or segregated material that fails to meet the requirements as directed by the Project Manager and at no additional cost to the Department.

Use pre-approved Materials in accordance with the current Department's Approved Products List. The Department will not allow changes in the source or character of the Materials without notifying the State Materials Bureau and obtaining written approval.

509.2.1 Reserved

509.2.2 Portland Cement

Use Type II, low-alkali portland cement in accordance with ASTM C 150 unless otherwise specified. If the results of the alkali-silica reactivity (ASR) mitigation tests required in Section 509.2.4.5 "Alkali-Silica Reactivity" are less than 0.10% for each of the individual aggregates in the mixture, the Department will waive the low-alkali requirement.

509.2.2.1 Source Approval and Acceptance

The Department will accept portland cement based on certification of the approved sources and satisfactory test results from Project verification samples. The State Materials Bureau must approve cement from a particular source or Contractor before use. Include the following information in the request for source approval:

1. The Supplier or company;
2. Cement plant location;
3. Storage facility type and capacity;
4. Average and maximum production capabilities;
5. Production procedures;
6. Details regarding the in-house Quality Control program information:
 - 6.1. Routine sampling and testing frequency;
 - 6.2. Documentation that the Laboratory responsible for the certified ASTM C 150, ASTM C 595, and ASTM C 1157 test results is currently participating in the Cement and Concrete Reference Laboratory (CCRL) proficiency sample and the pozzolan inspection programs;
 - 6.3. A copy of the Laboratory letter authorizing CCRL to send copies of the CCRL inspection programs and proficiency result reports directly to the State Materials Bureau;
 - 6.4. Documentation of measures taken to ensure that the Supplier keeps unacceptable cement separated from acceptable cement;
7. Copies of Quality Control program test reports for the previous six (6) months, including at least one (1) comprehensive ASTM C 150 analysis for each month.

The Department will maintain a list of approved sources.

509.2.2.2 Sources on Approved List

Provide the following information from approved sources to the State Materials Bureau monthly:

1. Copies of routine Quality Control program test results; and

2. A certified ASTM C 150 or ASTM C 595 analysis for each lot tested. An average over a period of time or over several different test lots will not be acceptable.

509.2.2.3 Withdrawal of Source Approval

The State Materials Bureau may withdraw source approval for any of the following reasons:

1. A change in Equipment or production procedure from that on the original request for approval;
2. Project sample failure to comply with specification requirements;
3. Chemistry or physical properties that vary more than allowed;
4. A source becomes inactive for a period of 3 months; or
5. A source does not provide cement to the Department for a period of 1 year;
6. The appropriate mill certificates are not regularly received.

Manufacture cement at the same production facility unless otherwise approved by the State Materials Bureau. Obtain approval for changes in cement sources. Submit a written source change request to the Project Manager. The State Materials Bureau will issue a written decision within seven (7) Days of receipt.

Provide documentation that the proposed source will provide cement that produces concrete with hardened properties equal to or better than the original source. Compliance with ASTM C 150 is not sufficient documentation.

509.2.2.4 Blended Portland-Fly Ash Cement

Use blended portland-fly ash cement in accordance with ASTM C 595 or ASTM C 1157. Blend or inter-grind portland cement with fly ash. Provide proof that the blended portland-fly ash cement contains the appropriate percentage of the proper fly ash by weight of the cement only, to mitigate ASR concerns for the aggregates used.

509.2.2.4.1 Approval of Blended Portland-Fly Ash Cement Source

Provide test data showing that the proposed source can provide blended portland fly ash cement that produces concrete in accordance with Table 509.2.8.1:1 “Concrete Classes for Laboratory Design of Concrete Mixtures” and Section 509.2.8.4, “Concrete Mix Design Development.”

509.2.2.5 Packaging

Mark portland cement and blended portland-fly ash cement packages with the name brand, the source manufacturing facility, and the cement type. Provide the same information on the shipping documents for bulk cement deliveries.

509.2.2.6 Storage

Protect cement from moisture. Store different brands or types of cement, or cement from different production facilities separately. Provide separate, identifiable blended portland-fly ash cement storage at the Project or plant site. Store portland cement and portland-fly ash cement separately.

509.2.2.7 Cement Rejection

The Department will reject cement if it:

1. Has come in contact with moisture, fly ash, or other cements; or
2. Has partially set or is lumpy.

509.2.3 Fly Ash

Use fly ash that complies with the physical and chemical requirements of ASTM C 618 and the optional requirements for available alkalis and reactivity with cement alkalis as

modified by Table 509.2.3:1, “Fly Ash Requirements.” Use Class F fly ash if either the coarse or the fine aggregate is reactive. If both the coarse and the fine aggregate are non-reactive, the Contractor may use a C/F blend fly ash or a Class C fly ash.

**Table 509.2.3:1
Fly Ash Requirements**

Characteristics	Class C	Class F
Sum of Al ₂ O ₃ , SiO ₂ , and Fe ₂ O ₃	—	>85%
Moisture content, maximum %	1.0	1.0
Loss on ignition, maximum %	3.0	3.0
Magnesium Oxide (MgO), maximum %	5.0	5.0
Available Alkalis, maximum %	1.5	1.5
Calcium Oxide (CaO), maximum % ^a	50.0	8.0

^aNMDOT will only consider a fly ash as Class F if the CaO is less than eight percent (8%). Fly ash meeting the requirements of ASTM C 618 and containing more than eight percent (8%) by weight of bulk CaO is considered as Class C fly ash and can only be used in concrete that is not exposed to sulfate environments or with “potentially reactive”, or “reactive” aggregate.

Use waterproof and clearly labeled bags when supplying fly ash in bags. Label with the name brand, the manufacturer, type, and source. Provide an executed Certificate of Compliance with each fly ash shipment. Permission for blending Class C and Class F fly ash depends upon approval by the State Materials Bureau. Ensure the blended fly ash is in accordance with ASTM C 618 and is limited to concrete mixes in which the coarse and fine aggregates are non-reactive.

509.2.3.1 Source Approval and Acceptance

The Department will accept fly ash based on certification of approved sources and satisfactory test results on Project verification samples. Obtain approval from the State Materials Bureau before using fly ash from a particular source or Supplier in PCC. Include the following in source approval requests:

1. Supplier or company name;
2. Source power plant location;
3. Coal type and origin;
4. Combustion process;
5. Storage facilities and capacity;
6. Production procedures;
7. Details regarding the Supplier’s Quality Control program including the following:
 - 7.1. Routine sampling and testing frequency;
 - 7.2. Documentation showing that the Laboratory responsible for the certified ASTM C 618 test results is currently participating in the CCRL proficiency sample and pozzolan inspection programs. Submit a letter authorizing CCRL to send the Laboratory’s inspection and proficiency reports directly to the State Materials Bureau; and
 - 7.3. Measures taken to ensure that fly ash not meeting specification requirements are kept separate from Material meeting the requirements;
8. Copies of the Quality Control program test reports for each lot tested for the previous six (6) months including at least one (1) complete ASTM C 618 analysis for

each month.

The Department will maintain an approved products list. Do not substitute the approved Material source for a different source without prior Department approval. The Department will consider a fly ash source change only after receiving a written request. The State Materials Bureau will review the request and provide written approval once they have verification of the equivalency of the proposed Material. Compliance with ASTM C 618 is not sufficient documentation to permit a change of sources. Provide information that verifies the proposed source Material performs equally as Material from the original source.

509.2.3.2 Sources on Approved List

Sources on the approved list are required to provide the State Materials Bureau with the following information on a monthly basis:

1. Test results obtained in their routine Quality Control program; and
2. A certified ASTM C 618 analysis for each lot tested.

509.2.3.3 Withdrawal of Source Approval

The Department may withdraw source approval for any of the following reasons:

1. If there is a change in Equipment or production procedures from what was shown in the original request for approval;
2. If a Project sample fails to comply with specification requirements;
3. If a source becomes inactive for 3 consecutive months or more; or
4. If a source does not furnish fly ash to the Department for a period of 1 year.

509.2.3.4 Storage

Protect fly ash from moisture. Store different brands or types of fly ash, or fly ash from different production facilities separately. Provide separate, identifiable blended portland-fly ash cement storage at the Project or plant site. Store portland cement and portland-fly ash cement separately.

509.2.4 Aggregate

The Department will allow the Contractor to combine aggregates from two (2) or more approved sources based on the following criteria:

1. Each source complies with Material requirements other than gradation; and
2. The blended Material meets all requirements.

509.2.4.1 Aggregate Testing

Test coarse and fine aggregate in accordance with the methods shown in Table 509.2.4.1:1, "Aggregate Test Methods." Concrete mixture design approval involving a designated source will remain in effect as long as annual test results for specific gravity, absorption, gradation, and sand equivalent (for fine aggregate only) and annual tests for other requirements (except ASR) demonstrate Material compliance.

Table 509.2.4.1:1
Aggregate Test Methods

Aggregate test	Method
Sampling	AASHTO T 2
Clay lumps	AASHTO T 112
Amount of Material passing No. 200 sieve	AASHTO T 11
Absorption & Specific Gravity of Coarse Aggregate	AASHTO T-85 or TP 77

**Table 509.2.4.1:1
Aggregate Test Methods**

Aggregate test	Method
Absorption & Specific Gravity of Fine Aggregate	AASHTO T-84 or TP 77
Sieve analysis	AASHTO T 27
Soundness with magnesium sulfate	AASHTO T 104
Sand equivalent	AASHTO T 176
Soft fragments	AASHTO T 112
Flat and elongated pieces	ASTM D 4791
Alkali-Silica Reactivity	AASHTO T303 or ASTM C1293

509.2.4.2 Coarse Aggregate

Coarse aggregate is crushed stone, crushed gravel, or natural washed gravel. Unless otherwise specified, ensure that at least 50% of the aggregate by weight has a minimum of 1 Fractured Face. Ensure that Class G mixes are composed of at least 50% particles with no Fractured Faces. The Department may waive the Fractured Face requirement for mixes other than Class G mixes if less than 1.0% of the Material passes the No. 200 sieve.

509.2.4.2.1 Deleterious Materials

Do not exceed the deleterious substance tolerances in accordance with Table 509.2.4.2.1:1, “Deleterious Materials Tolerances for Course Aggregate.” Perform tests in accordance with Table 510.2.4.1:1, “Aggregate Test Methods.”

**Table 509.2.4.2.1:1
Deleterious Materials Tolerances for Coarse Aggregate**

Substance	Maximum % by weight
Soft fragments	2.0
Coal and lignite	0.25
Clay lumps	2.5
Materials passing No. 200 sieve	2.0
Flat and elongated pieces	^a

^aEnsure that Material larger than 3/8 inch contains no more than 15% flat or elongated particles with a 3:1 or greater dimensional ratio in accordance with TTCP. Add the percentage of flat pieces to the percentage of elongated pieces to determine specification compliance. Count pieces that are both flat and elongated only once.

Provide aggregate that is free of organic matter. The Department will reject contaminated aggregate.

509.2.4.2.2 Coarse Aggregate Quality Requirements

Provide coarse aggregate with an AI of 25 or less, calculated in accordance with Section 901, "QUALITY CONTROL/QUALITY ASSURANCE (QC/QA)." The Department will reject aggregates with an AI greater than 25.

509.2.4.2.3 Coarse Aggregate Gradation Requirements

If the combined gradation procedure detailed in Section 509.2.8.3.1, “Combined Gradation” has been chosen by the Contractor, then the gradation requirements specified below do not apply. Comply with all other aggregate properties and characteristics, including

the amount of Material passing the No. 200 sieve.

Use coarse aggregate that complies with Table 509.2.4.2.3:1, “Coarse Aggregate Gradation Requirements.”

**Table 509.2.4.2.3:1
Coarse Aggregate Gradation Requirements**

Sieve size	% of aggregate passing sieve				
	1.5in	1.0 in	0.75 in	0.5 in	Class G
2.0 inch	100	—	—	—	—
1.5 inch	95–100	100	—	—	—
1.0 inch	—	95–100	100	—	100
3/4 inch	35–70	—	90–100	100	90–100
0.5 inch	—	25–60	—	90–100	—
3/8 inch	10–30	—	20–55	40–70	20–55
No. 4	0–5	0–10	0–10	0–15	0–10
No. 8	—	0–5	0–5	0–5	0–5
No. 200	0.0–2.0	0.0–2.0	0.0–2.0	0.0–2.0	0.0–2.0

Provide coarse aggregate that meets the following:

1. 50% of the Material has at least 1 Fractured Face; and
2. 2.0% or less (by weight) of the Material passes a No. 200 sieve.

The Department may accept coarse aggregate with more than the maximum percent passing the No. 200 sieve if the combined gradation of the coarse and fine aggregate percent passing the No. 200 sieve does not exceed 3.0%.

509.2.4.2.4 Portland Cement Concrete Pavement (PCCP) Gradations

Meet the coarse aggregate gradation requirements shown in Table 509.2.4.2.3:1, “Coarse Aggregate Gradation Requirements,” for PCCP, unless using the combined gradation procedure. Additionally, except when the gradation of the coarse and fine aggregate combined has less than one percent (1.0%) passing the No. 200 sieve, all of the particles retained on or above the 3/8 inch sieve must have at least one (1) Fractured Face. The Contractor may eliminate the Fractured Face requirement by washing the aggregate to produce a combined aggregate of which less than one percent (1.0%) passes a No. 200 sieve. Provide proof that the mix design meets performance and minimum specified hardened properties.

509.2.4.3 Fine Aggregate

Use fine aggregate that consists of natural sand, manufactured sand, or a combination of both.

509.2.4.3.1 Deleterious Materials

Provide fine aggregates in accordance with Table 509.2.4.3.1:1, “Deleterious Material Tolerances for Fine Aggregate.”

**Table 509.2.4.3.1:1
Deleterious Material Tolerances for Fine Aggregate**

Substance	Maximum % by weight
Soft fragments	2.0
Coal and lignite	1.0
Clay lumps	3.0

509.2.4.3.2 Fine Aggregate Quality Requirements

Provide fine aggregate with the following properties:

1. A soundness loss of 12 or less when tested in accordance with AASHTO T 104 using magnesium sulfate solution and a test duration of five (5) cycles; and
2. A sand equivalent of at least 75 when tested in accordance with AASHTO T 176.

509.2.4.3.3 Fine Aggregate Gradation Requirements

If the combined gradation procedure detailed in Section 509.2.8.3.1, “Combined Gradation” has been chosen by the Contractor, then the gradation requirements specified below do not apply. Comply with all other aggregate properties and characteristics, including the amount of Material passing the No. 200 sieve.

Use well-graded fine aggregate in accordance with Table 509.2.4.3.3:1, “Fine Aggregate Gradation Requirements.” The gradation requirements represent the limits that the Department will use to determine source acceptability.

The Department will not approve fine aggregate that has more than 45% passing any sieve and retained on the next finer sieve shown in Table 509.2.4.3.3:1, “Fine Aggregate Gradation Requirements.” Use a fineness modulus, calculated in accordance with AASHTO M 6, to determine the degree of uniformity between representative samples. If the combined gradation procedure has not been chosen, the Department may reject fine aggregate from designated sources with variation in fineness modulus greater than 0.20 above or below the fineness modulus shown on the approved concrete mix designs.

Variations in excess of these tolerances may be cause for rejection. The Department may accept the aggregate once the Contractor assures the State Materials Bureau that the source maintains the designated production tolerances.

Table 509.2.4.3.3:1**Fine Aggregate Gradation Requirements**

Sieve size	% Passing
3/8 inch	100
No. 4	90–100
No. 8	70–95
No. 16	45–80
No. 30	25–60
No. 50	5–30
No. 100	0–8
No. 200	0.0–3.0

The Department may accept fine aggregate with more than three percent (3%) percent passing the No. 200 sieve, but not more than five percent (5%) passing the No. 200 sieve if the combined fine and coarse aggregates passing the No. 200 sieve does not exceed three percent (3.0%).

509.2.4.4 Alkali-Silica Reactivity

Prevent damage from ASR in accordance with the following procedures.

Perform the initial proof-of-reactivity-potential test using standard Rio Grande Type I-II low alkali cement from the Rio Grande Cement plant located at Tijeras, New Mexico. Use cement with an alkali content of from 0.5% to 0.6%. The Department considers aggregates with mean mortar bar expansions of greater than 0.10% at 14 Days potentially reactive and

those less than 0.10% as non-reactive. Expansions greater than 0.20% are considered “Reactive.” If tested using ASTM C 1293, the Department will consider aggregate nonreactive if the average expansion at the end of one (1) year is less than 0.04%. Once the State Materials Bureau decides a particular aggregate source is non-reactive, it will not require the source to reevaluate for three (3) years unless concerns arise from possible aggregate source changes. Obtain a list of reactive, potentially reactive, and non-reactive aggregate sources tested to date from the State Materials Bureau. If the results of the initial proof-of-potential-reactivity test show the aggregate to be “potentially reactive” or “reactive”, repeat the test procedure using the actual cement, fly ash and, if desired, any of the ASR inhibiting admixtures shown in Table 509.2.4.4:1 “ASR Inhibiting Admixtures.” Report the minimum amount of Class F fly ash, and the minimum amount of ASR inhibiting admixture required to provide a maximum expansion at 14 Days that is less than 0.10%. Report the Fly Ash required as a percentage of the cement weight.

**Table 509.2.4.4:1
ASR Inhibiting Admixtures**

Material	Requirement
Fly ash (Class F)	Section 510.2.9, “Fly Ash”
Blended cement (Only Class F Fly Ash may be used)	Section 510.2.4.4, “Blended Portland Fly-Ash Cement”
Ground granulated blast furnace slag (GGBFS), Grade 100 and 200	AASHTO M 302
Silica fume	AASHTO M 307
Lithium nitrate (LiNO ₃)	Section 510.2.11, “Lithium”

Use admixtures in accordance with Table 509.2.4.4:2, “ASR Mitigation Dosage Rate Requirements,” unless it is determined that larger dosages are required to control the expansion.

**Table 509.2.4.4:2
ASR Mitigation Dosage Rate Requirements**

Material	Dosage Rate
Fly ash (Class F)	As required to mitigate ASR expansion, but not less than 20% by weight of cement only for binary blends; not less than 12% by weight for ternary blends as long as the total pozzolan dosage is at least 20%
Blended cement	As required, but not less than 20% by weight of cement only
GGBFS	As required, but not less than 25% by weight of cement only
Silica fume	As required, but not less than ten percent (10%) by weight of cement only
Lithium nitrate	0.55 gal/yd ³ of solution for each pound of cement sodium equivalent

509.2.4.4.1 ASR Mitigation Evaluation Criteria

The Department will consider an admixture effective if the mean mortar bar expansion at 14 Days is less than or equal to 0.10%, when tested in accordance with Section 509.2.4.4 “Alkali-Silica Reactivity.” Retest aggregates classified as “potential reactive” or “reactive” for ASR mitigation each time the comprehensive mix evaluation is performed. If the test results from AASHTO T 303 or ASTM C 1293 indicate “potentially

reactive” or “reactive” Material, but the Contractor believes that the aggregates are non-reactive, submit the following documentation as proof of non-reactivity:

1. A letter signed and sealed by an Engineer registered in New Mexico confirming direct knowledge of the fundamentals of ASR in concrete and stating that the subject aggregates have never caused ASR concrete deterioration; and
2. A report from an approved petrographer. The report will confirm that at least two (2) different concrete core samples obtained from different 15-year old exposed structures that used the subject aggregates in a cement-only mixture were examined and that there is no evidence of ASR reactivity.

After receipt of a stamped letter from the registered professional Engineer indicating no evidence of ASR gel found in either of the cores, the Department will consider the aggregate sources non-reactive.

509.2.5 Admixtures

Ensure the total admixture, or combinations of admixtures, of soluble and insoluble chloride content does not exceed 1,000 ppm. Use only admixtures on the Department’s Approved Products List.

509.2.5.1 Air Entraining Admixtures

Use air-entraining admixtures that comply with AASHTO M 154.

509.2.5.2 Chemical Admixtures

Use water-reducing and set-controlling admixtures set retarding admixtures, and non-chloride set accelerating admixtures, that comply with Section 509.2.5, “Admixtures,” and AASHTO M 194.

509.2.6 Water

Test non-potable water before use in accordance with AASHTO T 26. Use water for mixing and curing concrete or washing concrete aggregates that does not contain acid, oil, alkali, organic matter, or other Deleterious Material that will adversely affect the concrete. Use water with a pH value of from 6.0 to 8.5 in accordance with AASHTO T 26. Do not use water with a sulfate content or chloride content that exceeds 1,000 ppm. Prevent contamination from silt, clay, organic matter, or other Deleterious Material. Do not use residual water, wash water, or recycled water generated by Equipment, mixer trucks, or central mixers in concrete mixtures.

509.2.7 Fibrous Concrete Reinforcement

Use fibers in the concrete mix at a minimum dosage rate of 1.5 lb per cubic yard of concrete. Use only 100% virgin polypropylene fibrillated fibers, containing no reprocessed olefin Materials, and specifically manufactured for use in PCC.

509.2.8 PCC Mixture Design and Approval

509.2.8.1 Classifications

The classes of PCC are shown in Table 509.2.8.1:1, “Concrete Classes for Laboratory Design of Concrete Mixtures,” and as specified:

**Table 509.2.8.1:1
Concrete Classes for Laboratory Design of Concrete Mixtures**

Class	Use	Specified compressive strength at 28 Days, (psi)	Laboratory design slump (in)	Percent air content
A	Cast in-place structural	3,000	4.5 to 5.5	—
AA	Cast in-place Structural	4,000	4.5 to 5.5	—
D	Non-structural	2,500	4.5 to 5.5	—

E	Slip form structural	2,500c	2.0 to 2.5	—
F	Slip form structural	3,000c	2.0 to 2.5	—
F-LS	PCCP Low Shrinkage	3,000	2.0 to 2.5	

**Table 509.2.8.1:1
Concrete Classes for Laboratory Design of Concrete Mixtures**

Class	Use	Specified compressive strength at 28 Days, (psi)	Laboratory design slump ^a (in)	Percent air content
G	Drilled shafts	3,000	—	No entrained air agent allowed
HPD	Bridge decks and other low shrinkage applications	4,000	4.5 to 5.5	—
Special	The Contract Requirements for the individual Project will address special mix requirements.			

a. As determined by AASHTO T 119.

b. Project risk zone requirements apply; see Section 510.3.2, “Freeze-Thaw Risk Zones.”

c. The specified age for Class E and Class F is 14 Days.

509.2.8.1.1 Details for Table 510.2.9.1:1, “Concrete Classes for Laboratory Design of Concrete Mixtures”

Use Table 509.2.8.1:1, “Concrete Classes for Laboratory Design of Concrete Mixtures,” only for designing concrete mixes. Do not use to evaluate concrete delivered to Department Projects.

Use the minimum air content shown below in the Laboratory mix:

1. High Risk Zones: 7.0%
2. Medium Risk Zones: 6.5%
3. Low Risk Zones: 6.0%

Use a minimum compressive strength over-design at least 1,200 psi greater than the specified compressive strength for new mixes if there is no additional information available. For existing mixes with at least 15 compressive strength tests, or for plants which can provide at least 15 consecutive compressive strength tests for a similar mix (same entrained air and same specified compressive strength), determine the minimum allowable average compressive strength using one (1) of the following equations. Use the equation that produces the largest value to determine the minimum allowable compressive strength.

$$f'_{cr} = f'_c + (1.34 \times k \times s) \tag{1}$$

$$f'_{cr} = f'_c + (2.33 \times k \times s) - 500 \tag{2}$$

Where,

f'_{cr} is the minimum Laboratory compressive strength at the specified age

f'_c is the specified compressive strength

k the k-factor from Table 509.2.8.1.1:1, “k-factor for increasing standard deviation,” for standard deviation increase if the total number of tests is less than 30, but equal to or greater than 15

- s is the standard deviation for the compressive strength tests submitted of the same specified strength

Table 509.2.8.1.1:1
k-Factor for Increasing Standard Deviation

Total number of tests	k-Factor
15	1.16

Table 509.2.8.1.1:1
k-Factor for Increasing Standard Deviation

Total number of tests	k-Factor
20	1.08
25	1.03
>30	1.00

The Department will allow linear interpolation for an intermediate number of tests. A mix that was developed from a history of 15 or more test results from the preceding 12-month period is considered an existing mix. A mix developed without historical test results is considered a new mix.

Class E and Class F concrete must attain minimum strength at 14 Days. The minimum Class F over-design is 800 psi at 14 Days unless a lower value is calculated using the greater value from either Equation (1) or Equation (2). The minimum Class E over-design is 600 psi at 14 Days, unless a lower number is calculated using the greater value from either Equation (1) or Equation (2).

Class G shall have the following characteristics:

1. A minimum cementitious content of at least 611 lb;
2. A maximum water/cementitious ratio no greater than 0.44;
3. A maximum sized aggregate no greater than 0.75 inch;
4. A sand/aggregate ratio between 40% and 42% by total aggregate volume;
5. A maximum air content no greater than three percent (3.0%);
6. No air entrainment agent;
7. A slump range of seven, 7.0 inch \pm one, 1.0 inch, except when placing under a drilling fluid;
8. A slump range of eight, 8.0 inch \pm one, 1.0 inch for placement under a drilling fluid; and
9. Adjust admixtures for the job site conditions encountered so that the concrete remains workable and plastic for the two (2) h placement limit.

509.2.8.2 Freeze-Thaw Risk Zones

Design the concrete mixture for use in the freeze-thaw zone in which the Project is located. One freeze/thaw cycle is defined as a Day in which the lowest recorded temperature is equal to or less than 25 °F as recorded on the Western Regional Climate Center database. The web address is www.wrcc.dri.edu. The risk levels are defined as follows:

1. **Low-Risk.** The annual average number of freeze/thaw cycles is equal to or less than 30 cycles per year;
2. **Medium-Risk.** The annual average number of freeze/thaw cycles is greater than 30 but less than or equal to 130 cycles per year;
3. **High-Risk.** The annual average number of freeze/thaw cycles is greater than 130 cycles per year.

Obtain the number of freeze/thaw cycles using the closest weather station to the Project with the most similar environmental conditions. Use Table 509.2.8.2:1, “Statewide Concrete Risk Zones,” to determine the required risk zone.

**Table 509.2.8.2:1
Statewide Concrete Risk Zones**

District no.	County name	Station name	Concrete risk zone
1	Dona Ana	(County wide)	Low
1	Grant	(County wide)	Low

**Table 509.2.8.2:1
Statewide Concrete Risk Zones**

District no.	County name	Station name	Concrete risk zone
1	Hidalgo	(County wide)	Low
1	Luna	(County wide)	Low
1	Sierra	(County wide)	Low
1	Socorro	(County wide)	Medium
2	Chaves	(County wide)	Low
2	Curry	(County wide)	Medium
2	De Baca	(County wide)	Medium
2	Eddy	(County wide)	Low
2	Lea	(County wide)	Low
2	Lincoln	(County wide)a	Medium
2	Lincoln	Ruidoso	High
2	Otero	(County wide)	Medium
2	Roosevelt	(County wide)	Medium
3	Bernalillo	(County wide)a	Medium
3	Bernalillo	Sandia Crest	High
3	Sandoval	(County wide)	Medium
3	Valencia	(County wide)	Medium
4	Colfax	(County wide)	High
4	Guadalupe	(County wide)	Medium
4	Harding	(County wide)	Medium
4	Mora	(County wide)	High
4	Quay	(County wide)	Medium
4	San Miguel	(County wide)	Medium
4	Union	(County wide)	Medium
5	Los Alamos	(County wide)	Medium
5	Rio Arriba	(County wide)a	Medium
5	Rio Arriba	Chama	High
5	Rio Arriba	Dulce	High
5	Rio Arriba	El Vado Dam	High
5	Rio Arriba	Gavilan	High
5	Rio Arriba	Lindrith	High
5	Rio Arriba	Tres Piedras	High
5	San Juan	(County wide)	Medium
5	Santa Fe	(County wide)	Medium

5	Taos	(County wide)	High
5	Torrance	(County wide)	Medium
6	Catron	(County wide)	High
6	Cibola	(County wide)	High
6	McKinley	(County wide) ^a	High
6	Sandoval	(County wide)	High

^a Except as otherwise listed

The minimum allowable air content for mix design submittal purposes is:

1. 6.0% for low-risk zones;
2. 6.5% for medium-risk zones;
3. 7.0% for high-risk zones.

Confirm these contents by the pressure method and the volumetric method in accordance with Section 509.2.8.4.3, “Mix Design Submittal.”

509.2.8.3 PCC Mixture Development

Submit representative samples of all proposed Materials to a PTL that is pre-approved to design PCC mixtures by the State Materials Bureau. Provide a professional civil Engineer licensed by the State of New Mexico with a minimum of three (3) years experience in proportioning and testing PCC mixes to directly supervise all testing.

509.2.8.3.1 Combined Gradation

The combined gradation procedure is optional for all concrete mixes except for Class FLS and High Performance Deck (HPD) mixes. Class F-LS and HPD mixes must be prepared using the combined gradation procedure. Evaluate aggregates for concrete mixtures prepared for the combined gradation procedures in accordance with the following:

1. **Coarseness Factor.** Determine the Coarseness Factor in accordance with the following equation:

$$CF = \frac{Q}{Q+1} \times 100 \quad (3)$$

Where,

CF is the Coarseness Factor

Q is the weight of the aggregate retained on or above the 3/8-inch sieve

I is the weight of the aggregate passing the 3/8 inch sieve, but retained on the No. 8 sieve

2. **Workability Factor.** The weight of the aggregate passing the No. 8 sieve divided by the weight of the combined gradation, represented as a percent.

3. **Mortar Factor.** The volume of the cement, fly ash, water, air, other pozzolans, and aggregate passing the No. 8 sieve divided by the volume of the entire concrete mixture, represented as a percent.

4. **Paste Factor.** The volume of the cement, fly ash, water, air, and other pozzolans divided by the volume of the entire concrete mixture, represented as a percent.

Combine aggregates to produce a uniform gradation. Ensure that combined aggregates comply with the required individual physical and chemical properties. Individual gradation requirements will not apply. Use the .45 Power Curve to blend the aggregates to achieve the densest grading possible. Approximate targets for the Coarseness Factor and the Workability Factor are shown in Table 509.2.8.3.1:1, “Recommended Workability Factor and Coarseness Factor Targets,” for concrete mixtures designed using combined gradation.

**Table 509.2.8.3.1:1
Recommended Workability Factor and Coarseness Factor Targets**

Nominal Maximum Aggregate Size	Workability Factor	Coarseness Factor
3/4 inch	32-36	65-75
1/2 inch	40-42	10-20

509.2.8.4 Concrete Mix Design Development

Use fly ash in all concrete mixtures. If fly ash is the only pozzolan used, add at a minimum of 20%, by weight of cement only. Only use Class C or C/F blended fly ash with non-reactive aggregate. When using Class C or C/F blended fly ash instead of the Class F fly ash, use at a minimum dosage rate of 25%, by weight of cement. When using additional pozzolans, such as silica fume, metakaolin, or GGBFS, the minimum amount of fly ash required is 12% for mixtures using Class F fly ash and 15% for mixtures using Class C fly ash. When using multiple pozzolans, ensure that the total pozzolan content is at least 20% with Class F fly ash and 25% with Class C or C/F blend fly ash.

509.2.8.4.1 Concrete Mix Design Documentation

Submit documentation to the State Materials Bureau that verifies:

1. All Materials used comply with Section 510.2, "Materials;"
2. The PTL prepared and tested a proof mix using the designated Materials and batch weights;
3. A complete companion set of compressive strength test cylinders was delivered to the Department District Laboratory for comparison testing; and
4. The cylinders were cured for at least 48 h after casting, and the cylinders were transported upright in protected and cushioned containers to the Department District Laboratory.

509.2.8.4.2 Concrete Mix Design Designing & Proportion

Design and proportion the concrete mixtures to comply with the following performance requirements:

1. Except for concrete mixtures to be used exclusively in pre-stressed applications, all structural concrete mixtures must demonstrate strength gain characteristics as follows:
 - 1.1 28-Day strength of at least 130% of the seven (7)-Day strength;
 - 1.2 56-Day strength at least 108% of the 28Day test;
2. For Class F-LS Concrete mixtures, the minimum average flexural strength for three (3) beams cast in the Laboratory shall be 650 psi at 28 Days, when tested in accordance with AASHTO T-97
3. Structural concrete mixtures must achieve a minimum durability index:
 - 3.1 Greater than or equal to 85 for Low-Risk Zones;
 - 3.2 Greater than or equal to 90 for Medium-Risk Zones; and
 - 3.3 Greater than or equal to 95 for High-Risk Zones;
4. Determine the durability index from at least one (1) prism tested at 28 Days for 300 cycles, in accordance with ASTM C 666, Method A. Cure prisms tested for durability index by bathing in lime saturated water at a temperature of $73.3\text{ }^{\circ}\text{F} \pm 3.0\text{ }^{\circ}\text{F}$ for the first seven (7) Days followed by 21 Days in lime saturated water at a temperature of $100.0\text{ }^{\circ}\text{F} \pm 3.0\text{ }^{\circ}\text{F}$.
5. If the specimen cannot be tested immediately after curing, place immediately in a freezer at a maximum temperature of $10.0\text{ }^{\circ}\text{F}$ until testing;
6. Hardened air void system characteristics required of all structural concrete classes, when examined in accordance with the ASTM C 457 linear traverse method include:
 - 6.1 A minimum air content of five percent (5.0%);
 - 6.2 A specific surface greater than 600 in-1; and
 - 6.3 A spacing factor less than 0.008 inch;
7. Ensure that concrete complies with Section 509.2.4.4, "Alkali-Silica Reactivity," and Section 509.2.4.5.1, "ASR Mitigation Evaluation Criteria," as determined by the State Materials Bureau;

8. Provide chloride ion permeability at 28 Days for structural concrete tested in accordance with ASTM C 1202 that is:

8.1 Less than or equal to 3,000 coulombs for Low-Risk Zones; or

8.2 Less than 2,500 coulombs for Medium-Risk Zones; or Section 509: Portland Cement Concrete Mix Designs Page 308

8.3 Less than 2,000 coulombs for High-Risk Zones;

9. Cure concrete for chloride ion permeability the same way as the durability index specimens in accordance with #2, above;

10. The maximum shrinkage value for Class F-LS concrete mixtures and for HPD concrete mixtures is 0.05% at 56 Days when tested with three (3) inch x four (4) inch x 16 inch prism or three (3) inch x three (3) inch x ten (10) inch prism and cured in a standard cure for the first seven (7) Days. Following the seven (7) Day initial cure, cure in a relative humidity of 50% and test in accordance with AASHTO T 160;

11. For Class G mixtures, provide trial mix and slump loss test results that verify compliance with the concrete slump requirements for Class G.

Only technicians who are currently certified by TTCP-Concrete or ACI Concrete Field Technician, Level I shall determine concrete fresh properties in accordance with the appropriate AASHTO procedures. Laboratories approved by the Department's State Materials Bureau shall determine hardened properties. Technicians performing tests on aggregates and aggregate gradations shall be certified by TTCP or ACI Concrete Laboratory Level I. Those technicians performing strength tests on hardened concrete must be certified as an ACI Level I Laboratory Technician or by TTCP for Compressive Strength Testing of Concrete.

Develop concrete mixtures with compressive strengths as close as possible to the overdesign strengths calculated in accordance with Section 509.2.8.1.1, "Details for Table 509.2.8.1:1, 'Concrete Classes for Laboratory Design of Concrete Mixtures.'" Concrete with strengths substantially in excess of these over-design strengths will be rejected and returned to the submitting Laboratory for the appropriate adjustments.

509.2.8.4.3 Mixture Design Submittal

Submit a completed electronic copy of the NMDOT Concrete Mix Design Submittal Form to the Concrete Unit of the State Materials Bureau. Ensure that the following information is included:

1. Company name of the requestor;
2. Company address, telephone number and e-mail address;
3. PTL's name and signature; and
4. The New Mexico registration number of the professional Engineer who is responsible for the concrete mixture design Work;
 - 4.1. Ensure that the following information and the required documentation are provided electronically and through back-up documentation:
5. A comprehensive Materials list and the properties of each component, including:
 - 5.1. Aggregates:
 - 5.1.1. Source names;
 - 5.1.2. Specific source locations;
 - 5.1.3. For sources not on the Department approved list, provide a complete ASTM C 295 "Petrographic Examination of Aggregates for Concrete" and an ASTM C 294, Constituents of Natural Mineral Aggregates for both the coarse and fine aggregate Material after completing processing and manufacturing procedures and the aggregate is ready for use; include the geologic origin of the Material; perform and

- certify the analysis using a petrographer previously approved by the Department;
- 5.1.4. Soundness loss with calculations;
- 5.1.5. Percent of Fractured Faces for the coarse aggregate;
- 5.1.6. Gradations, including AASHTO T 11;
- 5.1.7. Bulk saturated surface dry specific gravities;
- 5.1.8. Los Angeles wear abrasion;
- 5.1.9. Fineness modulus;
- 5.1.10. Aggregate absorption;
- 5.1.11. Aggregate correction factor;
- 5.1.12. Sand equivalent of fine aggregate;
- 5.1.13. Dry-rodded coarse aggregate unit weight;
- 5.1.14. Fine aggregate clay lumps content; and
- 5.1.15. Organic impurity content, including soft fragments, coal and lignite, flat or elongated pieces, and other deleterious substances.
- 5.2. Cement:
 - 5.2.1. ASTM C 150 Analysis;
 - 5.2.2. Chemical and physical cement properties, including the amount of C3S, C2S, C3A, the amount finer than the No. 325 sieve, and the Blaine Fineness; and
 - 5.2.3. Cube strengths;
- 5.3. Fly Ash:
 - 5.3.1. ASTM C 618 Analysis;
 - 5.3.2. Specific gravity;
 - 5.3.3. Material retained on a No. 325 sieve;
 - 5.3.4. Moisture content;
 - 5.3.5. Loss on ignition;
 - 5.3.6. Magnesium oxide content; and
 - 5.3.7. Calcium oxide content.
- 5.4. Blended Cement:
 - 5.4.1. ASTM C 595 and ASTM C 1157 analyses;
 - 5.4.2. Chemical and physical cement properties, including the percent of C3S, C2S, C3A, the amount finer than a No. 325 sieve, and the Blaine Fineness;
 - 5.4.3. Total alkalis;
 - 5.4.4. ASTM C 618 Analysis; and
 - 5.4.5. Percent of fly ash;
- 5.5. Admixtures:
 - 5.5.1. Documentation of compliance with appropriate ASTM requirements; and
 - 5.5.2. Verification of supply availability;
- 5.6. Water:
- 6. Concrete mixture proportions; state clearly if submitting request under the combined gradation provisions;
- 7. Water/cementitious ratios;
- 8. Type and amount of admixtures; use admixtures on the Department's Approved Products List;
- 9. Water source and location; include pH, available alkalis, and a full chemical analysis, if the water source is not a certified NMED public potable water supply;
- 10. Plastic Concrete Properties:
 - 10.1. Air temperature;

- 10.2. Concrete temperature;
- 10.3. Slump; when using super-plasticizer, document the slump before and after addition of the super-plasticizer;
- 10.4. Unit weight; and
- 10.5. Air content measured in accordance with AASHTO T 152 or AASHTO T 121; Section 509: Portland Cement Concrete Mix Designs Page 310
- 10.6. When using super-plasticizer, document the measured air content before and after adding the super-plasticizer);
- 11. Hardened Concrete Properties:
 - 11.1. New Concrete Mixtures:
 - 11.1.1. Compressive strength tests (the average of three (3) cylinders tested at seven (7) Days, 28 Days, and 56 Days, except for Class E ,Class F and Class F-LS mixes which shall have t two (2) cylinders tested at 7, 14, 28 and 56 Days);
 - 11.1.2. Type of fracture of each cylinder;
 - 11.1.3. Flexural strength test results for Class F-LS(average of three (3) beams)
 - 11.1.4. Durability index (for structural mixes only);
 - 11.1.5. Hardened air void analysis (for structural mixes only);
 - 11.1.6. Rapid Chloride Permeability (for structural mixes only); and
 - 11.1.7. Expansion data from AASHTO T 303;
 - 11.2. Existing Concrete Mixtures:
 - 11.2.1. Consecutive compressive strength data with individual specimen test results from seven (7) Days, 28 Days, and 56 Days (at least 15 tests required); Present this data in chronological order;
 - 11.2.2. Durability index (for structural mixes only);
 - 11.2.3. Hardened air void analysis (for structural mixes only);
 - 11.2.4. Rapid Chloride Permeability (for structural mixes only); and
 - 11.2.5. Expansion data from AASHTO T 303:
 - 11.3. Incidental Concrete Mixtures (Only for specific Projects) Concrete mixes intended for Projects that anticipate less than 300 yd³ of each concrete class,but not more than 750 yd³ for concrete used on the Project:
 - 11.3.1. Compressive strength data (field performance data if using the mix within the previous 12 months, or Laboratory mix performance data not using it in the field); and
 - 11.3.2. Air content, as measured by the pressure method or the volumetric method; when using superplasticizer, show the air content before and after adding superplasticizer.

509.2.8.5 Mixture Design Approval

The Department will require at least 14 Days to review the submittal packages after receipt by the State Materials Bureau of all required information. The Department will approve designs for a period of 1 year from the date of issuance if the documentation verifies compliance with all requirements. At least 30 Days before the 1-year approval expires, the Contractor may request that the mix design be reissued. The Contractor must provide test reports showing that the mix design met specification requirements during the issue period. Mix designs may be re-approved for no more than 4 additional years. The Department will grant each approval period if the documentation verifies the following:

1. Constituent Material sources and the Material's properties remain the same;
2. The compressive strength performance data verifies compliance with Section 510.3.5.3, "Acceptance of Concrete Based on Cylinders;"

3. Compliance with other fresh and hardened properties is verified where the mixture was used;
4. The coefficient of variation (CV), determined in accordance with ACI 214, is less than 12%; and
5. When field performance data shows the CV exceeds 12%, a “Comprehensive Operations QC/QA Manual” that shows how the Contractor will reduce the variability and improve the consistency of its production process will be required.

At the discretion of the State Concrete Engineer, a mixture can be adjusted without rebatching by using “cement efficiency” calculations to determine the amount of change to the cement and the total cementitious content that is necessary to achieve the desired level of performance. When this procedure is allowed, the ratio of pozzolan to cement ratio will remain unchanged, the water content will remain unchanged, and the aggregates will be adjusted without changing the overall gradation to accommodate the changes in volume from changes made to the cement. All changes made by this method must be approved by the State Concrete Engineer before being implemented in the field.

If the constituent Materials change, immediately provide documentation to the State Materials Bureau describing how to resolve the problem. Return the affected Material to an approved condition or submit a new concrete mixture design package. If the compressive strengths do not comply with Department requirements, describe the needed adjustments. Submit a written summary of the adjustments to achieve compressive strength to the State Materials Bureau for approval. Do not use the concrete mixture on Department Projects before receipt of written approval from the State Materials Bureau.

The Department will not consider the addition of more cement a sufficient explanation or resolution without additional documentation explaining why other measures are not appropriate.

509.3 CONSTRUCTION REQUIREMENTS – Reserved

509.4 METHOD OF MEASUREMENT – Reserved

509.5 BASIS OF PAYMENT

The Department will pay for concrete in accordance with the section of these Standard Specifications for which the concrete is used.

SECTION 516: FLOWABLE FILL

516.1 DESCRIPTION

This Work consists of providing and placing flowable fill.

516.2 MATERIALS

516.2.1 General

Flowable fill is a flowable mixture of portland cement, fly ash, aggregates, admixtures and water.

516.2.2 Mix Design

The State Materials Bureau is responsible for approving the mix design for flowable fill. Approval of a Flowable fill mix design by the State Materials Bureau will be valid for a period of 5 years unless revoked due to performance problems.

516.2.3 Cement

See Section 509, “Portland Cement Concrete Mix Designs.”

516.2.4 AGGREGATE

Provide a uniform mixture of fine aggregate or coarse and fine aggregate. Provide coarse and fine aggregate with a gradation in accordance with Table 516.2.4:1, “Aggregate Mixture Gradation Requirements.”

**Table 516.2.4:1
Aggregate Mixture Gradation Requirements**

Sieve size	% passing
One (1) inch	100
3/8 inch	95 – 100
No. 4	80 – 100
No. 8	60 – 95
No. 16	45 – 80
No. 30	25 – 60
No. 50	5 – 45
No. 100	5 – 35
No. 200	0 – 30

516.2.5 Water

Provide concrete mix water in accordance with Section 509, “Portland Cement Concrete Mix Designs.”

516.2.6 Air-Entraining Admixture

The Contractor may use an air-entraining admixture to provide air entrainment no greater than 35% in the flowable fill.

516.2.7 Fly Ash

Provide approved Class F, Class C, or Class C/F blended fly ash in accordance with Section 509, “Portland Cement Concrete Mix Designs.”

516.2.8 Water-Reducing Admixture

The Contractor may use a water-reducing admixture.

516.2.9 Proportioning and Physical Property Requirements in the Laboratory

Provide a flowable fill mix design in accordance with the following limits:

1. Cement, maximum 50 lbs/yd³.
2. Fly Ash, from 150 lbs/yd³ to 300 lbs/yd³.
3. Air Content, optional.
4. Slump, from eight (8) inch to 11 inch.
5. Water/cement ratio, proportioned by weight to produce a slump within the prescribed limits.
6. Consistent aggregate throughout the concrete mixture.
7. Compressive strength will not exceed 150 psi at 28 Days.
8. Cast the test specimens in four (4) inch × eight (8) inch test cylinders, perforated on the bottom with four (4) 1/4 inch diameter holes for free draining;
9. Keep the test cylinders in a moist environment, but do not cure in a curing tank.
10. Cast six (6) compressive strength test cylinders in the Laboratory. Test two (2) cylinders at seven (7) Days, two (2) at 28 Days, and two (2) at 56 Days.

516.3 CONSTRUCTION REQUIREMENTS

516.3.1 Batching, Mixing, and Transporting

Perform batching, mixing, and transporting in accordance with Section 510, “Portland Cement Concrete.”

516.3.2 Testing Flowable Fill in the Field

Obtain the State Materials Bureau’s approval of the flowable fill mix properties before using the mix in the field.

For field testing, use a standard (15 lb) T-post fence driver to drive a #6 reinforcing bar with a flat end into the flowable fill Material 24 h after placement. Lift the driver until the bottom of the driver is even with a mark located six (6) inches below the top of the rebar, and then allow it to fall under its own weight. Remove and replace the flowable fill if fewer than six (6) blows or more than 25 blows are required to drive the rebar exactly 12 inches into the fill. Do not use compressive strength test cylinders for field-testing purposes.

516.3.3 Pre-Placement Requirements

Before placing flowable fill, remove any loose or uncompacted soils from the area to be filled. Ensure that all areas in which soils or construction Materials have sloughed off or collected are completely cleared. DO NOT PLACE FLOWABLE FILL AGAINST LOOSE OR UNCOMPACTED SURFACES/MATERIAL.

Ensure that all pipes or other embedded items which would otherwise float to the top of the flowable fill are adequately secured to prevent their floating out of position.

516.3.4 Placing

Place flowable fill uniformly to prevent voids in or segregation of the bedding and filling Material. Secure the Culvert or pipe from movement.

Place the flowable fill by direct discharge from a ready mix truck, pumping, or other method approved by the Project Manager. Place the flowable fill in layers no more than 12 ft high. Place the flowable fill in layers no more than four (4) ft high for areas that require forming. Do not place the individual layers until flowable fill in a previously placed layer has been in place at least two (2) h.

Submit a written request and obtain written approval from the District Construction Engineer before placing the flowable fill in a full depth layer.

Do not place the flowable fill on frozen ground or while it is raining. Protect flowable fill from flooding for at least 24 h after placement.

If necessary, place flowable fill in standing water that is positioned to keep the outside water from contaminating or mixing with the flowable fill.

If required, consolidate the flowable fill with internal vibrators in accordance with

Section 511.3.4.5, “Vibrating/Consolidation.”

Do not allow any imbedded items to float or otherwise dislodge. Secure pipe to compensate for buoyancy.

Fill the areas between the walls of the existing CBC and an inserted CMP thoroughly.

Do not disturb the flowable fill Material for at least 24 h after placement. The Contractor may reduce this 24-hour period, if the penetration resistance of the Material justifies, as tested in accordance with Section 516.2.10, “Sampling and Testing.”

516.3.5 Application of Load

The Contractor may cover the flowable fill within 24 h after placement, if a person weighing at least 150 lb does not sink into the Material more than one (1) inch, if standing on a four (4) inch × four (4) inch wooden block.

516.3.6 Temperature and Weather Limitations

Do not place flowable fill when the air temperature is lower than 35 °F. The Contractor may begin placement only when weather conditions are favorable and the air temperature is at least 35 °F and rising. If the air temperature at the time of placement is less than 40 °F, place flowable fill that has a temperature of at least 50 °F.

516.4 METHOD OF MEASUREMENT

The Department will measure flowable fill using the dimensions shown in the Contract or as approved by the Project Manager. The Department will consider flowable fill used at the Contractor's option to be Incidental to the associated Bid Item.

516.5 BASIS OF PAYMENT

PAY ITEM	PAY UNIT
<i>Flowable Fill</i>	Cubic Yard

516.5.1 Work Included In Payment

The following Work will be considered as included in the payment for the main item and will not be measured or paid for separately: When called for in the Contract, or the Contractor proposes its use and is approved by the Project Manager, flowable fill can be used for backfill in Culvert installations. No measurement or payment will be made for Work and Materials associated with backfilling pipes with flowable fill. This will be included in the Contract unit price per linear foot of Culvert pipe.

