



**THE METROPOLITAN SEWERAGE DISTRICT
OF BUNCOMBE COUNTY, NORTH CAROLINA**

REQUEST FOR QUOTATION

**INCINERATOR REHABILITATION MATERIALS PURCHASE
MSD PROJECT NO. 2022057**

NOVEMBER 4th, 2024

BIDS ARE DUE NO LATER THAN THURSDAY, DECEMBER 5th, 2024, AT 2:00 PM

ADVERTISEMENT FOR BIDS

Sealed bids will be received by the Metropolitan Sewerage District (DISTRICT) of Buncombe County, North Carolina at the 2nd floor conference room of the MSD W. H. Mull Building, 2028 Riverside Drive in Asheville, North Carolina, until **2:00 PM (local time), Thursday, December 5th, 2024**, and shall be immediately opened publicly and read aloud for the project described as follows:

Incinerator Rehabilitation Materials Purchase Project No. 2022057

The project shall generally consist of the Supplier furnishing materials that will be installed by others in the incinerator building at the Metropolitan Sewerage District's French Broad River Water Reclamation Facility in Asheville, NC (WRF). The installation of said materials shall be performed under a separate contract.

A pre-bid conference will not be held.

Complete specifications and contract documents may be accessed at the DISTRICT website:
<http://www.msdbc.org/purchasing.php>

All questions are to be directed to Darin Prosser, PE (MSD Project Manager) at least 48 hours prior to bid opening at (828) 225-8280 or dprosser@msdbc.org. All known bidders will be sent written copies of questions that require a written response or a change to the requirements and/or specifications. In the event of a major change to requirements and/or specifications, MSD reserves the right to postpone the bid opening, with advance notice to all known bidders.

If a bid is being mailed or emailed, it is recommended that they be sent in a manner to insure receipt at MSD by Wednesday, December 4th. Mailed bids shall be addressed as follows:

**Attention: Darin Prosser, PE
Metropolitan Sewerage District of Buncombe County, NC
2028 Riverside Drive
Asheville, NC 28804**

Each bid shall be accompanied by a deposit with the Metropolitan Sewerage District of Buncombe County of cash, or a cashier's check, or a certified check on some bank or trust company insured by the Federal Deposit Insurance Corporation in an amount equal to not less than five percent (5%) of the bid amount. In lieu of making the cash deposit as above described, a satisfactory Bid Bond in the amount of 5% of the total bid, executed by a corporate surety licensed under the laws of North Carolina to execute such bonds, shall be submitted with each bid, conditioned that the surety will upon demand forthwith make payment to the obligee upon said bond if the bidder fails to execute the contract in accordance with the bid bond. This deposit shall be retained if the successful bidder fails to execute the contract within ten (10) days after the award of bid or fails to give satisfactory surety as required in North Carolina General Statute Section 143-129.

The successful bidder will be required to furnish a Performance Bond in the amount of one hundred percent (100%) of the contract amount. Those bonds shall meet the requirements of North Carolina General Statute Section 143-129 and of Article 3 of Chapter 44A of the North Carolina General Statute.

No bid may be withdrawn after bids have been opened, except as provided in North Carolina General Statute Section 143-129.1.

The contract shall be awarded to the lowest responsive, responsible bidder, taking into consideration quality, performance and time of delivery. The DISTRICT reserves the right to reject any and all bids, including, without limitation, the right to reject any or all non-conforming, non-responsive, unbalanced or conditional bids, and to reject the bid of any bidder if the DISTRICT believes that it would not be in the best interest of the DISTRICT to make an award to that bidder. The DISTRICT also reserves the right to waive informalities.

**METROPOLITAN SEWERAGE DISTRICT OF
BUNCOMBE COUNTY, NORTH CAROLINA**

**BY: Thomas E. Hartye, P.E.
GENERAL MANAGER**

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BID PACKAGE REQUIREMENTS

Bids shall be submitted in a sealed envelope, to include the following documents:

1. Non-Collusion Affidavit
2. Bidder's Proposal on MSD form
3. Certificate of Insurance
4. Bid Bond on MSD Form
5. Bidder's Bid Amount on MSD supplied form
6. Statement of Compliance to the specifications and requirements of this bid package, and, if applicable, confirmation of receipt and acceptance of any amendments to this package. This can be included on the cover sheet.
7. Bidders may supply any other information deemed by them to be necessary for a complete understanding of their quotation. However, this information must be included at the end of the bid package and may not be considered by MSD in the awarding of this contract.

Non-Collusion Affidavit Of Prime Bidder

State of North Carolina
County of Buncombe

_____, being first duly sworn, deposes and says that:

- 1) He/She is President of _____ (Company/Corporation), that has submitted the attached bid for **Incinerator Rehabilitation Materials Purchase, Project No. 2022057.**
- 2) He/She is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;
- 3) Such Bid is genuine and is not a collusive or sham bid;
- 4) Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees, or parties in interest, including this affiant, has in any way colluded, conspired, connived, or agreed, directly or indirectly with any other Bidder, firm, or person to submit a collusive or sham Bid in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm, or person to fix the price or prices in the attached Bid or of any other Bidder, or to fix any overhead, profit, or cost element of the Bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the Metropolitan Sewerage District of Buncombe County or any person interested in the proposed Contract; and
- 5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

Signed: _____

Title: _____

Subscribed and sworn before me this the _____ day of _____, 2024.

Notary Public (Seal)

My Commission Expires: _____

Proposal

Date: _____

To: Metropolitan Sewerage District
Buncombe County, North Carolina
Asheville, North Carolina

Individual or Firm Name of Bidder

In response to your request the undersigned Bidder submits the following proposal for supplying materials for the proposed project described and specified in the attached documents titled:

**Incinerator Rehabilitation Materials Purchase
Project No. 2022057**

1. Bidder proposes and agrees, in event this proposal is accepted, to enter into a contract with the Metropolitan Sewerage District of Buncombe County, North Carolina (herein designated and referred to as the DISTRICT, in the form herein specified, to furnish the Fluidized Bed Incinerator rehabilitation materials in complete accordance with the requirements of the attached contract documents and plans, to the entire satisfaction of the DISTRICT, at the lump sum price we have inserted in the accompanying "Schedule of Estimated Quantities and Bid Prices" and/or bid sheet, which is an integral part of this proposal, and in accordance with the other terms and conditions of the Contract Documents.
2. Bidder hereby declares that the only person or persons interested in this proposal as principal or principals is or are named herein and that no other person than herein mentioned has any interest in this proposal or in the contract to be entered into, that this proposal is made without connection with any other person, company or parties making a proposal, and that this proposal is in all respects fair and made in good faith without collusion or fraud.
3. In submitting this Bid, Bidder warrants and represents that:
 - (a) Bidder has examined copies of all the Bidding Documents, the Advertisement for Bids, and of the following Addenda (receipt of all which is hereby acknowledged):

No. _____	Dated _____	No. _____	Dated _____
No. _____	Dated _____	No. _____	Dated _____
No. _____	Dated _____	No. _____	Dated _____
 - (b) Bidder has given the DISTRICT written notice of all conflicts, errors or discrepancies that it has discovered in the Contract Documents and the written resolution thereof by the DISTRICT is acceptable to Bidder.
 - (c) This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit false or sham Bid; Bidder has not solicited or induced any person, firm or a corporation to refrain from bidding; and Bidder has not sought by collusion to obtain for himself any advantage over any other Bidder or over Owner.
4. The Bidder agrees that the Work shall be delivered within the following durations:
Duration in calendar days from issuance of Purchase Order to Delivery of Engineering

Proposal

Submittals: 30 calendar days. The Bidder agrees to pay liquidated damages in the amount of \$500.00 per calendar day for each calendar day beyond the specified limit for submittal of the Engineering submittals.

Duration in calendar days from issuance of an Approved Engineering Submittal until delivery of the equipment to the project site: 365 calendar days. The Bidder agrees to pay liquidated damages in the amount of \$500.00 per calendar day for each calendar day beyond the specified limit for delivery of equipment to the project site.

5. The Bidder further declares that accompanying this proposal is a certified check or satisfactory bid bond in the sum of five percent (5%) of this proposal, and it is hereby agreed that in case of the withdrawal of this proposal without the consent of the DISTRICT within sixty (60) days after the bid opening, or that in case of failure on the part of the undersigned to execute the contract as aforesaid and to deliver same and the required security for the faithful performance of the contract, (executed in the form annexed hereto) to said DISTRICT within ten days from the date a notice of acceptance of this proposal is given to the undersigned personally, or by mail to the address as herein stated, then the undersigned Bidder will be deemed to have abandoned the contract, and thereupon the amount of such check or bond shall be absolutely due and payable thereunder to the DISTRICT.
6. The Bidder shall submit a list of reference installations with their bid submission demonstrating compliance with the minimum qualifications/experience outlined in the RFQ.
7. Payment and compensation terms for the equipment shall be as follows:
10% - Due net thirty (30) days from receipt of invoice from supplier following approved engineering submittals.

90% - Due net thirty (30) days from receipt of invoice upon delivery of the materials to the project site.

Individual or Firm Name of Bidder

By: _____

Title: _____

State License No. _____ Type: _____ Limit: _____ Expir. Date: _____

Bidder's Address: _____

Note: If the Bidder is a corporation give the following information:

State in which it is incorporated _____

Address of Principal Office _____

Bid Bond Form

**BID BOND
(FORM)**

Date of Execution
of this Bond: _____
Name and Address
of Principal (Bidder): _____

Name and Address
of Surety: _____

Name and Address
of Obligee: Metropolitan Sewerage District of Buncombe County, NC
2028 Riverside Drive - Asheville, NC 28804

Amount of Bond: Five Percent (5%) of attached bid dollars

Bid and Proposal
Dated: _____ for the **Incinerator Rehabilitation Materials Purchase,**
Project No. 2022057.

KNOW ALL MEN BY THESE PRESENTS, That we, the PRINCIPAL above named and SURETY above names who is duly licensed to act as SURETY in the State of North Carolina, are held and firmly bound unto the METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY, a body politic and corporate of the State of North Carolina, as Obligee, in the penal sum of FIVE PERCENT (5%) of the amount bid in the bid and proposal above described in lawful money of the United States of America, for the payment of which, well and truly to be made we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such, that if the Principal shall be awarded the contract for which the bid and proposal above described is submitted and shall execute the contract, give bond for the faithful performance of the contract, and give bond for the payment to all persons supplying labor and material in the prosecution of the work provided for in said contract, within ten (10) days after the award of the same to the Principal above named, then this obligation shall be null and void; but if the Principal above names fails to so execute such contract and give performance bond and payment bond as required by Section 129 of Chapter 143 of the General Statutes of North Carolina, as amended, and Article 3 of Chapter 44-A of the General Statutes of North Carolina, as amended, the Surety shall, upon demand, forthwith pay to the OBLIGEE the amount of this bond set forth above.

Bid Bond Form

IN WITNESS WHEREOF, the Principal above names and the Surety above names have executed this instrument under their several seals on the date set forth above.

WITNESS:

(Proprietorship or Partnership)

ATTEST: (Corporation)

BY: _____

TITLE: _____

(Corporate Secretary or Assistant Secretary only)

WITNESS:

Principal (name of individual, individual and trade name, partnership, corporation or joint venture)

BY: _____

TITLE: _____

(owner, partner, office held in corporation, joint venture)

(Corporate Seal)

Surety (name of Surety Company)

BY: _____

TITLE: Attorney-in-Fact
(Corporate Seal of Surety)

Address of Attorney-in-Fact)

NOTICE OF AWARD

TO:

**PROJECT: Incinerator Rehabilitation Materials Purchase
Project No. 2022057**

The DISTRICT has considered the BID submitted by you for the above described WORK in response to its Advertisement for Bid and Instruction to Bidders.

You are hereby notified that your BID has been accepted for items in the amount of
(_____) \$ _____.

You are required by the Instruction to Bidders to execute the Agreement and furnish the required CONTRACTOR's Performance Bond, Payment Bond and Certificates of Insurance within ten (10) calendar days from the date of receipt of this Notice by you.

If you fail to execute said agreement and to furnish said BONDS within ten (10) days from the date of your receipt of this NOTICE, said DISTRICT will be entitled to consider all your rights arising out of the BONDS. The DISTRICT will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the DISTRICT.

Dated this _____ day of _____, 20____.

**Metropolitan Sewerage District
of Buncombe County, North Carolina**

By: _____

W. Hunter Carson, P.E.

Title: **Director of Engineering**

ACCEPTANCE OF NOTICE

Receipt of the above **NOTICE OF AWARD** is hereby acknowledged by _____
this the _____ day of _____, 20____.

By: _____

Title: _____

Bonds

PERFORMANCE BOND

(Form)

Date of Execution
of this Bond:

Name and Address of
Principal (Contractor):

Name and Address
of Surety:

Name and Address of
Contracting Body:

**The Metropolitan Sewerage District of
Buncombe County, North Carolina
2028 Riverside Drive
Asheville, North Carolina 28804**

Amount of Bond:
Contract:

That certain contract by and between the Principal and the
Contracting Body above named dated _____ for the
Incinerator Rehabilitation Materials Purchase, Project No. 2022057

KNOW ALL MEN BY THESE PRESENTS, That we, the PRINCIPAL and SURETY above named, are held and firmly bound unto the above named Contracting Body, hereinafter called the Contracting Body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal entered into a certain contract with the Contracting Body, as identified and shown above and hereto attached:

NOW, THEREFORE, if the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term of said contract and any extensions thereof that may be granted by the Contracting Body, with or without notice to the Surety, and during the life of any guaranty required under the contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modification of the contract that may hereafter be made, notice of which modifications to the Surety being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue.

THIS PERFORMANCE BOND is made and given pursuant to the requirements and provisions of Section 129 of Chapter 143 of the General Statutes of North Carolina and pursuant to Article 3 of Chapter 44-A of the General Statutes of North Carolina, and each and every provision set forth and contained in Article 3 of Chapter 44-A of the General Statutes of North Carolina is incorporated herein, made a part hereof, and deemed to be conclusively written into this Bond.

Bonds

IN WITNESS WHEREOF, the principal and surety parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Principal (name of individual, individual
and trade name, partnership,
corporation or joint venture)

WITNESS:

(Proprietorship or Partnership)

BY: _____

(SEAL)

TITLE: _____
(owner, partner, office held in corporation,
joint venture)

ATTEST: (Corporation)

(Corporate Seal)

BY: _____

TITLE: _____
(Corporate Secretary or
Assistant Secretary only)

Surety (name of Surety Company)

WITNESS:

BY: _____

TITLE: Attorney-in-Fact
(Corporate Seal of Surety)

(Address of Attorney-in-Fact)

Certificate of Insurance

DATE OF ISSUANCE

To the Metropolitan Sewerage District of Buncombe County, North Carolina. The subscribing insurance company certifies that insurance of the kinds and types and for limits of liability covering the work herein designated has been procured by and furnished on behalf of the insured contractor/vendor listed below:

NAME AND ADDRESS OF PRODUCER:	CERTIFICATE HOLDER: METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY, NORTH CAROLINA 2028 RIVERSIDE DRIVE ASHEVILLE, NORTH CAROLINA 28804 TELEPHONE NO. (828) 254-9646
NAME AND ADDRESS OF INSURED:	COMPANIES AFFORDING COVERAGE
	COMPANY LETTER "A":
	COMPANY LETTER "B":
	COMPANY LETTER "C":
	COMPANY LETTER "D":
	COMPANY LETTER "E":

Description of Work & Location _____

CO. LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS (IN THOUSANDS)
	GENERAL LIABILITY _ Commercial General Liability _ Claims Usage _ Occurrence _ Owner & Contractor Protective _____ _____				General Aggregate \$ 2,000 Products-Comp/Ops Aggregate \$ 1,000 Personal & Advertising Injury \$ 1,000 Each Occurrence \$ 1,000 Fire Damage (any one fire) \$ 50 Medical Expense (any one person) \$ 5
	AUTOMOBILE LIABILITY _ Any Auto _ All owned Autos _ Scheduled Autos _ Hired Autos _ Non-Owned Autos _ Garage Liability _____				Combine Single Limit \$ 1,000 Bodily Injury (per person) \$ Bodily Injury (per accident) \$ Property Damage \$
	EXCESS LIABILITY _ Umbrella Form _ Other Than Umbrella Form				Each Occurrence \$ 1,000 Aggregate \$ 1,000
	WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY				STATUTORY (North Carolina) (Each Accident) \$ 100 (Disease-Policy Limit) \$ 500 (Disease-Each Employee) \$ 100
	OTHER				

UNDER GENERAL LIABILITY POLICY OR POLICIES: Y N

1. Does property damage liability insurance shown include coverage for XC and U hazards? _____
2. Is occurrence basis coverage provided under property damage liability? _____
3. Does Personal Injury Liability Insurance include coverage for personal injury sustained by any person as a result of an offense directly or indirectly related to the employment of such person by the insured? _____
4. Is coverage provided for Contractual Liability (including indemnification provision) assumed by insured? _____
5. The Metropolitan Sewerage District of Buncombe County, North Carolina is named as additionally insured? _____
6. Is Broad Form Property Damage Coverage provided for this project? _____

CANCELLATION / EXPIRATION: The subscribing company hereby agrees that thirty (30) days written notice shall be given to the Metropolitan Sewerage District of Buncombe County, North Carolina before any policy referred to herein is changed or canceled. In addition, immediate notice shall be given by the subscribing company to the Metropolitan Sewerage District of Buncombe County, North Carolina if any policy is not renewed by the insured.

Name of Insurance Company Authorized to do Business in North Carolina _____ Address _____

Signature of Authorized Representative _____ Date of Signature _____

INCINERATOR INTERIOR MATERIALS

GENERAL BACKGROUND

The Metropolitan Sewerage District of Buncombe County, North Carolina (DISTRICT) is soliciting Request for Quotations for fireclay brick and castable refractory material to rehabilitate the dome floor of the fluidizing bed incinerator (FBI) at DISTRICT's Water Reclamation Facility (WRF). The FBI is the DISTRICT's primary means of sanitary sewer solids disposal at the WRF. The existing FBI was originally placed into service in 1992 and underwent a major rebuild in 2004.

SCOPE OF WORK

The scope of the work shall include all materials for replacement of the FBI's existing dome floor "special shape" fireclay brick and castable refractory materials. The quantities and dimensions for each item shall be determined by supplier based on the 2004 Hankin "Modification to Fluidized Bed Incinerator" drawings provided by MSD. Supplier shall furnish all materials as specified herein. The installation of the said materials shall be performed under a separate contract.

GENERAL

- A. Furnish all "special shape" fireclay brick, extra strength castable, and extreme temperature castable to rebuild FBI dome floor complete starting at the bottom of the floor (elev. 1952.22) and terminating at the top, below the start of the corbel wall section (elev. 1954.67) as shown on drawings.
1. The fireclay brick material dimensions and quantity shall be determined by the drawings and as specified herein. The fireclay brick shall be manufactured to include the appropriate tuyere holes size and location. The fireclay brick shall meet or exceed all ASTM Standards.
 - Bulk Density of 139 lbs/ft³
 - Apparent porosity max. of 18%
 - Crushing strength min. of 4,000 lbs/in² at 70°F
 - Modulus of rupture min. of 1,200 lbs/in² at 70°F
 - Reheat test with permanent linear change after heat at 2,910°F max. of -1.2%
 - Load test (25 psi) with linear substance after heating at 2,640°F max. of 2.6%
 - Chemical analysis (Calcined Basis), approximate:

○ Silica	SiO ²	48.5%
○ Alumina	Al ₂ O ₃	56.5%
○ Titania	TiO ₂	2.3%
○ Iron Oxide	Fe ₂ O ₃	1.4%
○ Lime	CaO	0.3%
○ Magnesia	MgO	0.3%
○ Alkalies	Na ₂ O+K ₂ O	0.7%
 - The "special shape" fireclay brick shall be Varnon (Air Ram) Super Duty Fireclay Brick or approved equal.
 2. The extra strength castable refractory material quantity shall be determined by drawings and as specified herein. The castable material shall be high strength and resistant to

abrasion, spalling, and vitrification and withstand temperatures up to 2,550°F. The castable material shall meet or exceed all ASTM Standards.

- Bulk Density:
 - After 220°F at 127 lbs/ft³
 - After 1,500°F at 122 lbs/ft³
- Modulus of Rupture:
 - After 220°F at 900 lbs/in²
 - After 1,000°F at 600 lbs/in²
 - After 1,500°F at 600 lbs/in²
 - After 2,000°F at 450 lbs/in²
- Cold Crushing Strength:
 - After 220°F at 4,150 lbs/in²
 - After 1,000°F at 2,650 lbs/in²
 - After 1,500°F at 2,600 lbs/in²
 - After 2,000°F at 1,700 lbs/in²
- Permanent Linear Change:
 - After 220°F no shrinkage
 - After 1,000°F of 0.2% shrinkage
 - After 1,500°F of 0.2% shrinkage
 - After 2,000°F of 0.3% shrinkage
 - After 2,300°F of 0.4% shrinkage
 - After 2,500°F of 0.1% shrinkage
- Thermal Conductivity:
 - At 400°F of 5.99 Btu·in/hr·ft²·°F
 - At 800°F of 6.02 Btu·in/hr·ft²·°F
 - At 1,200°F of 6.09 Btu·in/hr·ft²·°F
 - At 1,600°F of 6.20 Btu·in/hr·ft²·°F
 - At 2,000°F of 6.35 Btu·in/hr·ft²·°F
- Particle size shall be less than 3% retained on No. 5 mesh screen
- Chemical analysis (Calcined Basis), approximate:

○ Silica	SiO ²	45.0%
○ Alumina	Al ₂ O ₃	41.9%
○ Titania	TiO ₂	2.6%
○ Iron Oxide	Fe ₂ O ₃	2.3%
○ Lime	CaO	7.1%
○ Magnesia	MgO	0.4%
○ Alkalies	Na ₂ O+K ₂ O	0.7%

- The extra strength castable material shall be KS-4 2,550°F, KS-4 Plus 2,550°F Castable or approved equal.

3. The extreme temperature castable refractory material quantity shall be determined by drawings and as specified herein. The castable material shall be high alumina material resistant to slags, vitrification, and withstand temperatures up to 3,000°F. The castable material shall meet or exceed all ASTM Standards.

- Bulk Density:
 - After 220°F at 143 lbs/ft³
 - After 1,500°F at 139 lbs/ft³

- Modulus of Rupture:
 - After 220°F at 1,075 lbs/in²
 - After 1,500°F at 700 lbs/in²
 - After 2,000°F at 475 lbs/in²
 - After 2,500°F at 950 lbs/in²
- Cold Crushing Strength:
 - After 220°F at 5,000 lbs/in²
 - After 1,500°F at 3,000 lbs/in²
 - After 2,000°F at 2,700 lbs/in²
 - After 2,500°F at 3,600 lbs/in²
- Permanent Linear Change:
 - After 220°F of 0.1% shrinkage
 - After 1,500°F of 0.2% shrinkage
 - After 2,000°F of 0.2% shrinkage
 - After 2,500°F of 0.9% expansion
 - After 2,900°F of 2.8% expansion
- Thermal Conductivity:
 - At 400°F of 7.8 Btu·in/hr·ft²·°F
 - At 800°F of 7.7 Btu·in/hr·ft²·°F
 - At 1,200°F of 7.6 Btu·in/hr·ft²·°F
 - At 1,600°F of 7.5 Btu·in/hr·ft²·°F
 - At 2,000°F of 7.4 Btu·in/hr·ft²·°F
 - At 2,400°F of 7.4 Btu·in/hr·ft²·°F
- Particle size shall be less than 5% retained on No. 4 mesh screen
- Chemical analysis (Calcined Basis), approximate:

○ Silica	SiO ²	32.5%
○ Alumina	Al ₂ O ₃	60.0%
○ Titania	TiO ₂	2.5%
○ Iron Oxide	Fe ₂ O ₃	1.5%
○ Lime	CaO	2.5%
○ Magnesia	MgO	0.4%
○ Alkalies	Na ₂ O+K ₂ O	0.6%
- The extreme temperature castable refractory material shall be Mizzou 60% Alumina, Mizzou Plus 60% Alumina Castable or approved equal.

- B. Other materials will be required to construct the dome floor. These remaining materials will be associated with a separate contract.
- C. The supplier shall provide material specifications and shop drawings.
- D. The 2004 Hankin “Modification to Fluidized Bed Incinerator” drawings are attached at the end of this section.
- E. The materials provided as part of this Agreement will be installed by a Contractor under a separate contract.

SUBMITTALS

- A. The materials supplier shall furnish to the DISTRICT for review an electronic PDF version of the materials submittal to demonstrate compliance with these specifications. The term

“submittal” as used herein shall be understood to include installation drawings, catalog sheets and data sheets. Submittals shall be made within the time limits identified in the Bid Form.

- B. Submittals shall include at least the following:
1. Descriptive literature, bulletins, and/or catalogs of the materials, materials and details of construction, indicating full compliance with this Section.
 2. Provide design data, test reports, and warranty data.
 3. A complete total bill of materials for all equipment.
 4. Manufacturer’s instructions for delivery, unloading, storage, handling and installation of the materials.

QUALITY ASSURANCE

- A. Qualifications - The materials specified under this Section shall be furnished by a manufacturer who is fully experienced, reputable, and qualified in the manufacture of the materials furnished.

EXECUTION

- A. Supplier shall be responsible for shipment and delivery of the materials to the DISTRICT’s facility in Asheville, North Carolina. Offloading and installation will be by others. Deliver the materials suitably protected for storage at the DISTRICT’s facility prior to installation. Installation of said materials is scheduled for Winter/Spring 2026.
- B. All materials shall be factory tested for compliance with the construction and functional requirements specified herein, and a certification of the results of these tests shall be submitted to the ENGINEER.
- C. The Contractor will verify proper operation of the materials during startup of the the existing fluidized bed incinerator. The materials shall demonstrate compliance with the operating requirements specified herein. Any deficiencies in the operation of the materials, due to the design or manufacturing, shall be repaired or corrected by the supplier at no additional cost to the DISTRICT.

RESOURCES BEING PROVIDED

- 2004 Hankin “Modifications to Fluidized Bed Incinerator” drawing sheets 0302-F-001, 0302-F-002, and 0302-F-006.

REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
1. ASTM C16 - Standard Specification for Thermal Insulation
 2. ASTM C20 - Standard Test Methods for Apparent Porosity, Water Absorption,

Apparent Specific Gravity, and Bulk Density of Burned Refractory Brick and Shapes by Boiling Water

3. ASTM C92 - Standard test Method for Sieve Analysis and Water Content of Refractory Materials
 4. ASTM C113 - Standard Test Method for Reheat Change of Refractory Brick
 5. ASTM C122 - Standard Test Method for Panel Spalling Testing Super-Duty Fireclay Brick
 6. ASTM C133 - Standard Test Methods for Cold Crushing Strength and Modulus of Rupture of Refractories
 7. ASTM A297 - Standard Specification for Steel Castings, Iron-Chromium and iron-Chromium-Nickel, Heat Resistant, for General Application
- B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

SCHEDULE OF ESTIMATED QUANTITIES AND BID PRICES

***WATER RECLAMATION FACILITY IMPROVEMENT INCINERATOR REHABILITATION
MATERIALS PROJECT NO. 2022057***

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

ITEM NO.	DESCRIPTION	QTY	UNITS	TOTAL
BASE BID				
1	FIRECLAY BRICKS AND REFRACTORY CASTABLE MATERIAL FOR FBI DOME FLOOR (QUANTITY AND DIMENSIONS DETERMINED BY SUPPLIER BASED ON 2004 HANKIN DRAWINGS)	1	LS	\$
	TOTAL BASE BID			
TOTAL WRITTEN BASE BID PRICE _____ _____ and _____ /100 dollars.				