SHAFER | ZAHNER | ZAHNER
OFFICE OF ARCHITECTURE

September 9, 2021
GS# 114-023 Science Bldg. Infiltration Repairs
University of Southern Mississippi – Gulf Park Campus
Long Beach, MS

Addendum No. 1

This Addendum forms part of the Contract Documents for the above referenced project. All other requirements of the original Contract Documents shall remain in effect except as specifically modified in this Addendum. Bidder is to acknowledge receipt of this Addendum with their bid proposal. Failure to do so may subject the Bidder to disqualification. This Addendum is issued to all known Plan Holders.

1. A Pre-Bid Meeting was held on September 8, 2021. See this addendum for resolution of questions asked and other information discussed at this meeting. See the Pre-Bid Conference Meeting Minutes and Pre-Bid Conference Attendance Roster attached.
    a. Deadline for questions to be received by Shafer Zahner Zahner from prospective bidders: **Wednesday September 15, 2021 by C.O.B.**

2. Specifications:
    a. Section 01910, delete and replace with revised Section 01910, attached
    b. Add Section 01 91 15 Building Exterior Enclosure Commissioning, attached
    c. Add Building Exterior Enclosure Testing Matrix, attached
    d. Section 08 81 00 Glazing, Section 2.2 Paragraph B: Delete reference to green tint

Contents: This addendum consists of **22** (8 ½" x 11") sheets and 0 (24" x 36") sheets.

End of Addendum No. 1 for: GS# 114-023 Science Bldg. Infiltration Repairs

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A LIMITED LIABILITY CORPORATION

SHAFER ZAHNER ZAHNER
OFFICE OF ARCHITECTURE

PRE-BID CONFERENCE

Project: **GS# 114-023**
Science Building Infiltration Repairs
University of Southern Mississippi – Gulf Park Campus

Date/Time: September 8, 2021 @ 11:00 AM
Location: Science Building (the project site), USM Gulf Park – Long Beach, MS 39560
Present: See attached sign-in sheet

1. Project Team:
   - **Shafer-Zahner-Zahner: Sally Zahner & Scott Comish 662-323-1628, szahner@szzarch.com**
   - **Sinergi: Patrik Lazzari 601-832-6369, plazzari@singergiconsulting.com**
   - **Bureau of Building: Garry Stegall; garry.stegall@dfa.ms.gov**

2. Bid Date: *September 21, 2021 at 2:00 pm @* the office of the Bureau of Building, Grounds and Real Property Management, 501 North West Street [Woolfolk Building], Jackson, Mississippi, 39201.
   - Official Time is by the BOB (14th floor)
   - Allow enough time for security screening, parking, etc.
   - Current Bidders List: **2 current** General Contractors
   - Construction days: **180** calendar days for project (see *Proposal Form*)
   - Notice to Proceed – by BOB. Must hold price per specifications.

3. Instructions to bidders
   - Proposed addendum dates: Before COB Thursday, September 16, 2021.
   - **Last day for questions to SZZ: September 15, 2021 COB**.
   - Division One……follow all BOB rules

4. Contract Administration: Architect and Commissioning Agent will be on site to inspect at regular intervals.
   - Construction Progress Meetings held monthly as required by Division 1.
   - **Cx requires a 'BER' Building Envelope Review meeting, required attendance by all trades to review envelope detailing, sequencing, testing, etc.**

5. Scope of work: selective demolition and wall envelope replacement for entire building
   - stucco system with waterproofing on new glass mat sheathing
   - new storefront and curtainwall systems in existing rough openings
   - There are (0) Additive Bid Alternates –
   - **there are (2) unit prices for sheathing and batt insulation**

6. Construction Access and Special Phasing; Discuss:

- Special Phasing: **Discussed/to be addressed**
    i. **the building will be at least partially occupied during the work**
    ii. **phasing is indicated based on expected start of construction and campus scheduling needs**
        1. **as timeline for material procurement, contracts, etc is unknown, phasing information is shown for more time for informational purposes**
        2. **multiple mobilizations are possible**
    iii. **three phases are shown – expect locations/sequence adjust if construction schedule changes to accommodate lab scheduling**
    iv. **The design team assumes the window and curtainwall lead time will be determining factor for start of work and sequencing**

- Other considerations:
    i. **There is a mock up wall required for this project. The mock up wall will be used for some envelope testing.**
    ii. **Materials specified are Basis of Design – complete systems for waterproofing, stucco, storefront and curtainwall. Any substitutions shall be complete systems that are compatible.**

- Staging Areas/Fencing/Access/Construction Sign: **Discussed/to be addressed**
    i. Maintain right of ways in adjacent streets
        1. **The Truck route to the site is via S Nicholson Ave to E 3rd Street (construction traffic may NOT utilize the main campus entry)**
    ii. Maintain safe and accessible access into building
    iii. Secure work areas and materials
    iv. Lay down and parking areas are available immediately adjacent to the building
    v. Lay down areas, parking, fencing locations to be addressed in the Pre-Construction Meeting with University's representative
    vi. **USM will move loose lab equipment and furnishings out of the work areas as the work is sequenced throughout the building.**

7. Bidding rules: Pay attention to *Instructions To Bidders*

8. Common mistakes:
    - Certificate of Responsibility and Contractor's License number on envelope.
    - Any changes to bid on outside of envelope. Initial and date.
    - Acknowledge addenda.

9. Questions –

10. Walk through of existing facility and site

PRE-BID MEETING SIGN IN SHEET

Project:	GS# 114-023 Science Building Infiltration Repairs	**Meeting Date:**	9/8/2021
Place/Room:	Science Building (the site) – USM Gulf Park		

Name	Company	Phone	E-Mail
Sally Zahner	Shafer-Zahner-Zahner	662-323-1628	szahner@szzarch.com
Jimmy Miller	United Restoration	504-427-6503	Jamesm@urpinc.com
Chris Paradee	United Restoration	504-390-7616	Chrisp@urpinc.com
Dason Malaney	Century Const	662-401-6452	dmalaney@centurycg.com
Billy Carr	HANCO Corporation	601-583-6500	BCARR@HANCOCORP.com
MARK Bowman	Gulf Coast Plaster	601-441-2352	Mbowman@gulfcoastplaster.com
Lucas Applewhite	USM-Facilities	228-818-8019	lucas.applewhite@usm.edu
JASON CANTU	USM "	956-358-2008	Jason.cantu@usm.edu
Michael McCabe	Butler Snow	228-575-3025	michael.mccabe@butlersnow.com
Mel Faciane	Hopkins Const.	985-960-0221	Mfaciane@choosehopkins.com

MODIFIED BY ADDENDUM NO. 1

SECTION 01910

UNIVERSITY OF SOUTHERN MISSISSIPPI SPECIAL CONDITIONS

PART 1 UNIVERSITY OF SOUTHERN MISSISSIPPI SPECIAL CONDITIONS

This Section must be included in Division 1 of the Specifications for all construction projects conducted on the campus of The University of Southern Mississippi in Hattiesburg, MS.

GENERAL

1.01 DISPOSAL OF CONSTRUCTION MATERIALS

A. Contractors are expected to provide sufficient construction dumpsters and/or trash containers to use in conjunction with disposal of construction debris. Use of University-owned site furnishings, custodial containers and/or dumpsters is expressly prohibited.

B. Contractors are specifically advised to schedule timely emptying of dumpsters to suit specific project needs and to be aware that dumpster services are generally unavailable on weekends.

C. From the very start of the Work, until entire completion of the building, the Contractor shall keep on hand an adequate crew of laborers, or others to keep the entire building and surrounding streets, sidewalks, alleys, etc., free from any dirt, rubbish and other debris resulting from the execution of this contract. It is the intent of this paragraph to remove bulky debris such as crafting material, etc., brought onto the job and left by other contractors.

D. It shall be the responsibility of each individual prime contractor to remove all unwanted materials from the building and the site each day. Job sites are to be cleaned up on a daily basis, including construction debris and litter generated by workers. At all times, the site of the work shall present a neat, orderly and workmanlike appearance.

E. Disposal of reasonable amounts of recyclable construction materials (steel, glass, cardboard, concrete, etc.) may be coordinated through the University's project coordinator assigned to the project. Unless specific arrangements are made in advance with the designated Project Manager, contractors are prohibited from using University-owned recycling bins and are expected to remove all recyclables from the job site.

F. To reduce urban stormwater pollution and comply with requirements of the United States Environmental Protection Agency, all contractors and subcontractors are expressly prohibited from the disposal of paints, solvents, clean-up materials and similar products into gutters, sewers, drains, pipes or sinks located anywhere on campus.

G. Through special arrangement with a project manager, painting subcontractors may on occasion be directed to use the University's disposal areas for clean-up following work performed. These areas are located in the paint shop of USM's Physical Plant compound on the west side of Building 615 (red brick building located at 3101 West 4th Street).

1.02 USE OF PREMISES AND DAMAGE TO PREMISES

A. All material and equipment shall be brought onto the site by making use of such roadways and drives as designated by the University and across the grounds along routes established by the University.

B. Should road closures, sidewalk closures, utility shut-downs, etc., be required during the course of construction, contractors are expected to provide a minimum of 36 hours advance notice to make suitable arrangements. The same advance notice is required for similar items which require coordination with the University Police, Fire/Safety, Parking Management, Office of Disability Accommodations or similar campus personnel.

C. Any streets, roadways, sidewalks, grounds, plantings, trees or other property that may be damaged as a result of the contract work shall be properly repaired or fully replaced by the Contractor to the full satisfaction of all interests involved. The contractor's final payment may be held until equivalent compensation is received.

D. No more space than is absolutely necessary will be permitted to be used on the grounds immediately around the construction site, and the contractor must use every care against damage to the grounds. Upon completion of the project, the entire site shall be restored to the conditions as delivered to the Contractor with the Notice to Proceed.

1.03 DESIGNATED STORAGE AND WORKING AREAS

A. The exact boundaries of the area which may be used by the General Contractor and Subcontractors for the storage of materials and as a working area will be designated by the Architect / Engineer and University as defined on the contract documents. The Contractor must confine his operations and provide within the designated area space for all Subcontractors.

B. Trees and planting within the work area shall be protected at all times. There shall be no trimming of trees or bushes without permission from the University.

C. At no time will vehicular parking or storage of materials be allowed under trees or on top of tree roots. Damaged areas may require repairs or replacement of shrubs and trees. The Contractor shall be responsible for trees, shrubs, ground cover or sod damaged during construction.

D. Any damage to the above within the designated area or storage area shall be repaired by the Contractor and left on completion either in the same state as found to exist at the start of the work or as shown on the contract documents.

E. Recovery of damages may include repairs or replacement of sod, shrubs, trees, sidewalks, driveways, curbs, etc. In order to be consistent with the University's Campus Landscape Standards, the required species of replacement sod is "Tifway 419 Hybrid Bermuda" or as otherwise directed by University groundskeeping personnel.

F. The contractor's final payment may be withheld until site restoration is accepted.

1.04 DESIGNATED PARKING AREAS

A. If sufficient parking area is not available within the designated storage and working area for the vehicles of workmen employed on the building, the Contractor shall require workmen to park their vehicles in areas designated by the Architect / Engineer and University. Workmen failing to comply with traffic and parking regulations of the University shall be removed from the job at the request of the proper University officials.

Vehicles of any General Contractor or Subcontractor must display an official University "Hanging Parking Tag" (if vehicle does not have company signage).

B. At no time will contractors be permitted to park in handicapped parking spaces or service zones. Vehicles parked in these areas are subject to being booted or towed and owners of vehicles will be ticketed and fined.

C. Contractors and subcontractors must register for parking permits. Policy revisions dating from August 2014 pertain specifically to contractors and subcontractors. These can be found in the 2014-15 "Traffic and Parking Regulations", Paragraph 2, Subparagraphs 2.17 and 2.19), partially excerpted below:

> "2.17 All contractors are required to obtain parking permits for their employees' privately owned vehicles if the employee is parking on campus. This requirement does not apply to company-owned vehicles. Companies shall submit a letter (mail or fax) to the Department of Parking Management requesting the number of parking permits needed. Parking permits will be issued to the individual. Contractor employees who bring privately owned vehicles to campus are expected to abide by and follow the University parking regulations (see General Information)."

1.05 NON-INTERFERENCE

A. The Contractor will manage the work of this contract in such a manner as to not unnecessarily interfere with normal University operations. The Contractor expressly undertakes at his own expense to comply with the regulations governing the operations of premises which are occupied and to perform his contract in such a manner as not to interrupt or interfere with the operation of the University and to perform after working hours, or on Sunday, or regular holidays without additional expense to the University, any work necessary to comply with this stipulation.

B. During normal working hours, all building entrances and exits shall remain open at all times.

C. The work site shall present a neat, orderly and workmanlike appearance at all times.

1.06 SPECIAL REGULATIONS

A. All contractors are expected to comply with the University's e-Verify requirements.

B. The University will not be responsible for the safety of the Contractor's work, materials or equipment.

C. Protection of the property within the contract work area both day and night shall be the responsibility of the Contractor.

D. Due to the nature of certain University projects, employees of the General Contractor and their Subcontractors may be subject to criminal background checks at any time during the term of the contract. Only employees who must enter or work in restricted areas will be checked. Instances are expected to be incidental rather than routine and will be at the discretion of the Director of the Physical Plant. The cost of background checks (approximately $15 each) will borne by the General Contractor and his Subcontractors.

E. No work will normally be allowed on the campus on Sunday except by special permission from the University. Please note, however, that due to the nature of the delivery of heavy equipment and the anticipated traffic flow through parts of the campus, special arrangements may be made to give access on Sundays for purposes of delivering heavy equipment to the site.

F. The general contractor will be responsible for conduct of any subcontractors working by special permission, including provisions to lock up whenever workers are not present.

1.07 OBJECTIONABLE WORKERS

A. Any workers who may, because of improper conduct, become objectionable will be promptly removed by the Contractor at the request of the proper University officials.

B. No firearms of any kind are allowed on the campus. Possession of a firearm on campus constitutes improper conduct.

C. The possession or consumption of alcoholic beverages is forbidden on campus and constitutes improper conduct.

D. The University is a smokeless campus except in designated smoking areas. The use of tobacco products (including smokeless tobacco) is prohibited off the job site. Any workers found smoking off the job site or not in a designated smoking area are subject to being ticketed and fined.

E. Smoking will be restricted to within the construction limits and to areas immediately adjacent to the construction trailer. Suitable waste receptacles are to be provided. For projects involving jobsites located on interiors of buildings, smoking will only be allowed at exterior locations of the building within the construction limits. At no time will smokeless cigarettes, tobacco cigarettes, smokeless tobacco products or similar items be permitted on the interior of any campus buildings.

F. Workers shall wear shirts and long pants while on campus. Work shirts shall contain information identifying workers as representatives of the company employing them (company name, logo, etc.). Non-compliance constitutes improper conduct.

G. Use of offensive language or gestures constitutes improper conduct.

1.08 EXCAVATION

A. No person shall make any excavation or opening in any of the grounds of the campus without first obtaining a permission to do so from the Physical Plant's Project Manager. The grounds of the University as used herein include, but are not limited to, the streets, sidewalks, parking areas, and all other public and private areas of the Hattiesburg Campus, whether covered or uncovered.

B. Any excess excavation shall be trucked to dumping points on the University campus as indicated on the drawings (map and/or distance), or to a proper location of their own off campus by special permission of the University.

C. The public is to be protected at the perimeter of all excavations, pits, holes, etc. by means of orange plastic barrier mesh fencing supported by steel t-post stakes.

1.09 PROTOCOLS

A. The University will require a minimum of 30 days to issue approval of color schedules, samples selections, keying schedules, etc. from complete sets of submittals as soon after contract award as possible.

B. From project start to project completion, copies of all project submittals exchanged between parties throughout the construction period will concurrently be provided to the University for review and approval. (Copies of approved submittals will also be provided as formally required for Project Closeout).

C. An appropriate representative of the University must be present during periods of major testing (i.e., systems tests, performance tests, load tests, etc.). Provide 24 hour advance notice to University personnel who will attend equipment testing and structural testing. Failure to give advance warning to University personnel will require repeating the test procedures. The presence of University personnel does not relieve the Contractor, Architect and/or Engineer of the requirement to be present during said system tests, performance tests, load tests, etc.

1.10 FIRE AND SAFETY

A. There shall be no burning of materials on properties of the University of Southern Mississippi. All clearing and grubbing, debris, rubbish, trash and any other material which is subject to burning, shall be removed and disposed of outside the limits of the University property. It shall be the responsibility of the contractor to acquire, maintain and pay for, if necessary, a disposal area.

B. Organized safety measures shall be enforced on all construction work.

C. Protective devices such as signs, lights, barricades, covered walkways, signals, fences, etc., shall be utilized night and day to protect students and personnel on the campus. All temporary construction shall conform to or exceed the requirements of Chapter 33, "Safeguards During Construction", of the International Building Code, latest edition, and as identified on the Life Safety / Building Code sheet of the project drawings.

D. The intent of the Construction Limits Plan is to provide for safe vehicular access to the site and pedestrian access points to buildings. On occasion, covered protection from overhead construction may be required. Overriding considerations are that ADA compliant access routes must be retained or provided in and around construction sites and that the safety of faculty, staff and students is paramount at all times.

E. Temporary construction project fence requirements are generally to provide fence enclosure around the construction limits. In general, the construction site will be enclosed by 8' tall, Post-weave hot-dipped galvanized chain link fabric, 2" (max.) mesh size, line posts 1.9" min. diameter, top rails 1-5/8" min. diameter. Post spacing is to be in accordance with manufacturer's instructions and as necessary to properly support the. Include end clamps, post caps, hinges, pipe sleeves and other accessories as required to complete installation. Provide anchorage that will not damage any existing materials/surfaces (provide metal shoes at posts on pavement that is to remain). Install a privacy screen of green vinyl coated polyester, full height with seamed reinforcement hems and grommets (24" on center) at all edges. Privacy screen shall be equal to U.S. Fence's privacy netting. The fence location and access gate(s) are to be installed as shown on the site diagram or as directed by the Professional. See related sections for all additional requirements. At job completion remove and repair any materials/surfaces as required.

F. Adjacent property shall be protected at all times. Contractors will be responsible to pay for or reimburse the University for any Property Damage that occurs as a result of the construction.

END OF SECTION 01910

SECTION 019115

BUILDING EXTERIOR ENCLOSURE COMMISSIONING

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes general requirements and procedures for building exterior enclosure commissioning, including exterior opaque wall systems, exterior glazed wall systems, party walls, waterproofing systems, air and moisture barrier systems, and roofing construction that protect climate-controlled interior spaces from unconditioned spaces and the exterior environment, as follows:

1. Below-grade construction including foundations and slab-on grade that functions as part of the exterior enclosure system but excluding structural systems and components
2. Superstructure floor and roof construction that functions as part of the exterior enclosure system
3. Exterior enclosure construction, above grade, including exterior opaque walls, windows, and doors including sheathing, framing, and insulation, and interior finish materials attached to the exterior wall

B. Related Requirements:

1. Section "General Commissioning Requirements" for general requirements for commissioning including definitions, commissioning team membership, Government's responsibilities, Contractor's responsibilities, and commissioning authorities' responsibilities.
2. Divisions 03, 04, 07, and 08 Sections for building exterior enclosure commissioning requirements specific to the Work of each Section.

C. The purpose of the building exterior enclosure commissioning is to provide a process for independent, third-party verification that the installed performance of the building exterior enclosure meets or exceeds the minimum performance requirements set forth by the Contract Documents.

1. The commissioning plan includes by reference all requirements set forth by the Architect for preconstruction laboratory and field performance testing of the materials, components, systems, and assemblies that comprise the building exterior enclosure.
    a. Full and complete compliance with the building exterior enclosure performance requirements for this project is required to achieve successful commissioning of the building exterior enclosure.

1.2 COMMISSIONING AUTHORITY'S RESPONSIBILITIES

A. In addition to the responsibilities listed in Division 01 Section "General Commissioning Requirements" the commissioning agent will provide the following as they relate to the building exterior enclosure.

1. Coordinate the commissioning work and, with the GC and PM, ensure that commissioning activities are being scheduled into the master schedule
2. Plan and conduct a commissioning kick-off and scoping meeting
3. Review normal contractor submittals applicable to systems being commissioned concurrent with the A/E reviews for compliance with commissioning, O&M needs, and coordination

issues.

4. Schedule and conduct a Building Envelope Coordination Meeting with all the envelope contractors and GC to review all critical elements and transitions in the building envelope and assess constructability, material compatibility, sequencing and potential scope gaps.
5. Provide project-specific construction checklists and commissioning process test procedures based on the manufacturer's installation procedures, technical data sheets and submittals received by the exterior envelope sub-contractors.
6. Verify the execution of commissioning process activities. Verification will include, but is not limited to review of product submittals; prepare construction checklists; review operating and maintenance data and test reports to verify compliance with the Contract Documents. Failure to meet the requirements of the Contract Documents will be reported by CxA in the "Issues Log."
7. Document construction checklist completion by reviewing completed construction checklists and by selected site observation
8. Witness and verify systems testing performed by the installing contractors. Coordinate re-testing as necessary until satisfactory performances achieved.
9. Maintain a master deficiency and resolution log and a separate testing record. Provide the PM and A/E with written progress reports and test results with recommended actions.
10. Compile test data, inspection reports, and certificates and include them in the closeout documents.
11. Review and verify the preparation of the O&M manual
12. Provide a Final Commissioning Report

B. The commissioning services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1.3 CONTRACTOR'S RESPONSIBILITIES

A. In addition to the responsibilities listed in Division 01 Section "General Commissioning Requirements" provide the following as they relate to the building exterior enclosure.
   1. Participate in design- and construction-phase coordination meetings.
   2. Provide information to the CxA for developing construction-phase commissioning plan.
   3. Provide schedule of field quality control tests and inspections required by the Contract Documents to CxA for incorporation into the commissioning plan.
   4. Submit product data, submittals and manufacturer's installation procedures for the commissioned building envelope systems and components
   5. Submit field quality control testing and inspection reports on exterior enclosure construction to the CxA.
   6. Submit operation and maintenance data for systems, subsystems, and components to the CxA.
   7. Participate in testing-procedures meetings.
   8. Participate in testing of installed systems, subsystems, and construction.
   9. Provide test data, inspection reports, and certificates to CxA.
   10. Participate in maintenance orientation and inspection.
   11. Participate in operation and maintenance training sessions.
   12. Participate in final review at acceptance meeting.
   13. Provide input for final commissioning documentation.

B. Cooperate with the commissioning authority personnel, including building exterior enclosure commissioning consultant, provide access to the Work, and provide adequate schedule for the

commissioning tasks related to the Work.

C. Furnish copies of all shop drawings, manufacturer's product data, installation instructions, maintenance information, schedules, warranties, and other information requested for the building exterior enclosure systems and components.

D. Provide qualified personnel for assistance to complete the commissioning tests, including required air and water leakage testing for elements of the building exterior enclosure systems.

E. Submit a copy of the Contractor's project specific quality assurance program to be implemented for construction for review by Architect, Government, and CxA prior to start of construction.

F. Participate and ensure all subcontractors utilized for work on this contract participate in a Building Envelope Coordination Meeting prior to start of envelope work and mock-up. This meeting will be to discuss construction sequencing and the coordination of trades, material compatibility and constructability. The General Contractor's project and site specific Quality Assurance Program related to the building envelope construction will also be reviewed.

G. Construct field mockups to facilitate field quality control testing and inspections as specified in individual Sections of the specifications in Divisions 03 through 08.

1. Check for constructability of the building exterior enclosure, including but not limited to wall-to-window interfaces, roof-to-wall intersections, and provide personnel and representatives from each trade associated with installing the system.
2. Ensure that personnel from each trade that will be completing the work in the field are utilized to construct each required mockup.
3. Provide a written protocol and timeline for repair of deficiencies noted during the performance testing, or a written report from the third party agency performing the tests indicating what repairs were required for a successful test.

a. Repaired elements shall not be covered up without review by the CxA. Photographic documentation may substitute for CxA field visit when applicable.

H. Building Enclosure Review Meeting (BERM): Schedule and conduct a quality control pre-construction conference to review the detailed quality control and construction requirements for all materials and/or systems as appropriate, not less than 15 working days prior to commencement of the applicable portion of the work related to the building exterior enclosure, and prior to constructing mockups.

1. Attendees at this conference include all contractors that will be involved in the construction of the building exterior enclosure, including but not limited to, Contractor's superintendent, material suppliers and representatives, and testing agency.
2. This conference will be to discuss construction sequencing and coordination of various trades, and to review the Contractor's quality assurance program for the building exterior enclosure.
3. The Building Enclosure CxA will moderate this meeting. The AOR should be invited
4. The submittals and shop drawings for the most critical enclosure elements/components should be received, but not necessarily approved prior to this meeting
5. A minimum of 4 hours should be allowed for this meeting. Coordinate with the CxA to generate a meeting agenda
6. The General Contractor is responsible for taking notes during the meeting and to distribute to all participants no later than 5 business days after the meeting

I. Conduct weekly or bi-weekly building exterior enclosure quality assurance meetings with the appropriate contractors in attendance to review and discuss issues and concerns related to the

building exterior enclosure noted by the Architect, CxA or Government during the previous week.

1. Maintain a nonconformance log indicating what action will be taken to correct the deficiencies and date corrections were completed.

J. Field Testing: Provide a representative to be present from each trade or contractor associated with installing the system during the random field testing of the building exterior enclosure for air and water leakage, as indicated in the individual Sections of Divisions 03 through 08 and in the enclosed Building Enclosure Testing Matrix.

1. Provide a written protocol and timeline for repair of deficiencies noted during the performance testing, or a written report from the third party agency performing the tests indicating what repairs were required for a successful test.
2. Provide a repair and remediation protocol for any system failures identified by the CxA, including a timeline for repair of all affected elements.
    a. Repaired elements shall not be covered up without review by the CxA. Photographic documentation may substitute for CxA field visit when applicable.

J. Provide copies of all test and inspection reports for inclusion in the Systems Manual to be submitted as part of the closeout documentation.

K. Provide Closeout Documents for inclusion in the Systems Manual for each major building exterior enclosure system, including the following:

1. Exterior walls, stucco system, aluminum glazing systems, etc.
2. Sheet metal coping, flashing and trim.
3. Sealants, control joints, and expansion joints.
4. Other special building exterior enclosure systems

L. Participate in maintenance orientation and inspection, and in one maintenance and training session with the building operations and maintenance staff and other participants identified by the Owner and Architect-of-record, with the assistance of the CxA

M. Provide labor and facilities to provide access to the work to be tested.

1.4 COMMISSIONING DOCUMENTATION

A. Commissioning Plan: Coordinate with and provide information to Commissioning Authority to permit updating of Commissioning Plan information with approval of final selections for materials, assemblies, and systems for the building exterior enclosure. Provide the following:

1. Submittals, information for systems manuals, and other required documents and reports.
2. Identification of installed exterior enclosure components, assemblies, systems, and equipment, including design changes that occurred during the construction phase.
3. Certificate of completion, certifying that exterior enclosure assemblies are complete and ready for testing.
4. Test and inspection reports and certificates.
5. Corrective action documents.

B. Documents Log: Provide as part of the project record closeout documentation a dedicated CxA Log that includes the following related to the building enclosure commissioning:

1. As-built drawings, including a copy of all details and drawings that were installed as part of any addendum or change order directives. All deviations from the contract documents shall be clearly marked or noted.

2. Specifications for the project, including all accepted product substitutions and any additional specifications as part of any addenda or change order directives. Mark accepted product substitutions and deviations clearly.
3. A copy of all accepted change orders.
4. A copy of all final shop drawings for each product requiring shop drawings, with the A/E review comments, showing final as-built conditions.
5. A copy of all warranties, organized by product, and any and all product manufacturer letters indicating the product as appropriate to use for the application intended on the project as well as any installation guidance.
6. A master product list summarizing all products used on the project for construction of the building exterior enclosure, organized by tabs in a binder, including the following information:

    a. Product name.
    b. Product manufacturer.
    c. Catalog or other applicable number for ordering.
    d. Manufacturer's contact information.
    e. Product color.
    f. Supplier contact information.
    g. Product installation instructions.
    h. Maintenance guide.
    i. Manufacturer's checklist for periodic review of the product and procedures for repairs.

1.5 COMMISSIONING SUBMITTALS

A. The following commissioning submittals are in addition to those specified in Division 01 Section "General Commissioning Requirements."

1. Submit commissioning submittals concurrently to commissioning authority. Submittal will be returned to Architect before being returned to Contractor.
2. Coordination Drawings: Provide cross references on all shop drawings indicating that drawings have been checked and cross-referenced by the Contractor to ensure adjacent elements, dimensions, and construction tolerances indicated allow all work at interfaces and intersections to be constructed.
3. Qualification Data: For fabricators, installers, and testing agencies, submit to the CxA for review all qualifications required in Divisions 2 through 9 for review.
4. Mock-up Test Reports: all preconstruction air and water leakage performance test results, including all failed tests, recording the noted deficiencies and the required repair, and provide a copy of all remediation processes and QC/QA processes that will be put in place to address the deficiency on future work product
5. Field Quality Control Reports: Test reports for air and water penetration and other specified building exterior enclosure tests completed.
6. Special inspection reports indicated in individual Sections.

1.6 QUALITY ASSURANCE

A. Quality Control Program: Furnish a detailed quality control program to demonstrate quality control procedures that will be followed during the installation of components of the building exterior enclosure, including, but not limited to, visual inspection, and where appropriate, field testing.

B. Preconstruction Commissioning Conference: Schedule a preconstruction commissioning conference for the building exterior enclosure before starting construction, at a time convenient to Government, commissioning authority, and Architect, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review commissioning responsibilities and personnel assignments. This Conference

may be combined with the Quality Control Pre-construction Conference.

1. Attendees: Authorized representatives of Government, commissioning authority, Architect and consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:
   a. Commissioning plan.
   b. Construction schedule.
   c. Phasing.
   d. Critical work sequencing and long-lead items.
   e. Designation of key personnel and their duties.
   f. Mockup construction and testing.
   g. Procedures for testing and inspecting.
   h. Submittal procedures.
   i. Preparation of Record Documents.
3. Minutes: Record and distribute meeting minutes.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TESTING VERIFICATION

A. Contractor shall perform the following:
   1. Certify that building exterior enclosure systems, subsystems, and construction have been completed according to the Contract Documents.
   2. Certify that field quality control procedures have been completed, field quality control reports have been submitted, discrepancies have been corrected, and corrective work approved.

B. Commissioning authority will witness and document field quality-control tests and inspections.
   1. Verify that field quality-control testing of building exterior enclosure has been completed and approved, that discrepancies have been corrected and corrective work re-inspected and retested.
   2. Promptly notify Architect and Contractor of irregularities and deficiencies in the work that are observed during performance of services.
   3. Annotate checklist or data sheet when a deficiency is observed.

C. Commissioning authority is not authorized to perform any of the following:
   1. Release, revoke, alter, or expand requirements of the Contract Documents.
   2. Approve or accept any portion of the work.
   3. Perform any duties of the Contractor.

D. Deferred Testing:
   1. If tests cannot be completed because of a deficiency outside the scope of the building exterior enclosure, the deficiency shall be documented and reported to the Owner. Deficiencies shall be resolved and corrected by Contractor and tests rescheduled.

E. Testing Reports:
   1. Reports shall include measured data, data sheets, and a comprehensive summary describing the building exterior enclosure systems at the time of testing.

2. Prepare a preliminary test report. Deficiencies will be evaluated by Architect to determine corrective action. Deficiencies shall be corrected and test repeated.

3.2 SYSTEMS TO BE COMMISSIONED

A. The systems requiring field testing and commissioning are specified in Divisions 03 through 08. The systems and elements to be commissioned include the following:

1. Exterior Glazed Wall Systems:
    a. Aluminum Storefront Systems
    b. Curtainwall Systems
1. Waterproofing Systems.
2. Thermal Insulation.
3. Air and Moisture Barrier Systems.
4. Stucco Systems
5. Exterior Joint Sealants.
6. Elastomeric Coatings

3.3 PRE-FUNCTIONAL CHECKLISTS

A. Pre-functional checklists consist of procedures and checks to ensure systems and assemblies are ready for testing and/or inspection, and are provided by the CxA to the Contractor.

1. The Contractor and appropriate subs provide their standard installation checklists to the CxA who will use them to develop the pre-functional checklists the contractors will complete prior to testing or inspection.
2. Subs shall complete pre-functional checklists as sections of work are completed and submit completed checklists to the CxA through the Contractor. Completion of the pre-functional checklist is notification that the specific system is complete and ready for testing or inspection.
3. Each assembly being commissioned receives full construction checkout by the Contractor following the approved plan and forms. No sampling strategies are used. Only individuals that have direct knowledge and witnessed that a line item task in the pre-functional checklist was actually performed shall initial or check that item off. It is not acceptable for non-witnessing supervisors to fill out the forms.
4. The Contractor determines which trade is responsible for executing and documenting each of the line item tasks on the checklists and notes that trade on the checklist form.
5. The Contractor and subs, under their own direction, execute and document the pre-functional checklists were completed according to the approved drawings prior to acceptance testing or inspection.
6. The Contractor and Subs shall complete pre-concealment procedures before concealing any assembly. The Contractor shall notify the CxA at least five days in advance of any assembly concealment, providing the CxA a copy of the pre-concealment sections of the pre-functional checklists
7. The CxA performs periodic construction observations of selected systems and procedures on the checklists will be spot-checked by the CxA prior to testing.
8. The test procedures for the project have been coordinated with the testing requirements specified in each specification Section.
9. Items of non-compliance in material, installation, or setup are corrected at the Contractor’s expense and the system or building enclosure assembly retested.
10. The Contractor shall correct all areas that are deficient or incomplete in the checklists in a timely manner.

B. Sample Checklists: Construction and Industry checklists shall be developed by the Contractor for the building exterior enclosure, including the following:
   1. Weather Resistive Barriers.
   2. Waterproofing membranes
   3. Stucco Systems.
   4. Aluminum storefront systems.
   5. Curtainwall Systems
   6. Exterior joint sealants.

C. General Checklist Commentary: The manufacturers' or contractors' checklists shall include a systematic series of events appropriate to the specific systems, including but not limited to the following:
   1. Verify product specified is appropriate to the site conditions.
   2. Verify installer is authorized by manufacturer to apply product.
   3. Verify that weather conditions, substrates, and construction contiguous to assemblies are acceptable for application of product.
   4. Verify that construction is within specified tolerances where systems will be installed.
   5. Verify that stored materials are protected against moisture.
   6. Verify that products are undamaged prior to installation.
   7. Verify that products are correct size, shape, thickness, and color.
   8. Verify that components are preassembled, including factory installed sealant, as indicated on the approved shop drawings.
   9. Verify proper fasteners and adhesives are used.
   10. Verify that isolation is provided between dissimilar metals.
   11. Verify that proper safety measures are employed by installers.
   12. Verify that materials are in accordance with approved submittals, including shop drawings, product data, and samples.
   13. Verify that dimensions are correct.
   14. Verify product installation is in accordance with manufacturer's written instructions.
   15. Verify that erection tolerances are maintained regarding horizontal and vertical alignment and plumbness.
   16. Verify anchorage to structure is secure for transfer of wind load.
   17. Verify provisions for thermal expansion.
   18. Verify provisions for deflection of structural members.
   19. Verify that flashings, end dams, sub sills, and sealants are in place, including weep holes.
   20. Verify that final cleaning is performed as required, and repairs are satisfactory. Verify that unsuitable repairs are replaced with new materials.
   21. Verify that finished work is protected.
   22. Verify that operating components of systems comply with accessibility requirements.
   23. Verify that systems are ready for air leakage and water penetration test procedures.
   24. Verify that warranties can be obtained.
   25. Verify operation and maintenance data has been submitted.

3.4 TESTING PROCEDURES

A. The testing procedures are the step-by-step process which must be executed by the Contractor to fulfill the test requirements that are specified in the Contract Documents by the Architect in

Divisions 03 – 08.

B. Objectives and Scope: Performance testing is to demonstrate that each system is operating or functioning according to documented Government objectives and Contract Documents.

C. Performance Test Procedures: Testing shall verify the performance of the assembly in its installed state under conditions specified in the testing requirements. Areas of deficient performance shall be identified and corrected.

D. Mockups of Exterior Wall Assemblies: Testing shall be done on mockup assemblies of the exterior building enclosure as described in the project specifications. These assemblies will be used to establish the installation practices and workmanship that will be maintained by the installers during the assembly of the exterior wall systems.

1. Prerequisites: Pre-functional checklist items shall be complete and signed off by Contractor and sealants shall be cured prior to testing.
2. AAMA certified independent testing agency shall conduct testing, document the test results, and the CxA will witness the testing.
3. Cost for additional testing if work requires retesting will be borne by Contractor.
4. Concerns identified during the testing of the mockups must be resolved before proceeding with installation of the permanent exterior wall and roof assemblies, including metal cladding, glazed curtain walls and storefronts, flashings, and joint sealants.

3.5 FIELD TEST PROCEDURES

A. General:

1. Contractor and subcontractors for each building enclosure assembly shall review the test procedures for feasibility, safety, and warranty protection.
2. Contractor and subcontractors shall provide assistance to the commissioning agent in preparing specific functional performance test procedures (answering questions about assemblies and sequences, etc.) as specified in individual specification Sections.
3. Contractor shall arrange a startup orientation meeting before construction begins to reiterate to the subcontractors exactly what will be required of them, and to allow them to voice any concerns prior to the commencement of the work.
4. Contractor shall review his quality control procedures, quality assurance inspection and testing procedures, review drawings and specifications, review shop drawings and submittals, review construction schedule and sequencing, material selection and compatibility, and other installation concerns.
5. Contractor shall construct the field mockup(s) of the key details of the system in accordance with the construction documents. Mockups shall be constructed by the people representative of the skill level that will be working on the project.
6. Contractor shall not install any components of the building enclosure, including mockup installation, until product submittals have been approved.
7. Contractor shall certify materials comply with specified laboratory testing prior to installation of any building enclosure materials. Field testing assumes materials comply with laboratory tests.
8. Contractor shall complete pre-functional checklists and certify that systems are ready for functional testing prior to any testing.
9. Contractor shall address punch list items before functional testing.
10. Field testing shall be performed by an approved independent testing agency qualified to conduct the specified tests. The commissioning agent will not perform any tests, but will witness the tests.

11. In the event that a functional test fails, the Contractor shall determine the cause of the failure, and the appropriate and affected trades shall correct all deficiencies as soon as possible.
12. Contractor shall provide retesting for all failed tests. If more than two functional tests of the same system are required, the Contractor shall reimburse the Owner and their subconsultants for all associated costs.
13. The commissioning agent may recommend solutions to problems found, however the burden of responsibility to solve, correct, and retest problems is the Contractor's responsibility.
14. Test performance requirements shall be as described in each individual Section where the testing requirements are specified.
15. The testing agency will record the results of the functional test on the test procedure form. Deficiencies or non-conformance issues shall be noted and reported to the Contractor.
16. Corrections of minor deficiencies identified may be made during the test at the discretion of the commissioning agent.
17. As tests progress and a deficiency is identified, the testing agency and commissioning agent will discuss the issue with the Contractor, document the deficiency and the Contractor's response and intentions for correction.
18. The testing agency notes each satisfactory demonstrated function on the test form. The Contractor, Architect, and Owner's representative give final approval on each test using the same form, providing a signed copy to the commissioning agent.

B. Air and Moisture Barriers:
1. Complete construction checklist.
2. Perform membrane thickness verification inspections (dry or wet film thickness) at a minimum of five locations on the mockup panel to comply with manufacturer's requirements. Dry film thickness measurements may be done by removing samples and measuring with a micrometer.
3. Verify continuity of membrane at interconnections between materials, assemblies of materials, and penetrations.
4. Verify structural integrity of the substrate.
5. Perform bond to substrate test according to ASTM D 7234.

C. Stucco System:
1. Construct mockup panel as detailed.
2. Complete construction checklists of the various materials and components in the mockup panel.

D. Glazed Aluminum Storefronts:
1. Install typical full size storefront assembly in the field mockup panel.
2. Complete construction checklist.
3. Test storefront assembly for water penetration according to ASTM E 1105 (Mock-up, at 10 percent and 50 percent field completion).

E. Curtainwall System:
1. Complete construction checklist.
2. Test Curtainwall assembly for water penetration according to ASTM E 1105 (at 10 percent and 50 percent completion).

F. Exterior Joint Sealants:
   1. Complete construction checklist of the joint sealant installation on the mockup panel.
   2. Allow joint sealants to fully cure prior to testing.
   3. Test joint sealant adhesion according to ASTM C 1521. (Joint sealants to be tested for each different substrate).
   4. Repair tested sealants prior to further testing.

G. Elastomeric Coating:
   1. Complete construction checklist of the elastomeric coating on the mockup panel.
   2. Test coating adhesion according to ASTM D-3359 Method B

3.6 REFERENCE STANDARDS

A. ASTM C 1521 Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints.

B. ASTM D 7234 Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers.

C. ASTM E 1105 Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform or Cyclic Static Air Pressure Difference.

D. ASTM E 1105 (Modified): Similar test to above without the test chamber and air pressure difference. The modified test consists of an approved spray grid for 1 hour to simulate local rainstorm conditions.

END OF SECTION 019115

Performance Testing Matrix

Building Exterior Enclosure Commissioning

Property	***Standard Designation***	***Materials/Systems***	***Field Mockup***	***In-Situ***	***Frequency/Time Frame***
Adhesion & Durability	ASTM D7234	Air/Water Barrier	1	1*	Prior to concealment
Water Penetration	ASTM E1105	Aluminum Storefront Systems	1	2*	10% / 50%
Water Penetration	ASTM E1105	Curtainwall Systems	1	1*	10% / 50%
Sealant Adhesion	ASTM C1521	Exterior sealants	1	2*	TBD
Adhesion	ASTM D-3359 Method B	Elastomeric Coating	1	0	