



ARCHITECTS

Capital Bank Plaza

333 Fayetteville Street, Suite 225

Raleigh NC 27601

PROJECT MANUAL

VOLUME 1 of 3

Divisions 00 thru 01

Harnett County Schools

1008 South 11th Street

Lillington, North Carolina 27546

Multiple Schools - Additions / Renovations

Architect's Project Number: 02110.000

Locations:

Highland Elementary School

1915 Buffalo Lake Road

Sanford, NC 27332

Overhills Elementary School

2626 Ray Road

Spring Lake, NC 28390

Harnett Primary School

800 W Harnett Street

Dunn, NC 28334

August 15, 2022

Bid Set

Set Number: _____

SECTION 00 01 01**PROJECT TITLE PAGE**

Date August 15, 2022
Bid Set

Project Identification Multiple Schools - Additions / Renovations
Architect's Project Number: 02110.000

Locations:

Highland Elementary School
1915 Buffalo Lake Road
Sanford, NC 27332

Overhills Elementary School
2626 Ray Road
Spring Lake, NC 28390

Harnett Primary School
800 W Harnett Street
Dunn, NC 28334

Owner Harnett County Schools
1008 South 11th Street
Lillington, North Carolina 27546
Telephone: 910-893-8151

Architect SfL+a Architects
333 Fayetteville Street, Suite 225
Raleigh, North Carolina 27601
Telephone: 919-573-6350

Structural Engineer LHC Structural Engineers
5430 Wade Park Blvd, Suite 400
Raleigh, North Carolina 27607
Telephone: 919-832-5587

Fire Protection Engineer
Plumbing Engineer
Mechanical Engineer
Electrical Engineer Optima Engineering, PA
150 Fayetteville Street, Suite 520
Raleigh, North Carolina 27601
Telephone: 919-926-2200

Civil Engineer

LKC Engineering, PLLC
140 Aqua Shed Court
Aberdeen, NC 28315
Telephone: 910-420-1437

END OF SECTION

SECTION 00 01 07

SEALS PAGE

Architectural

SfL+a Architects, PA
NC Corporate Registration
NC Registration Number 50676



Architectural

SfL+a Architects, PA
Thomas Warren Hughes
NC Registration Number 9537



Structural Engineering

LHC Structural Engineers, A Division of Bennett & Pless
Robert E. Lasater, Jr.
NC Registration Number 14526

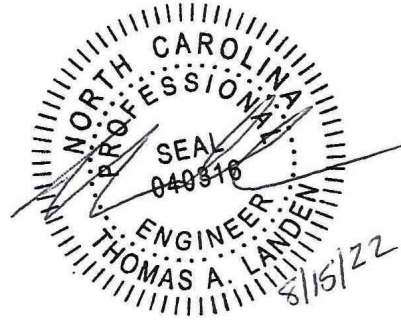


Fire Protection Engineering
Plumbing Engineering

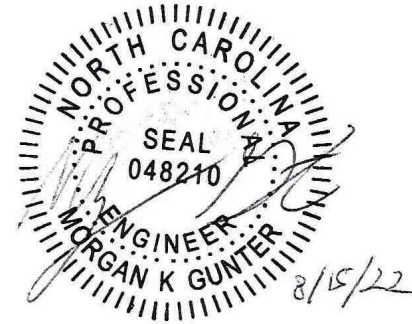
Optima Engineering, PA
Gary P. Kosten
NC Registration Number 032219



Mechanical Engineering
Optima Engineering, PA
Thomas A. Landen
NC Registration Number 040316



Electrical Engineering
Fire Alarm Engineering
Optima Engineering, PA
Morgan K. Gunter
NC Registration Number 048210



Civil Engineering
LKC Engineering, PLLC
Philip A. Picerno
NC Registration Number 043255



END OF SECTION

TABLE OF CONTENTS**Volume One***(of three)***Divisions 00 - 01****Multiple Schools - Additions/Renovations****Legend**

Section Titles followed by an underscore and uppercase letters apply only to the following Work Sites:

| | |
|------------|--|
| _HES = | Highland Elementary School |
| _OES = | Overhills Elementary School |
| _HPS = | Harnett Primary School |
| _HES-HPS = | Highland Elementary School & Harnett Primary School |
| _HES-OES = | Highland Elementary School & Overhills Elementary School |

PROCUREMENT AND CONTRACTING REQUIREMENTS GROUP**DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

| |
|---|
| 00 01 01 - Project Title Page |
| 00 01 07 - Seals Page |
| 00 01 10 - Table of Contents Vol 1 - Vol 3 |
| 00 11 16 - Notice to Bidders |
| 00 21 13 - Information for Bidders |
| 00 31 00 - Available Project Information <ul style="list-style-type: none"> • Geotechnical Exploration Information_HES • Geotechnical Exploration Information_OES • Geotechnical Exploration Information_HPS |
| 00 41 00 - Bid Form |
| 00 43 39 - Identification of Minority Business Participation (Attach to Bid) |
| 00 43 39.10 - AFFIDAVIT A - Listing of Good Faith Efforts (Attach to Bid) |
| 00 43 39.20 - AFFIDAVIT B - Intent to Perform Contract with Own Workforce (Attach to Bid) |
| 00 43 39.30 - AFFIDAVIT C - Portion of the Work to be Performed by Minority Firms |
| 00 43 39.40 - AFFIDAVIT D - Good Faith Efforts |
| 00 52 00 - Section C - Owner-Contractor Agreement |
| 00 61 13 - Performance and Payment Bond Form |
| 00 62 16 - Certificate of Insurance Sample |
| 00 62 76.13 - Sales Tax Form |
| 00 72 00 - Section V - General Conditions |
| 00 73 00 - Section SC - Supplemental Conditions |

SPECIFICATIONS GROUP**DIVISION 01 - GENERAL REQUIREMENTS**

| |
|--|
| 01 10 00 - Summary |
| 01 21 00 - Allowances |
| 01 22 00 - Unit Prices |
| 01 23 00 - Alternates |
| 01 26 00 - Contract Modification Procedures |
| 01 29 00 - Payment Procedures |
| 01 30 00 - Administrative Requirements |
| 01 31 26 - Electronic Communication Protocols |
| 01 32 00 - Construction Progress Documentation |
| 01 33 00 - Submittal Procedures |
| 01 40 00 - Quality Requirements |
| 01 45 00.10 - Inspection Requirements_HES |
| 01 45 00.20 - Inspection Requirements_OES |
| 01 45 00.30 - Inspection Requirements_HPS |
| 01 50 00 - Temporary Facilities and Controls |
| 01 60 00 - Product Requirements |
| 01 73 00 - Execution |
| 01 77 00 - Closeout Procedures |
| 01 78 23 - Operation and Maintenance Data |
| 01 78 39 - Project Record Documents |
| 01 79 00 - Demonstration and Training |

TABLE OF CONTENTS**Volume Two***(of three)***Divisions 02 - 19****Multiple Schools - Additions/Renovations****Legend**

Section Titles followed by an underscore and uppercase letters apply only to the following Work Sites:

| | |
|------------|--|
| _HES = | Highland Elementary School |
| _OES = | Overhills Elementary School |
| _HPS = | Harnett Primary School |
| _HES-HPS = | Highland Elementary School & Harnett Primary School |
| _HES-OES = | Highland Elementary School & Overhills Elementary School |

PROCUREMENT AND CONTRACTING REQUIREMENTS GROUP**DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

00 01 01 - Project Title Page

00 01 07 - Seals Page

00 01 10 - Table of Contents Vol 1 - Vol 3

*Refer to Volume One for Additional Procurement, Contracting and General Requirements***SPECIFICATIONS GROUP***(Continued from Volume One)***DIVISION 02 - EXISTING CONDITIONS**

Not Used

DIVISION 03 - CONCRETE

03 10 00 - Concrete Forming and Accessories

03 20 00 - Concrete Reinforcing

03 30 00 - Cast-In-Place Concrete

DIVISION 04 - MASONRY

04 05 03 - Masonry Mortaring and Grouting

04 20 00 - Unit Masonry

04 72 00 - Cast Stone Masonry

DIVISION 05 - METALS

05 12 00 - Structural Steel

05 21 00 - Steel Joists

05 31 00 - Steel Deck

05 40 00 - Cold Formed Steel Framing

05 50 00 - Metal Fabrications

05 52 00 - Metal Railings

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

| |
|--|
| 06 10 53 - Miscellaneous Rough Carpentry |
| 06 20 00 - Finish Carpentry |
| 06 61 16 - Solid Surfacing Fabrications |

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

| |
|--|
| 07 11 00 - Dampproofing |
| 07 14 16 - Cold Fluid-Applied Waterproofing |
| 07 21 00 - Thermal Insulation |
| 07 21 19 - Foamed-In-Place Insulation |
| 07 27 00 - Air Barriers |
| 07 41 13 - Metal Roof Panels |
| 07 42 13 - Metal Wall Panels_HES |
| 07 42 93.13 - Metal Soffit Panels |
| 07 62 00 - Sheet Metal Flashing and Trim |
| 07 71 23 - Manufactured Gutters and Downspouts |
| 07 84 00 - Firestopping |
| 07 90 00 - Joint Protection |
| 07 95 13 - Expansion Joint Cover Assemblies |

DIVISION 08 - OPENINGS

| |
|---|
| 08 11 13 - Hollow Metal Doors and Frames |
| 08 14 16 - Flush Wood Doors |
| 08 17 43 - Integrated Composite Door Opening Assemblies |
| 08 31 13 - Access Doors and Frames |
| 08 41 13 - Aluminum-Framed Entrances and Storefronts |
| 08 71 00.10 - Door Hardware_HES |
| 08 71 00.20 - Door Hardware_OES |
| 08 71 00.30 - Door Hardware_HPS |
| 08 80 00 - Glazing |
| 08 91 00 - Louvers |

DIVISION 09 - FINISHES

| |
|--|
| 09 21 16 - Gypsum Board Assemblies |
| 09 30 00 - Tiling |
| 09 51 13 - Acoustical Panel Ceilings |
| 09 65 00 - Resilient Flooring |
| 09 67 23 - Resinous Flooring |
| 09 68 13 - Tile Carpeting |
| 09 68 16 - Sheet Carpeting |
| 09 77 23 - Fabric Wrapped Panels_HES-OES |
| 09 90 00 - Painting and Coating |

DIVISION 10 - SPECIALTIES

| |
|---|
| 10 11 00 - Visual Display Units |
| 10 14 00 - Signage |
| 10 21 13.19 - Plastic Toilet Compartments |
| 10 22 39 - Folding Panel Partitions_HES |
| 10 28 00 - Toilet Accessories |
| 10 44 00 - Fire Protection Specialties |
| 10 56 16 - Fabricated Wood Storage Shelving_HPS |
| 10 73 16 - Canopies_HPS |

DIVISION 11 - EQUIPMENT

Not Used

DIVISION 12 - FURNISHINGS

| |
|--|
| 12 21 13 - Horizontal Louver Blinds |
| 12 32 16 - Manufactured Plastic-Laminate-Clad Casework |

DIVISIONS 13 - 19

Not Used

TABLE OF CONTENTS**Volume Three***(of three)***Divisions 20 - 39****Multiple Schools - Additions/Renovations****Legend**

Section Titles followed by an underscore and uppercase letters apply only to the following Work Sites:

| | |
|------------|--|
| _HES = | Highland Elementary School |
| _OES = | Overhills Elementary School |
| _HPS = | Harnett Primary School |
| _HES-HPS = | Highland Elementary School & Harnett Primary School |
| _HES-OES = | Highland Elementary School & Overhills Elementary School |

PROCUREMENT AND CONTRACTING REQUIREMENTS GROUP**DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

00 01 01 - Project Title Page

00 01 07 - Seals Page

00 01 10 - Table of Contents Vol 1 - Vol 3

*Refer to Volume One for Additional Procurement, Contracting and General Requirements***SPECIFICATIONS GROUP***(Continued from Volume Two)***DIVISION 20**

Not Used

DIVISION 21 - FIRE SUPPRESSION

21 01 00 - Fire Protection General Requirements_HES-OES

21 01 05 - Fire Protection Submittal Requirements_HES-OES

21 05 32 - Firestopping For Fire Protection Systems_HES-OES

21 05 48 - Vibration Controls For Fire-Suppression Piping And Equipment_HES-OES

21 13 00 - Automatic Sprinkler Systems_HES-OES

21 20 00 - Stationary Fire Pumps_HES

DIVISION 22 - PLUMBING

22 01 00 - Plumbing General Requirements

22 01 05 - Plumbing Submittal Requirements

22 05 29 - Hangers And Supports For Plumbing Systems

22 05 32 - Firestopping For Plumbing Systems

22 05 48 - Vibration Controls For Fire Suppression Piping And Equipment

22 05 53 - Identification For Plumbing Systems

22 07 00 - Insulation For Plumbing Systems

22 11 00 - Domestic Water Systems

22 13 00 - Sanitary Waste And Vent Systems

22 33 00 - Electric Domestic Water Heaters

22 40 00 - Plumbing Fixtures

DIVISION 23 - MECHANICAL (HVAC)

| |
|---|
| 23 05 00 - Common Results For HVAC |
| 23 05 13 - Common Motor Requirements For HVAC Equipment |
| 23 05 19 - Meters And Gages For HVAC Piping |
| 23 05 23 - General-Duty Valves For HVAC Piping_HES-OES |
| 23 05 29 - Hangers And Supports For HVAC Piping And Equipment_HES-OES |
| 23 05 48 - Vibration And Seismic Controls For HVAC Piping And Equipment_HPS |
| 23 05 53 - Identification For HVAC Piping And Equipment |
| 23 05 93 - Testing, Adjusting, And Balancing For HVAC |
| 23 07 00 - HVAC Insulation |
| 23 09 00 - Direct Digital Control System_HPS |
| 23 21 13 - Hydronic Piping_HES-OES |
| 23 31 13 - Metal Ducts |
| 23 33 00 - Air Duct Accessories |
| 23 34 23 - HVAC Power Ventilators |
| 23 37 13 - Diffusers, Registers, And Grilles |
| 23 81 27 - Split System Air-Conditioners_HPS |
| 23 82 19 - Fan Coil Units_HES-OES |

DIVISION 24 - 25

Not Used

DIVISION 26 - ELECTRICAL

| |
|--|
| 26 05 00 - Common Work Results For Electrical |
| 26 05 19 - Low-Voltage Electrical Power Conductors And Cables |
| 26 05 23 - Control-Voltage Electrical Power Cables |
| 26 05 26 - Grounding And Bonding For Electrical Systems |
| 26 05 29 - Hangers And Supports For Electrical Systems |
| 26 05 33 - Raceway And Boxes For Electrical Systems |
| 26 05 36 - Cable Trays For Electrical Systems_HES-HPS |
| 26 05 43 - Underground Ducts And Raceways For Electrical Systems |
| 26 05 48 - Vibration And Seismic Controls For Electrical Systems |
| 26 05 53 - Identification For Electrical Systems |
| 26 09 23 - Lighting Control Devices |
| 26 09 43 - Network Lighting Controls |
| 26 22 00 - Low-Voltage Transformers |
| 26 24 13 - Switchboards_HPS |
| 26 24 16 - Panelboards |
| 26 27 26 - Wiring Devices |
| 26 28 13 - Fuses |
| 26 28 16 - Enclosed Switches And Circuit Breakers |
| 26 32 13 - Engine Generators_HES |
| 26 43 13 - Transient-Voltage Suppression For Low-Voltage Electrical Circuits (SPD) |
| 26 51 16 - Lighting |

DIVISION 27 - COMMUNICATIONS

| |
|--|
| 27 53 19 - Emergency Responder Radio Antenna-Repeater System_HES-HPS |
|--|

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

| |
|---|
| 28 31 11 - Digital, Addressable Fire-Alarm System |
|---|

Multiple Schools - Additions/Renovations - 02110.000

DIVISION 29 - 30

Not Used

DIVISION 31 - EARTHWORK

| |
|---|
| 31 11 00 - Clearing and Grubbing |
| 31 22 00 - Site Earthwork |
| 31 23 33 - Excavation, Trenching, and Backfilling for Utilities Systems |
| 31 31 16 - Termite Control |

DIVISION 32 - EXTERIOR IMPROVEMENTS

| |
|---|
| 32 11 23 - Graded Crushed Aggregate Base Course for Flexible Pavement_HES |
| 32 12 16 - Hot Mix Bituminous Pavement |
| 32 13 13 - Concrete Driveways, Sidewalks, and Curbs and Gutters |
| 32 31 00 - Fences |
| 32 90 00 - Planting |
| 32 92 00 - Turf and Grasses |
| 32 92 19 - Seeding |

DIVISION 33 - UTILITIES

| |
|--|
| 33 11 00 - Water Distribution - Harnett Regional Standards_HES-OES |
| 33 13 00 - Disinfection |
| 33 30 00 - Sanitary Sewerage - Harnett Regional Standards_HES-OES |
| 33 42 11 - Stormwater Gravity Piping |

DIVISIONS 34 - 39

Not Used

END OF TABLE OF CONTENTS

SECTION 00 11 16
NOTICE TO BIDDERS

Harnett County Schools invites single prime bids on Multiple Schools project known as “H.O.P.”, which include the schools Highland Elementary School, Overhills Elementary School and Harnett-Primary School. Sealed bids will be received at the office of the Harnett County School Central Offices, 1008 S 11th St, Lillington, NC 27546, until 3:00 p.m. on Thursday, September 22, 2022, for the construction of the H.O.P. All bids will be opened and read aloud starting at 3:05 PM in the Board Room at the Administrative Offices facility. This project will be bid and awarded in accordance with G.S143-128, G.S. 143-129, and the Federal Uniform Guidance for projects involving funds.

Work of the Project includes construction of the

- 1) Highland Elementary School Addition and Renovation; a one-story, 16,098 square foot building addition, slab on grade, masonry load-bearing structure with cavity wall construction with brick veneer exterior walls, CMU interior walls, CF metal roof trusses, and standing seam metal roof. Interior finishes of painted CMU, acoustical tile ceilings, VCT floors, aluminum windows with insulated glass, hollow metal door frames and wood doors. Renovation work to also include removal of wall between existing cafeteria and media room. Related site work will include extension of fire lane, egress ramp at the rear of the addition and concrete sidewalks. Refer to the project construction documents for all reports and regulatory procedures.
- 2) Overhills Elementary School Addition; a one-story, 16,706 square foot building addition, slab on grade, masonry load-bearing structure with cavity wall construction with brick veneer exterior walls, CMU interior walls, CF metal roof trusses, and standing seam metal roof. Interior finishes of painted CMU, acoustical tile ceilings, VCT floors, aluminum windows with insulated glass, hollow metal door frames and wood doors. Related site work will include extension of existing concrete sidewalks. Refer to the project construction documents for all reports and regulatory procedures.
- 3) Harnett-Primary Elementary School Addition; a one-story, 19,065 square foot building addition, slab on grade, masonry load-bearing structure with cavity wall construction with brick veneer exterior walls, CMU interior walls, CF metal roof trusses, and standing seam metal roof. Interior finishes of painted CMU, acoustical tile ceilings, VCT floors, aluminum windows with insulated glass, hollow metal door frames and wood doors. Related site work will include extension of existing concrete sidewalks. Refer to the project construction documents for all reports and regulatory procedures.

A Pre-Bid Conference will be held on Tuesday, September 6, 2022, at 3:30 p.m. at the Overhills Elementary School facility located at 2626 Ray Road, Spring Lake, NC 28390. Tours of the building sites can be schedule upon request and prior approval with HCS. All questions shall be submitted via email to the Design Consultant at SfL+a Architects, 333 Fayetteville Street, Suite 225, Raleigh, North Carolina 27601 via email to: hcsmultiple@sfla.biz

Contract Documents, including drawings and specifications, may be obtained from the Construction Connect (iSqFt) website at: www.constructionconnect.com, or complete plans and specifications may be examined at the offices of SfL+a Architects, 333 Fayetteville Street, Suite 225, Raleigh, North Carolina 27601 during normal office hours beginning Tuesday, August 23, 2022. Complete plans and specification may be downloaded from the SfL+a Architects’ ShareFile website by acquiring a link by sending an email to: hcsmultiple@sfla.biz. Contract documents are also available for review at Harnett County Schools school maintenance offices, 1500 South Main Street, Lillington, NC 27546 during normal business hours – call ahead for availability (910-893-4808).

Each proposal shall be accompanied by a Bid Guarantee of five percent (5%) of the bid in cash, certified check or a fully executed Bid Bond. The deposit shall be retained by the Owner if the successful bidder

fails to execute the contract within ten (10) days after award or fails to give satisfactory surety as required herein. (General Statutes of North Carolina, Chapter 143, Article 8, Section 129.) No bid may be withdrawn for a period of ninety (90) days after the opening thereof. The successful bidder will be required to furnish 100% Performance Bond and a 100% Labor and Material Payment Bond.

Bidders are required on school construction and renovation projects covered by N.C. Gen. Stat. 143-128 to make a “good faith effort” to meet minority participation goals. Bidders shall identify on its bid the minority businesses that it will use on the project. Bidders shall submit along with the bid an affidavit listing the good faith efforts it has made pursuant to subsection (f) of G.S. 143-128.2 and the total dollar value of the bid that will be performed by the minority businesses. A bidder that performs all of the work under the contract with its own workforce may submit an affidavit to that effect in lieu of the aforementioned affidavit otherwise required under this subsection.

The Harnett County Schools reserves the right to reject any and all bids, waive informalities and irregularities in bidding, and to accept bids that are considered to be in the best interest of the School System.

END OF DOCUMENT

SECTION 00 21 13
INFORMATION FOR BIDDERS

A-1. SUBMISSION OF BIDS AND BID OPENING:

- A. Bids will be received by Harnett County Schools and will be opened and read at the times and places set forth in the solicitation. Bidders, or their representative, and other interested persons may be present at the opening of proposals.
- B. The envelopes containing the bids must be sealed and addressed to Harnett County Central Offices, 1008 S 11th St, Lillington, NC 27546 and marked on the outside of the envelope Proposal for Harnett County Schools – H.O.P. Additions, with the name of the Bidder and his North Carolina State Contractor's Registration Number.
- C. The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

A-2. BIDDING DOCUMENTS:

- A. Bidding Documents include the Information for Bidders, Form of Proposal and the proposed Contract Documents, including any Addenda issued prior to receipt of bids. All requirements and obligations of the Bidding Documents are hereby incorporated by reference into the Contract Documents and are binding on the Successful Bidder upon award of the contract.

A-3. BIDDER'S REPRESENTATIONS:

Each Bidder by submitting his Bid represents that:

- A. He has read and understands that Bidding Documents and his Bid is made in accordance therewith; and Bidder agrees to be bound by the terms and requirements set forth in the Bidding and Contract Documents;
- B. He has visited the site, has familiarized himself with the local conditions under which the Work is to be performed herein, and has correlated his observations with the requirements of the proposed Contract Documents;
- C. The Bidder acknowledges and represents that he has made allowances for normal inclement weather indigenous to the Project Site, in his estimating, planning and scheduling of the Work. The Bidder hereby certifies that the work shall be completed, in place, in full accordance with the Contract Documents, within the time limits specified.
- D. He has made a good faith effort to solicit Minority Business Enterprises (MBEs) per N.C. Gen. Stat. 143-131, as subcontractors.
- E. He has received the General and any Supplementary Conditions for the Project.

A-4. SITE CONDITIONS AND CONDITIONS OF THE WORK:

- A. Each bidder must acquaint himself thoroughly as to the character and nature of the work to be done. Each bidder furthermore must make a careful examination of the site of the work

and inform himself fully as to the difficulties to be encountered in the performance of the work, the facilities for delivering, storing and placing materials and equipment, and other conditions relating to construction and labor.

- B. No plea of ignorance of conditions that exist or may hereafter exist on the site of the work, or difficulties that may be encountered in the execution of the work, as a result of failure to make necessary investigations and examinations, will be accepted as an excuse for any failure or omission on the part of the successful Bidder to fulfill in every detail all the requirements of the Contract Documents and to complete the work or the consideration set forth therein, or as a basis for any claim whatsoever.
- C. Insofar as possible, the Successful Bidder, in carrying out his work, must employ such methods or means as will not cause interruption of or interference with the work of the Owner or any separate contractor.

A-5. BIDDER'S QUESTIONS, ADDENDA AND INTERPRETATIONS:

- A. Bidders and Sub-bidders shall promptly notify the Design Consultant of any ambiguity, inconsistency or error which they may discover upon examination of the Bidding and Contract Documents or of the site and local conditions. No interpretation of the meaning of the drawings, specifications or other contract documents will be made to any Bidder orally.
- B. Every request for such interpretation should be in writing addressed to the Design Consultant with a copy forwarded to the Owner.
- C. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the Bidding Documents which, if issued, will be transmitted to all prospective Bidders (at the respective addresses furnished for such purposes) not later than three calendar days prior to the date fixed for the opening of bids. Neither the Design Consultant nor the Owner will be responsible for any other explanations or interpretations of the proposed documents. Failure of any Bidder to receive any such addendum or interpretation shall not relieve any bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the Contract Documents.
- D. Each Bidder shall ascertain prior to submitting his bid that he has received all Addenda issued, and he shall acknowledge receipt and inclusion in his proposal of all Addenda.
- E. He has received the General and any Supplementary Conditions for the Project.

A-6. SECURITY FOR FAITHFUL PERFORMANCE:

- A. The Successful bidder shall furnish a Performance Bond in an amount equal to one hundred percent (100%) of the Contract Sum as security for the faithful performance of this Contract and also a Labor and Material Payment Bond in an amount not less than one hundred percent (100%) of the Contract Sum, as security for the payment of all persons performing labor and furnishing materials under this Contract. The Performance Bond and the Labor and Material Payment Bond shall be delivered to the Owner not later than the date of execution of the Contract.

A-7. LIABILITY INSURANCE AND WORKMEN'S COMPENSATION:

The Successful Bidder will be required to carry public liability and workmen's compensation and other insurance in the amounts and under the terms stipulated under the General Conditions.

A-8. RIGHT TO REJECT BIDS:

The Owner expressly reserves the right to reject any or all bids, to waive any informalities or irregularities in the bids received, and to accept that bid which in its judgment, best serves the interest of the Owner.

A-9. EQUAL PRODUCTS AND SUBSTITUTIONS:

- A. Unless specifically stated to the contrary, any Bidder may, with Owner's written approval, use any article, device, product, material, fixture, form or type of construction which in the judgment of the Design Consultant is equal to that specified considering quality, workmanship, economy of operation, durability, suitably for the purpose intended, and acceptability for use on the project. Approval by the Owner prior to bid opening is mandatory and acceptance of substitutions will be in the form of an Addendum to the Specifications issued to all prospective Bidders indicating that the additional makes or brands are equivalent to those specified. Nothing in this paragraph is intended to restrict or inhibit free and open competition on school system projects. The bidder may request approval for substitutions after award of the contract in accordance with the contract General Conditions.

A-10. PREPARATION AND SUBMITTAL OF FORM OF BID:

- A. Bids shall be submitted utilizing the Form of Proposal as bound herein, or otherwise provided with the Contract Documents, and shall be complete in every respect. The total bid amount shall be entered in words and figures in the space provided. Where applicable, the unit price or lump sum items, and their extensions, shall be entered in figures in the respective columns provided for each bid item. All entries shall be typewritten or printed in ink. The signatures of all persons shall be in longhand. Any entry of amount that appears on the face of the bid to have involved an erasure, deletion, white-out and/or substitution or other such change or alteration, shall show by them the initials of the person signing the bid and the date of the change or alteration. A failure to comply with this requirement may be cause for disqualification of the bid.
- B. For Unit Price bids, in the event of any discrepancies between the unit prices and the extensions thereof or the total bid amount, the unit prices shall govern. For Lump Sum bids, in the event of a discrepancy between the bid amount in writing and that in figures, the written value shall govern.
- C. Bids shall not contain any restatement or qualifications of work to be done, and alternate bids will not be considered unless called for. No oral bids or modifications will be considered.
- D. All applicable Federal, State and Local taxes shall be included in the Bidder's proposal.

A-11. MODIFICATION OR WITHDRAWAL OF BID:

- A. A bidder may withdraw his bid from consideration if such bid was based upon a mistake.
- B. Prior to the time and date designated for receipt of bids, any bid submitted may be modified or withdrawn by notice to the party receiving bids at the place designated for receipt of bids. Such notice shall be in writing over the signature of the Bidder.
- C. Withdrawn bids may be resubmitted up to the time designated for the receipt of Bids provided that they are then fully in conformance with this Information for Bidders.

A-12. DETAILED BID BREAKDOWN:

If the Owner directs, the Bidder shall provide a detailed breakdown of his bid acceptable to the Owner. In addition to verifying accounting requirements, the breakdown may be used by the Owner to determine whether the Bidder has grossly misjudged the requirements of any area. Failure to provide the requested detailed breakdown may result in rejection of the bid proposal.

A-13. AWARD OF CONTRACT:

The contract will be awarded to the lowest responsive and responsible bidder, taking into consideration quality, performance, and the time specified in the bids for the performance of the contract.

- A. The lowest bidders shall be determined by the aggregate amount of the unit prices set forth in the form of bid, if work is bid on a unit price basis, or the aggregate amount of the Base Bid, plus any Alternates selected by the Owner.
- B. A Responsible Bidder shall mean a Bidder who has the capability, in all respects, to perform fully the contract requirements and the moral and business integrity and reliability which will assure good faith performance. In determining responsibility, the following criteria will be considered:
 - 1. The ability, capacity and skill of the Bidder to perform the contract or provide the service required;
 - 2. Whether the bidder can perform the contract or provide the service promptly, or within the time specified, without delay or interference;
 - 3. The character, integrity, reputation, judgment, experience and efficiency of the Bidder;
 - 4. The quality of performance of previous contracts or services. For example the following information will be considered:
 - a. The administrative and consultant cost overruns incurred by Owners on previous contracts with Bidder,
 - b. The Bidder's compliance record with contract general conditions on other projects,

- c. The submittal by the bidder of excessive and/or unsubstantiated extra cost proposals and claims on other projects,
 - d. The Bidder's record for completion of the work within the Contract Time or within Contract Milestones and Bidders compliance with scheduling and coordination requirements on other projects,
 - e. The Bidder's demonstrated cooperation with the Owner or the Design Consultant and other contractors on previous contracts,
 - f. Whether the work performed and materials furnished on previous contracts was in accordance with the Contract Documents;
5. The previous and existing compliance by the bidder with laws and ordinances relating to contracts or services;
 6. The sufficiency of the financial resources and ability of the Bidder to perform the contract or provide the service;
 7. The quality, availability and adaptability of the goods or services to the particular use required;
 8. The ability of the Bidder to provide future maintenance and service for the warranty period of the contract;
 9. Whether the Bidder has been declared in default on a project;
 10. Whether the bidder has demonstrated a good faith effort to use MBEs as subcontractors;
 11. Such other information as may be secured by the Owner having a bearing on the decision to award the contract, to include, but not limited to:
 - a. The ability, experience and commitment of the Bidder to properly and reasonably plan, schedule, coordinate and execute the Work,
 - b. Whether the Bidder has ever been debarred from bidding or found ineligible for bidding on any other projects.
- D. The purpose of the above is to enable the Owner in its opinion, to select the lowest responsible bidder. The ability of the low Bidder to provide the required bonds will not of itself demonstrate responsibility of the Bidder.
- E. The Owner reserves the right to require from the Bidder within twenty-four (24) hours of bid opening: (1) submissions of references to include a listing of previous and current projects, including a listing of public school construction projects completed in North Carolina, (2) financial statements indicating current financial status, prepared in accordance with generally accepted accounting principles, by a CPA licensed to do business in North Carolina, and (3) any other information deemed necessary in order to establish the responsiveness and responsibility of the bidder.
- F. The Owner reserves the right to defer award of this contract for a period of ninety (90) days after the due date of bids. During this period time, the Bidder shall guarantee the prices quoted in his bid.

END OF SECTION

SECTION 00 31 00
AVAILABLE PROJECT INFORMATION

PART 1 GENERAL**1.1 SUMMARY**

- A. Section Includes:
1. Geotechnical Exploration Information.

1.2 GEOTECHNICAL EXPLORATION INFORMATION

- A. A copy of the referenced information is included in PART 3 of this Section.
1. Highland Elementary School Site:
 - a. Title: GEOTECHNICAL ENGINEERING REPORT; Highland Elementary School; Classroom Addition; 1915 Buffalo Lake Road; Sanford, North Carolina.
 - b. Prepared For: Mr. Steve Matthews, Harnett County Schools, 1008 S 11th Street, Lillington, NC 27546.
 - c. Prepared By: Terracon Consultants, Inc.; 2401 Brentwood Road, Suite 107; Raleigh, NC 27604; Hugo Santana, PE; Andrew A. Nash, PE.
 - d. Preparer's Project No: 70215252.
 - e. Report Date: January 7, 2022.
 - f. Total Pages: 40 pages.
 2. Overhills Elementary School Site:
 - a. Title: GEOTECHNICAL ENGINEERING REPORT; Overhills Elementary School; Classroom Addition; 2626 Ray Road; Spring Lake, North Carolina.
 - b. Prepared For: Mr. Steve Matthews, Harnett County Schools, 1008 S 11th Street, Lillington, NC 27546.
 - c. Prepared By: Terracon Consultants, Inc.; 2401 Brentwood Road, Suite 107; Raleigh, NC 27604; Hugo Santana, PE; Andrew A. Nash, PE.
 - d. Preparer's Project No: 70215251.
 - e. Report Date: January 7, 2022.
 - f. Total Pages: 40 pages.
 3. Harnett Primary School Site:
 - a. Title: GEOTECHNICAL ENGINEERING REPORT; Harnett Primary School; Classroom Addition; 800 West Harnett Street; Dunn, North Carolina.
 - b. Prepared For: Mr. Steve Matthews, Harnett County Schools, 1008 S 11th Street, Lillington, NC 27546.
 - c. Prepared By: Terracon Consultants, Inc.; 2401 Brentwood Road, Suite 107; Raleigh, NC 27604; Hugo Santana, PE; Andrew A. Nash, PE.
 - d. Preparer's Project No: 70215253.
 - e. Report Date: January 7, 2022.
 - f. Total Pages: 40 pages.
- B. This report identifies properties of below grade conditions and offers recommendations for design of foundations, prepared primarily for use of the Architect and Engineer.
- C. Recommendations described are not requirements of this Contract, unless specifically referenced in Contract Documents.
- D. This report, by its nature, cannot reveal all conditions existing on the site. Each bidder is responsible for investigating the site and independently verifying subsurface information and conditions prior to bidding.

- E. All bidders are to assume the site is classified soil and price accordingly. The contract documents include provisions for unit cost or allowances for soil work. The Unit Costs include allowances for costs to be included in the base bid.

PART 2 (Not Used)

PART 3 INFORMATION AND REPORTS

3.1 INFORMATION AND REPORTS

- A. The information and reports referenced in PART 1 of this Section are included after this page, unless indicated otherwise in PART 1.
- B. This Section ends after the last referenced and included informational document.



Geotechnical Engineering Report

**Highland Elementary School Classroom Addition
Sanford, North Carolina**

January 7, 2022

Terracon Project No. 70215252

Prepared for:

Harnett County Schools
Lillington, North Carolina

Prepared by:

Terracon Consultants, Inc.
Raleigh, North Carolina



January 7, 2022

Harnett County Schools
1008 S. 11th Street
Lillington, North Carolina 27546



Attn: Mr. Steve Matthews
P: (910) 893 4808
E: smatthews@harnett.k12.nc.us

Re: Geotechnical Engineering Report
Highland Elementary School Classroom Addition
1915 Buffalo Lake Road
Sanford, North Carolina
Terracon Project No. 70215252

Dear Mr. Matthews:

We have completed the Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. P70215193 dated September 29, 2021. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations and floor slabs for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

Hugo Santana, PE
Geotechnical Staff Engineer
Registered, NC 047922



Santana, Hugo
Jan 7 2022 11:26 AM

Andrew A. Nash, PE
Geotechnical Department Manager
Registered, NC 031022

REPORT TOPICS

INTRODUCTION..... 1

SITE CONDITIONS..... 1

PROJECT DESCRIPTION 2

GEOTECHNICAL CHARACTERIZATION..... 2

GEOTECHNICAL OVERVIEW 3

EARTHWORK..... 4

SHALLOW FOUNDATIONS 8

SEISMIC CONSIDERATIONS 11

FLOOR SLABS..... 11

GENERAL COMMENTS..... 13

FIGURES 15

ATTACHMENTS..... 16

Note: This report was originally delivered in a web-based format. For more interactive features, please view your project online at client.terracon.com.

ATTACHMENTS

- EXPLORATION AND TESTING PROCEDURES
- SITE LOCATION AND EXPLORATION PLANS
- EXPLORATION RESULTS
- SUPPORTING INFORMATION

Note: Refer to each individual Attachment for a listing of contents.

Geotechnical Engineering Report

Highland Elementary School Classroom Addition ■ Sanford, North Carolina
January 7, 2022 ■ Terracon Project No. 70215252

**REPORT SUMMARY**

Terracon has completed the geotechnical engineering report for the proposed Classroom Addition project located at Highland Elementary School in Sanford, North Carolina. A total of four (4) soil test borings were performed in the proposed construction areas. The following geotechnical considerations were identified:

- Generally, the site appears suitable for the proposed construction provided the subgrade is prepared and tested as described in this report. The soils at the site consist of very loose to medium dense sand soils interlaid with medium stiff sandy clay soils.
- The near surface soils moisture sensitive and could become unstable, especially after precipitation events, as well as with typical earthwork and construction traffic. The effective drainage should be completed early in the construction sequence and maintained after construction to avoid potential issues. If possible, the grading should be performed during the warmer and drier times of the year. If grading is performed during the winter months, an increased risk for possible undercutting and replacement of unstable subgrade will persist. Additional site preparation recommendations, including subgrade improvement and fill placement, are provided in the Earthwork section.
- Shallow foundations bearing on properly prepared and approved native soils or engineered fill can be designed with an allowable soil bearing pressure of 3,000 pounds per square foot (psf).
- Groundwater was not observed in the borings while drilling or for the limited time they were left open. The boring caved between 11.8 to 16.9 feet below the existing ground surface, cave depth can indicate the groundwater level. We do not anticipate that groundwater will impact site development.
- An ASCE Chapter 20 seismic site classification of "D" is appropriate for this site.
- The geotechnical engineer should be retained during the construction phase of the project to observe earthwork and to perform necessary tests and observations during subgrade preparation; proof-rolling; placement and compaction of controlled compacted fills and backfilling of excavations into the completed subgrade.

This summary should be used in conjunction with the entire report for design purposes. It should be recognized that details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein. The section titled **General Comments** should be read for an understanding of the report limitations.

Geotechnical Engineering Report
Highland Elementary School Classroom Addition
1915 Buffalo Lake Road
Sanford, North Carolina
Terracon Project No. 70215252
January 7, 2022

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed Classroom Addition to be located at Highland Elementary School at 1915 Buffalo Lake Road in Sanford, North Carolina. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Site preparation and earthwork
- Excavation considerations
- Foundation design and construction
- Floor slab design and construction
- Seismic site classification per IBC

The geotechnical engineering Scope of Services for this project included the advancement of four (4) test borings to depths of approximately 30 feet below existing site grades.

Maps showing the site and boring locations are shown in the **Site Location** and **Exploration Plan** sections, respectively. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included on the boring logs and/or as separate graphs in the **Exploration Results** section.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

| Item | Description |
|---------------------------|--|
| Parcel Information | The project is located at the existing Highland Elementary School at 1915 Buffalo Lake Road in Sanford, North Carolina. Approximate site coordinates: 35.3064, Latitude; -79.0407 Longitude See Site Location |

Geotechnical Engineering Report

Highland Elementary School Classroom Addition ■ Sanford, North Carolina
January 7, 2022 ■ Terracon Project No. 70215252



| Item | Description |
|------------------------------|--|
| Existing Improvements | The existing elementary school is a single-story, masonry-block and brick structure with slabs-on-grade. Site improvements include paved parking and drop-off loop, several modular classroom buildings, playgrounds and perimeter fencing. |
| Current Ground Cover | Mixture of grass, gravel access road and landscaping materials. |
| Existing Topography | The site appears to be relatively flat. |
| Geology | The project site is located in the Coastal Plain physiographic province of North Carolina. The Coastal Plain consists mainly of alluvial and marine deposits of sand, silt and clay placed during periods of fluctuating shorelines. According to the 1998 Geologic Map of North Carolina, the site is underlain by the Castle Hayne Formation (Tertiary). |

PROJECT DESCRIPTION

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

| Item | Description |
|---------------------------------|--|
| Information Provided | Project information was provided via email correspondence and the following documents: <ul style="list-style-type: none"> ■ Emails dated from March 2021 ■ HCS – Add_Reno – REQUEST FOR PROPOSAL – GEOTECHNICAL 2021.07.27 ■ HCS – RFP – Boring Maps – 2021.07.26 |
| Project Description | We understand that the project will include a new classroom addition. |
| Proposed Structures | The buildings are assumed to be slab-on-grade (non-basement) and masonry or steel framed. |
| Finished Floor Elevation | Not provided but assumed to match the existing building's FFE. |
| Maximum Loads | <ul style="list-style-type: none"> ■ Columns: 50 kips ■ Walls: 1 to 3 kips per linear foot (klf) |
| Grading/Slopes | Based on the existing grading we assume cut/fill of less than 5 feet. |
| Pavements | Pavements for the school addition are not anticipated. |

GEOTECHNICAL CHARACTERIZATION

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of

Geotechnical Engineering Report

Highland Elementary School Classroom Addition ■ Sanford, North Carolina
January 7, 2022 ■ Terracon Project No. 70215252



the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of site preparation and foundation options. Conditions encountered at each exploration point are indicated on the individual logs. The individual logs can be found in the **Exploration Results** section and the GeoModel can be found in the **Figures** section of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

| Model Layer | Layer Name | General Description |
|-------------|--|----------------------------|
| 1 | Topsoil | -- |
| 2 | Fill - Clayey SAND | Medium dense |
| 3 | Silty/Clayey SAND, Poorly Graded SAND | Very loose to medium dense |
| 4 | Sandy CLAY | Medium stiff |

Groundwater

Groundwater was not observed in the borings while drilling or for the limited time they were left open. The boring caved between 11.8 to 16.9 feet below the existing ground surface, cave depth can indicate the groundwater level. Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

GEOTECHNICAL OVERVIEW

The borings encountered very loose to medium dense silty/clayey sand interlaid with medium stiff sandy clay soils. These materials, are generally suitable for construction of the proposed foundations and slabs following site preparation according to the recommendations provided in the **Site Preparation** section.

The near surface soils are expected to be suitable for foundation, slab and pavement support after performing remedial earthwork. We recommend in-place compaction using a medium to heavy weight vibratory sheepsfoot roller to densify the loose near surface sand. The near surface soils could become unstable, especially after precipitation events, as well as with typical earthwork and construction traffic. The effective drainage should be completed early in the construction sequence and maintained after construction to avoid potential issues. If possible, the grading should be performed during the warmer and drier times of the year. If grading is performed during the winter

Geotechnical Engineering Report

Highland Elementary School Classroom Addition ■ Sanford, North Carolina
January 7, 2022 ■ Terracon Project No. 70215252



months, an increased risk for possible undercutting and replacement of unstable subgrade will persist. Additional site preparation recommendations, including subgrade improvement and fill placement, are provided in the Earthwork section.

We recommend identifying remaining soft/loose areas following vibratory rolling by performing proofrolling with a loaded tandem-axle truck. Areas exhibiting excessive deflection or rutting, or areas where otherwise unsuitable material is encountered should be remediated as directed by the geotechnical engineer. We expect that some localized areas may require additional overexcavation and replacement to develop adequate subgrade support.

The geotechnical engineer should be retained at this time to observe earthwork and to perform necessary tests and observations during subgrade preparation; proofrolling; placement and compaction of controlled compacted fills; backfilling of excavations into the completed subgrade, and just prior to construction of foundations.

The **General Comments** section provides an understanding of the report limitations.

EARTHWORK

Earthwork is anticipated to include clearing, excavations, and fill placement. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria, as necessary, to render the site in the state considered in our geotechnical engineering evaluation for foundations, floor slabs, and pavements.

A qualified geotechnical engineer should be retained during the earthwork phase of the project to observe earthwork and to perform necessary tests and observations during subgrade preparation; to monitor proof-rolling, placement and compaction of controlled compacted fills, and backfilling of excavations to the completed subgrade.

Site Preparation

Site preparation should begin with the demolition of the existing pavement and structures and debris removal where new construction will occur. As part of the demolition, buried concrete foundations associated with existing modular structures should also be removed. Existing utilities that are to be abandoned should be removed or filled with grout. The excavations resulting from utility removal should be properly backfilled with compacted structural fill as described in the Fill Material Types and Compaction sections of this report. Utilities that are to remain in service should be accurately located horizontally and vertically to minimize conflict with new foundation construction.

Prior to placing fill, existing vegetation and root mat should be removed. Complete stripping of the topsoil should be performed in the proposed building pad areas.

Geotechnical Engineering Report

Highland Elementary School Classroom Addition ■ Sanford, North Carolina
January 7, 2022 ■ Terracon Project No. 70215252



The subgrade should be proofrolled with an adequately loaded vehicle such as a fully-loaded tandem-axle dump truck. The proofrolling should be performed under the direction of the Geotechnical Engineer. Areas excessively deflecting under the proofroll should be delineated and subsequently addressed by the Geotechnical Engineer. Excessively wet or dry material should either be removed, or moisture conditioned and recompacted.

Existing Fill

As noted in **Geotechnical Characterization**, boring B-3 encountered existing fill to a depth of 3 feet. The fill appears to have been placed in a controlled manner, but we have no records to indicate the degree of control. Support of footings, floor slabs, and pavements, on or above existing fill soils, is discussed in this report. However, even with the recommended construction procedures, there is inherent risk for the owner that compressible fill or unsuitable material, within or buried by the fill will, not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill, but can be reduced by following the recommendations contained in this report.

If the owner elects to construct the footings and floor slabs on the existing fill, the following protocol should be followed. Once the planned grading has been completed, the area should be closely monitored during proofrolling, to confirm relative denseness and to aid in delineating areas of soft or otherwise unsuitable soil. Excessively wet or dry material should either be removed, evaluated for reuse as structural fill, moisture conditioned and recompacted. Once unsuitable materials have been remediated, and the subgrade has passed the proofroll test construction can continue.

Fill Material Types

Fill required to achieve design grade should be classified as structural fill and general fill. Structural fill is material used below, or within 10 feet of structures, pavements or constructed slopes. General fill is material used to achieve grade outside of these areas. Earthen materials used for structural and general fill should meet the following material property requirements:

| Soil Type ¹ | USCS Classification | Acceptable Location for Placement |
|--|-------------------------|---|
| Low Plasticity Cohesive | CL, CL-ML ML, SM, SC | All locations and elevations. |
| Sand / Gravel with less than 12% fines (silt and clay) | GW, GP, SW, SP | NCDOT ABC beneath floor slabs, pavements or as a replacement material in over excavated areas. |
| On-Site Soils | SM | Generally suitable for all locations and elevations when low to moderate plasticity requirement is met. |

Geotechnical Engineering Report

Highland Elementary School Classroom Addition ■ Sanford, North Carolina
January 7, 2022 ■ Terracon Project No. 70215252



| Soil Type ¹ | USCS Classification | Acceptable Location for Placement |
|---|---------------------|-----------------------------------|
| <ol style="list-style-type: none"> Structural and general fill should consist of approved materials free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to the Geotechnical Engineer for evaluation prior to use on this site. CH or MH soils should not be used within 3 feet of finished grade in building area and 1 foot below finished grade in other structural fill areas. | | |

Fill Compaction Requirements

Structural and general fill should meet the following compaction requirements.

| Item | Structural Fill | General Fill |
|--|--|---|
| Maximum Lift Thickness | 8 inches or less in loose thickness when heavy, self-propelled compaction equipment is used 4 to 6 inches in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is used | Same as Structural fill |
| Minimum Compaction Requirements ^{1, 2} | Minimum 95% of the material's maximum standard Proctor dry density (ASTM D 698). The upper 12 inches of subgrade in pavement areas should be compacted to at least 98% of the materials maximum standard Proctor dry density (ASTM D 698) | 92% of max. |
| Water Content Range ¹ | Low plasticity cohesive: -2% to +3% of optimum High plasticity cohesive: 0 to +4% of optimum Granular: -3% to +3% of optimum | As required to achieve min. compaction requirements |

- Maximum density and optimum water content as determined by the standard Proctor test (ASTM D 698).
- High plasticity cohesive fill should not be compacted to more than 100% of standard Proctor maximum dry density.

Utility Trench Backfill

For low permeability subgrades, utility trenches are a common source of water infiltration and migration. Utility trenches penetrating beneath the building should be effectively sealed to restrict water intrusion and flow through the trenches, which could migrate below the building. The trench should provide an effective trench plug that extends at least 5 feet from the face of the building exterior. The plug material should consist of cementitious flowable fill or low permeability clay. The trench plug material should be placed to surround the utility line. If used, the clay trench plug material should be placed and compacted to comply with the water content and compaction recommendations for structural fill stated previously in this report.

Geotechnical Engineering Report

Highland Elementary School Classroom Addition ■ Sanford, North Carolina
January 7, 2022 ■ Terracon Project No. 70215252

**Grading and Drainage**

All grades must provide effective drainage away from the building during and after construction and should be maintained throughout the life of the structure. Water retained next to the building can result in soil movements greater than those discussed in this report. Greater movements can result in unacceptable differential floor slab and/or foundation movements, cracked slabs and walls, and roof leaks. The roof should have gutters/drains with downspouts that discharge onto splash blocks at a distance of at least 10 feet from the building.

Exposed ground should be sloped and maintained at a minimum 5% away from the building for at least 10 feet beyond the perimeter of the building. Locally, flatter grades may be necessary to transition ADA access requirements for flatwork. After building construction and landscaping have been completed, final grades should be verified to document effective drainage has been achieved. Grades around the structure should also be periodically inspected and adjusted, as necessary, as part of the structure's maintenance program. Where paving or flatwork abuts the structure, a maintenance program should be established to effectively seal and maintain joints and prevent surface water infiltration.

Earthwork Construction Considerations

Shallow excavations for the proposed structure are anticipated to be accomplished with conventional construction equipment. Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction of floor slabs. Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over or adjacent to construction areas should be removed. If the subgrade freezes, desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompact prior to floor slab construction.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, "Excavations" and its appendices, and in accordance with any applicable local, and/or state regulations.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety, or the contractor's activities; such responsibility shall neither be implied nor inferred.

Geotechnical Engineering Report

Highland Elementary School Classroom Addition ■ Sanford, North Carolina
January 7, 2022 ■ Terracon Project No. 70215252

**Construction Observation and Testing**

The earthwork efforts should be monitored under the direction of the Geotechnical Engineer. Monitoring should include documentation of adequate removal of vegetation and topsoil, proofrolling, and mitigation of areas delineated by the proofroll to require mitigation.

Each lift of compacted fill should be tested, evaluated, and reworked, as necessary, until approved by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency of at least one test for every 2,500 square feet of compacted fill in the building areas and 5,000 square feet in pavement areas. One density and water content test should be performed for every 50 linear feet of compacted utility trench backfill.

In areas of foundation excavations, the bearing subgrade should be evaluated under the direction of the Geotechnical Engineer. If unanticipated conditions are encountered, the Geotechnical Engineer should prescribe mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

SHALLOW FOUNDATIONS

If the site has been prepared in accordance with the requirements noted in **Earthwork**, the following design parameters are applicable for shallow foundations.

Design Parameters – Compressive Loads

| Item | Description |
|--|---|
| Maximum Net Allowable Bearing pressure ^{1, 2, 3} | 3,000 psf |
| Minimum Foundation Dimensions | Columns: 30 inches Continuous: 18 inches |
| Ultimate Coefficient of Sliding Friction ⁴ | 0.35 (granular native soils) |
| Minimum Embedment below Finished Grade ⁵ | 18 inches |
| Estimated Total Settlement from Structural Loads ² | Less than about 1 inch |
| Estimated Differential Settlement ^{2, 6} | Less than ½ inch |

Geotechnical Engineering Report

Highland Elementary School Classroom Addition ■ Sanford, North Carolina
January 7, 2022 ■ Terracon Project No. 70215252



| Item | Description |
|------|--|
| 1. | The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. An appropriate factor of safety has been applied. Values assume that exterior grades are no steeper than 20% within 10 feet of structure. |
| 2. | Values provided are for maximum loads noted in Project Description . |
| 3. | Unsuitable or soft soils should be over-excavated and replaced per the recommendations presented in the Earthwork . |
| 4. | Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to net uplift conditions. |
| 5. | Embedment necessary to minimize the effects of frost and/or seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure. |
| 6. | Differential settlements are as measured over a span of 50 feet. |

The foundation bearing materials should be evaluated at the time of the foundation excavation. This is an essential part of the construction process. A representative of the geotechnical engineer should use a combination of hand auger borings and dynamic cone penetrometer (DCP) testing to determine the suitability of the bearing materials for the design bearing pressure. DCP testing should be performed to a depth of 3 to 5 feet below the bottom of foundation excavation. Excessively soft, loose, or wet bearing soils should be over excavated to a depth recommended by the geotechnical engineer. The excavated soils should be replaced with structural fill or crushed stone (NCDOT ABC). However, footings could bear directly on the soils after over excavation if approved by the Geotechnical Engineer.

Existing fill was found below the proposed building footprint as currently shown. In areas where existing fill remains under the proposed building the frequency of hand auger and DCP testing should be increased and should be extended to natural soils.

Construction Adjacent to Existing Building

Differential settlement between the addition and the existing building is expected to approach the magnitude of the total settlement (1-inch) of the addition. Expansion joints should be provided between the existing building and the proposed addition to accommodate differential movements between the two structures. Underground piping between the two structures should be designed with flexible couplings and utility knockouts in foundation walls should be oversized, so minor deflections in alignment do not result in breakage or distress. Care should be taken during excavation adjacent to existing foundations, to avoid disturbing existing foundation bearing soils.

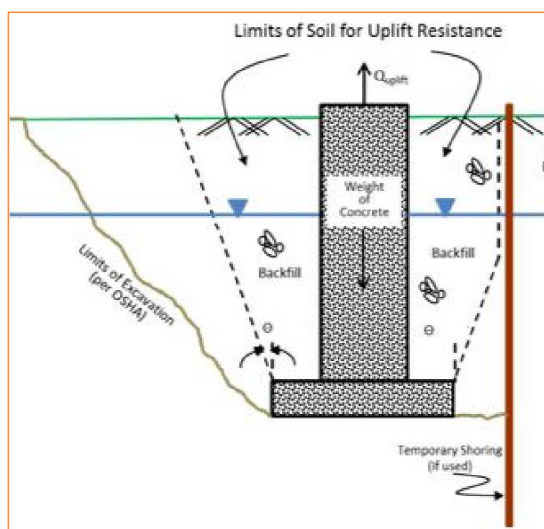
New footings should bear at or near the bearing elevation of immediately adjacent existing foundations. Depending upon their locations and current loads on the existing footings, footings for the new addition could cause settlement of adjacent walls. To reduce this concern and risk, clear distances at least equal to the new footing widths should be maintained between the addition's footings and footings supporting the existing building.

Geotechnical Engineering Report

Highland Elementary School Classroom Addition ■ Sanford, North Carolina
January 7, 2022 ■ Terracon Project No. 70215252

**Design Parameters - Uplift Loads**

Uplift resistance of spread footings can be developed from the effective weight of the footing and the overlying soils. As illustrated on the subsequent figure, the effective weight of the soil prism defined by diagonal planes extending up from the top of the perimeter of the foundation to the ground surface at an angle, θ , of 20 degrees from the vertical can be included in uplift resistance. The maximum allowable uplift capacity should be taken as a sum of the effective weight of soil plus the dead weight of the foundation, divided by an appropriate factor of safety. A maximum total unit weight of 100 pcf should be used for the backfill. This unit weight should be reduced to 40 pcf for portions of the backfill or natural soils below the groundwater elevation.

**Foundation Construction Considerations**

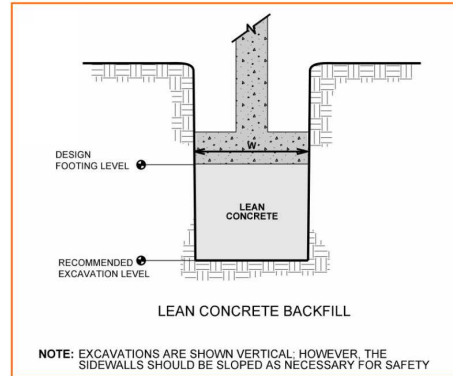
As noted in **Earthwork**, the footing excavations should be evaluated under the direction of the Geotechnical Engineer. The base of all foundation excavations should be free of water and loose soil, prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Care should be taken to prevent wetting or drying of the bearing materials during construction. Excessively wet or dry material or any loose/disturbed material in the bottom of the footing excavations should be removed/reconditioned before foundation concrete is placed.

If unsuitable bearing soils are encountered at the base of the planned footing excavation, the excavation should be extended deeper to suitable soils, and the footings could bear directly on these soils at the lower level or on lean concrete backfill placed in the excavations. This is illustrated on the sketch below.

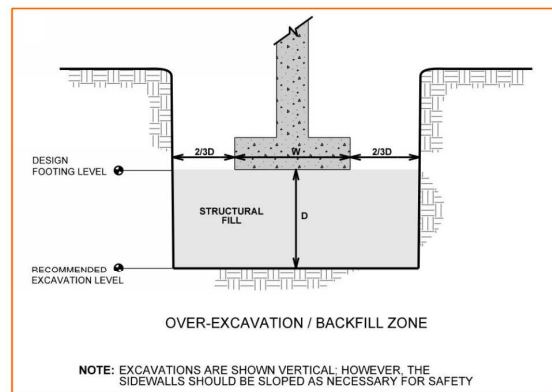
Geotechnical Engineering Report

Highland Elementary School Classroom Addition ■ Sanford, North Carolina

January 7, 2022 ■ Terracon Project No. 70215252



Over-excavation for structural fill placement below footings should be conducted as shown below. The over-excavation should be backfilled up to the footing base elevation, with structural fill placed, as recommended in the **Earthwork** section.

**SEISMIC CONSIDERATIONS**

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. The Site Classification is generally based on the upper 100 feet of the site profile characterized by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7-10. Geophysical surveying of the site using MASW (Multi-Spectral Analysis of Surface Waves) determined a **Seismic Site Classification is D**. Average shear wave velocities were measured between 835 to 928 feet/second.

Geotechnical Engineering Report

Highland Elementary School Classroom Addition ■ Sanford, North Carolina
January 7, 2022 ■ Terracon Project No. 70215252

**FLOOR SLABS**

Design parameters for floor slabs assume the requirements for **Earthwork** have been followed. Specific attention should be given to positive drainage away from the structure and positive drainage of the aggregate base beneath the floor slab.

Floor Slab Design Parameters

| Item | Description |
|--|--|
| Floor Slab Support ¹ | Approved native soils or new engineered fill. |
| Estimated Modulus of Subgrade Reaction ² | 100 pounds per square inch per inch (psi/in) for point loads |
| Stone Base Course / Capillary break | 4 inches of aggregate base course (NCDOT ABC). |

1. Floor slabs should be structurally independent of building footings or walls to reduce the possibility of floor slab cracking caused by differential movements between the slab and foundation.
2. Modulus of subgrade reaction is an estimated value based upon our experience with the subgrade condition, the requirements noted in **Earthwork**, and the floor slab support as noted in this table. It is provided for point loads. For large area loads the modulus of subgrade reaction would be lower.

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Saw-cut control joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations refer to the ACI Design Manual. Joints or cracks should be sealed with a water-proof, non-extruding compressible compound specifically recommended for heavy duty concrete pavement and wet environments.

Where floor slabs are tied to perimeter walls or turn-down slabs to meet structural or other construction objectives, our experience indicates differential movement between the walls and slabs will likely be observed in adjacent slab expansion joints or floor slab cracks beyond the length of the structural dowels. The Structural Engineer should account for potential differential settlement through use of sufficient control joints, appropriate reinforcing or other means.

Settlement of floor slabs supported on existing fill materials cannot be accurately predicted, but could be larger than normal and result in some cracking. Mitigation measures, as noted in **Existing Fill** within **Earthwork**, are critical to the performance of floor slabs. In addition to the

Geotechnical Engineering Report

Highland Elementary School Classroom Addition ■ Sanford, North Carolina
January 7, 2022 ■ Terracon Project No. 70215252



mitigation measures, the floor slab can be stiffened by adding steel reinforcement, grade beams and/or post-tensioned elements.

Floor Slab Construction Considerations

Finished subgrade, within and for at least 10 feet beyond the floor slab, should be protected from traffic, rutting, or other disturbance and maintained in a relatively moist condition until floor slabs are constructed. If the subgrade should become damaged or desiccated prior to construction of floor slabs, the affected material should be removed and structural fill should be added to replace the resulting excavation. Final conditioning of the finished subgrade should be performed immediately prior to placement of the floor slab support course.

The Geotechnical Engineer should approve the condition of the floor slab subgrades immediately prior to placement of the floor slab support course, reinforcing steel, and concrete. Attention should be paid to high traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client, and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Geotechnical Engineering Report

Highland Elementary School Classroom Addition ■ Sanford, North Carolina

January 7, 2022 ■ Terracon Project No. 70215252



Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

FIGURES

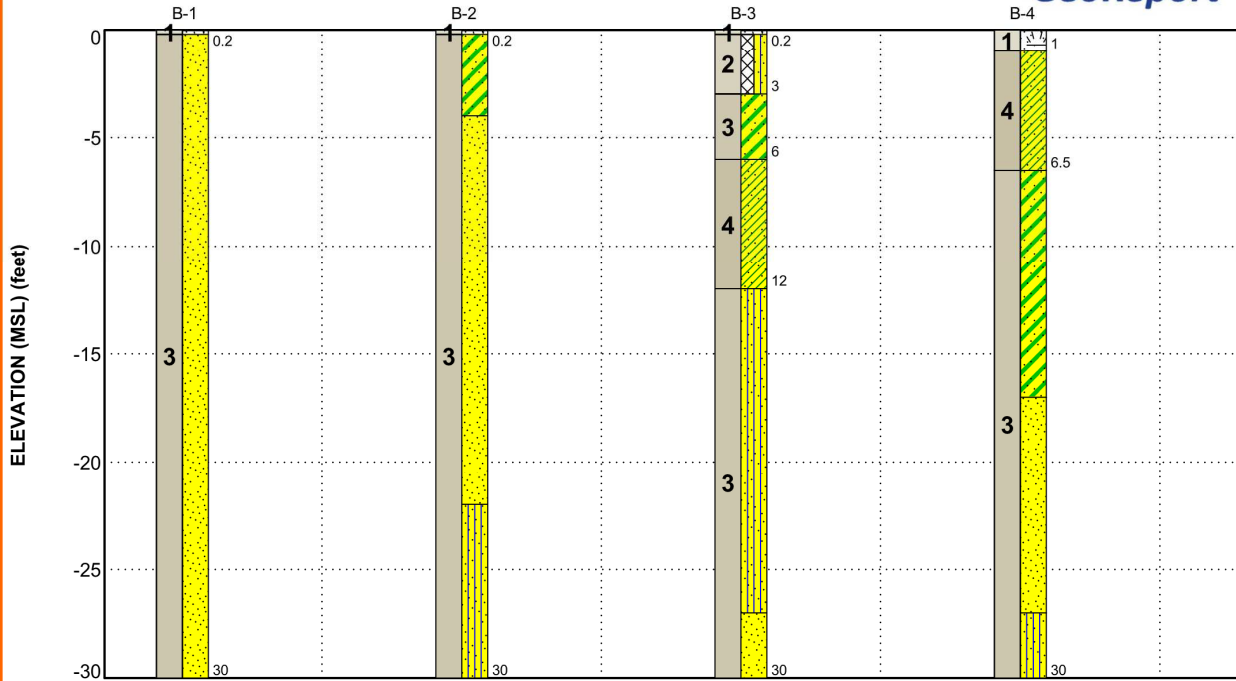
Contents:

GeoModel

Responsive ■ Resourceful ■ Reliable

GEOMODEL

Highland Elementary School - Classroom Addition ■ Sanford, NC
Terracon Project No. 70215252



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

| Model Layer | Layer Name | General Description |
|-------------|---------------------------------------|----------------------------|
| 1 | Topsoil | -- |
| 2 | Fill - Silty SAND | Medium dense |
| 3 | Silty/Clayey SAND, Poorly Graded SAND | Very loose to medium dense |
| 4 | Sandy CLAY | Medium stiff |

LEGEND

- Topsoil
- Silty Sand
- Poorly-graded Sand
- Sandy Lean Clay
- Clayey Sand

NOTES:

Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

ATTACHMENTS

Responsive ■ Resourceful ■ Reliable

Geotechnical Engineering Report

Highland Elementary School Classroom Addition ■ Sanford, North Carolina
January 7, 2022 ■ Terracon Project No. 70215252



EXPLORATION AND TESTING PROCEDURES

Field Exploration

| Number of Borings | Boring Depth (feet) | Planned Location |
|-------------------|---------------------|-------------------|
| 4 | 30 or auger refusal | Building Addition |

Boring Layout and Elevations: Unless otherwise noted, Terracon personnel provided the boring layout. Coordinates were obtained with a handheld GPS unit (estimated horizontal accuracy of about ± 10 feet). Surface elevations were not obtained. If elevations and a more precise boring layout are desired, we recommend borings be surveyed following completion of fieldwork.

Subsurface Exploration Procedures: We advanced the borings with a Geoprobe 6620 DT rotary drill rig using continuous hollow stem augers. Four samples were obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. We observed and recorded groundwater levels during drilling and sampling. For safety purposes, all borings were backfilled with auger cuttings after their completion.

The sampling depths, penetration distances, and other sampling information was recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and classification by a Geotechnical Engineer. Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials encountered during drilling and our interpretation of the subsurface conditions between samples. Final boring logs were prepared from the field logs. The final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Seismic Site Classification

Terracon used a seismic system to perform a seismic site class survey per IBC 2018 (ASCE 7) to aid in determining the shear-wave velocity at the site. We performed two tests at one location on the site.

Geotechnical Engineering Report

Highland Elementary School Classroom Addition ■ Sanford, North Carolina
January 7, 2022 ■ Terracon Project No. 70215252



The seismic survey included:

- For each test, an array of 24 seismic sensors (geophones) were placed in an accessible area using ground plates, spaced 5-feet apart.
- Active (i.e. sledge hammer and strike plate) and passive (ambient vibrational noise) components were collected.
- Data was post-processed off-site to produce a 1-D shear wave profile for each test array.

Analysis - Terracon analyzed and processed the seismic data using a wavefield- transformation data-processing technique and an interactive Rayleigh-wave dispersion- modeling tool. The refraction microtremor method exploits aspects of spectral analysis of surface waves (SASW) and multi- channel analysis of surface waves (MASW) to derive an average shear-wave velocity for the top 100 feet (V_s^{100}).

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests to understand the engineering properties of the various soil strata, as necessary, for this project. Procedural standards noted below are for reference to methodology in general. In some cases, variations to methods were applied because of local practice or professional judgment. Standards noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

- ASTM D2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- ASTM D422 Standard Test Method for Particle-Size Analysis of Soils

The laboratory testing program often included examination of soil samples by an engineer. Based on the material's texture and plasticity, we described and classified the soil samples in accordance with the Unified Soil Classification System.

SITE LOCATION AND EXPLORATION PLANS

Contents:

Site Location Plan (2 pages)

Exploration Plan (2 pages)

Note: All attachments are one page unless noted above.

SITE LOCATION

Highland Elementary School Classroom Addition ■ Sanford, North Carolina
January 7, 2022 ■ Terracon Project No. 70215252

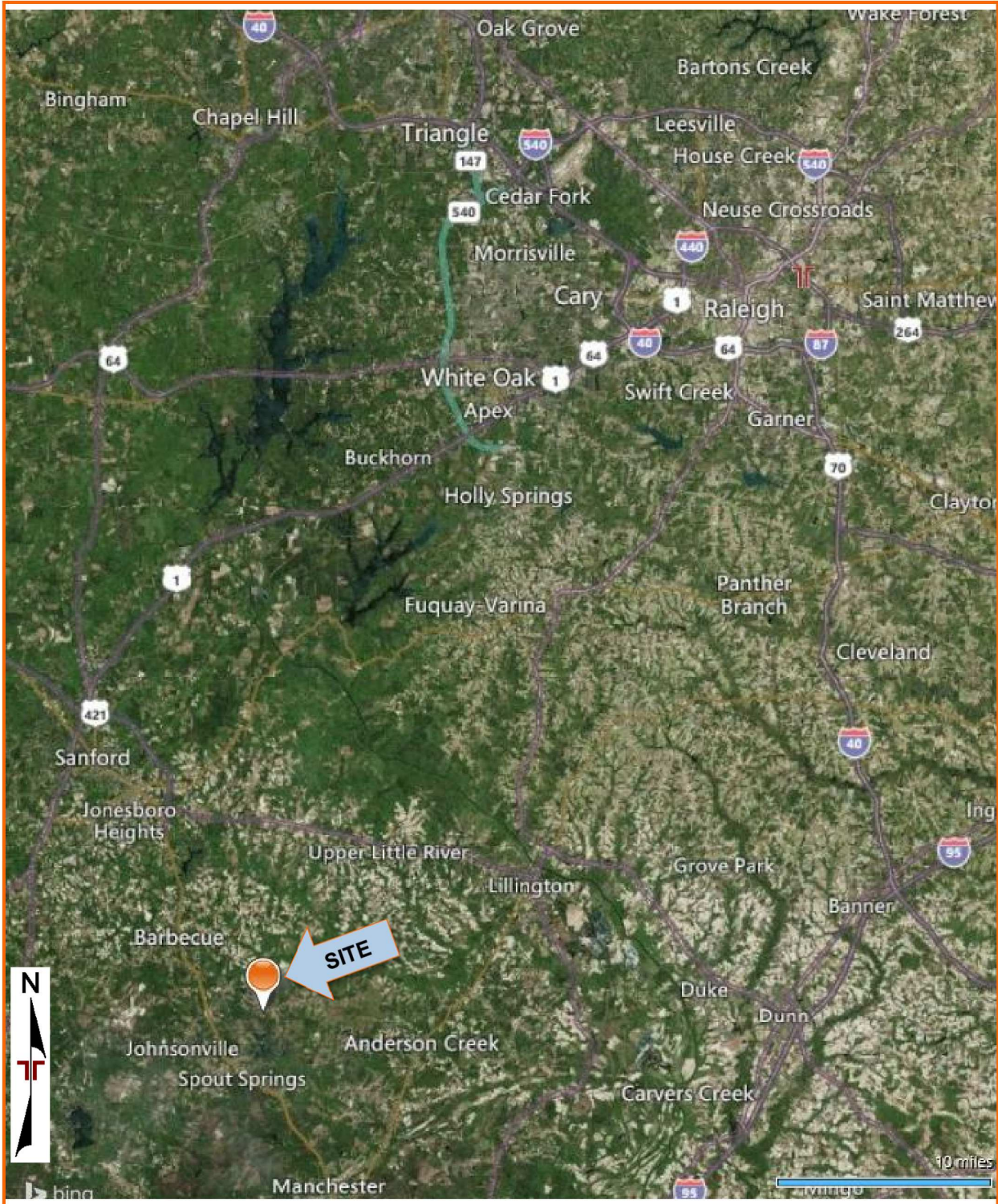
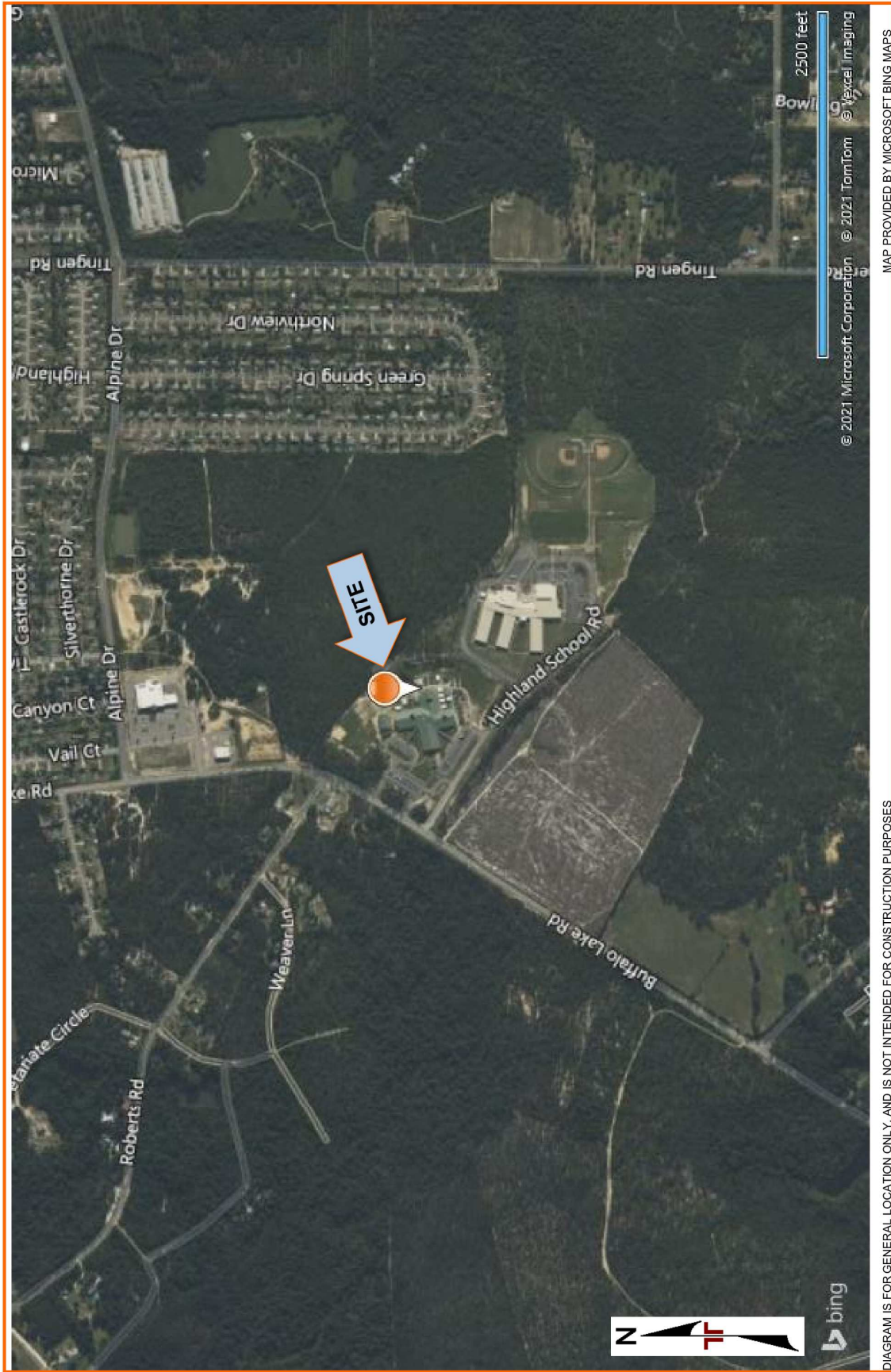


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

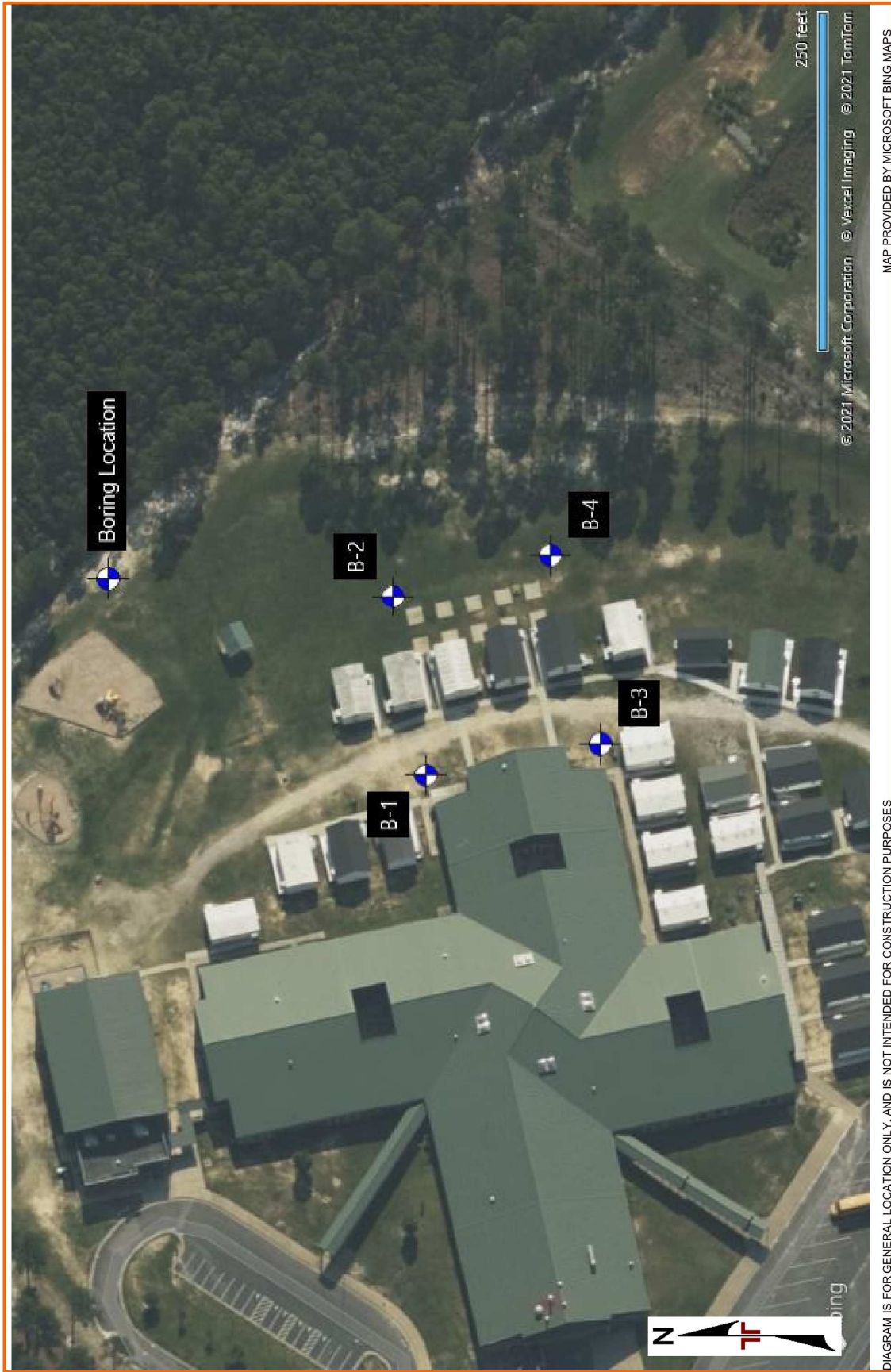


SITE LOCATION
Highland Elementary School Classroom Addition ■ Sanford, North Carolina
January 7, 2022 ■ Terracon Project No. 70215252





EXPLORATION PLAN
Highland Elementary School Classroom Addition ■ Sanford, North Carolina
January 7, 2022 ■ Terracon Project No. 70215252





EXPLORATION PLAN
Highland Elementary School Classroom Addition ■ Sanford, North Carolina
January 7, 2022 ■ Terracon Project No. 70215252



MAP PROVIDED BY MICROSOFT BING MAPS

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

EXPLORATION RESULTS

Contents:

Boring Logs (B-1 through B-5)

Atterberg Limits

Grain Size Distribution

Shear-Wave Velocity (2 pages)

Note: All attachments are one page unless noted above.

BORING LOG NO. B-1

PROJECT: Highland Elementary School - Classroom Addition

CLIENT: Harnett County Schools
Lillington, NC

SITE: 1915 Buffalo Lake Road
Sanford, NC

| MODEL LAYER | GRAPHIC LOG | LOCATION See Exploration Plan Latitude: 35.3066° Longitude: -79.0409° | DEPTH (FT.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | FIELD TEST RESULTS | STRENGTH TEST | | | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS | |
|-------------|-------------|--|-------------|--------------------------|-------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------|--|
| | | | | | | | TEST TYPE | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) | | | LL-PL-PI | |
| | | DEPTH 0.2' TOPSOIL , 2" Topsoil | | | | | | | | | | | |
| | | POORLY GRADED SAND (SP) , fine to medium grained, tan, white and orange, medium dense | | | | 4-5-5 N=10 | | | | | | | |
| | | | 5 | | | 3-5-6 N=11 | | | 2.7 | | | NP | |
| | | | | | | 3-5-6 N=11 | | | | | | | |
| | | | 10 | | | 4-6-8 N=14 | | | | | | | |
| | | | 15 | | | 5-5-5 N=10 | | | | | | | |
| | | | 20 | | | 7-7-8 N=15 | | | | | | | |
| | | | 25 | | | 6-7-9 N=16 | | | | | | | |
| | | | 30 | | | 5-10-11 N=21 | | | | | | | |
| | | Boring Terminated at 30 Feet | | | | | | | | | | | |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
HSA

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS
Groundwater not encountered



Boring Started: 12-14-2021

Boring Completed: 12-14-2021

Drill Rig: Geoprobe 6620 DT

Driller: M. Padgette

Project No.: 70215252

Cave-in observed at a depth of 14 feet.

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEC SMART LOG-NO WELL 70215252 HIGHLAND ELEMENTA.GPJ TERRACON_DATATEMPLATE.GDT 1/17/22

BORING LOG NO. B-2

PROJECT: Highland Elementary School - Classroom Addition

CLIENT: Harnett County Schools
Lillington, NC

SITE: 1915 Buffalo Lake Road
Sanford, NC

| MODEL LAYER | GRAPHIC LOG | LOCATION See Exploration Plan Latitude: 35.3066° Longitude: -79.0405° | DEPTH (FT.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | FIELD TEST RESULTS | STRENGTH TEST | | | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS | |
|-------------------------------------|-------------|--|-------------|--------------------------|-------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------|--|
| | | | | | | | TEST TYPE | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) | | | LL-PL-PI | |
| | | TOPSOIL , 2" Topsoil | 0.2 | | | | | | | | | | |
| | | CLAYEY SAND (SC) , fine to medium grained, brown, loose | 4.0 | | | 5-3-4 N=7 | | | | | | | |
| | | POORLY GRADED SAND (SP) , fine to medium grained, tan and white, loose to medium dense | 5.0 | | | 3-2-5 N=7 | | | | | | | |
| | | | 10.0 | | | 3-5-5 N=10 | | | | | | | |
| | | | 11.8 | | | 3-5-6 N=11 | | | | | | | |
| | | | 15.0 | | | 5-6-9 N=15 | | | | | | | |
| | | | 20.0 | | | 5-5-6 N=11 | | | | | | | |
| | | SILTY SAND (SM) , fine to medium grained, tan, orange and light gray, loose to medium dense | 22.0 | | | 5-3-5 N=8 | | | | | | | |
| | | | 30.0 | | | 3-4-6 N=10 | | | | | | | |
| Boring Terminated at 30 Feet | | | | | | | | | | | | | |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
HSA

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS
Groundwater not encountered



Boring Started: 12-14-2021

Boring Completed: 12-14-2021

Drill Rig: Geoprobe 6620 DT

Driller: M. Padgette

Project No.: 70215252

Cave-in observed at a depth of 11.8 feet.

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEC SMART LOG-NO WELL 70215252 HIGHLAND ELEMENTA.GPJ TERRACON_DATATEMPLATE.GDT 1/7/22

BORING LOG NO. B-3

PROJECT: Highland Elementary School - Classroom Addition

CLIENT: Harnett County Schools
Lillington, NC

SITE: 1915 Buffalo Lake Road
Sanford, NC

| MODEL LAYER | GRAPHIC LOG | LOCATION See Exploration Plan Latitude: 35.3062° Longitude: -79.0408° | DEPTH (FT.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | FIELD TEST RESULTS | STRENGTH TEST | | | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS LL-PL-PI |
|-------------|-------------|---|-------------|--------------------------|-------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------------------|
| | | | | | | | TEST TYPE | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) | | | |
| 1 | | TOPSOIL , 2" Topsoil | 0.2 | | | | | | | | | |
| 2 | | FILL - SILTY SAND (SM) , fine to medium grained, red, medium dense | 3.0 | | | 6-7-8 N=15 | | | 12.9 | | 34-24-10 | |
| 3 | | CLAYEY SAND (SC) , fine to medium grained, tan and orange, medium dense | 6.0 | | | 10-7-11 N=18 | | | | | | |
| 4 | | SANDY LEAN CLAY (CL) , tan, orange and light gray, stiff to medium stiff | 12.0 | | | 3-4-5 N=9 | | | | | | |
| | | | | | | 3-4-4 N=8 | | | | | | |
| | | SILTY SAND (SM) , fine to medium grained, tan, white and orange, loose to medium dense | 16.9 | | | 2-4-9 N=13 | | | | | | |
| | | | | | | 2-3-6 N=9 | | | | | | |
| | | | | | | 4-6-6 N=12 | | | | | | |
| | | POORLY GRADED SAND (SP) , fine to medium grained, tan, medium dense | 27.0 | | | 7-11-12 N=23 | | | | | | |
| | | Boring Terminated at 30 Feet | 30.0 | | | | | | | | | |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
HSA

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS
Groundwater not encountered



Boring Started: 12-14-2021

Boring Completed: 12-14-2021

Drill Rig: Geoprobe 6620 DT

Driller: M. Padgette

Project No.: 70215252

Cave-in observed at a depth of 16.9 feet.

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEC SMART LOG-NO WELL 70215252 HIGHLAND ELEMENTA.GPJ TERRACON_DATATEMPLATE.GDT 1/7/22

BORING LOG NO. B-4

PROJECT: Highland Elementary School - Classroom Addition

CLIENT: Harnett County Schools
Lillington, NC

SITE: 1915 Buffalo Lake Road
Sanford, NC

| MODEL LAYER | GRAPHIC LOG | LOCATION See Exploration Plan Latitude: 35.3063° Longitude: -79.0404° | DEPTH (FT.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | FIELD TEST RESULTS | STRENGTH TEST | | | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS LL-PL-PI |
|-------------|-------------|--|-------------|--------------------------|-------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------------------|
| | | | | | | | TEST TYPE | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) | | | |
| 1 | | TOPSOIL , 12" Topsoil | 1.0 | | | | | | | | | |
| 4 | | SANDY LEAN CLAY (CL) , gray to tan and orange, medium stiff | | | X | 4-4-4 N=8 | | | | 22.5 | | 38-22-16 |
| | | | 5 | | X | 2-3-5 N=8 | | | | | | |
| | | | 10 | | X | 3-4-5 N=9 | | | | | | |
| | | | 15 | | X | 3-2-3 N=5 | | | | | | |
| 3 | | POORLY GRADED SAND (SP) , fine to medium grained, brown to white, loose | | | X | 2-2-2 N=4 | | | | | | |
| | | | 20 | | X | 5-3-2 N=5 | | | | | | |
| | | | 25 | | X | 3-2-2 N=4 | | | | | | |
| | | SILTY SAND (SM) , fine to medium grained, brown and tan, loose | 27.0 | | | | | | | | | |
| | | Boring Terminated at 30 Feet | 30.0 | | | | | | | | | |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
HSA

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS
Groundwater not encountered



Boring Started: 12-14-2021

Boring Completed: 12-14-2021

Drill Rig: Geoprobe 6620 DT

Driller: M. Padgette

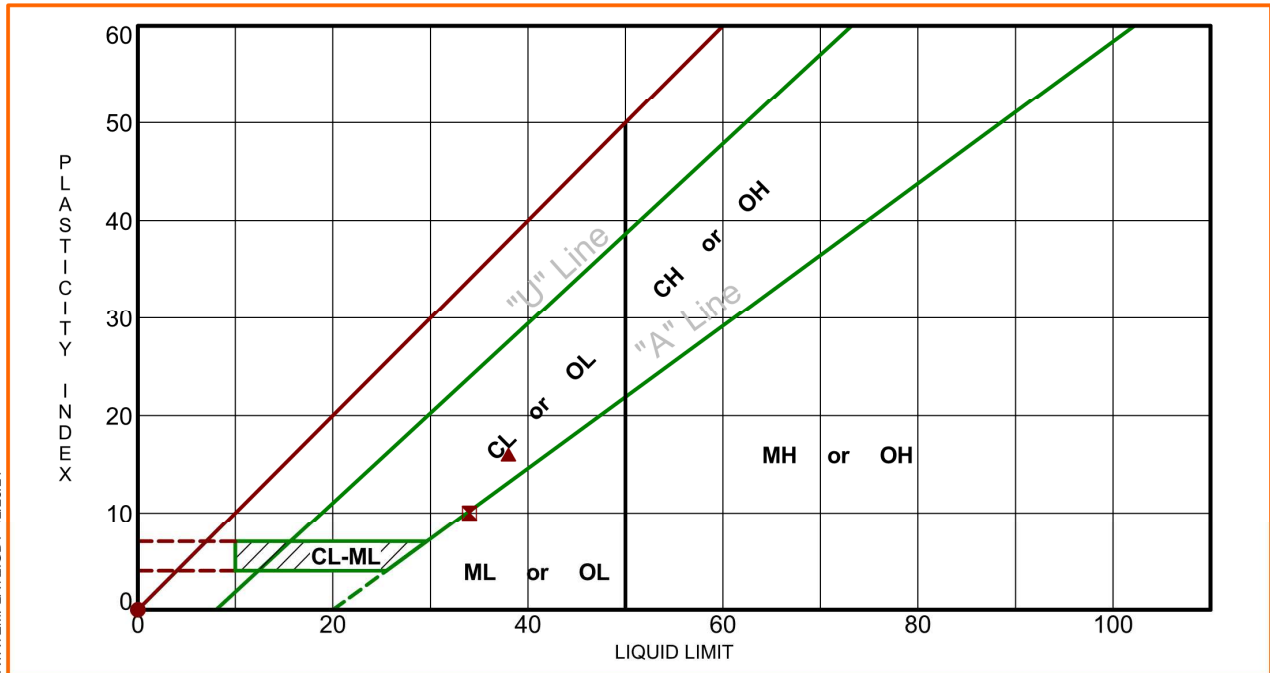
Project No.: 70215252

Cave-in observed at a depth of 15 feet.

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEC SMART LOG-NO WELL 70215252 HIGHLAND ELEMENTA.GPJ TERRACON_DATATEMPLATE.GDT 1/7/22

ATTERBERG LIMITS RESULTS

ASTM D4318



| Boring ID | Depth | LL | PL | PI | Fines | USCS | Description |
|-----------|---------|----|----|----|-------|------|--------------------|
| ● B-1 | 3.5 - 5 | NP | NP | NP | 1.9 | SP | POORLY GRADED SAND |
| ☒ B-3 | 1 - 2.5 | 34 | 24 | 10 | 20.6 | SM | SILTY SAND |
| ▲ B-4 | 1 - 2.5 | 38 | 22 | 16 | 50.9 | CL | SANDY LEAN CLAY |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ATTERBERG LIMITS 70215252-HIGHLAND ELEMENTARY.GPJ TERRACON DATATEMPLATE.GDT 12/28/21

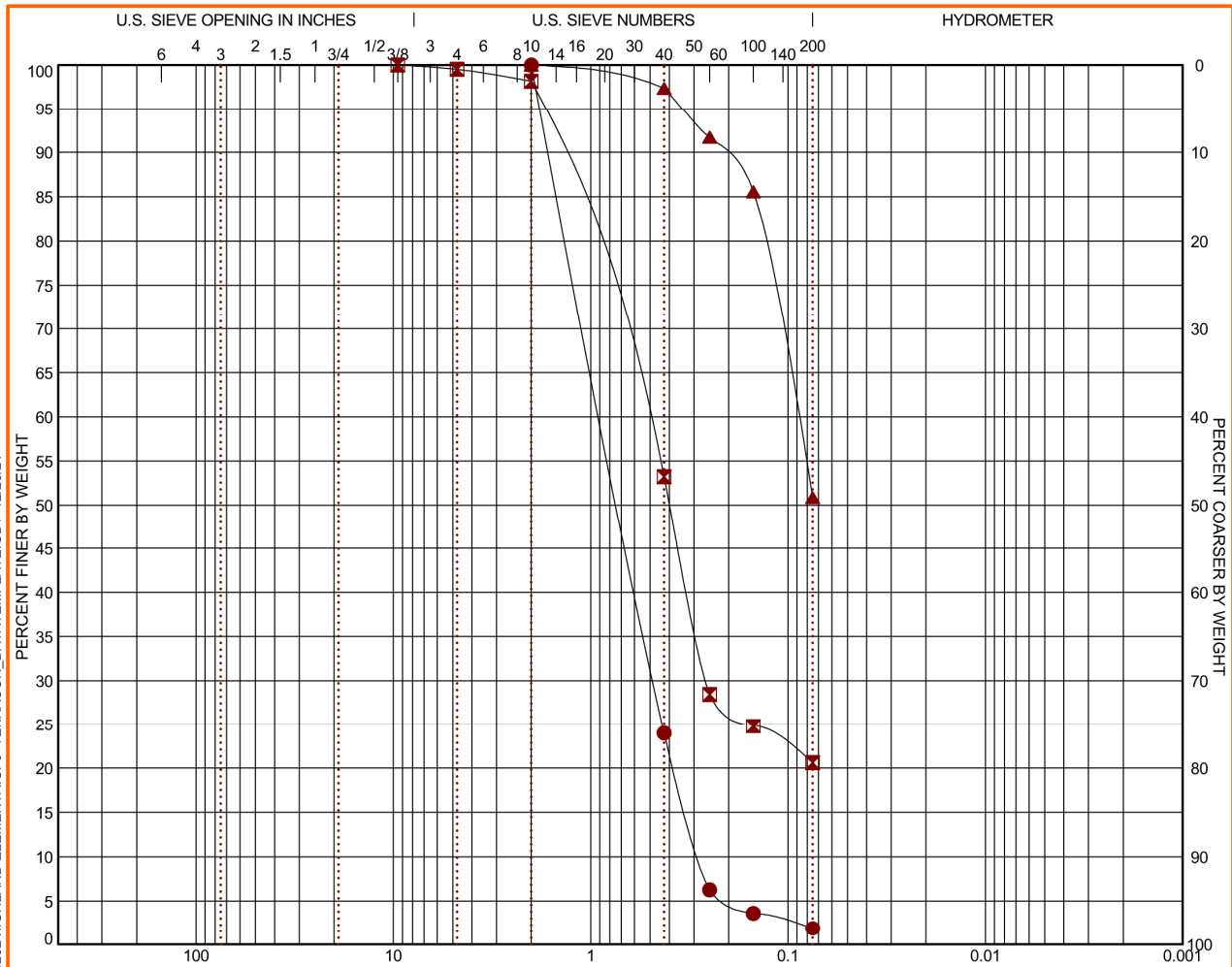
PROJECT: Highland Elementary School - Classroom Addition
SITE: 2626 Ray Road, Spring Lake, NC



PROJECT NUMBER: 70215252
CLIENT: Harnett County Schools, Lillington, NC

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 70215252 HIGHLAND ELEMENTA.GPJ TERRACON_DATATEMPLATE.GDT 12/28/21

| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---------|--------|------|--------|--------|------|--------------|
| | coarse | fine | coarse | medium | fine | |

| BORING ID | DEPTH | % COBBLES | % GRAVEL | % SAND | % SILT | % FINES | % CLAY | USCS |
|-----------|---------|-----------|----------|--------|--------|---------|--------|------|
| ● B-1 | 3.5 - 5 | 0.0 | 0.0 | 98.1 | | 1.9 | | SP |
| ☒ B-3 | 1 - 2.5 | 0.0 | 0.5 | 78.9 | | 20.6 | | SM |
| ▲ B-4 | 1 - 2.5 | 0.0 | 0.0 | 49.1 | | 50.9 | | CL |

| GRAIN SIZE | | | | SOIL DESCRIPTION | | | | | | |
|-----------------|-------|---------|-------|------------------|-------|---------|-------|---------|-------|---------|
| | ● | ☒ | ▲ | ● | | ☒ | | ▲ | | |
| | Sieve | % Finer | Sieve | % Finer | Sieve | % Finer | Sieve | % Finer | Sieve | % Finer |
| D ₆₀ | 0.885 | 0.536 | 0.09 | #10 | 100.0 | 3/8" | 100.0 | #10 | 100.0 | |
| D ₅₀ | 0.481 | 0.258 | | #40 | 23.97 | #4 | 99.52 | #40 | 97.36 | |
| D ₁₀ | 0.279 | | | #60 | 6.29 | #10 | 98.16 | #60 | 91.7 | |
| | | | | #100 | 3.63 | #40 | 53.25 | #100 | 85.56 | |
| | | | | #200 | 1.88 | #60 | 28.44 | #200 | 50.87 | |
| | | | | | | #100 | 24.81 | | | |
| | | | | | | #200 | 20.59 | | | |

| COEFFICIENTS | | | |
|----------------|------|---|---|
| | ● | ☒ | ▲ |
| C _c | 0.93 | | |
| C _u | 3.17 | | |

| REMARKS |
|---------------------------|
| ● POORLY GRADED SAND (SP) |
| ☒ SILTY SAND (SM) |
| ▲ SANDY LEAN CLAY (CL) |
| |
| |
| |

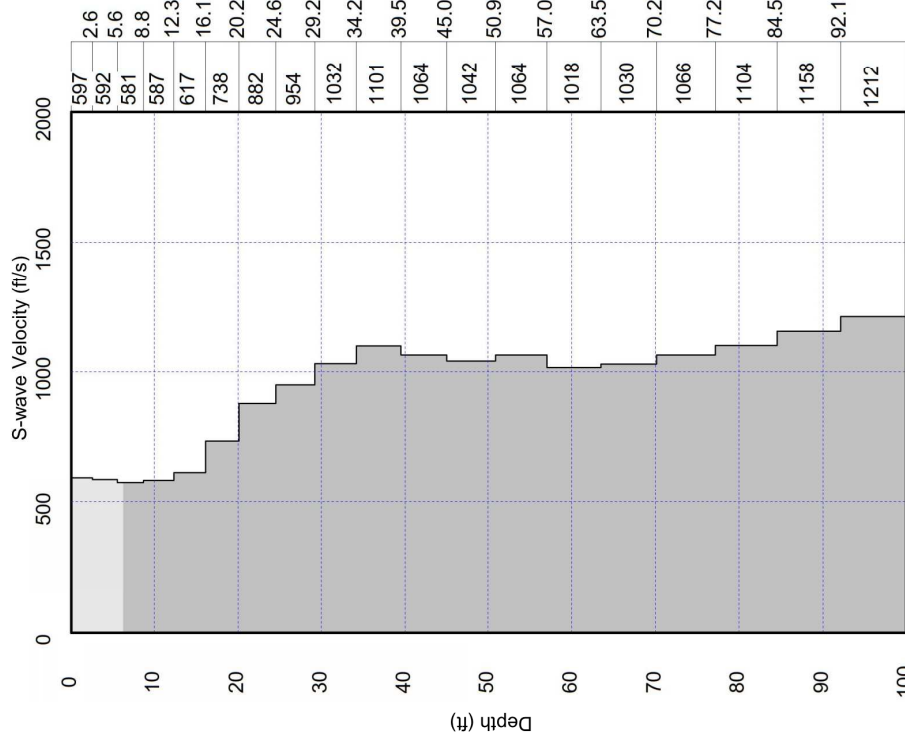
| | | |
|--|---|--|
| PROJECT: Highland Elementary School - Classroom Addition |  2401 Brentwood Rd Ste 107 Raleigh, NC | PROJECT NUMBER: 70215252 |
| SITE: 2626 Ray Road Spring Lake, NC | | CLIENT: Harnett County Schools Lillington, NC |



Exploration Results

Highland Elementary
Terracon Project No. 70215252

Array 1



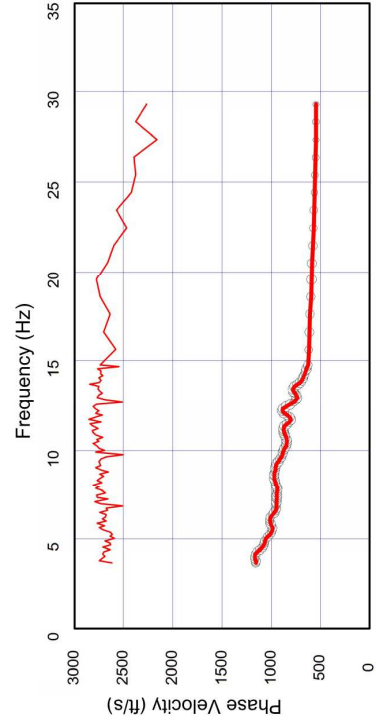
Average Weighted Shear Wave Velocity (ft/s)^{1/2} = **928**

Seismic Site Classification¹ = **D**

1. per 2018 International Building Code

2. measured between 0 ft and 100 ft.

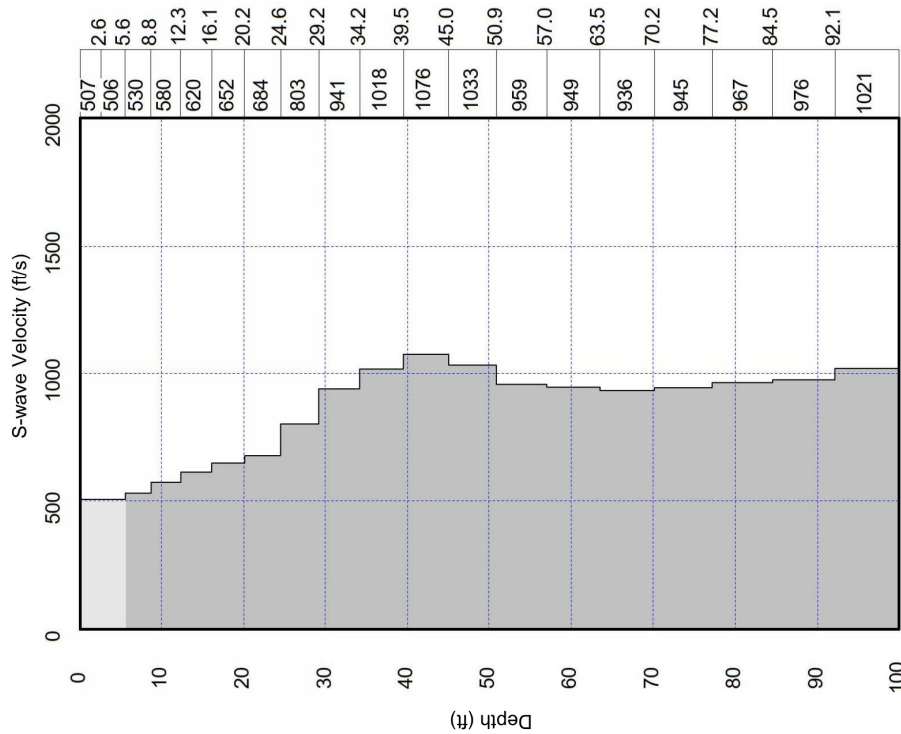
| Depth(ft) | S-wave velocity(ft/s) |
|-----------|-----------------------|
| 0.0 | 597.2 |
| 2.6 | 592.1 |
| 5.6 | 581.7 |
| 8.8 | 587.3 |
| 12.3 | 617.3 |
| 16.1 | 738.7 |
| 20.2 | 882.9 |
| 24.6 | 954.3 |
| 29.2 | 1032.8 |
| 34.2 | 1101.6 |
| 39.5 | 1064.9 |
| 45.0 | 1042.9 |
| 50.9 | 1064.9 |
| 57.0 | 1018.8 |
| 63.5 | 1030.4 |
| 70.2 | 1066.5 |
| 77.2 | 1104.1 |
| 84.5 | 1158.7 |
| 92.1 | 1212.3 |
| 100.0 | 1298.0 |





Array 2

Exploration Results
Highland Elementary
Terracon Project No. 70215252

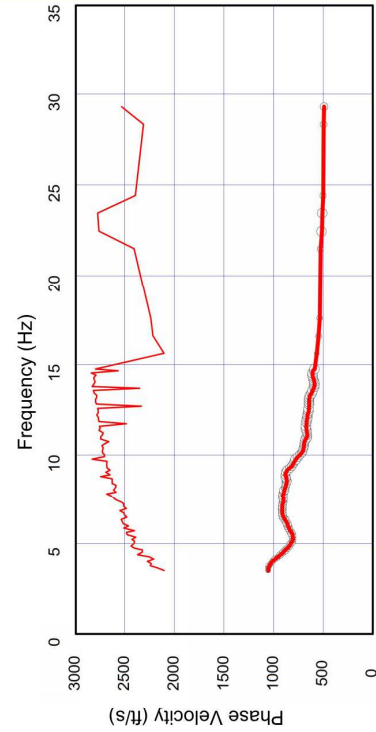


Average Weighted Shear Wave Velocity (ft/s)^{1/2} = **835**

Seismic Site Classification¹ = **D**

1. per 2018 International Building Code
2. measured between 0 ft and 100 ft.

| Depth(ft) | S-wave velocity(ft/s) |
|-----------|-----------------------|
| 0.0 | 507.6 |
| 2.6 | 506.7 |
| 5.6 | 530.7 |
| 8.8 | 580.1 |
| 12.3 | 620.4 |
| 16.1 | 652.4 |
| 20.2 | 684.0 |
| 24.6 | 803.9 |
| 29.2 | 941.5 |
| 34.2 | 1018.2 |
| 39.5 | 1076.5 |
| 45.0 | 1033.8 |
| 50.9 | 959.0 |
| 57.0 | 949.4 |
| 63.5 | 936.5 |
| 70.2 | 945.4 |
| 77.2 | 967.5 |
| 84.5 | 976.6 |
| 92.1 | 1021.5 |
| 100.0 | 1150.7 |



SUPPORTING INFORMATION

Contents:





General Notes

Unified Soil Classification System

Note: All attachments are one page unless noted above.

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

| | | | | | | |
|-----------------|---|--------------------|--|--------------------|--|---|
| SAMPLING |  Split Spoon | WATER LEVEL |  Water Initially Encountered  Water Level After a Specified Period of Time  Water Level After a Specified Period of Time Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations. | FIELD TESTS | | N Standard Penetration Test Resistance (Blows/Ft.) (HP) Hand Penetrometer (T) Torvane (DCP) Dynamic Cone Penetrometer (PID) Photo-Ionization Detector (OVA) Organic Vapor Analyzer |
|-----------------|---|--------------------|--|--------------------|--|---|

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

| STRENGTH TERMS | RELATIVE DENSITY OF COARSE-GRAINED SOILS <small>(More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance</small> | | CONSISTENCY OF FINE-GRAINED SOILS <small>(50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance</small> | | |
|----------------|---|---|---|---|---|
| | Descriptive Term (Density) | Standard Penetration or N-Value Blows/Ft. | Descriptive Term (Consistency) | Unconfined Compressive Strength Qu, (psf) | Standard Penetration or N-Value Blows/Ft. |
| | Very Loose | 0 - 3 | Very Soft | less than 500 | 0 - 1 |
| | Loose | 4 - 9 | Soft | 500 to 1,000 | 2 - 4 |
| | Medium Dense | 10 - 29 | Medium Stiff | 1,000 to 2,000 | 4 - 8 |
| | Dense | 30 - 50 | Stiff | 2,000 to 4,000 | 8 - 15 |
| | Very Dense | > 50 | Very Stiff | 4,000 to 8,000 | 15 - 30 |
| | | | Hard | > 8,000 | > 30 |

RELATIVE PROPORTIONS OF SAND AND GRAVEL

| Descriptive Term(s) of other constituents | Percent of Dry Weight |
|---|-----------------------|
| Trace | < 15 |
| With | 15 - 29 |
| Modifier | > 30 |

GRAIN SIZE TERMINOLOGY

| Major Component of Sample | Particle Size |
|---------------------------|--------------------------------------|
| Boulders | Over 12 in. (300 mm) |
| Cobbles | 12 in. to 3 in. (300mm to 75mm) |
| Gravel | 3 in. to #4 sieve (75mm to 4.75 mm) |
| Sand | #4 to #200 sieve (4.75mm to 0.075mm) |
| Silt or Clay | Passing #200 sieve (0.075mm) |

RELATIVE PROPORTIONS OF FINES

| Descriptive Term(s) of other constituents | Percent of Dry Weight |
|---|-----------------------|
| Trace | < 5 |
| With | 5 - 12 |
| Modifier | > 12 |

PLASTICITY DESCRIPTION

| Term | Plasticity Index |
|-------------|------------------|
| Non-plastic | 0 |
| Low | 1 - 10 |
| Medium | 11 - 30 |
| High | > 30 |

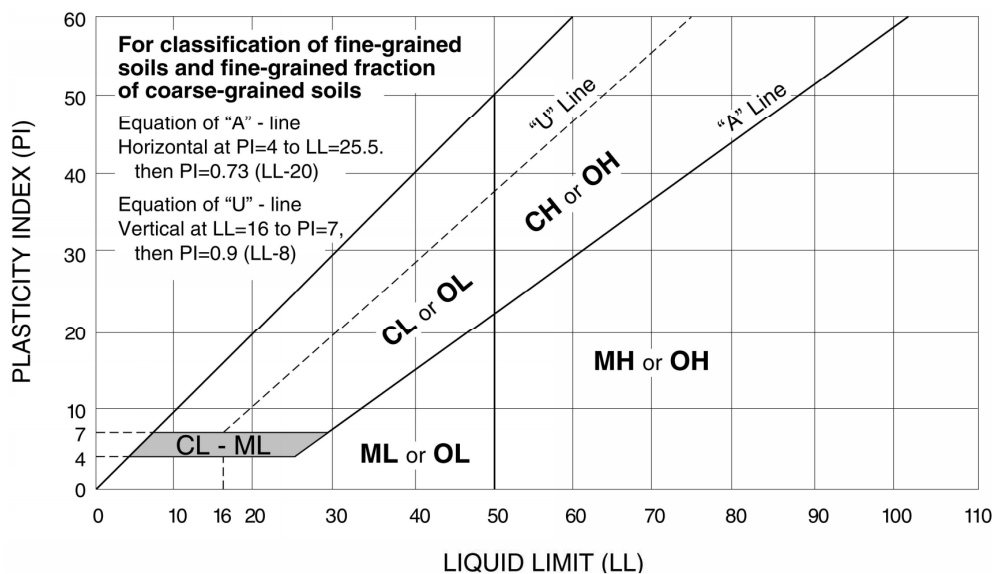


UNIFIED SOIL CLASSIFICATION SYSTEM

| Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^A | | | | Soil Classification | | | | |
|--|---|--|---|---------------------|-----------------------------------|---------------------------------|------|--|
| | | | | Group Symbol | Group Name ^D | | | |
| Coarse Grained Soils: More than 50% retained on No. 200 sieve | Gravels: More than 50% of coarse fraction retained on No. 4 sieve | Clean Gravels: Less than 5% fines ^C | $Cu \geq 4$ and $1 \leq Cc \leq 3$ ^E | GW | Well-graded gravel ^F | | | |
| | | Gravels with Fines: More than 12% fines ^C | $Cu < 4$ and/or $1 > Cc > 3$ ^E | GP | Poorly graded gravel ^F | | | |
| | Sands: 50% or more of coarse fraction passes No. 4 sieve | Clean Sands: Less than 5% fines ^D | Fines classify as ML or MH | GM | Silty gravel ^{F,G,H} | | | |
| | | | Fines classify as CL or CH | GC | Clayey gravel ^{F,G,H} | | | |
| | | Sands with Fines: More than 12% fines ^D | $Cu \geq 6$ and $1 \leq Cc \leq 3$ ^E | SW | Well-graded sand ^I | | | |
| | | | $Cu < 6$ and/or $1 > Cc > 3$ ^E | SP | Poorly graded sand ^I | | | |
| Fine-Grained Soils: 50% or more passes the No. 200 sieve | Silts and Clays: Liquid limit less than 50 | Inorganic: | $PI > 7$ and plots on or above "A" line ^J | CL | Lean clay ^{K,L,M} | | | |
| | | | $PI < 4$ or plots below "A" line ^J | ML | Silt ^{K,L,M} | | | |
| | | Organic: | Liquid limit - oven dried | < 0.75 | OL | Organic clay ^{K,L,M,N} | | |
| | | | Liquid limit - not dried | | | Organic silt ^{K,L,M,O} | | |
| | Silts and Clays: Liquid limit 50 or more | Inorganic: | PI plots on or above "A" line | CH | Fat clay ^{K,L,M} | | | |
| | | | PI plots below "A" line | MH | Elastic Silt ^{K,L,M} | | | |
| | | Organic: | Liquid limit - oven dried | < 0.75 | OH | Organic clay ^{K,L,M,P} | | |
| | | | Liquid limit - not dried | | | Organic silt ^{K,L,M,Q} | | |
| | | | Highly organic soils: | | | PT | Peat | |
| | | | Primarily organic matter, dark in color, and organic odor | | | | | |

- ^A Based on the material passing the 3-in. (75-mm) sieve
- ^B If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
- ^C Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
- ^D Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay
- ^E $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
- ^F If soil contains $\geq 15\%$ sand, add "with sand" to group name.
- ^G If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

- ^H If fines are organic, add "with organic fines" to group name.
- ^I If soil contains $\geq 15\%$ gravel, add "with gravel" to group name.
- ^J If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
- ^K If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
- ^L If soil contains $\geq 30\%$ plus No. 200 predominantly sand, add "sandy" to group name.
- ^M If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.
- ^N $PI \geq 4$ and plots on or above "A" line.
- ^O $PI < 4$ or plots below "A" line.
- ^P PI plots on or above "A" line.
- ^Q PI plots below "A" line.





Geotechnical Engineering Report

**Overhills Elementary School Classroom Addition
Spring Lake, North Carolina**

January 7, 2022

Terracon Project No. 70215251

Prepared for:

Harnett County Schools
Lillington, North Carolina

Prepared by:

Terracon Consultants, Inc.
Raleigh, North Carolina



January 7, 2022

Harnett County Schools
1008 S. 11th Street
Lillington, North Carolina 27546



Attn: Mr. Steve Matthews
P: (910) 893 4808
E: smatthews@harnett.k12.nc.us

Re: Geotechnical Engineering Report
Overhills Elementary School Classroom Addition
2626 Ray Road
Spring Lake, North Carolina
Terracon Project No. 70215251

Dear Mr. Matthews:

We have completed the Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. P70215193 dated September 29, 2021. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations and floor slabs for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

Hugo Santana, PE
Geotechnical Staff Engineer
Registered, NC 047922



Santana, Hugo
Jan 7 2022 11:25 AM

Nash, Andrew A.
Jan 7 2022 12:16 PM

Andrew A. Nash, PE
Geotechnical Department Manager
Registered, NC 031022

REPORT TOPICS

INTRODUCTION..... 1

SITE CONDITIONS..... 1

PROJECT DESCRIPTION 2

GEOTECHNICAL CHARACTERIZATION..... 2

GEOTECHNICAL OVERVIEW 3

EARTHWORK..... 4

SHALLOW FOUNDATIONS 8

SEISMIC CONSIDERATIONS 11

FLOOR SLABS..... 11

GENERAL COMMENTS..... 13

FIGURES 15

ATTACHMENTS..... 16

Note: This report was originally delivered in a web-based format. For more interactive features, please view your project online at client.terracon.com.

ATTACHMENTS

- EXPLORATION AND TESTING PROCEDURES
- SITE LOCATION AND EXPLORATION PLANS
- EXPLORATION RESULTS
- SUPPORTING INFORMATION

Note: Refer to each individual Attachment for a listing of contents.

Geotechnical Engineering Report

Overhills Elementary School Classroom Addition ■ Spring Lake, North Carolina
January 7, 2022 ■ Terracon Project No. 70215251

**REPORT SUMMARY**

Terracon has completed the geotechnical engineering report for the proposed Classroom Addition project located at Overhills Elementary School in Spring Lake, North Carolina. A total of four (4) soil test borings were performed in the proposed construction areas. The following geotechnical considerations were identified:

- Generally, the site appears suitable for the proposed construction provided the subgrade is prepared and tested as described in this report. The soils at the site consist of very loose to medium dense sand soils interlaid with medium stiff sandy clay soils.
- The near surface soils moisture sensitive and could become unstable, especially after precipitation events, as well as with typical earthwork and construction traffic. The effective drainage should be completed early in the construction sequence and maintained after construction to avoid potential issues. If possible, the grading should be performed during the warmer and drier times of the year. If grading is performed during the winter months, an increased risk for possible undercutting and replacement of unstable subgrade will persist. Additional site preparation recommendations, including subgrade improvement and fill placement, are provided in the Earthwork section.
- Shallow foundations bearing on properly prepared and approved native soils or engineered fill can be designed with an allowable soil bearing pressure of 3,000 pounds per square foot (psf).
- Groundwater was encountered in all test borings at depths of 14 to 23.5 feet below ground surface during our field exploration. Cave-in depths were measured between 15.3 and 18.1 feet in depth in the test locations. We do not anticipate that groundwater will impact site development.
- An ASCE Chapter 20 seismic site classification of "C" is appropriate for this site.
- The geotechnical engineer should be retained during the construction phase of the project to observe earthwork and to perform necessary tests and observations during subgrade preparation; proof-rolling; placement and compaction of controlled compacted fills and backfilling of excavations into the completed subgrade.

This summary should be used in conjunction with the entire report for design purposes. It should be recognized that details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein. The section titled **General Comments** should be read for an understanding of the report limitations.

Geotechnical Engineering Report
Overhills Elementary School Classroom Addition
2626 Ray Road
Spring Lake, North Carolina
Terracon Project No. 70215251
January 7, 2022

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed Classroom Addition to be located at Overhills Elementary School at 2626 Ray Road in Spring Lake, North Carolina. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Site preparation and earthwork
- Excavation considerations
- Foundation design and construction
- Floor slab design and construction
- Seismic site classification per IBC

The geotechnical engineering Scope of Services for this project included the advancement of four (4) test borings to depths of approximately 30 feet below existing site grades.

Maps showing the site and boring locations are shown in the **Site Location** and **Exploration Plan** sections, respectively. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included on the boring logs and/or as separate graphs in the **Exploration Results** section.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

| Item | Description |
|---------------------------|--|
| Parcel Information | The project is located at the existing Overhills Elementary School at 2626 Ray Road in Spring Lake, North Carolina. Approximate site coordinates: 35.2469, Latitude; -78.9656 Longitude See Site Location |

Geotechnical Engineering Report

Overhills Elementary School Classroom Addition ■ Spring Lake, North Carolina
January 7, 2022 ■ Terracon Project No. 70215251



| Item | Description |
|------------------------------|---|
| Existing Improvements | The existing elementary school is a single-story, masonry-block and brick structure with slabs-on-grade. Site improvements include paved parking and drop-off loop, several modular classroom buildings, playgrounds and perimeter fencing. |
| Current Ground Cover | Mixture of grass, gravel access road and landscaping materials. |
| Existing Topography | The site appears to be relatively flat. |
| Geology | The project site is located in the Coastal Plain physiographic province of North Carolina. The Coastal Plain consists mainly of alluvial and marine deposits of sand, silt and clay placed during periods of fluctuating shorelines. According to the 1998 Geologic Map of North Carolina, the site is underlain by the Middendorf Formation (Cretaceous) and the Pinehurst Formation (Tertiary). |

PROJECT DESCRIPTION

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

| Item | Description |
|---------------------------------|--|
| Information Provided | Project information was provided via email correspondence and the following documents: <ul style="list-style-type: none"> ■ Emails dated from March 2021 ■ HCS – Add_Reno – REQUEST FOR PROPOSAL – GEOTECHNICAL 2021.07.27 ■ HCS – RFP – Boring Maps – 2021.07.26 |
| Project Description | We understand that the project will include a new classroom addition. |
| Proposed Structures | The buildings are assumed to be slab-on-grade (non-basement) and masonry or steel framed. |
| Finished Floor Elevation | Not provided but assumed to match the existing building's FFE. |
| Maximum Loads | <ul style="list-style-type: none"> ■ Columns: 50 kips ■ Walls: 1 to 3 kips per linear foot (klf) |
| Grading/Slopes | Based on the existing grading we assume cut/fill of less than 5 feet. |
| Pavements | Pavements for the school addition are not anticipated. |

GEOTECHNICAL CHARACTERIZATION

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of

Geotechnical Engineering Report

Overhills Elementary School Classroom Addition ■ Spring Lake, North Carolina
January 7, 2022 ■ Terracon Project No. 70215251



the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of site preparation and foundation options. Conditions encountered at each exploration point are indicated on the individual logs. The individual logs can be found in the **Exploration Results** section and the GeoModel can be found in the **Figures** section of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

| Model Layer | Layer Name | General Description |
|-------------|--|----------------------------|
| 1 | Fill - Silty SAND | Medium dense |
| 2 | Silty/Clayey SAND and Poorly Graded SAND | Very loose to medium dense |
| 3 | Sandy CLAY | Medium stiff |

Groundwater

Groundwater was encountered in all test borings at depths of 14 to 23.5 feet below ground surface during our field exploration. Cave-in depths were measured between 15.3 and 18.1 feet in depth in the test locations.

The groundwater level can change due to seasonal variations in the amount of rainfall, runoff, lower permeability of the soil, and other factors not evident at the time of our exploration. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

GEOTECHNICAL OVERVIEW

The borings encountered very loose to medium dense silty/clayey sand with some medium stiff sandy clay soils found deeper. These materials, are generally suitable for construction of the proposed foundations and slabs following site preparation according to the recommendations provided in the **Site Preparation** section.

The near surface soils are expected to be suitable for foundation, slab and pavement support after performing remedial earthwork. We recommend in-place compaction using a medium to heavy weight vibratory sheepsfoot roller to densify the loose near surface sand. The near surface soils could become unstable, especially after precipitation events, as well as with typical earthwork and construction traffic. The effective drainage should be completed early in the construction sequence and maintained after construction to avoid potential issues. If possible, the grading should be performed during the warmer and drier times of the year. If grading is performed during the winter months, an increased risk for possible undercutting and replacement of unstable subgrade will

Geotechnical Engineering Report

Overhills Elementary School Classroom Addition ■ Spring Lake, North Carolina
January 7, 2022 ■ Terracon Project No. 70215251



persist. Additional site preparation recommendations, including subgrade improvement and fill placement, are provided in the Earthwork section.

We recommend identifying remaining soft/loose areas following vibratory rolling by performing proofrolling with a loaded tandem-axle truck. Areas exhibiting excessive deflection or rutting, or areas where otherwise unsuitable material is encountered should be remediated as directed by the geotechnical engineer. We expect that some localized areas may require additional overexcavation and replacement to develop adequate subgrade support.

The geotechnical engineer should be retained at this time to observe earthwork and to perform necessary tests and observations during subgrade preparation; proofrolling; placement and compaction of controlled compacted fills; backfilling of excavations into the completed subgrade, and just prior to construction of foundations.

The **General Comments** section provides an understanding of the report limitations.

EARTHWORK

Earthwork is anticipated to include clearing, excavations, and fill placement. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria, as necessary, to render the site in the state considered in our geotechnical engineering evaluation for foundations, floor slabs, and pavements.

A qualified geotechnical engineer should be retained during the earthwork phase of the project to observe earthwork and to perform necessary tests and observations during subgrade preparation; to monitor proof-rolling, placement and compaction of controlled compacted fills, and backfilling of excavations to the completed subgrade.

Site Preparation

Site preparation should begin with the demolition of the existing pavement and structures and debris removal where new construction will occur. As part of the demolition, buried concrete foundations associated with existing modular structures should also be removed. Existing utilities that are to be abandoned should be removed or filled with grout. The excavations resulting from utility removal should be properly backfilled with compacted structural fill as described in the Fill Material Types and Compaction sections of this report. Utilities that are to remain in service should be accurately located horizontally and vertically to minimize conflict with new foundation construction.

Prior to placing fill, existing vegetation and root mat should be removed. Complete stripping of the topsoil should be performed in the proposed building pad areas.

Geotechnical Engineering Report

Overhills Elementary School Classroom Addition ■ Spring Lake, North Carolina
January 7, 2022 ■ Terracon Project No. 70215251



The subgrade should be proofrolled with an adequately loaded vehicle such as a fully-loaded tandem-axle dump truck. The proofrolling should be performed under the direction of the Geotechnical Engineer. Areas excessively deflecting under the proofroll should be delineated and subsequently addressed by the Geotechnical Engineer. Excessively wet or dry material should either be removed, or moisture conditioned and recompacted.

Existing Fill

As noted in **Geotechnical Characterization**, boring B-2 encountered existing fill to a depth of 3 feet. The fill appears to have been placed in a controlled manner, but we have no records to indicate the degree of control. Support of footings, floor slabs, and pavements, on or above existing fill soils, is discussed in this report. However, even with the recommended construction procedures, there is inherent risk for the owner that compressible fill or unsuitable material, within or buried by the fill will, not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill, but can be reduced by following the recommendations contained in this report.

If the owner elects to construct the footings and floor slabs on the existing fill, the following protocol should be followed. Once the planned grading has been completed, the area should be closely monitored during proofrolling, to confirm relative denseness and to aid in delineating areas of soft or otherwise unsuitable soil. Excessively wet or dry material should either be removed, evaluated for reuse as structural fill, moisture conditioned and recompacted. Once unsuitable materials have been remediated, and the subgrade has passed the proofroll test construction can continue.

Fill Material Types

Fill required to achieve design grade should be classified as structural fill and general fill. Structural fill is material used below, or within 10 feet of structures, pavements or constructed slopes. General fill is material used to achieve grade outside of these areas. Earthen materials used for structural and general fill should meet the following material property requirements:

| Soil Type ¹ | USCS Classification | Acceptable Location for Placement |
|--|-------------------------|---|
| Low Plasticity Cohesive | CL, CL-ML ML, SM, SC | All locations and elevations. |
| Sand / Gravel with less than 12% fines (silt and clay) | GW, GP, SW, SP | NCDOT ABC beneath floor slabs, pavements or as a replacement material in over excavated areas. |
| On-Site Soils | SM | Generally suitable for all locations and elevations when low to moderate plasticity requirement is met. |

Geotechnical Engineering Report

Overhills Elementary School Classroom Addition ■ Spring Lake, North Carolina
January 7, 2022 ■ Terracon Project No. 70215251



| Soil Type ¹ | USCS Classification | Acceptable Location for Placement |
|---|---------------------|-----------------------------------|
| <ol style="list-style-type: none"> Structural and general fill should consist of approved materials free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to the Geotechnical Engineer for evaluation prior to use on this site. CH or MH soils should not be used within 3 feet of finished grade in building area and 1 foot below finished grade in other structural fill areas. | | |

Fill Compaction Requirements

Structural and general fill should meet the following compaction requirements.

| Item | Structural Fill | General Fill |
|--|--|---|
| Maximum Lift Thickness | 8 inches or less in loose thickness when heavy, self-propelled compaction equipment is used 4 to 6 inches in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is used | Same as Structural fill |
| Minimum Compaction Requirements ^{1, 2} | Minimum 95% of the material's maximum standard Proctor dry density (ASTM D 698). The upper 12 inches of subgrade in pavement areas should be compacted to at least 98% of the materials maximum standard Proctor dry density (ASTM D 698) | 92% of max. |
| Water Content Range ¹ | Low plasticity cohesive: -2% to +3% of optimum High plasticity cohesive: 0 to +4% of optimum Granular: -3% to +3% of optimum | As required to achieve min. compaction requirements |

- Maximum density and optimum water content as determined by the standard Proctor test (ASTM D 698).
- High plasticity cohesive fill should not be compacted to more than 100% of standard Proctor maximum dry density.

Utility Trench Backfill

For low permeability subgrades, utility trenches are a common source of water infiltration and migration. Utility trenches penetrating beneath the building should be effectively sealed to restrict water intrusion and flow through the trenches, which could migrate below the building. The trench should provide an effective trench plug that extends at least 5 feet from the face of the building exterior. The plug material should consist of cementitious flowable fill or low permeability clay. The trench plug material should be placed to surround the utility line. If used, the clay trench plug material should be placed and compacted to comply with the water content and compaction recommendations for structural fill stated previously in this report.

Geotechnical Engineering Report

Overhills Elementary School Classroom Addition ■ Spring Lake, North Carolina
January 7, 2022 ■ Terracon Project No. 70215251

**Grading and Drainage**

All grades must provide effective drainage away from the building during and after construction and should be maintained throughout the life of the structure. Water retained next to the building can result in soil movements greater than those discussed in this report. Greater movements can result in unacceptable differential floor slab and/or foundation movements, cracked slabs and walls, and roof leaks. The roof should have gutters/drains with downspouts that discharge onto splash blocks at a distance of at least 10 feet from the building.

Exposed ground should be sloped and maintained at a minimum 5% away from the building for at least 10 feet beyond the perimeter of the building. Locally, flatter grades may be necessary to transition ADA access requirements for flatwork. After building construction and landscaping have been completed, final grades should be verified to document effective drainage has been achieved. Grades around the structure should also be periodically inspected and adjusted, as necessary, as part of the structure's maintenance program. Where paving or flatwork abuts the structure, a maintenance program should be established to effectively seal and maintain joints and prevent surface water infiltration.

Earthwork Construction Considerations

Shallow excavations for the proposed structure are anticipated to be accomplished with conventional construction equipment. Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction of floor slabs. Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over or adjacent to construction areas should be removed. If the subgrade freezes, desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompacted prior to floor slab construction.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, "Excavations" and its appendices, and in accordance with any applicable local, and/or state regulations.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety, or the contractor's activities; such responsibility shall neither be implied nor inferred.

Geotechnical Engineering Report

Overhills Elementary School Classroom Addition ■ Spring Lake, North Carolina
January 7, 2022 ■ Terracon Project No. 70215251

**Construction Observation and Testing**

The earthwork efforts should be monitored under the direction of the Geotechnical Engineer. Monitoring should include documentation of adequate removal of vegetation and topsoil, proofrolling, and mitigation of areas delineated by the proofroll to require mitigation.

Each lift of compacted fill should be tested, evaluated, and reworked, as necessary, until approved by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency of at least one test for every 2,500 square feet of compacted fill in the building areas and 5,000 square feet in pavement areas. One density and water content test should be performed for every 50 linear feet of compacted utility trench backfill.

In areas of foundation excavations, the bearing subgrade should be evaluated under the direction of the Geotechnical Engineer. If unanticipated conditions are encountered, the Geotechnical Engineer should prescribe mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

SHALLOW FOUNDATIONS

If the site has been prepared in accordance with the requirements noted in **Earthwork**, the following design parameters are applicable for shallow foundations.

Design Parameters – Compressive Loads

| Item | Description |
|--|---|
| Maximum Net Allowable Bearing pressure ^{1, 2, 3} | 3,000 psf |
| Minimum Foundation Dimensions | Columns: 30 inches Continuous: 18 inches |
| Ultimate Coefficient of Sliding Friction ⁴ | 0.35 (granular native soils) |
| Minimum Embedment below Finished Grade ⁵ | 18 inches |
| Estimated Total Settlement from Structural Loads ² | Less than about 1 inch |
| Estimated Differential Settlement ^{2, 6} | Less than ½ inch |

Geotechnical Engineering Report

Overhills Elementary School Classroom Addition ■ Spring Lake, North Carolina
January 7, 2022 ■ Terracon Project No. 70215251



| Item | Description |
|------|--|
| 1. | The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. An appropriate factor of safety has been applied. Values assume that exterior grades are no steeper than 20% within 10 feet of structure. |
| 2. | Values provided are for maximum loads noted in Project Description . |
| 3. | Unsuitable or soft soils should be over-excavated and replaced per the recommendations presented in the Earthwork . |
| 4. | Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to net uplift conditions. |
| 5. | Embedment necessary to minimize the effects of frost and/or seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure. |
| 6. | Differential settlements are as measured over a span of 50 feet. |

The foundation bearing materials should be evaluated at the time of the foundation excavation. This is an essential part of the construction process. A representative of the geotechnical engineer should use a combination of hand auger borings and dynamic cone penetrometer (DCP) testing to determine the suitability of the bearing materials for the design bearing pressure. DCP testing should be performed to a depth of 3 to 5 feet below the bottom of foundation excavation. Excessively soft, loose, or wet bearing soils should be over excavated to a depth recommended by the geotechnical engineer. The excavated soils should be replaced with structural fill or crushed stone (NCDOT ABC). However, footings could bear directly on the soils after over excavation if approved by the Geotechnical Engineer.

Existing fill was found below the proposed building footprint as currently shown. In areas where existing fill remains under the proposed building the frequency of hand auger and DCP testing should be increased and should be extended to natural soils.

Construction Adjacent to Existing Building

Differential settlement between the addition and the existing building is expected to approach the magnitude of the total settlement (1-inch) of the addition. Expansion joints should be provided between the existing building and the proposed addition to accommodate differential movements between the two structures. Underground piping between the two structures should be designed with flexible couplings and utility knockouts in foundation walls should be oversized, so minor deflections in alignment do not result in breakage or distress. Care should be taken during excavation adjacent to existing foundations, to avoid disturbing existing foundation bearing soils.

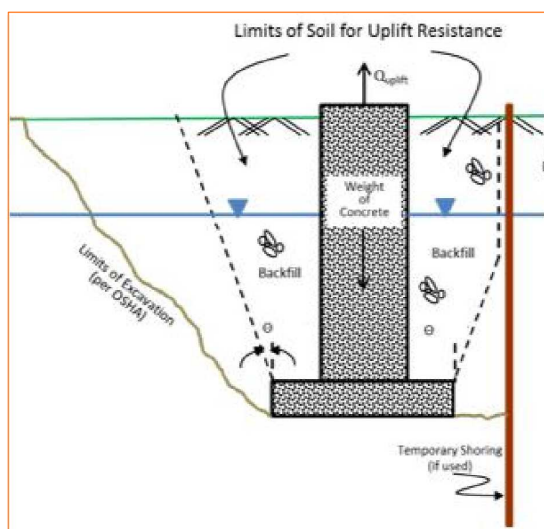
New footings should bear at or near the bearing elevation of immediately adjacent existing foundations. Depending upon their locations and current loads on the existing footings, footings for the new addition could cause settlement of adjacent walls. To reduce this concern and risk, clear distances at least equal to the new footing widths should be maintained between the addition's footings and footings supporting the existing building.

Geotechnical Engineering Report

Overhills Elementary School Classroom Addition ■ Spring Lake, North Carolina
January 7, 2022 ■ Terracon Project No. 70215251

**Design Parameters - Uplift Loads**

Uplift resistance of spread footings can be developed from the effective weight of the footing and the overlying soils. As illustrated on the subsequent figure, the effective weight of the soil prism defined by diagonal planes extending up from the top of the perimeter of the foundation to the ground surface at an angle, θ , of 20 degrees from the vertical can be included in uplift resistance. The maximum allowable uplift capacity should be taken as a sum of the effective weight of soil plus the dead weight of the foundation, divided by an appropriate factor of safety. A maximum total unit weight of 100 pcf should be used for the backfill. This unit weight should be reduced to 40 pcf for portions of the backfill or natural soils below the groundwater elevation.

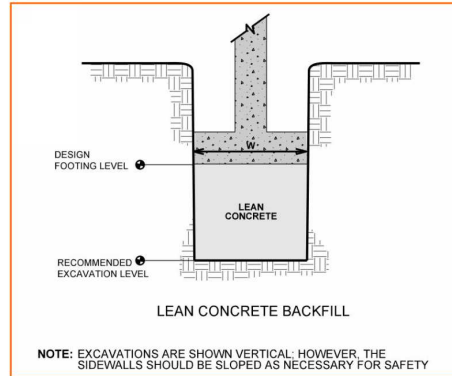
**Foundation Construction Considerations**

As noted in **Earthwork**, the footing excavations should be evaluated under the direction of the Geotechnical Engineer. The base of all foundation excavations should be free of water and loose soil, prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Care should be taken to prevent wetting or drying of the bearing materials during construction. Excessively wet or dry material or any loose/disturbed material in the bottom of the footing excavations should be removed/reconditioned before foundation concrete is placed.

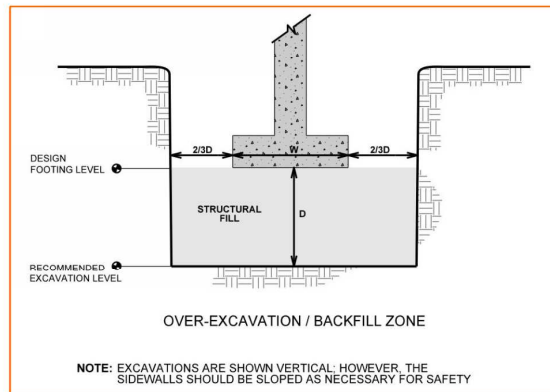
If unsuitable bearing soils are encountered at the base of the planned footing excavation, the excavation should be extended deeper to suitable soils, and the footings could bear directly on these soils at the lower level or on lean concrete backfill placed in the excavations. This is illustrated on the sketch below.

Geotechnical Engineering Report

Overhills Elementary School Classroom Addition ■ Spring Lake, North Carolina
January 7, 2022 ■ Terracon Project No. 70215251



Over-excavation for structural fill placement below footings should be conducted as shown below. The over-excavation should be backfilled up to the footing base elevation, with structural fill placed, as recommended in the **Earthwork** section.



SEISMIC CONSIDERATIONS

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. The Site Classification is generally based on the upper 100 feet of the site profile characterized by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7-10. Geophysical surveying of the site using MASW (Multi-Spectral Analysis of Surface Waves) determined a **Seismic Site Classification is C**. Average shear wave velocities were measured between 1,274 to 1,354 feet/second.

Geotechnical Engineering Report

Overhills Elementary School Classroom Addition ■ Spring Lake, North Carolina
January 7, 2022 ■ Terracon Project No. 70215251

**FLOOR SLABS**

Design parameters for floor slabs assume the requirements for **Earthwork** have been followed. Specific attention should be given to positive drainage away from the structure and positive drainage of the aggregate base beneath the floor slab.

Floor Slab Design Parameters

| Item | Description |
|--|--|
| Floor Slab Support ¹ | Approved native soils or new engineered fill. |
| Estimated Modulus of Subgrade Reaction ² | 100 pounds per square inch per inch (psi/in) for point loads |
| Stone Base Course / Capillary break | 4 inches of aggregate base course (NCDOT ABC). |

1. Floor slabs should be structurally independent of building footings or walls to reduce the possibility of floor slab cracking caused by differential movements between the slab and foundation.
2. Modulus of subgrade reaction is an estimated value based upon our experience with the subgrade condition, the requirements noted in **Earthwork**, and the floor slab support as noted in this table. It is provided for point loads. For large area loads the modulus of subgrade reaction would be lower.

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Saw-cut control joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations refer to the ACI Design Manual. Joints or cracks should be sealed with a water-proof, non-extruding compressible compound specifically recommended for heavy duty concrete pavement and wet environments.

Where floor slabs are tied to perimeter walls or turn-down slabs to meet structural or other construction objectives, our experience indicates differential movement between the walls and slabs will likely be observed in adjacent slab expansion joints or floor slab cracks beyond the length of the structural dowels. The Structural Engineer should account for potential differential settlement through use of sufficient control joints, appropriate reinforcing or other means.

Settlement of floor slabs supported on existing fill materials cannot be accurately predicted, but could be larger than normal and result in some cracking. Mitigation measures, as noted in **Existing Fill** within **Earthwork**, are critical to the performance of floor slabs. In addition to the

Geotechnical Engineering Report

Overhills Elementary School Classroom Addition ■ Spring Lake, North Carolina
January 7, 2022 ■ Terracon Project No. 70215251



mitigation measures, the floor slab can be stiffened by adding steel reinforcement, grade beams and/or post-tensioned elements.

Floor Slab Construction Considerations

Finished subgrade, within and for at least 10 feet beyond the floor slab, should be protected from traffic, rutting, or other disturbance and maintained in a relatively moist condition until floor slabs are constructed. If the subgrade should become damaged or desiccated prior to construction of floor slabs, the affected material should be removed and structural fill should be added to replace the resulting excavation. Final conditioning of the finished subgrade should be performed immediately prior to placement of the floor slab support course.

The Geotechnical Engineer should approve the condition of the floor slab subgrades immediately prior to placement of the floor slab support course, reinforcing steel, and concrete. Attention should be paid to high traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client, and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Geotechnical Engineering Report

Overhills Elementary School Classroom Addition ■ Spring Lake, North Carolina
January 7, 2022 ■ Terracon Project No. 70215251



Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

FIGURES

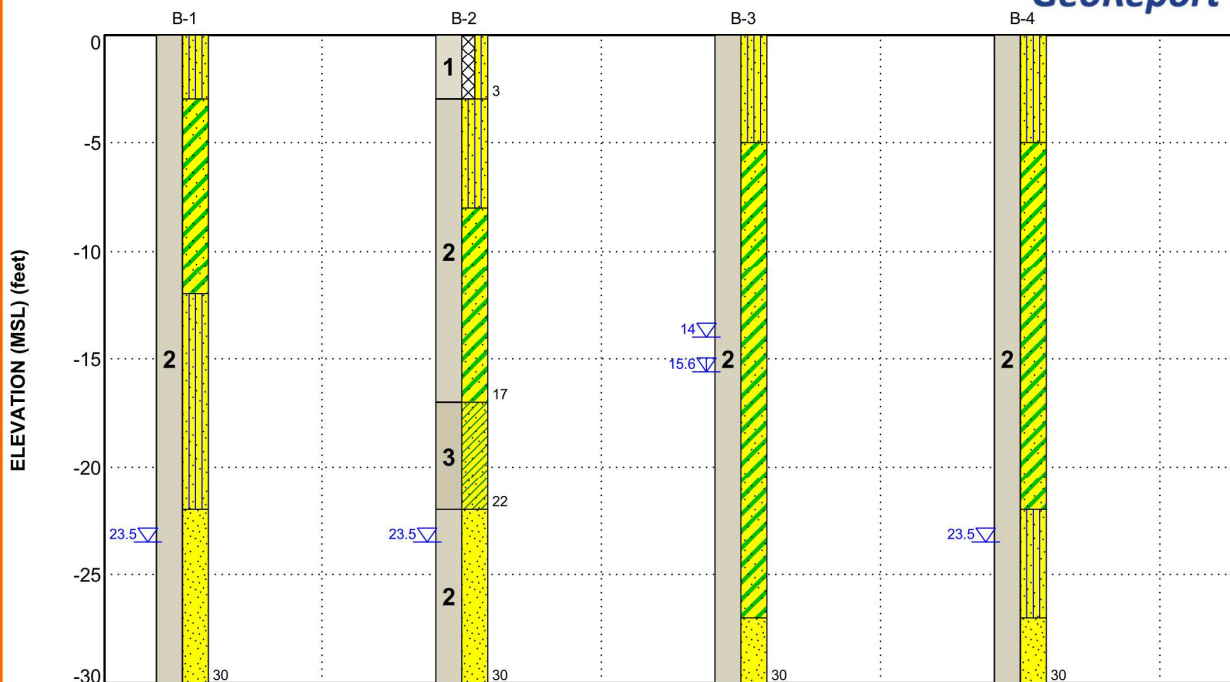
Contents:

GeoModel

Responsive ■ Resourceful ■ Reliable

GEOMODEL

Overhills Elementary School Classroom Addition ■ Spring Lake, NC
Terracon Project No. 70215251



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

| Model Layer | Layer Name | General Description |
|-------------|--|----------------------------|
| 1 | Fill - Silty SAND | Medium dense |
| 2 | Silty/Clayey SAND and Poorly Graded SAND | Very loose to medium dense |
| 3 | Sandy CLAY | Medium stiff |

LEGEND

- Silty Sand
- Sandy Lean Clay
- Clayey Sand
- Poorly-graded Sand

- First Water Observation
- Second Water Observation

NOTES:

Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time. Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

ATTACHMENTS

Responsive ■ Resourceful ■ Reliable

Geotechnical Engineering Report

Overhills Elementary School Classroom Addition ■ Spring Lake, North Carolina
January 7, 2022 ■ Terracon Project No. 70215251



EXPLORATION AND TESTING PROCEDURES

Field Exploration

| Number of Borings | Boring Depth (feet) | Planned Location |
|-------------------|---------------------|-------------------|
| 4 | 30 or auger refusal | Building Addition |

Boring Layout and Elevations: Unless otherwise noted, Terracon personnel provided the boring layout. Coordinates were obtained with a handheld GPS unit (estimated horizontal accuracy of about ± 10 feet). Surface elevations were not obtained. If elevations and a more precise boring layout are desired, we recommend borings be surveyed following completion of fieldwork.

Subsurface Exploration Procedures: We advanced the borings with a Geoprobe 6620 DT rotary drill rig using continuous hollow stem augers. Four samples were obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. We observed and recorded groundwater levels during drilling and sampling. For safety purposes, all borings were backfilled with auger cuttings after their completion.

The sampling depths, penetration distances, and other sampling information was recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and classification by a Geotechnical Engineer. Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials encountered during drilling and our interpretation of the subsurface conditions between samples. Final boring logs were prepared from the field logs. The final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Seismic Site Classification

Terracon used a seismic system to perform a seismic site class survey per IBC 2018 (ASCE 7) to aid in determining the shear-wave velocity at the site. We performed two tests at one location on the site.

Geotechnical Engineering Report

Overhills Elementary School Classroom Addition ■ Spring Lake, North Carolina
January 7, 2022 ■ Terracon Project No. 70215251



The seismic survey included:

- For each test, an array of 24 seismic sensors (geophones) were placed in an accessible area using ground plates, spaced 5-feet apart.
- Active (i.e. sledge hammer and strike plate) and passive (ambient vibrational noise) components were collected.
- Data was post-processed off-site to produce a 1-D shear wave profile for each test array.

Analysis - Terracon analyzed and processed the seismic data using a wavefield- transformation data-processing technique and an interactive Rayleigh-wave dispersion- modeling tool. The refraction microtremor method exploits aspects of spectral analysis of surface waves (SASW) and multi- channel analysis of surface waves (MASW) to derive an average shear-wave velocity for the top 100 feet (V_s^{100}).

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests to understand the engineering properties of the various soil strata, as necessary, for this project. Procedural standards noted below are for reference to methodology in general. In some cases, variations to methods were applied because of local practice or professional judgment. Standards noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

- ASTM D2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- ASTM D422 Standard Test Method for Particle-Size Analysis of Soils

The laboratory testing program often included examination of soil samples by an engineer. Based on the material's texture and plasticity, we described and classified the soil samples in accordance with the Unified Soil Classification System.

SITE LOCATION AND EXPLORATION PLANS

Contents:

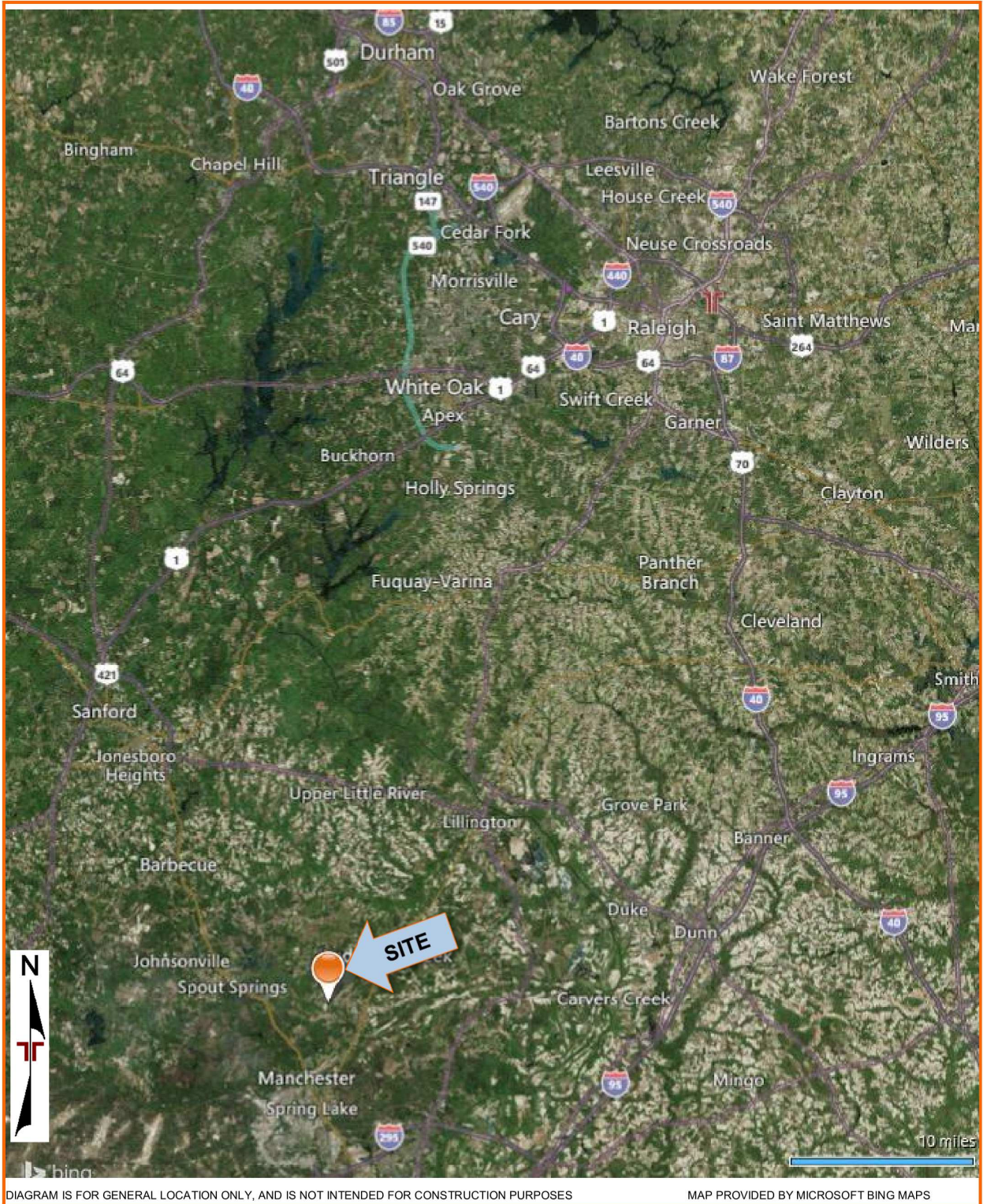
Site Location Plan (2 pages)

Exploration Plan (2 pages)

Note: All attachments are one page unless noted above.

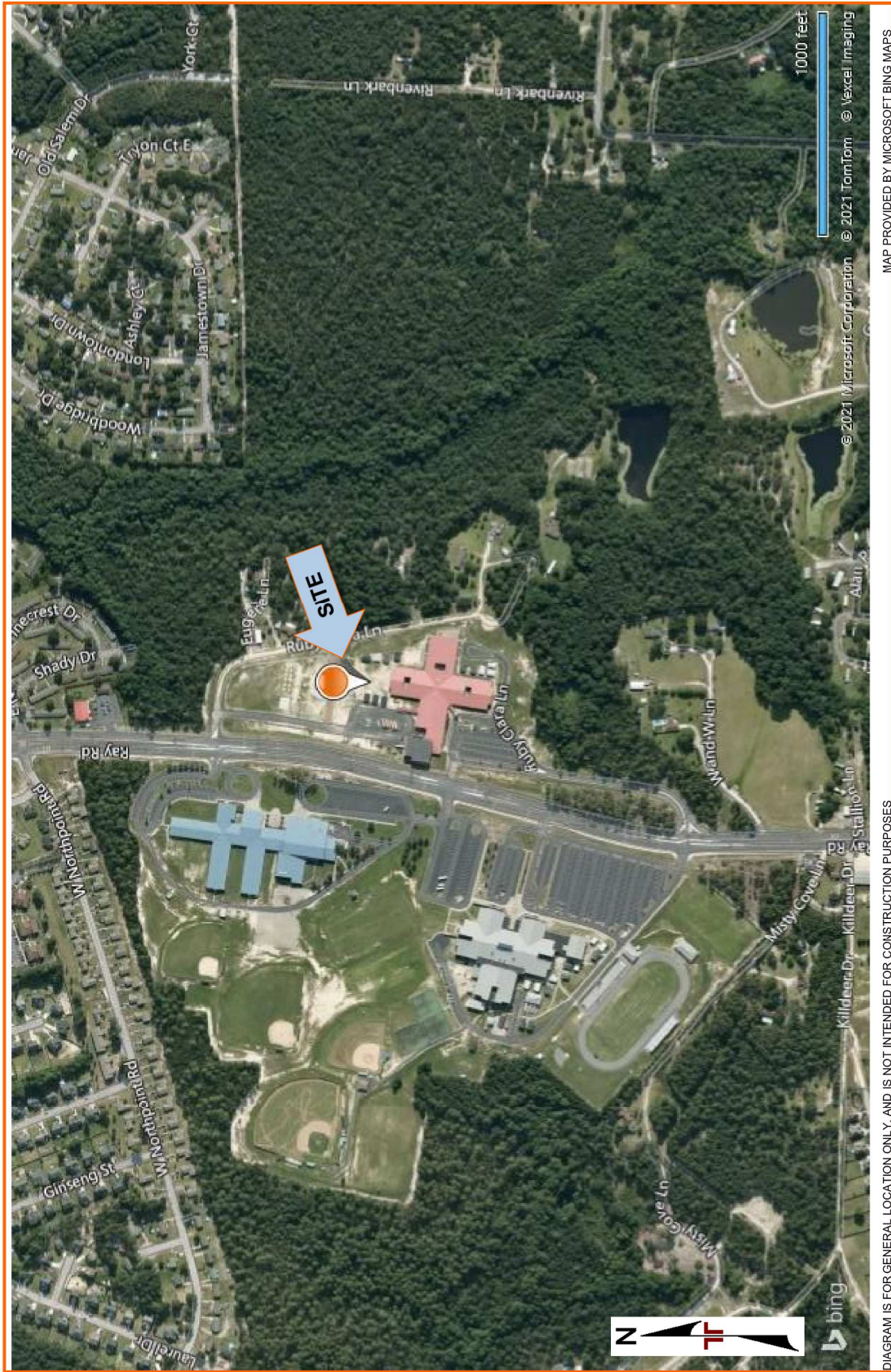
SITE LOCATION

Overhills Elementary School Classroom Addition ■ Spring Lake, North Carolina
January 7, 2022 ■ Terracon Project No. 70215251





SITE LOCATION
Overhills Elementary School Classroom Addition ■ Spring Lake, North Carolina
January 7, 2022 ■ Terracon Project No. 70215251



MAP PROVIDED BY MICROSOFT BING MAPS
DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES



EXPLORATION PLAN
Overhills Elementary School Classroom Addition ■ Spring Lake, North Carolina
January 7, 2022 ■ Terracon Project No. 70215251

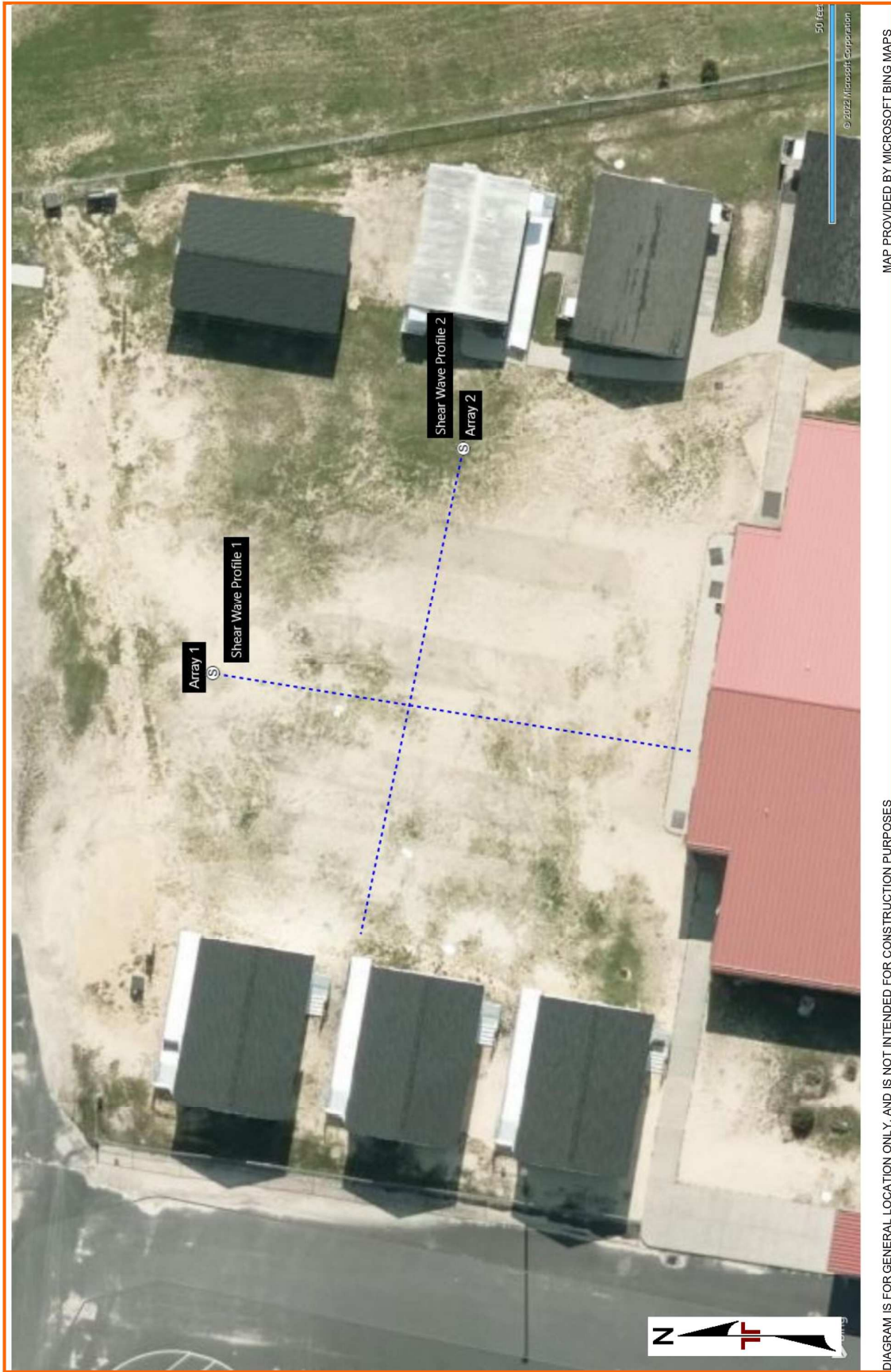


MAP PROVIDED BY MICROSOFT BING MAPS

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES



EXPLORATION PLAN
Overhills Elementary School Classroom Addition ■ Spring Lake, North Carolina
January 7, 2022 ■ Terracon Project No. 70215251



MAP PROVIDED BY MICROSOFT BING MAPS

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

EXPLORATION RESULTS

Contents:

Boring Logs (B-1 through B-4)

Atterberg Limits

Grain Size Distribution

Shear-Wave Velocity (2 pages)

Note: All attachments are one page unless noted above.

BORING LOG NO. B-1

PROJECT: Overhills Elementary School Classroom Addition

CLIENT: Harnett County Schools
Lillington, NC

SITE: 2626 Ray Road
Spring Lake, NC

| MODEL LAYER | GRAPHIC LOG | LOCATION See Exploration Plan Latitude: 35.2469° Longitude: -78.9658° | DEPTH (FT.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | FIELD TEST RESULTS | STRENGTH TEST | | | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS LL-PL-PI |
|-------------|-------------|--|-------------|--------------------------|-------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------------------|
| | | | | | | | TEST TYPE | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) | | | |
| | | SILTY SAND (SM) , fine to medium grained, brown, medium dense | 3.0 | | X | 4-9-14 N=23 | | | 17.2 | | 51-29-22 | |
| | | CLAYEY SAND (SC) , fine to medium grained, red, medium dense | 5 | | X | 4-11-12 N=23 | | | | | | |
| | | | 8 | | X | 8-7-8 N=15 | | | | | | |
| | | | 10 | | X | 8-8-10 N=18 | | | | | | |
| | | SILTY SAND (SM) , fine to medium grained, red and orange, medium dense | 12.0 | | X | | | | | | | |
| | | | 15 | | X | 8-8-8 N=16 | | | | | | |
| | | | 20 | | X | 13-13-11 N=24 | | | | | | |
| | | POORLY GRADED SAND (SP) , fine to coarse grained, tan and orange, loose to medium dense | 22.0 | | X | | | | | | | |
| | | | 25 | ▽ | X | 6-5-4 N=9 | | | | | | |
| | | | 30 | | X | 3-6-13 N=19 | | | | | | |
| | | Boring Terminated at 30 Feet | | | | | | | | | | |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
HSA

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevations were not determined.

WATER LEVEL OBSERVATIONS

▽ While drilling



2401 Brentwood Rd Ste 107
Raleigh, NC

Boring Started: 12-15-2021

Boring Completed: 12-15-2021

Drill Rig: Geoprobe 6620 DT

Driller: M. Padgette

Project No.: 70215251

☒ Cave-in observed at a depth of 17.9 feet.

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEC SMART LOG-NO WELL 70215251 OVERHILLS ELEMENT.GPJ TERRACON_DATATEMPLATE.GDT 1/7/22

BORING LOG NO. B-2

PROJECT: Overhills Elementary School Classroom Addition

CLIENT: Harnett County Schools
Lillington, NC

SITE: 2626 Ray Road
Spring Lake, NC

| MODEL LAYER | GRAPHIC LOG | LOCATION See Exploration Plan Latitude: 35.2468° Longitude: -78.9654° | DEPTH (FT.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | FIELD TEST RESULTS | STRENGTH TEST | | | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS LL-PL-PI |
|-------------------------------------|-------------|--|-------------|--------------------------|-------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------------------|
| | | | | | | | TEST TYPE | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) | | | |
| 1 | | FILL - SILTY SAND (SM) , fine to medium grained, brown, medium dense | 3.0 | | X | 6-7-8 N=15 | | | | 2.3 | | NP |
| | | SILTY SAND (SM) , fine to medium grained, black to tannish gray, medium dense to very loose | 5.0 | | X | 5-7-8 N=15 | | | | | | |
| | | | 8.0 | | X | 1-1-1 N=2 | | | | | | |
| 2 | | CLAYEY SAND (SC) , fine to medium grained, tan, gray and red, loose to medium dense | 10.0 | | X | 1-3-4 N=7 | | | | | | |
| | | | 15.0 | | X | 11-10-10 N=20 | | | | | | |
| 3 | | SANDY LEAN CLAY (CL) , gray, medium stiff | 20.0 | | X | 2-3-5 N=8 | | | | | | |
| | | POORLY GRADED SAND (SP) , fine to coarse grained, tan and orange, medium dense | 25.0 | ▽ | X | 7-10-11 N=21 | | | | | | |
| 2 | | | 30.0 | | X | 10-10-13 N=23 | | | | | | |
| Boring Terminated at 30 Feet | | | | | | | | | | | | |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
HSA

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevations were not determined.

WATER LEVEL OBSERVATIONS

▽ While drilling



2401 Brentwood Rd Ste 107
Raleigh, NC

Boring Started: 12-15-2021

Boring Completed: 12-15-2021

Drill Rig: Geoprobe 6620 DT

Driller: M. Padgette

Project No.: 70215251

☒ Cave-in observed at a depth of 18.1 feet.

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEC SMART LOG-NO WELL 70215251 OVERHILLS ELEMENT.GPJ TERRACON_DATATEMPLATE.GDT 1/5/22

BORING LOG NO. B-3

PROJECT: Overhills Elementary School Classroom Addition

CLIENT: Harnett County Schools
Lillington, NC

SITE: 2626 Ray Road
Spring Lake, NC

| MODEL LAYER | GRAPHIC LOG | LOCATION See Exploration Plan Latitude: 35.2473° Longitude: -78.9657° | DEPTH (FT.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | FIELD TEST RESULTS | STRENGTH TEST | | | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS | |
|-------------|-------------|--|-------------|--------------------------|-------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------|--|
| | | | | | | | TEST TYPE | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) | | | LL-PL-PI | |
| | | SILTY SAND (SM) , fine to medium grained, grayish tan to tan, medium dense to loose | | | | | | | | | | | |
| | 5.0 | | | | | | | | | | | | |
| | | CLAYEY SAND (SC) , fine to medium grained, red, tan and light gray, medium dense to loose | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | 15 | | | ▽ | | | | | | | | | |
| | | | | ▽ | | | | | | | | | |
| | 20 | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | 27.0 | | | | | | | | | | | | |
| | | POORLY GRADED SAND (SP) , fine to coarse grained, tan and orange, medium dense | | | | | | | | | | | |
| | 30.0 | | | | | | | | | | | | |
| | | Boring Terminated at 30 Feet | | | | | | | | | | | |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
HSA

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevations were not determined.

WATER LEVEL OBSERVATIONS

▽ While drilling

▽ At completion of drilling

☒ Cave-in observed at a depth of 16 feet.



Boring Started: 12-15-2021

Boring Completed: 12-15-2021

Drill Rig: Geoprobe 6620 DT

Driller: M. Padgette

Project No.: 70215251

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEC SMART LOG-NO WELL 70215251 OVERHILLS ELEMENT.GPJ TERRACON_DATATEMPLATE.GDT 1/5/22

BORING LOG NO. B-4

PROJECT: Overhills Elementary School Classroom Addition

CLIENT: Harnett County Schools
Lillington, NC

SITE: 2626 Ray Road
Spring Lake, NC

| MODEL LAYER | GRAPHIC LOG | LOCATION See Exploration Plan Latitude: 35.2473° Longitude: -78.9654° | DEPTH (FT.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | FIELD TEST RESULTS | STRENGTH TEST | | | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS | |
|-------------|-------------|--|-------------|--------------------------|-------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------|--|
| | | | | | | | TEST TYPE | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) | | | LL-PL-PI | |
| | | SILTY SAND (SM) , fine to medium grained, grayish tan, loose to medium dense | | | | 3-4-5 N=9 | | | | | | | |
| | | | 5.0 | | | 10-10-8 N=18 | | | | | | | |
| | | CLAYEY SAND (SC) , fine to medium grained, reddish orange and tan, medium dense | | | | 6-12-14 N=26 | | | 13.9 | | | NP | |
| | | | 10 | | | 8-10-15 N=25 | | | | | | | |
| | | | 15 | | | 6-4-11 N=15 | | | | | | | |
| | | | 20 | | | 10-10-10 N=20 | | | | | | | |
| | | SILTY SAND (SM) , fine to medium grained, tan, loose | 22.0 | | | | | | | | | | |
| | | | 27.0 | | | 2-4-4 N=8 | | | | | | | |
| | | POORLY GRADED SAND (SP) , fine to coarse grained, tan, loose | | | | 4-4-5 N=9 | | | | | | | |
| | | Boring Terminated at 30 Feet | 30.0 | | | | | | | | | | |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
HSA

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevations were not determined.

WATER LEVEL OBSERVATIONS

▽ While drilling



Boring Started: 12-15-2021

Boring Completed: 12-15-2021

Drill Rig: Geoprobe 6620 DT

Driller: M. Padgette

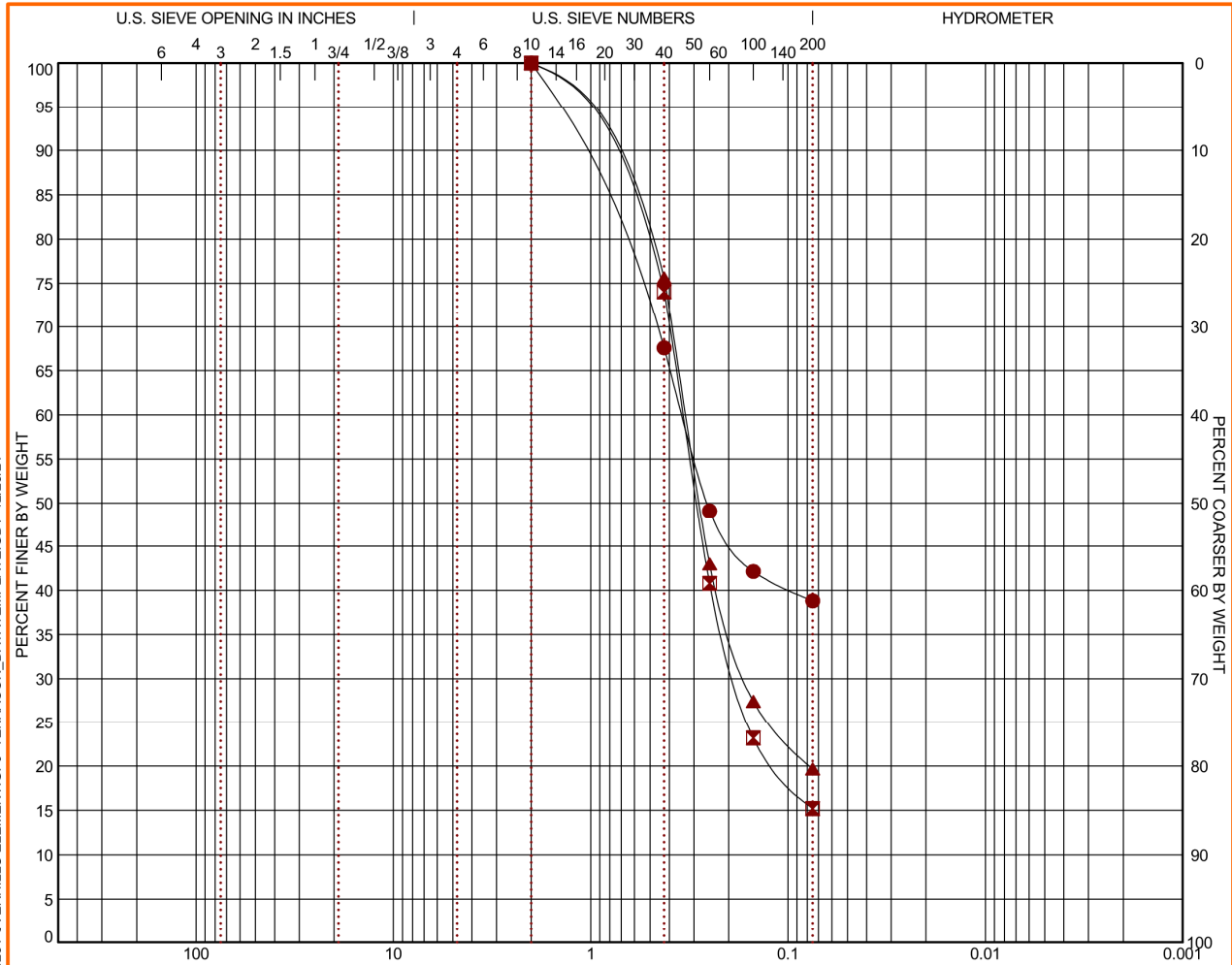
Project No.: 70215251

☒ Cave-in observed at a depth of 15.3 feet.

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 70215251 OVERHILLS ELEMENT.GPJ TERRACON_DATATEMPLATE.GDT 1/5/22

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 70215251 OVERHILLS ELEMENT.GPJ TERRACON_DATATEMPLATE.GDT 12/28/21

| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---------|--------|------|--------|--------|------|--------------|
| | coarse | fine | coarse | medium | fine | |

| BORING ID | DEPTH | % COBBLES | % GRAVEL | % SAND | % SILT | % FINES | % CLAY | USCS |
|-----------|---------|-----------|----------|--------|--------|---------|--------|------|
| ● B-1 | 1 - 2.5 | 0.0 | 0.0 | 61.2 | | 38.8 | | SM |
| ☒ B-2 | 1 - 2.5 | 0.0 | 0.0 | 84.8 | | 15.2 | | SM |
| ▲ B-4 | 6 - 7.5 | 0.0 | 0.0 | 80.3 | | 19.7 | | SM |

| GRAIN SIZE | ● | | ☒ | | ▲ | | SOIL DESCRIPTION |
|-----------------|-------|---------|-------|---------|-------|---------|-------------------|
| | Sieve | % Finer | Sieve | % Finer | Sieve | % Finer | |
| D ₆₀ | 0.342 | 0.34 | 0.33 | | | | ● SILTY SAND (SM) |
| D ₃₀ | | 0.183 | 0.163 | | | | ☒ SILTY SAND (SM) |
| D ₁₀ | | | | | | | ▲ SILTY SAND (SM) |
| | #10 | 100.0 | #10 | 100.0 | #10 | 100.0 | |
| | #40 | 67.59 | #40 | 74.06 | #40 | 75.64 | |
| | #60 | 49.12 | #60 | 40.79 | #60 | 43.0 | |
| | #100 | 42.15 | #100 | 23.17 | #100 | 27.43 | |
| | #200 | 38.82 | #200 | 15.22 | #200 | 19.67 | |

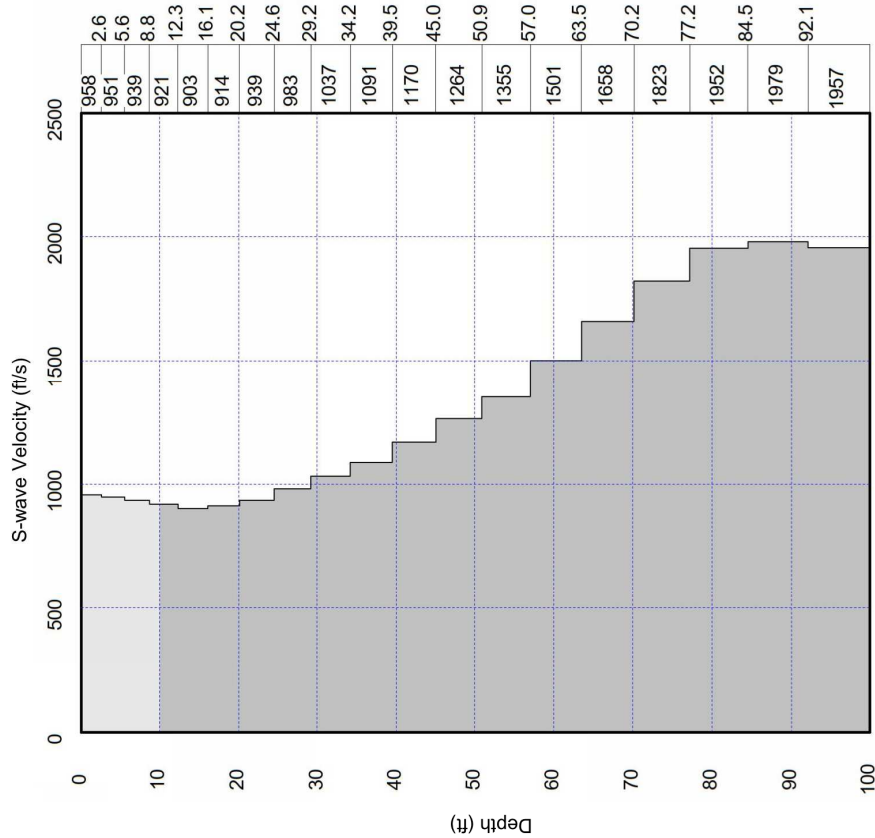
| COEFFICIENTS | | | REMARKS |
|----------------|---|---|---------|
| C _c | ● | ☒ | |
| C _u | ● | ☒ | |
| C _c | | | ● |
| C _u | | | ☒ |
| | | | ▲ |

| | | |
|---|---|---|
| PROJECT: Overhills Elementary School Classroom Addition |  2401 Brentwood Rd Ste 107 Raleigh, NC | PROJECT NUMBER: 70215251 |
| SITE: 2626 Ray Road Spring Lake, NC | | CLIENT: Harnett County Schools Lillington, NC |



Exploration Results
Overhills Elementary
Terracon Project No. 70215251

Array 1

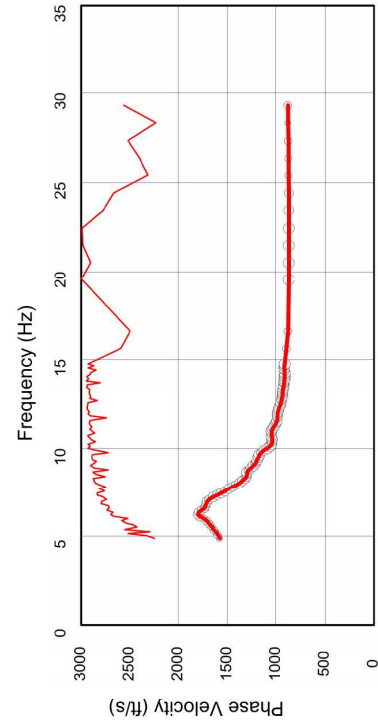


Average Weighted Shear Wave Velocity (ft/s)^{1,2} = **1,274**

Seismic Site Classification¹ = **C**

1. per 2018 International Building Code
2. measured between 0 ft and 100 ft.

| Depth(ft) | S-wave velocity(ft/s) |
|-----------|-----------------------|
| 0.0 | 958.4 |
| 2.6 | 951.5 |
| 5.6 | 939.1 |
| 8.8 | 921.6 |
| 12.3 | 903.7 |
| 16.1 | 914.5 |
| 20.2 | 939.4 |
| 24.6 | 983.4 |
| 29.2 | 1037.0 |
| 34.2 | 1091.5 |
| 39.5 | 1170.1 |
| 45.0 | 1264.2 |
| 50.9 | 1355.1 |
| 57.0 | 1501.1 |
| 63.5 | 1658.9 |
| 70.2 | 1823.4 |
| 77.2 | 1953.0 |
| 84.5 | 1979.3 |
| 92.1 | 1957.4 |
| 100.0 | 1979.3 |

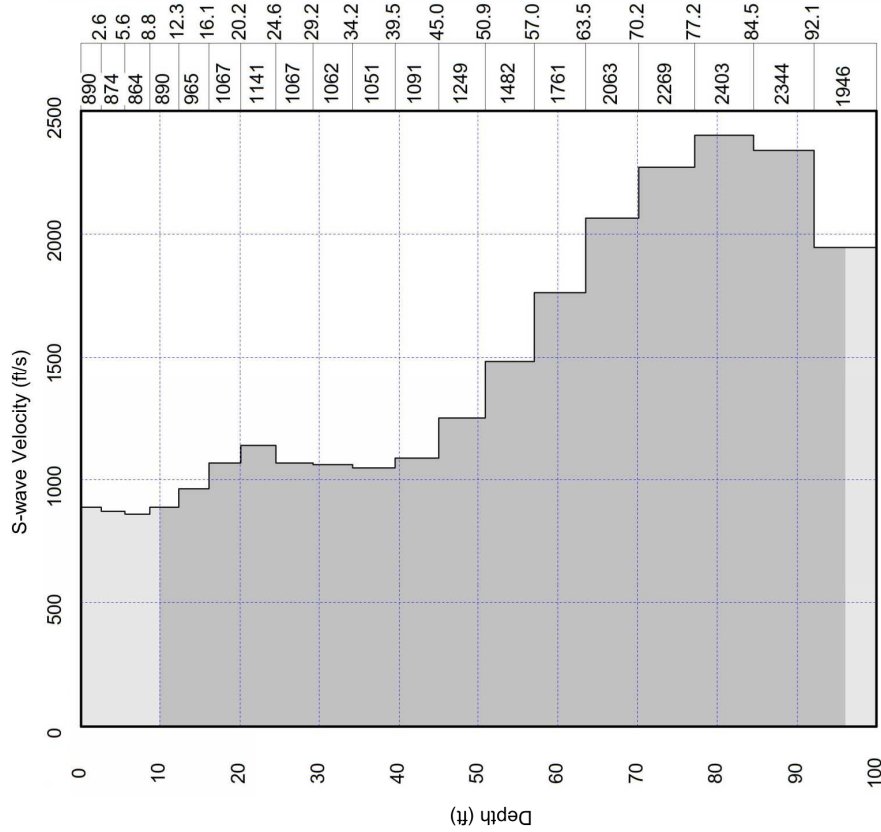




Exploration Results

Overhills Elementary
Terracon Project No. 70215251

Array 2

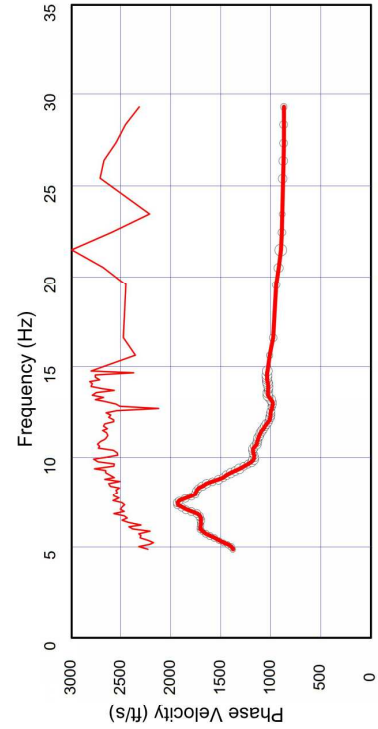


Average Weighted Shear Wave Velocity (ft/s)^{1,2} = **1,354**

Seismic Site Classification¹ = **C**

1. per 2018 International Building Code
2. measured between 0 ft and 100 ft.

| Depth(ft) | S-wave velocity(ft/s) |
|-----------|-----------------------|
| 0.0 | 890.9 |
| 2.6 | 874.4 |
| 5.6 | 864.8 |
| 8.8 | 890.9 |
| 12.3 | 965.7 |
| 16.1 | 1067.9 |
| 20.2 | 1141.7 |
| 24.6 | 1068.0 |
| 29.2 | 1062.2 |
| 34.2 | 1051.4 |
| 39.5 | 1091.7 |
| 45.0 | 1249.6 |
| 50.9 | 1482.6 |
| 57.0 | 1761.5 |
| 63.5 | 2063.4 |
| 70.2 | 2270.0 |
| 77.2 | 2403.5 |
| 84.5 | 2344.3 |
| 92.1 | 1946.8 |
| 100.0 | 2403.5 |



SUPPORTING INFORMATION

Contents:



General Notes

Unified Soil Classification System

Note: All attachments are one page unless noted above.

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

| | | | | | | |
|-----------------|---|--------------------|---|--------------------|--|---|
| SAMPLING |  Split Spoon | WATER LEVEL |  <p> Water Initially Encountered Water Level After a Specified Period of Time Water Level After a Specified Period of Time </p> <p>Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.</p> | FIELD TESTS | | N Standard Penetration Test Resistance (Blows/Ft.) (HP) Hand Penetrometer (T) Torvane (DCP) Dynamic Cone Penetrometer (PID) Photo-Ionization Detector (OVA) Organic Vapor Analyzer |
|-----------------|---|--------------------|---|--------------------|--|---|

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

| STRENGTH TERMS | RELATIVE DENSITY OF COARSE-GRAINED SOILS <small>(More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance</small> | | CONSISTENCY OF FINE-GRAINED SOILS <small>(50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance</small> | | |
|----------------|---|---|---|---|---|
| | Descriptive Term (Density) | Standard Penetration or N-Value Blows/Ft. | Descriptive Term (Consistency) | Unconfined Compressive Strength Qu, (psf) | Standard Penetration or N-Value Blows/Ft. |
| | Very Loose | 0 - 3 | Very Soft | less than 500 | 0 - 1 |
| | Loose | 4 - 9 | Soft | 500 to 1,000 | 2 - 4 |
| | Medium Dense | 10 - 29 | Medium Stiff | 1,000 to 2,000 | 4 - 8 |
| | Dense | 30 - 50 | Stiff | 2,000 to 4,000 | 8 - 15 |
| | Very Dense | > 50 | Very Stiff | 4,000 to 8,000 | 15 - 30 |
| | | | Hard | > 8,000 | > 30 |

RELATIVE PROPORTIONS OF SAND AND GRAVEL

| Descriptive Term(s) of other constituents | Percent of Dry Weight |
|---|-----------------------|
| Trace | < 15 |
| With | 15 - 29 |
| Modifier | > 30 |

GRAIN SIZE TERMINOLOGY

| Major Component of Sample | Particle Size |
|---------------------------|--------------------------------------|
| Boulders | Over 12 in. (300 mm) |
| Cobbles | 12 in. to 3 in. (300mm to 75mm) |
| Gravel | 3 in. to #4 sieve (75mm to 4.75 mm) |
| Sand | #4 to #200 sieve (4.75mm to 0.075mm) |
| Silt or Clay | Passing #200 sieve (0.075mm) |

RELATIVE PROPORTIONS OF FINES

| Descriptive Term(s) of other constituents | Percent of Dry Weight |
|---|-----------------------|
| Trace | < 5 |
| With | 5 - 12 |
| Modifier | > 12 |

PLASTICITY DESCRIPTION

| Term | Plasticity Index |
|-------------|------------------|
| Non-plastic | 0 |
| Low | 1 - 10 |
| Medium | 11 - 30 |
| High | > 30 |

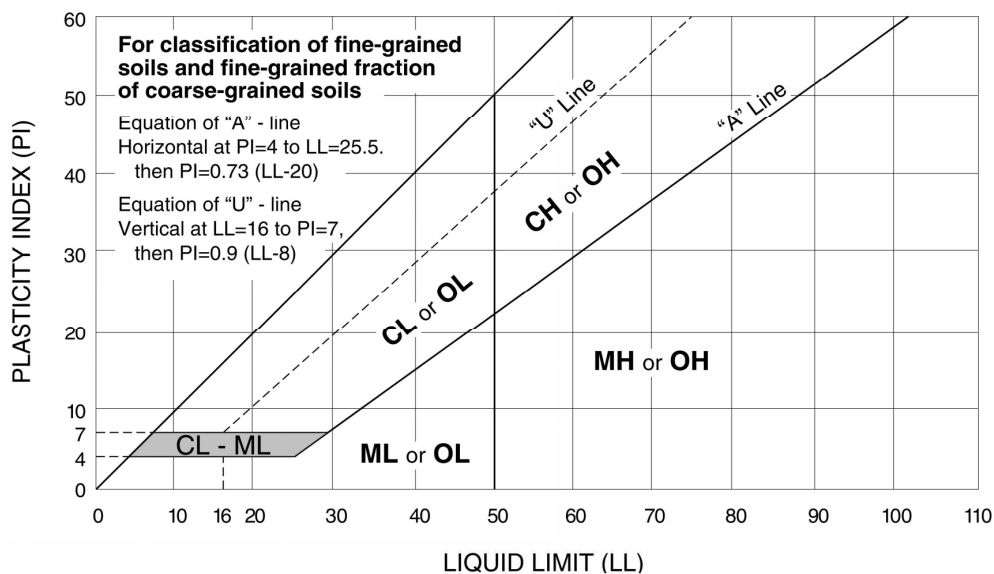


UNIFIED SOIL CLASSIFICATION SYSTEM

| Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^A | | | | Soil Classification | | | |
|--|--|--|--|---------------------------------|-----------------------------------|---------------------------------|--|
| | | | | Group Symbol | Group Name ^D | | |
| Coarse Grained Soils: More than 50% retained on No. 200 sieve | Gravels: More than 50% of coarse fraction retained on No. 4 sieve | Clean Gravels: Less than 5% fines ^C | $Cu \geq 4$ and $1 \leq Cc \leq 3$ ^E | GW | Well-graded gravel ^F | | |
| | | Gravels with Fines: More than 12% fines ^C | $Cu < 4$ and/or $1 > Cc > 3$ ^E | GP | Poorly graded gravel ^F | | |
| | Sands: 50% or more of coarse fraction passes No. 4 sieve | Clean Sands: Less than 5% fines ^D | Fines classify as ML or MH | GM | Silty gravel ^{F,G,H} | | |
| | | | Fines classify as CL or CH | GC | Clayey gravel ^{F,G,H} | | |
| | | Sands with Fines: More than 12% fines ^D | $Cu \geq 6$ and $1 \leq Cc \leq 3$ ^E | SW | Well-graded sand ^I | | |
| | | | $Cu < 6$ and/or $1 > Cc > 3$ ^E | SP | Poorly graded sand ^I | | |
| Fine-Grained Soils: 50% or more passes the No. 200 sieve | Silts and Clays: Liquid limit less than 50 | Inorganic: | $PI > 7$ and plots on or above "A" line ^J | CL | Lean clay ^{K,L,M} | | |
| | | | $PI < 4$ or plots below "A" line ^J | ML | Silt ^{K,L,M} | | |
| | | Organic: | Liquid limit - oven dried | < 0.75 | OL | Organic clay ^{K,L,M,N} | |
| | | | Liquid limit - not dried | | OH | Organic silt ^{K,L,M,O} | |
| | | Silts and Clays: Liquid limit 50 or more | Inorganic: | PI plots on or above "A" line | CH | Fat clay ^{K,L,M} | |
| | | | | PI plots below "A" line | MH | Elastic Silt ^{K,L,M} | |
| | Organic: | | Liquid limit - oven dried | < 0.75 | OH | Organic clay ^{K,L,M,P} | |
| | | | Liquid limit - not dried | | OH | Organic silt ^{K,L,M,Q} | |
| | Highly organic soils: Primarily organic matter, dark in color, and organic odor | | | | PT | Peat | |

- ^A Based on the material passing the 3-in. (75-mm) sieve
- ^B If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
- ^C Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
- ^D Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay
- ^E $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
- ^F If soil contains $\geq 15\%$ sand, add "with sand" to group name.
- ^G If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

- ^H If fines are organic, add "with organic fines" to group name.
- ^I If soil contains $\geq 15\%$ gravel, add "with gravel" to group name.
- ^J If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
- ^K If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
- ^L If soil contains $\geq 30\%$ plus No. 200 predominantly sand, add "sandy" to group name.
- ^M If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.
- ^N $PI \geq 4$ and plots on or above "A" line.
- ^O $PI < 4$ or plots below "A" line.
- ^P PI plots on or above "A" line.
- ^Q PI plots below "A" line.





Geotechnical Engineering Report

**Harnett Primary School Classroom Addition
Dunn, North Carolina**

January 7, 2022

Terracon Project No. 70215253

Prepared for:

Harnett County Schools
Lillington, North Carolina

Prepared by:

Terracon Consultants, Inc.
Raleigh, North Carolina



January 7, 2022

Harnett County Schools
1008 S. 11th Street
Lillington, North Carolina 27546



Attn: Mr. Steve Matthews
P: (910) 893 4808
E: smatthews@harnett.k12.nc.us

Re: Geotechnical Engineering Report
Harnett Primary School Classroom Addition
800 West Harnett Street
Dunn, North Carolina
Terracon Project No. 70215253

Dear Mr. Matthews:

We have completed the Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. P70215193 dated September 29, 2021. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations and floor slabs for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

Hugo Santana, PE
Geotechnical Staff Engineer
Registered, NC 047922



Santana, Hugo
Jan 7 2022 11:28 AM

Andrew A. Nash, PE
Geotechnical Department Manager
Registered, NC 031022

REPORT TOPICS

INTRODUCTION..... 1

SITE CONDITIONS..... 1

PROJECT DESCRIPTION 2

GEOTECHNICAL CHARACTERIZATION..... 2

GEOTECHNICAL OVERVIEW 3

EARTHWORK..... 4

SHALLOW FOUNDATIONS 8

SEISMIC CONSIDERATIONS 11

FLOOR SLABS..... 11

GENERAL COMMENTS..... 13

FIGURES 14

ATTACHMENTS..... 15

Note: This report was originally delivered in a web-based format. For more interactive features, please view your project online at client.terracon.com.

ATTACHMENTS

- EXPLORATION AND TESTING PROCEDURES
- SITE LOCATION AND EXPLORATION PLANS
- EXPLORATION RESULTS
- SUPPORTING INFORMATION

Note: Refer to each individual Attachment for a listing of contents.

Geotechnical Engineering Report

Harnett Primary School Classroom Addition ■ Dunn, North Carolina
January 7, 2022 ■ Terracon Project No. 70215253

**REPORT SUMMARY**

Terracon has completed the geotechnical engineering report for the proposed Classroom Addition project located at Harnett Primary School in Dunn, North Carolina. A total of six (6) soil test borings were performed in the proposed construction areas. The following geotechnical considerations were identified:

- Generally, the site appears suitable for the proposed construction provided the subgrade is prepared and tested as described in this report. The soils at the site consist of medium stiff to hard elastic silt and lean clay soils underlain by very loose to medium dense silty/clayey sand soils.
- Highly plastic elastic silts (MH) were encountered at boring B-4 near the surface. To reduce potential soil expansion effects of highly plastic soils under foundations, slabs, and pavements, we recommend fine grained soils with plasticity indices greater than 50 to be removed (or chemically treated), where present, within 3 feet of finished grade within building footprints, and within 2 feet of finished pavement grade. Undercut and replacement of highly plastic soil, extending depth of footings, or lime treatment can reduce soil expansion potential. We recommend that the contractor be requested to submit a unit rate cost for removal (undercutting) and replacement as part of the bidding process.
- Near-surface clayey and silty soils are moisture sensitive and can become soft and unstable when wet and shrink as they dry out. These characteristics make moisture sensitive soils particularly difficult to place and compact as engineered fill. Subgrade soils may require improvement such as incorporation of geotextiles, or lime modification. We recommend a budget contingency be established for additional work to improve subgrade soils.
- Shallow foundations bearing on properly prepared and approved native soils or engineered fill can be designed with an allowable soil bearing pressure of 3,000 pounds per square foot (psf).
- Groundwater was encountered in all test borings at depths of 13.5 to 18.8 feet below ground surface during our field exploration. Cave-in depths were measured between 9.2 and 16.4 feet in depth in the test locations. We do not anticipate that groundwater will impact site development.
- An ASCE Chapter 20 seismic site classification of "D" is appropriate for this site.

Geotechnical Engineering Report

Harnett Primary School Classroom Addition ■ Dunn, North Carolina

January 7, 2022 ■ Terracon Project No. 70215253



- The geotechnical engineer should be retained during the construction phase of the project to observe earthwork and to perform necessary tests and observations during subgrade preparation; proof-rolling; placement and compaction of controlled compacted fills and backfilling of excavations into the completed subgrade.

This summary should be used in conjunction with the entire report for design purposes. It should be recognized that details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein. The section titled **General Comments** should be read for an understanding of the report limitations.

Geotechnical Engineering Report
Harnett Primary School Classroom Addition
800 West Harnett Street
Dunn, North Carolina
Terracon Project No. 70215253
January 7, 2022

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed Classroom Addition to be located at Harnett Primary School at 800 West Harnett Street in Dunn, North Carolina. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Site preparation and earthwork
- Excavation considerations
- Foundation design and construction
- Floor slab design and construction
- Seismic site classification per IBC

The geotechnical engineering Scope of Services for this project included the advancement of six (6) test borings to depths of approximately 30 feet below existing site grades.

Maps showing the site and boring locations are shown in the **Site Location** and **Exploration Plan** sections, respectively. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included on the boring logs and/or as separate graphs in the **Exploration Results** section.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

| Item | Description |
|---------------------------|--|
| Parcel Information | The project is located at the existing Harnett Primary School at 800 West Harnett Street in Dunn, North Carolina. Approximate site coordinates: 35.3147, Latitude; -78.6145 Longitude See Site Location |

Geotechnical Engineering Report

Harnett Primary School Classroom Addition ■ Dunn, North Carolina
January 7, 2022 ■ Terracon Project No. 70215253



| Item | Description |
|------------------------------|--|
| Existing Improvements | The existing elementary school is a single-story, masonry-block and brick structure with slabs-on-grade. Site improvements include paved parking and drop-off loop, several modular classroom buildings, playgrounds and perimeter fencing. |
| Current Ground Cover | Mixture of grass, gravel access road and landscaping materials. |
| Existing Topography | The site appears to be relatively flat. |
| Geology | The project site is located in the Coastal Plain physiographic province of North Carolina. The Coastal Plain consists mainly of alluvial and marine deposits of sand, silt and clay placed during periods of fluctuating shorelines. According to the 1998 Geologic Map of North Carolina, the site is underlain by the Castle Hayne Formation (Tertiary). |

PROJECT DESCRIPTION

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

| Item | Description |
|---------------------------------|--|
| Information Provided | Project information was provided via email correspondence and the following documents: <ul style="list-style-type: none"> ■ Emails dated from March 2021 ■ HCS – Add_Reno – REQUEST FOR PROPOSAL – GEOTECHNICAL 2021.07.27 ■ HCS – RFP – Boring Maps – 2021.07.26 |
| Project Description | We understand that the project will include a new classroom addition. |
| Proposed Structures | The buildings are assumed to be slab-on-grade (non-basement) and masonry or steel framed. |
| Finished Floor Elevation | Not provided but assumed to match the existing building's FFE. |
| Maximum Loads | <ul style="list-style-type: none"> ■ Columns: 50 kips ■ Walls: 1 to 3 kips per linear foot (klf) |
| Grading/Slopes | Based on the existing grading we assume cut/fill of less than 5 feet. |
| Pavements | Pavements for the school addition are not anticipated. |

GEOTECHNICAL CHARACTERIZATION

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of

Geotechnical Engineering Report

Harnett Primary School Classroom Addition ■ Dunn, North Carolina
January 7, 2022 ■ Terracon Project No. 70215253



the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of site preparation and foundation options. Conditions encountered at each exploration point are indicated on the individual logs. The individual logs can be found in the **Exploration Results** section and the GeoModel can be found in the **Figures** section of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

| Model Layer | Layer Name | General Description |
|-------------|-------------------------------|----------------------------|
| 1 | Topsoil | -- |
| 2 | Sandy Lean CLAY | Medium stiff to very stiff |
| 3 | Sandy SILT/Sandy Elastic SILT | Stiff to hard |
| 4 | Silty/Clayey SAND | Very loose to medium dense |

Groundwater

Groundwater was encountered in all test borings at depths of 13.5 to 18.8 feet below ground surface during our field exploration. Cave-in depths were measured between 9.2 and 16.4 feet in depth in the test locations.

The groundwater level can change due to seasonal variations in the amount of rainfall, runoff, lower permeability of the soil, and other factors not evident at the time of our exploration. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

GEOTECHNICAL OVERVIEW

Based on project test boring information, shallow subsurface conditions consist of medium stiff to stiff elastic silt and lean clay soils underlain by very loose to medium dense silty/clayey sand soils. When prepared as described in this report, the site is expected to be suitable for the proposed building and may be supported on conventional spread and strip footings with a net allowable bearing pressure of 3,000 psf, with some localized repairs expected.

Shallow, medium stiff to stiff high plasticity elastic silt (MH) (liquid limit greater than 50) soils were encountered at boring B-4. These soils could become unstable with typical earthwork and construction traffic, especially after precipitation events, and will require removal to a depth of at least 3 feet below finished exterior grades for foundations and 2 feet below proposed floor slabs or pavement subgrade during construction when encountered at these locations. Alternatively, soil subgrade can be chemically stabilized with lime. This would help if highly plastic soils are exposed to wet conditions.

Geotechnical Engineering Report

Harnett Primary School Classroom Addition ■ Dunn, North Carolina
January 7, 2022 ■ Terracon Project No. 70215253



The near surface soils moisture sensitive and could become unstable, especially after precipitation events, as well as with typical earthwork and construction traffic. The effective drainage should be completed early in the construction sequence and maintained after construction to avoid potential issues. If possible, the grading should be performed during the warmer and drier times of the year. If grading is performed during the winter months, an increased risk for possible undercutting and replacement of unstable subgrade will persist. Additional site preparation recommendations, including subgrade improvement and fill placement, are provided in the **Earthwork** section.

The geotechnical engineer should be retained at this time to observe earthwork and to perform necessary tests and observations during subgrade preparation; proofrolling; placement and compaction of controlled compacted fills; backfilling of excavations into the completed subgrade, and just prior to construction of foundations.

The **General Comments** section provides an understanding of the report limitations.

EARTHWORK

Earthwork is anticipated to include clearing, excavations, and fill placement. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria, as necessary, to render the site in the state considered in our geotechnical engineering evaluation for foundations, floor slabs, and pavements.

A qualified geotechnical engineer should be retained during the earthwork phase of the project to observe earthwork and to perform necessary tests and observations during subgrade preparation; to monitor proof-rolling, placement and compaction of controlled compacted fills, and backfilling of excavations to the completed subgrade.

Site Preparation

Site preparation should begin with the demolition of the existing pavement and structures and debris removal where new construction will occur. As part of the demolition, buried concrete foundations associated with existing modular structures should also be removed. Existing utilities that are to be abandoned should be removed or filled with grout. The excavations resulting from utility removal should be properly backfilled with compacted structural fill as described in the Fill Material Types and Compaction sections of this report. Utilities that are to remain in service should be accurately located horizontally and vertically to minimize conflict with new foundation construction.

Prior to placing fill, existing vegetation and root mat should be removed. Complete stripping of the topsoil should be performed in the proposed building pad areas.

Geotechnical Engineering Report

Harnett Primary School Classroom Addition ■ Dunn, North Carolina
January 7, 2022 ■ Terracon Project No. 70215253



The subgrade should be proofrolled with an adequately loaded vehicle such as a fully-loaded tandem-axle dump truck. The proofrolling should be performed under the direction of the Geotechnical Engineer. Areas excessively deflecting under the proofroll should be delineated and subsequently addressed by the Geotechnical Engineer. Excessively wet or dry material should either be removed, or moisture conditioned and recompacted.

Near surface high plasticity soils were encountered on portions of the site. If site work is performed during seasons of high precipitation, these soils may be difficult to work as they are very moisture sensitive. These difficulties can include softening of exposed subgrade soils, excessive rutting or deflection under construction traffic, and the inability to adequately dry and compact wet soil. If subgrade soils are unsuitable, they will require removal and replacement; however, if they are unstable due to excessive moisture, the most economical solution for remediation may be to scarify, dry and recompact the material. This remediation is most effective during the typically hotter months of the year (May to October). If construction is performed during the cooler period of the year, the timeline for scarifying, drying, and recompacting typically increases considerably and may lead to alternative remediation solutions. These solutions can include overexcavation of some or all of the unstable materials and replaced with either approved engineered fill or Aggregate Base Course (ABC) Stone. A geotextile could be used with the new fill or ABC stone. Potential undercutting can be reduced if the site preparation work is performed during a period of dry weather and if construction traffic is kept to a minimum on prepared subgrades. We recommend that the contractor be requested to submit a unit rate cost for undercutting as part of the bidding process.

Fill Material Types

Fill required to achieve design grade should be classified as structural fill and general fill. Structural fill is material used below, or within 10 feet of structures, pavements or constructed slopes. General fill is material used to achieve grade outside of these areas. Earthen materials used for structural and general fill should meet the following material property requirements:

| Soil Type ¹ | USCS Classification | Acceptable Location for Placement |
|--|-------------------------|---|
| Low Plasticity Cohesive | CL, CL-ML ML, SM, SC | All locations and elevations. |
| Sand / Gravel with less than 12% fines (silt and clay) | GW, GP, SW, SP | NCDOT ABC beneath floor slabs, pavements or as a replacement material in over excavated areas. |
| On-Site Soils | CL, SM, SC | Generally suitable for all locations and elevations when low to moderate plasticity requirement is met. |

Geotechnical Engineering Report

Harnett Primary School Classroom Addition ■ Dunn, North Carolina
January 7, 2022 ■ Terracon Project No. 70215253



| Soil Type ¹ | USCS Classification | Acceptable Location for Placement |
|---|---------------------|-----------------------------------|
| <ol style="list-style-type: none"> Structural and general fill should consist of approved materials free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to the Geotechnical Engineer for evaluation prior to use on this site. CH or MH soils should not be used within 3 feet of finished grade in building area and 2 foot below finished grade in other structural fill areas. | | |

Fill Compaction Requirements

Structural and general fill should meet the following compaction requirements.

| Item | Structural Fill | General Fill |
|--|--|---|
| Maximum Lift Thickness | 8 inches or less in loose thickness when heavy, self-propelled compaction equipment is used 4 to 6 inches in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is used | Same as Structural fill |
| Minimum Compaction Requirements ^{1, 2} | Minimum 95% of the material's maximum standard Proctor dry density (ASTM D 698). The upper 12 inches of subgrade in pavement areas should be compacted to at least 98% of the materials maximum standard Proctor dry density (ASTM D 698) | 92% of max. |
| Water Content Range ¹ | Low plasticity cohesive: -2% to +3% of optimum High plasticity cohesive: 0 to +4% of optimum Granular: -3% to +3% of optimum | As required to achieve min. compaction requirements |

- Maximum density and optimum water content as determined by the standard Proctor test (ASTM D 698).
- High plasticity cohesive fill should not be compacted to more than 100% of standard Proctor maximum dry density.

Utility Trench Backfill

For low permeability subgrades, utility trenches are a common source of water infiltration and migration. Utility trenches penetrating beneath the building should be effectively sealed to restrict water intrusion and flow through the trenches, which could migrate below the building. The trench should provide an effective trench plug that extends at least 5 feet from the face of the building exterior. The plug material should consist of cementitious flowable fill or low permeability clay. The trench plug material should be placed to surround the utility line. If used, the clay trench plug material should be placed and compacted to comply with the water content and compaction recommendations for structural fill stated previously in this report.

Geotechnical Engineering Report

Harnett Primary School Classroom Addition ■ Dunn, North Carolina
January 7, 2022 ■ Terracon Project No. 70215253

**Grading and Drainage**

All grades must provide effective drainage away from the building during and after construction and should be maintained throughout the life of the structure. Water retained next to the building can result in soil movements greater than those discussed in this report. Greater movements can result in unacceptable differential floor slab and/or foundation movements, cracked slabs and walls, and roof leaks. The roof should have gutters/drains with downspouts that discharge onto splash blocks at a distance of at least 10 feet from the building.

Exposed ground should be sloped and maintained at a minimum 5% away from the building for at least 10 feet beyond the perimeter of the building. Locally, flatter grades may be necessary to transition ADA access requirements for flatwork. After building construction and landscaping have been completed, final grades should be verified to document effective drainage has been achieved. Grades around the structure should also be periodically inspected and adjusted, as necessary, as part of the structure's maintenance program. Where paving or flatwork abuts the structure, a maintenance program should be established to effectively seal and maintain joints and prevent surface water infiltration.

Earthwork Construction Considerations

Shallow excavations for the proposed structure are anticipated to be accomplished with conventional construction equipment. Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction of floor slabs. Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over or adjacent to construction areas should be removed. If the subgrade freezes, desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompact prior to floor slab construction.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, "Excavations" and its appendices, and in accordance with any applicable local, and/or state regulations.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety, or the contractor's activities; such responsibility shall neither be implied nor inferred.

Geotechnical Engineering Report

Harnett Primary School Classroom Addition ■ Dunn, North Carolina
January 7, 2022 ■ Terracon Project No. 70215253

**Construction Observation and Testing**

The earthwork efforts should be monitored under the direction of the Geotechnical Engineer. Monitoring should include documentation of adequate removal of vegetation and topsoil, proofrolling, and mitigation of areas delineated by the proofroll to require mitigation.

Each lift of compacted fill should be tested, evaluated, and reworked, as necessary, until approved by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency of at least one test for every 2,500 square feet of compacted fill in the building areas and 5,000 square feet in pavement areas. One density and water content test should be performed for every 50 linear feet of compacted utility trench backfill.

In areas of foundation excavations, the bearing subgrade should be evaluated under the direction of the Geotechnical Engineer. If unanticipated conditions are encountered, the Geotechnical Engineer should prescribe mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

SHALLOW FOUNDATIONS

If the site has been prepared in accordance with the requirements noted in **Earthwork**, the following design parameters are applicable for shallow foundations.

Design Parameters – Compressive Loads

| Item | Description |
|--|---|
| Maximum Net Allowable Bearing pressure ^{1, 2, 3} | 3,000 psf |
| Minimum Foundation Dimensions | Columns: 30 inches Continuous: 18 inches |
| Ultimate Coefficient of Sliding Friction ⁴ | 0.35 (granular native soils) |
| Minimum Embedment below Finished Grade ⁵ | 18 inches |
| Estimated Total Settlement from Structural Loads ² | Less than about 1 inch |
| Estimated Differential Settlement ^{2, 6} | Less than ½ inch |

Geotechnical Engineering Report

Harnett Primary School Classroom Addition ■ Dunn, North Carolina
January 7, 2022 ■ Terracon Project No. 70215253



| Item | Description |
|------|--|
| 1. | The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. An appropriate factor of safety has been applied. Values assume that exterior grades are no steeper than 20% within 10 feet of structure. |
| 2. | Values provided are for maximum loads noted in Project Description . |
| 3. | Unsuitable or soft soils should be over-excavated and replaced per the recommendations presented in the Earthwork . |
| 4. | Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to net uplift conditions. |
| 5. | Embedment necessary to minimize the effects of frost and/or seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure. |
| 6. | Differential settlements are as measured over a span of 50 feet. |

The foundation bearing materials should be evaluated at the time of the foundation excavation. This is an essential part of the construction process. A representative of the geotechnical engineer should use a combination of hand auger borings and dynamic cone penetrometer (DCP) testing to determine the suitability of the bearing materials for the design bearing pressure. DCP testing should be performed to a depth of 3 to 5 feet below the bottom of foundation excavation. Excessively soft, loose, or wet bearing soils should be over excavated to a depth recommended by the geotechnical engineer. The excavated soils should be replaced with structural fill or ABC Stone. Washed stone should not be used due to the presents of highly plastic material onsite. However, footings could bear directly on the soils after over excavation if approved by the Geotechnical Engineer.

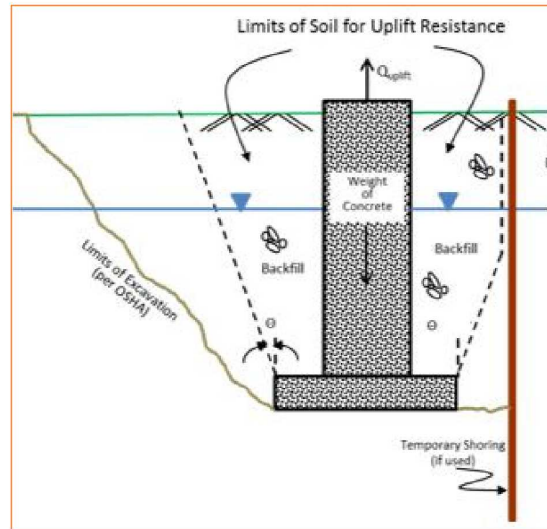
Design Parameters - Uplift Loads

Uplift resistance of spread footings can be developed from the effective weight of the footing and the overlying soils. As illustrated on the subsequent figure, the effective weight of the soil prism defined by diagonal planes extending up from the top of the perimeter of the foundation to the ground surface at an angle, θ , of 20 degrees from the vertical can be included in uplift resistance. The maximum allowable uplift capacity should be taken as a sum of the effective weight of soil plus the dead weight of the foundation, divided by an appropriate factor of safety. A maximum total unit weight of 100 pcf should be used for the backfill. This unit weight should be reduced to 40 pcf for portions of the backfill or natural soils below the groundwater elevation.

Geotechnical Engineering Report

Harnett Primary School Classroom Addition ■ Dunn, North Carolina

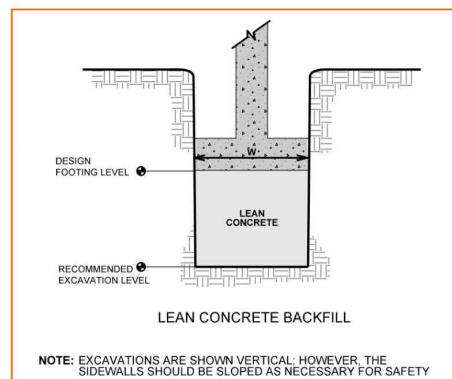
January 7, 2022 ■ Terracon Project No. 70215253



Foundation Construction Considerations

As noted in **Earthwork**, the footing excavations should be evaluated under the direction of the Geotechnical Engineer. The base of all foundation excavations should be free of water and loose soil, prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Care should be taken to prevent wetting or drying of the bearing materials during construction. Excessively wet or dry material or any loose/disturbed material in the bottom of the footing excavations should be removed/reconditioned before foundation concrete is placed.

If unsuitable bearing soils are encountered at the base of the planned footing excavation, the excavation should be extended deeper to suitable soils, and the footings could bear directly on these soils at the lower level or on lean concrete backfill placed in the excavations. This is illustrated on the sketch below.

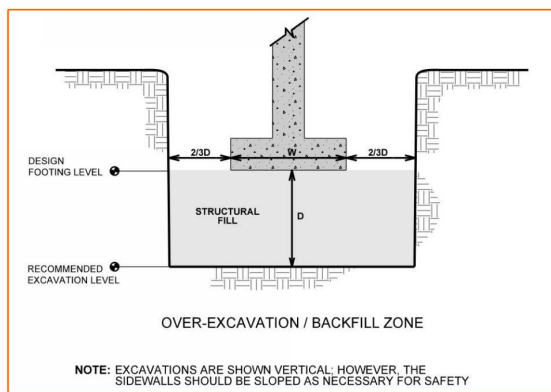


Geotechnical Engineering Report

Harnett Primary School Classroom Addition ■ Dunn, North Carolina
January 7, 2022 ■ Terracon Project No. 70215253



Over-excavation for structural fill placement below footings should be conducted as shown below. The over-excavation should be backfilled up to the footing base elevation, with structural fill placed, as recommended in the **Earthwork** section.



SEISMIC CONSIDERATIONS

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. The Site Classification is generally based on the upper 100 feet of the site profile characterized by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7-10. Geophysical surveying of the site using MASW (Multi-Spectral Analysis of Surface Waves) determined a **Seismic Site Classification is D**. Average shear wave velocities were measured between 1,110 to 1,182 feet/second.

FLOOR SLABS

Design parameters for floor slabs assume the requirements for **Earthwork** have been followed. Specific attention should be given to positive drainage away from the structure and positive drainage of the aggregate base beneath the floor slab.

Floor Slab Design Parameters

| Item | Description |
|---|--|
| Floor Slab Support ¹ | Approved native soils or new engineered fill. |
| Estimated Modulus of Subgrade Reaction ² | 100 pounds per square inch per inch (psi/in) for point loads |

Geotechnical Engineering Report

Harnett Primary School Classroom Addition ■ Dunn, North Carolina
January 7, 2022 ■ Terracon Project No. 70215253



| Item | Description |
|---|--|
| Stone Base Course / Capillary break | 4 inches of aggregate base course (NCDOT ABC). |
| <ol style="list-style-type: none"> 1. Floor slabs should be structurally independent of building footings or walls to reduce the possibility of floor slab cracking caused by differential movements between the slab and foundation. 2. Modulus of subgrade reaction is an estimated value based upon our experience with the subgrade condition, the requirements noted in Earthwork, and the floor slab support as noted in this table. It is provided for point loads. For large area loads the modulus of subgrade reaction would be lower. | |

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Saw-cut control joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations refer to the ACI Design Manual. Joints or cracks should be sealed with a water-proof, non-extruding compressible compound specifically recommended for heavy duty concrete pavement and wet environments.

Where floor slabs are tied to perimeter walls or turn-down slabs to meet structural or other construction objectives, our experience indicates differential movement between the walls and slabs will likely be observed in adjacent slab expansion joints or floor slab cracks beyond the length of the structural dowels. The Structural Engineer should account for potential differential settlement through use of sufficient control joints, appropriate reinforcing or other means.

Floor Slab Construction Considerations

Finished subgrade, within and for at least 10 feet beyond the floor slab, should be protected from traffic, rutting, or other disturbance and maintained in a relatively moist condition until floor slabs are constructed. If the subgrade should become damaged or desiccated prior to construction of floor slabs, the affected material should be removed and structural fill should be added to replace the resulting excavation. Final conditioning of the finished subgrade should be performed immediately prior to placement of the floor slab support course.

The Geotechnical Engineer should approve the condition of the floor slab subgrades immediately prior to placement of the floor slab support course, reinforcing steel, and concrete. Attention should be paid to high traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

Geotechnical Engineering Report

Harnett Primary School Classroom Addition ■ Dunn, North Carolina
January 7, 2022 ■ Terracon Project No. 70215253

**GENERAL COMMENTS**

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client, and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

FIGURES

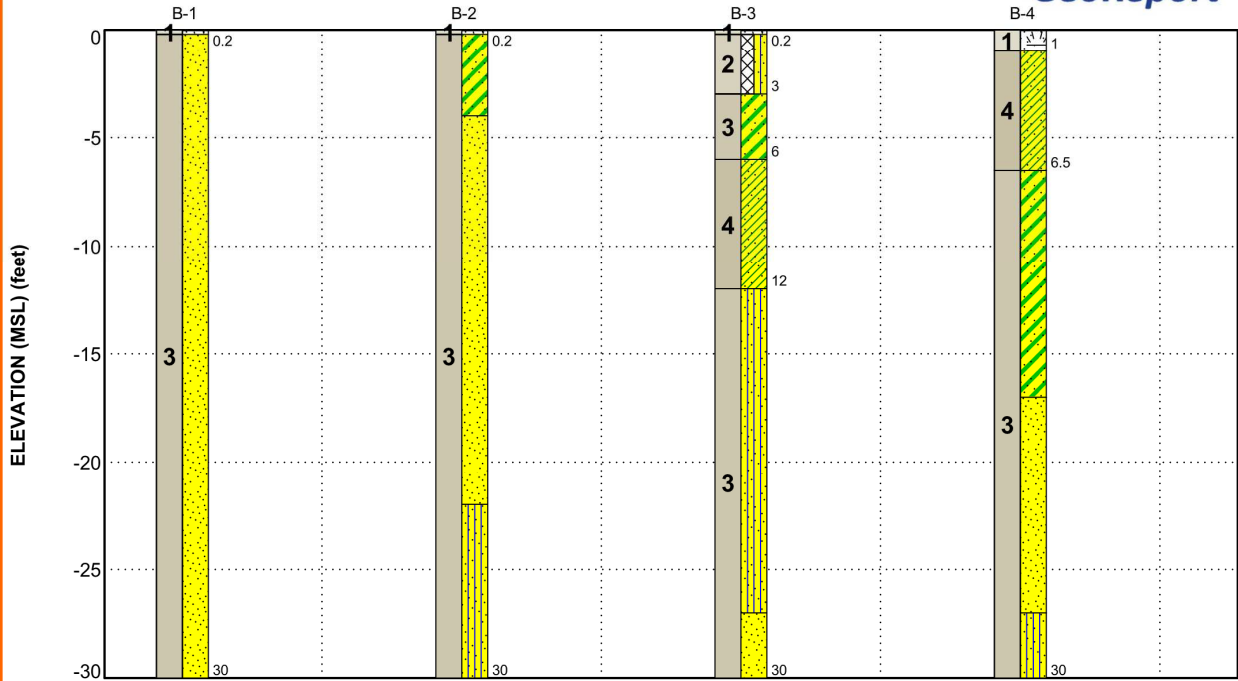
Contents:

GeoModel

Responsive ■ Resourceful ■ Reliable

GEOMODEL

Highland Elementary School - Classroom Addition ■ Sanford, NC
Terracon Project No. 70215252



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

| Model Layer | Layer Name | General Description |
|-------------|---------------------------------------|----------------------------|
| 1 | Topsoil | -- |
| 2 | Fill - Silty SAND | Medium dense |
| 3 | Silty/Clayey SAND, Poorly Graded SAND | Very loose to medium dense |
| 4 | Sandy CLAY | Medium stiff |

LEGEND

- Topsoil
- Silty Sand
- Poorly-graded Sand
- Sandy Lean Clay
- Clayey Sand

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

ATTACHMENTS

Responsive ■ Resourceful ■ Reliable

Geotechnical Engineering Report

Harnett Primary School Classroom Addition ■ Dunn, North Carolina
January 7, 2022 ■ Terracon Project No. 70215253



EXPLORATION AND TESTING PROCEDURES

Field Exploration

| Number of Borings | Boring Depth (feet) | Planned Location |
|-------------------|---------------------|-------------------|
| 6 | 30 or auger refusal | Building Addition |

Boring Layout and Elevations: Unless otherwise noted, Terracon personnel provided the boring layout. Coordinates were obtained with a handheld GPS unit (estimated horizontal accuracy of about ± 10 feet). Surface elevations were not obtained. If elevations and a more precise boring layout are desired, we recommend borings be surveyed following completion of fieldwork.

Subsurface Exploration Procedures: We advanced the borings with a Geoprobe 6620 DT rotary drill rig using continuous hollow stem augers. Four samples were obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. We observed and recorded groundwater levels during drilling and sampling. For safety purposes, all borings were backfilled with auger cuttings after their completion. Pavements were patched with cold-mix asphalt and/or pre-mixed concrete, as appropriate.

The sampling depths, penetration distances, and other sampling information was recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and classification by a Geotechnical Engineer. Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials encountered during drilling and our interpretation of the subsurface conditions between samples. Final boring logs were prepared from the field logs. The final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Seismic Site Classification

Terracon used a seismic system to perform a seismic site class survey per IBC 2018 (ASCE 7) to aid in determining the shear-wave velocity at the site. We performed two tests at one location on the site.

Geotechnical Engineering Report

Harnett Primary School Classroom Addition ■ Dunn, North Carolina
January 7, 2022 ■ Terracon Project No. 70215253



The seismic survey included:

- For each test, an array of 24 seismic sensors (geophones) were placed in an accessible area using ground plates, spaced 5-feet apart.
- Active (i.e. sledge hammer and strike plate) and passive (ambient vibrational noise) components were collected.
- Data was post-processed off-site to produce a 1-D shear wave profile for each test array.

Analysis - Terracon analyzed and processed the seismic data using a wavefield- transformation data-processing technique and an interactive Rayleigh-wave dispersion- modeling tool. The refraction microtremor method exploits aspects of spectral analysis of surface waves (SASW) and multi- channel analysis of surface waves (MASW) to derive an average shear-wave velocity for the top 100 feet (V_s^{100}).

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests to understand the engineering properties of the various soil strata, as necessary, for this project. Procedural standards noted below are for reference to methodology in general. In some cases, variations to methods were applied because of local practice or professional judgment. Standards noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

- ASTM D2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- ASTM D422 Standard Test Method for Particle-Size Analysis of Soils

The laboratory testing program often included examination of soil samples by an engineer. Based on the material's texture and plasticity, we described and classified the soil samples in accordance with the Unified Soil Classification System.

SITE LOCATION AND EXPLORATION PLANS

Contents:

Site Location Plan (2 pages)

Exploration Plan (2 pages)

Note: All attachments are one page unless noted above.

SITE LOCATION

Harnett Primary School Classroom Addition ■ Dunn, North Carolina
January 7, 2022 ■ Terracon Project No. 70215253

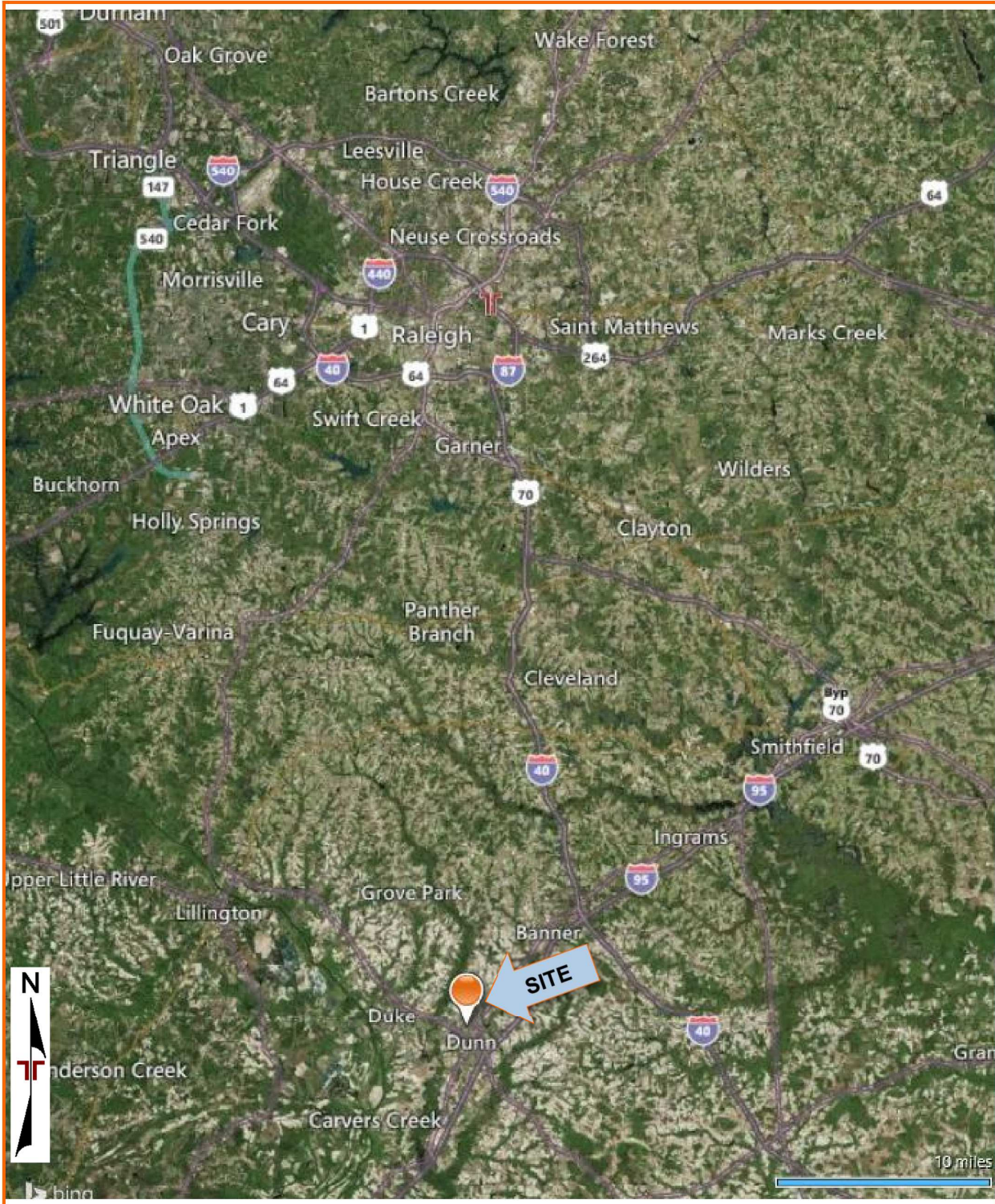


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES MAP PROVIDED BY MICROSOFT BING MAPS



SITE LOCATION
Harnett Primary School Classroom Addition ■ Dunn, North Carolina
January 7, 2022 ■ Terracon Project No. 70215253

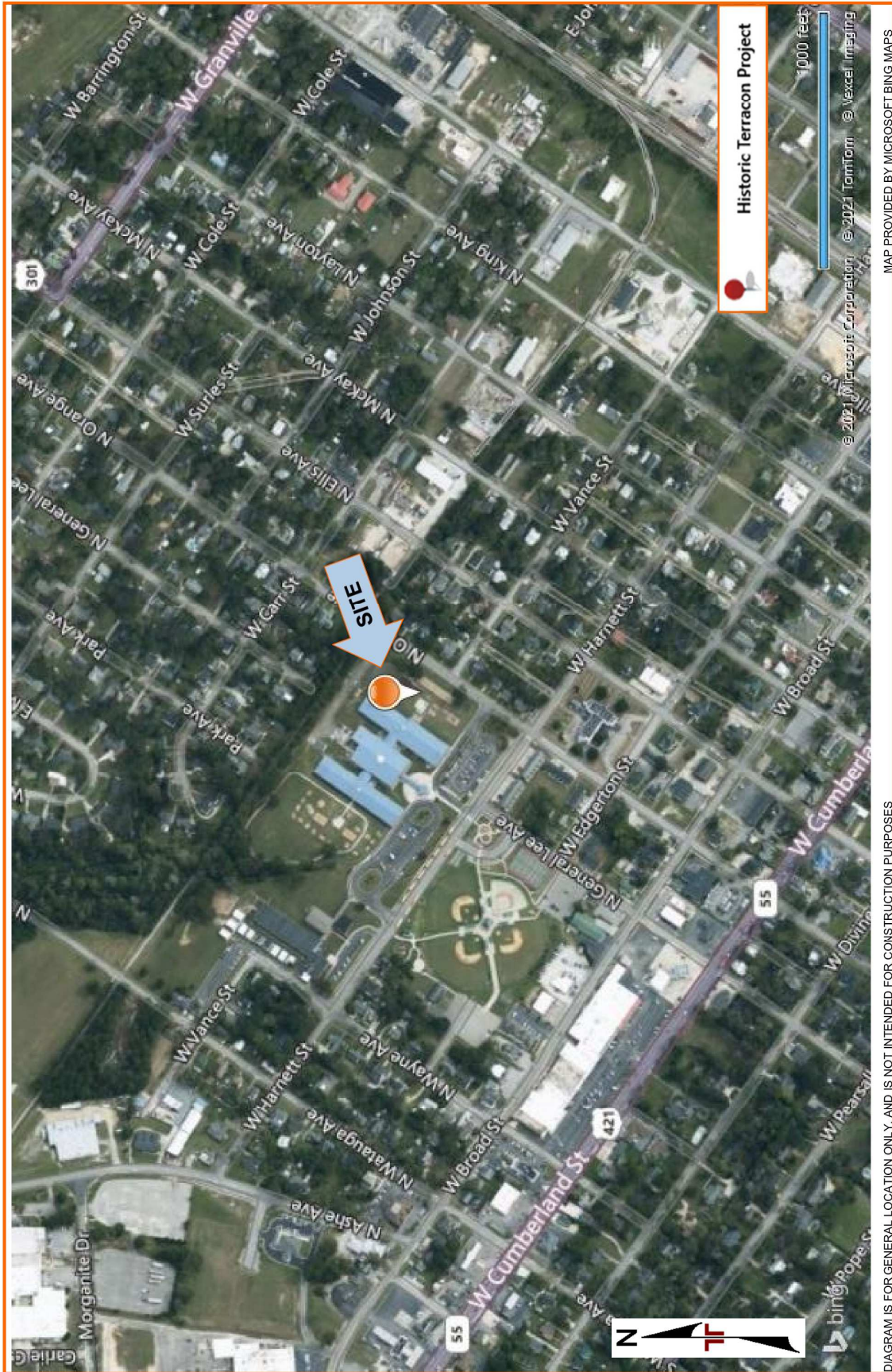


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS



EXPLORATION PLAN
Harnett Primary School Classroom Addition ■ Dunn, North Carolina
January 7, 2022 ■ Terracon Project No. 70215253

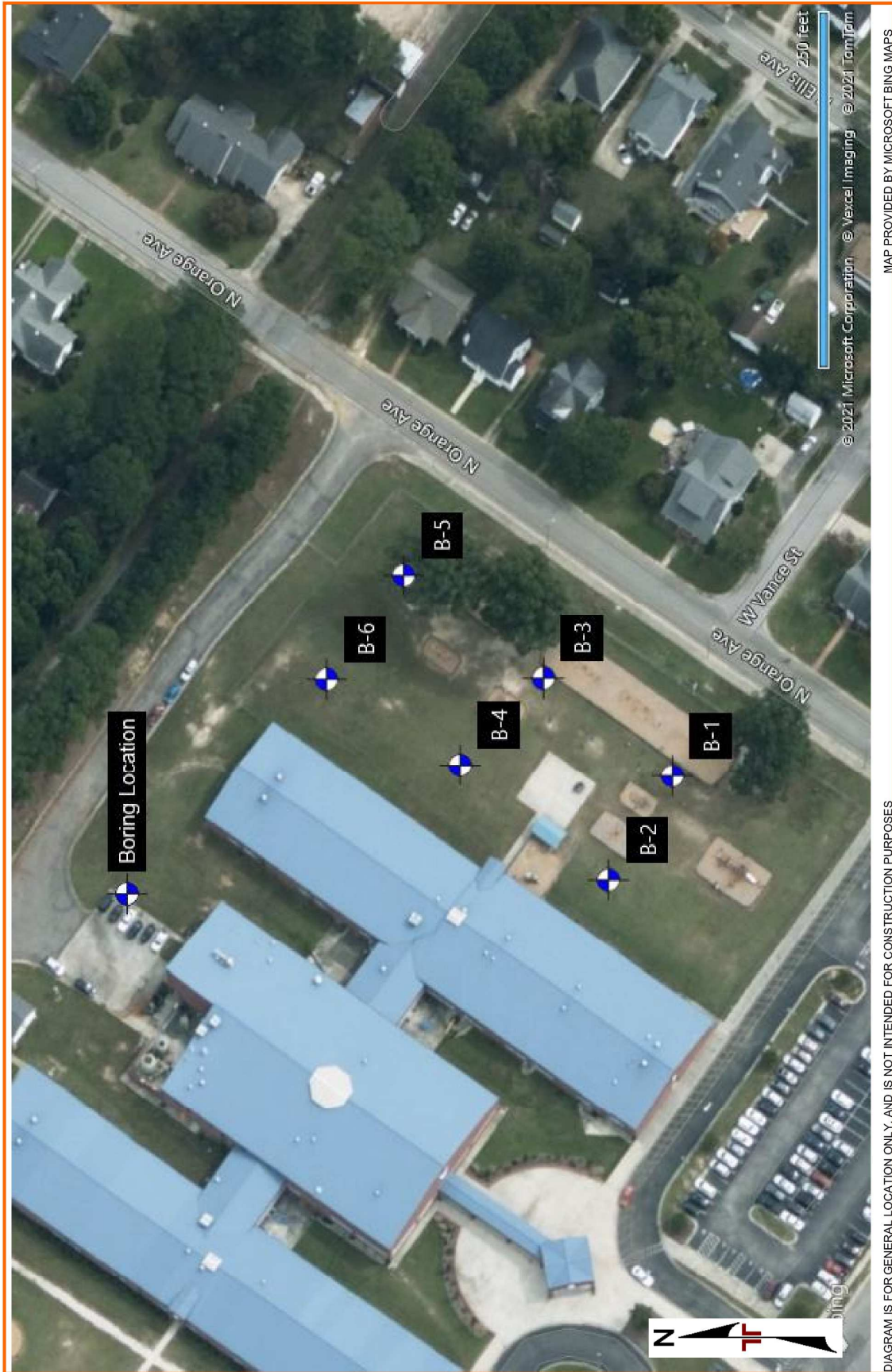
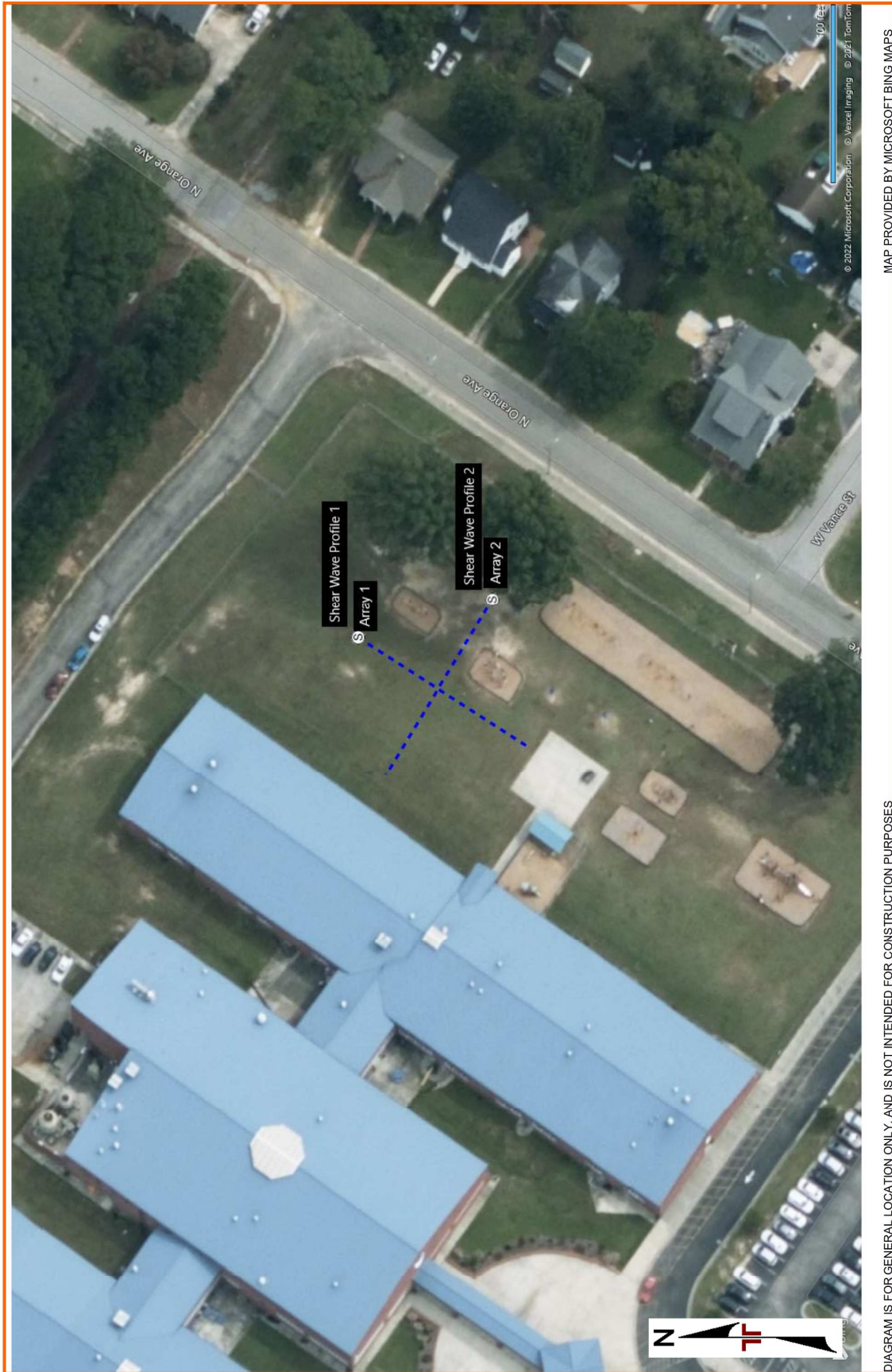


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS



EXPLORATION PLAN
Harnett Primary School Classroom Addition ■ Dunn, North Carolina
January 7, 2022 ■ Terracon Project No. 70215253



MAP PROVIDED BY MICROSOFT BING MAPS

EXPLORATION RESULTS

Contents:

Boring Logs (B-1 through B-6)

Atterberg Limits

Grain Size Distribution

Shear-Wave Velocity (2 pages)

Note: All attachments are one page unless noted above.

BORING LOG NO. B-1

PROJECT: Highland Elementary School - Classroom Addition

CLIENT: Harnett County Schools
Lillington, NC

SITE: 1915 Buffalo Lake Road
Sanford, NC

| MODEL LAYER | GRAPHIC LOG | LOCATION See Exploration Plan Latitude: 35.3066° Longitude: -79.0409° | DEPTH (FT.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | FIELD TEST RESULTS | STRENGTH TEST | | | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS | |
|-------------|-------------|--|-------------|--------------------------|-------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------|--|
| | | | | | | | TEST TYPE | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) | | | LL-PL-PI | |
| | | DEPTH 0.2' TOPSOIL , 2" Topsoil | | | | | | | | | | | |
| | | POORLY GRADED SAND (SP) , fine to medium grained, tan, white and orange, medium dense | | | | 4-5-5 N=10 | | | | | | | |
| | | | 5 | | | 3-5-6 N=11 | | | 2.7 | | | NP | |
| | | | | | | 3-5-6 N=11 | | | | | | | |
| | | | 10 | | | 4-6-8 N=14 | | | | | | | |
| | | | 15 | | | 5-5-5 N=10 | | | | | | | |
| | | | 20 | | | 7-7-8 N=15 | | | | | | | |
| | | | 25 | | | 6-7-9 N=16 | | | | | | | |
| | | | 30 | | | 5-10-11 N=21 | | | | | | | |
| | | Boring Terminated at 30 Feet | | | | | | | | | | | |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
HSA

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS
Groundwater not encountered



Boring Started: 12-14-2021

Boring Completed: 12-14-2021

Drill Rig: Geoprobe 6620 DT

Driller: M. Padgette

Project No.: 70215252

Cave-in observed at a depth of 14 feet.

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEC SMART LOG-NO WELL 70215252 HIGHLAND ELEMENTA.GPJ TERRACON_DATATEMPLATE.GDT 1/17/22

BORING LOG NO. B-2

PROJECT: Highland Elementary School - Classroom Addition

CLIENT: Harnett County Schools
Lillington, NC

SITE: 1915 Buffalo Lake Road
Sanford, NC

| MODEL LAYER | GRAPHIC LOG | LOCATION See Exploration Plan Latitude: 35.3066° Longitude: -79.0405° | DEPTH (FT.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | FIELD TEST RESULTS | STRENGTH TEST | | | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS | |
|-------------|-------------|--|-------------|--------------------------|-------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------|--|
| | | | | | | | TEST TYPE | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) | | | LL-PL-PI | |
| | | TOPSOIL , 2" Topsoil | 0.2 | | | | | | | | | | |
| | | CLAYEY SAND (SC) , fine to medium grained, brown, loose | 4.0 | | | 5-3-4 N=7 | | | | | | | |
| | | POORLY GRADED SAND (SP) , fine to medium grained, tan and white, loose to medium dense | 5.0 | | | 3-2-5 N=7 | | | | | | | |
| | | | | | | 3-5-5 N=10 | | | | | | | |
| | | | | | | 3-5-6 N=11 | | | | | | | |
| | | | | | | 5-6-9 N=15 | | | | | | | |
| | | | | | | 5-5-6 N=11 | | | | | | | |
| | | SILTY SAND (SM) , fine to medium grained, tan, orange and light gray, loose to medium dense | 22.0 | | | 5-3-5 N=8 | | | | | | | |
| | | | | | | 3-4-6 N=10 | | | | | | | |
| | | Boring Terminated at 30 Feet | 30.0 | | | | | | | | | | |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
HSA

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS
Groundwater not encountered



Boring Started: 12-14-2021

Boring Completed: 12-14-2021

Drill Rig: Geoprobe 6620 DT

Driller: M. Padgette

Project No.: 70215252

Cave-in observed at a depth of 11.8 feet.

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEC SMART LOG-NO WELL 70215252 HIGHLAND ELEMENTA.GPJ TERRACON_DATATEMPLATE.GDT 1/7/22

BORING LOG NO. B-3

PROJECT: Highland Elementary School - Classroom Addition

CLIENT: Harnett County Schools
Lillington, NC

SITE: 1915 Buffalo Lake Road
Sanford, NC

| MODEL LAYER | GRAPHIC LOG | LOCATION See Exploration Plan Latitude: 35.3062° Longitude: -79.0408° | DEPTH (FT.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | FIELD TEST RESULTS | STRENGTH TEST | | | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS LL-PL-PI |
|-------------|-------------|---|-------------|--------------------------|-------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------------------|
| | | | | | | | TEST TYPE | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) | | | |
| 1 | | TOPSOIL , 2" Topsoil | 0.2 | | | | | | | | | |
| 2 | | FILL - SILTY SAND (SM) , fine to medium grained, red, medium dense | 3.0 | | | 6-7-8 N=15 | | | 12.9 | | 34-24-10 | |
| 3 | | CLAYEY SAND (SC) , fine to medium grained, tan and orange, medium dense | 6.0 | | | 10-7-11 N=18 | | | | | | |
| 4 | | SANDY LEAN CLAY (CL) , tan, orange and light gray, stiff to medium stiff | 12.0 | | | 3-4-5 N=9 | | | | | | |
| | | | | | | 3-4-4 N=8 | | | | | | |
| | | SILTY SAND (SM) , fine to medium grained, tan, white and orange, loose to medium dense | 17.0 | | | 2-4-9 N=13 | | | | | | |
| | | | | | | 2-3-6 N=9 | | | | | | |
| | | | | | | 4-6-6 N=12 | | | | | | |
| | | POORLY GRADED SAND (SP) , fine to medium grained, tan, medium dense | 27.0 | | | 7-11-12 N=23 | | | | | | |
| | | Boring Terminated at 30 Feet | 30.0 | | | | | | | | | |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
HSA

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS
Groundwater not encountered



Boring Started: 12-14-2021

Boring Completed: 12-14-2021

Drill Rig: Geoprobe 6620 DT

Driller: M. Padgette

Project No.: 70215252

Cave-in observed at a depth of 16.9 feet.

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEC SMART LOG-NO WELL 70215252 HIGHLAND ELEMENTA.GPJ TERRACON_DATATEMPLATE.GDT 1/7/22

BORING LOG NO. B-4

PROJECT: Highland Elementary School - Classroom Addition

CLIENT: Harnett County Schools
Lillington, NC

SITE: 1915 Buffalo Lake Road
Sanford, NC

| MODEL LAYER | GRAPHIC LOG | LOCATION See Exploration Plan Latitude: 35.3063° Longitude: -79.0404° | DEPTH (FT.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | FIELD TEST RESULTS | STRENGTH TEST | | | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS LL-PL-PI |
|-------------------------------------|-------------|--|-------------|--------------------------|-------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------------------|
| | | | | | | | TEST TYPE | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) | | | |
| 1 | | TOPSOIL , 12" Topsoil | 1.0 | | | | | | | | | |
| 4 | | SANDY LEAN CLAY (CL) , gray to tan and orange, medium stiff | | | X | 4-4-4 N=8 | | | 22.5 | | 38-22-16 | |
| | | | 5 | | X | 2-3-5 N=8 | | | | | | |
| | | | 10 | | X | 3-4-5 N=9 | | | | | | |
| | | | 15 | | X | 3-2-3 N=5 | | | | | | |
| 3 | | CLAYEY SAND (SC) , fine to medium grained, tan and brown, loose | | | X | 2-2-2 N=4 | | | | | | |
| | | | 17.0 | | X | 5-3-2 N=5 | | | | | | |
| | | | 25 | | X | 3-2-2 N=4 | | | | | | |
| | | POORLY GRADED SAND (SP) , fine to medium grained, brown to white, loose | 27.0 | | | | | | | | | |
| | | SILTY SAND (SM) , fine to medium grained, brown and tan, loose | 30.0 | | | | | | | | | |
| Boring Terminated at 30 Feet | | | | | | | | | | | | |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
HSA

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS
Groundwater not encountered



Boring Started: 12-14-2021

Boring Completed: 12-14-2021

Drill Rig: Geoprobe 6620 DT

Driller: M. Padgette

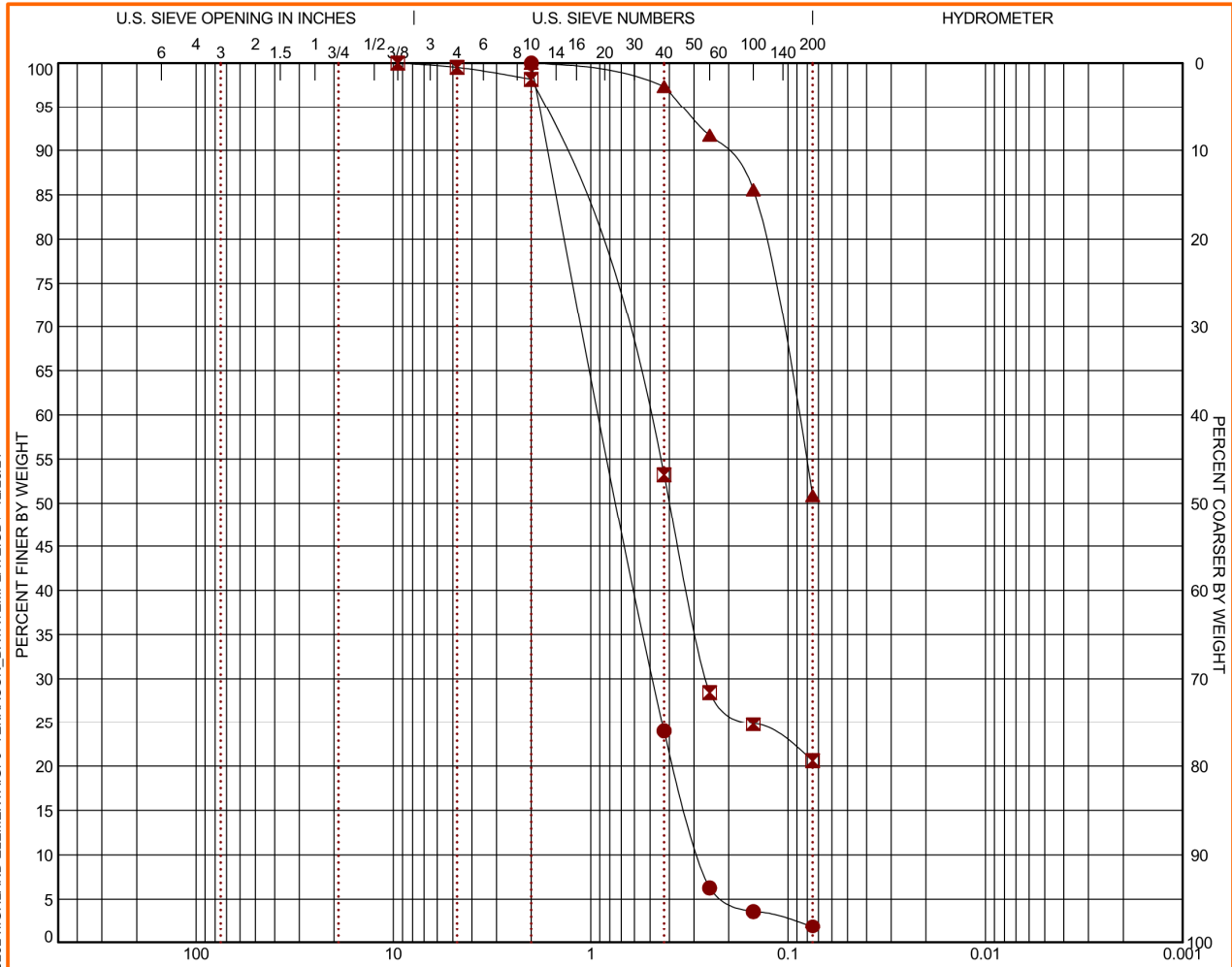
Project No.: 70215252

Cave-in observed at a depth of 15 feet.

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEC SMART LOG-NO WELL 70215252 HIGHLAND ELEMENTA.GPJ TERRACON_DATATEMPLATE.GDT 1/7/22

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 70215252 HIGHLAND ELEMENTA.GPJ TERRACON_DATATEMPLATE.GDT 12/28/21

| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---------|--------|------|--------|--------|------|--------------|
| | coarse | fine | coarse | medium | fine | |

| BORING ID | DEPTH | % COBBLES | % GRAVEL | % SAND | % SILT | % FINES | % CLAY | USCS |
|-----------|---------|-----------|----------|--------|--------|---------|--------|------|
| ● B-1 | 3.5 - 5 | 0.0 | 0.0 | 98.1 | | 1.9 | | SP |
| ☒ B-3 | 1 - 2.5 | 0.0 | 0.5 | 78.9 | | 20.6 | | SM |
| ▲ B-4 | 1 - 2.5 | 0.0 | 0.0 | 49.1 | | 50.9 | | CL |

| GRAIN SIZE | | | | SOIL DESCRIPTION | | | | | |
|-----------------|-------|-------|------|---------------------------|-------|------|-------|------|-------|
| | ● | ☒ | ▲ | ● | | ☒ | | ▲ | |
| D ₆₀ | 0.885 | 0.536 | 0.09 | #10 | 100.0 | 3/8" | 100.0 | #10 | 100.0 |
| D ₃₀ | 0.481 | 0.258 | | #40 | 23.97 | #4 | 99.52 | #40 | 97.36 |
| D ₁₀ | 0.279 | | | #60 | 6.29 | #10 | 98.16 | #60 | 91.7 |
| | | | | #100 | 3.63 | #40 | 53.25 | #100 | 85.56 |
| | | | | #200 | 1.88 | #60 | 28.44 | #200 | 50.87 |
| | | | | | | #100 | 24.81 | | |
| | | | | | | #200 | 20.59 | | |
| COEFFICIENTS | | | | REMARKS | | | | | |
| C _c | 0.93 | | | ● POORLY GRADED SAND (SP) | | | | | |
| C _u | 3.17 | | | ☒ SILTY SAND (SM) | | | | | |
| | | | | ▲ SANDY LEAN CLAY (CL) | | | | | |

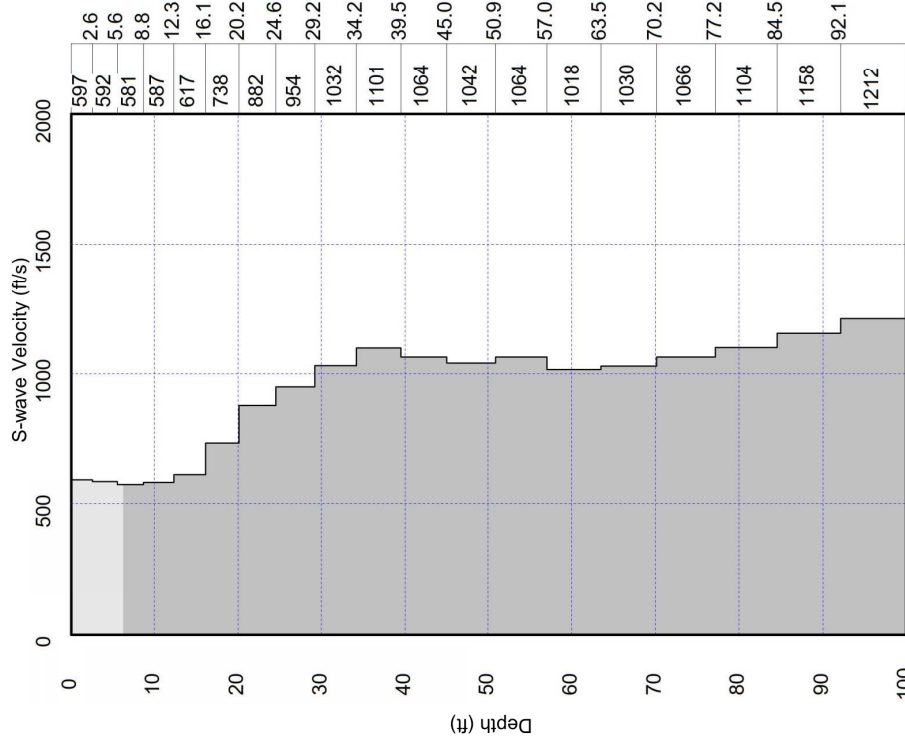
| | | |
|--|--|--|
| PROJECT: Highland Elementary School - Classroom Addition | <p>2401 Brentwood Rd Ste 107 Raleigh, NC</p> | PROJECT NUMBER: 70215252 |
| SITE: 2626 Ray Road Spring Lake, NC | | CLIENT: Harnett County Schools Lillington, NC |



Exploration Results

Highland Elementary
Terracon Project No. 70215252

Array 1



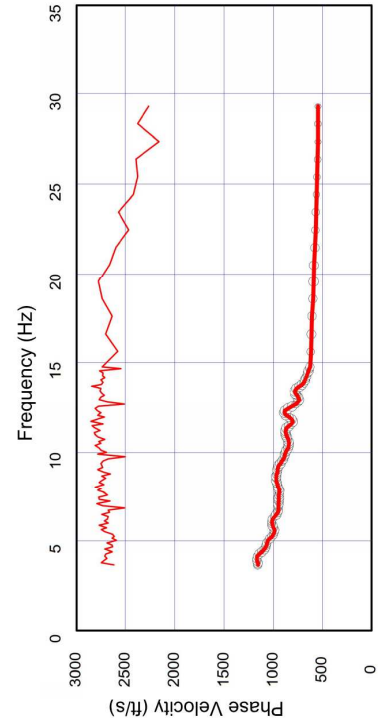
Average Weighted Shear Wave Velocity (ft/s)^{1/2} = **928**

Seismic Site Classification¹ = **D**

1. per 2018 International Building Code

2. measured between 0 ft and 100 ft.

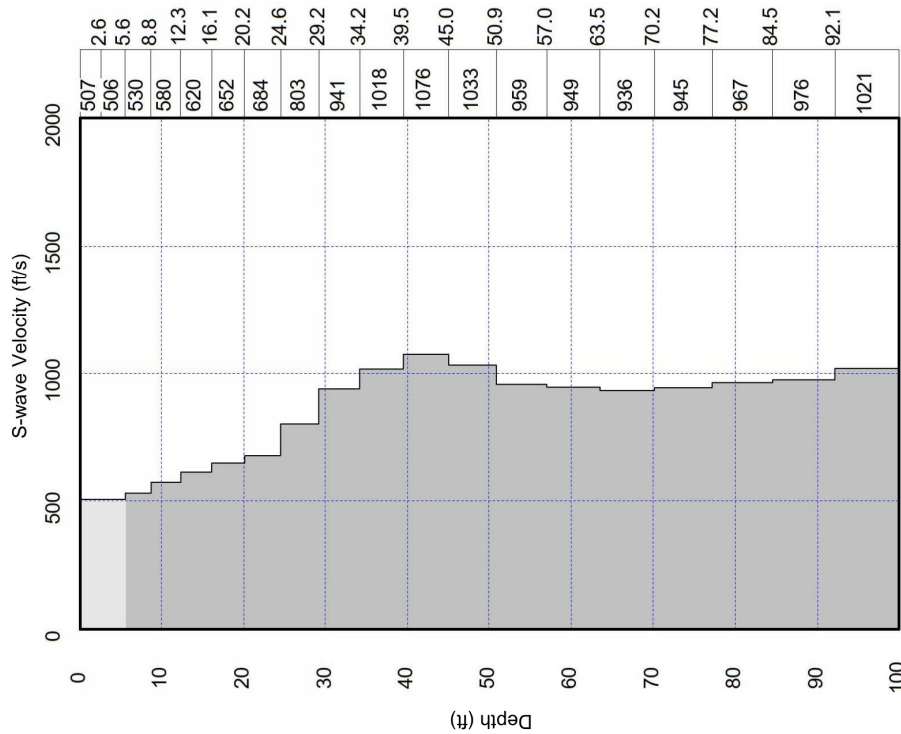
| Depth(ft) | S-wave velocity(ft/s) |
|-----------|-----------------------|
| 0.0 | 597.2 |
| 2.6 | 592.1 |
| 5.6 | 581.7 |
| 8.8 | 587.3 |
| 12.3 | 617.3 |
| 16.1 | 738.7 |
| 20.2 | 882.9 |
| 24.6 | 954.3 |
| 29.2 | 1032.8 |
| 34.2 | 1101.6 |
| 39.5 | 1064.9 |
| 45.0 | 1042.9 |
| 50.9 | 1064.9 |
| 57.0 | 1018.8 |
| 63.5 | 1030.4 |
| 70.2 | 1066.5 |
| 77.2 | 1104.1 |
| 84.5 | 1158.7 |
| 92.1 | 1212.3 |
| 100.0 | 1298.0 |





Array 2

Exploration Results
Highland Elementary
Terracon Project No. 70215252

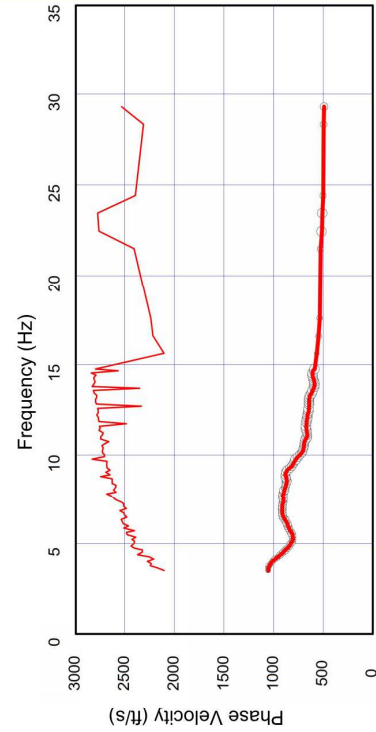


Average Weighted Shear Wave Velocity (ft/s)^{1,2} = **835**

Seismic Site Classification¹ = **D**

1. per 2018 International Building Code
2. measured between 0 ft and 100 ft.

| Depth(ft) | S-wave velocity(ft/s) |
|-----------|-----------------------|
| 0.0 | 507.6 |
| 2.6 | 506.7 |
| 5.6 | 530.7 |
| 8.8 | 580.1 |
| 12.3 | 620.4 |
| 16.1 | 652.4 |
| 20.2 | 684.0 |
| 24.6 | 803.9 |
| 29.2 | 941.5 |
| 34.2 | 1018.2 |
| 39.5 | 1076.5 |
| 45.0 | 1033.8 |
| 50.9 | 959.0 |
| 57.0 | 949.4 |
| 63.5 | 936.5 |
| 70.2 | 945.4 |
| 77.2 | 967.5 |
| 84.5 | 976.6 |
| 92.1 | 1021.5 |
| 100.0 | 1150.7 |



SUPPORTING INFORMATION

Contents:





General Notes

Unified Soil Classification System

Note: All attachments are one page unless noted above.

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

| | | | | | | |
|-----------------|---|--------------------|--|--------------------|--|---|
| SAMPLING |  Split Spoon | WATER LEVEL |  Water Initially Encountered  Water Level After a Specified Period of Time  Water Level After a Specified Period of Time Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations. | FIELD TESTS | | N Standard Penetration Test Resistance (Blows/Ft.) (HP) Hand Penetrometer (T) Torvane (DCP) Dynamic Cone Penetrometer (PID) Photo-Ionization Detector (OVA) Organic Vapor Analyzer |
|-----------------|---|--------------------|--|--------------------|--|---|

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

| STRENGTH TERMS | RELATIVE DENSITY OF COARSE-GRAINED SOILS <small>(More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance</small> | | CONSISTENCY OF FINE-GRAINED SOILS <small>(50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance</small> | | |
|-----------------------|---|---|---|---|---|
| | Descriptive Term (Density) | Standard Penetration or N-Value Blows/Ft. | Descriptive Term (Consistency) | Unconfined Compressive Strength Qu, (psf) | Standard Penetration or N-Value Blows/Ft. |
| | Very Loose | 0 - 3 | Very Soft | less than 500 | 0 - 1 |
| | Loose | 4 - 9 | Soft | 500 to 1,000 | 2 - 4 |
| | Medium Dense | 10 - 29 | Medium Stiff | 1,000 to 2,000 | 4 - 8 |
| | Dense | 30 - 50 | Stiff | 2,000 to 4,000 | 8 - 15 |
| | Very Dense | > 50 | Very Stiff | 4,000 to 8,000 | 15 - 30 |
| | | Hard | > 8,000 | > 30 | |

RELATIVE PROPORTIONS OF SAND AND GRAVEL

| Descriptive Term(s) of other constituents | Percent of Dry Weight |
|---|-----------------------|
| Trace | < 15 |
| With | 15 - 29 |
| Modifier | > 30 |

GRAIN SIZE TERMINOLOGY

| Major Component of Sample | Particle Size |
|---------------------------|--------------------------------------|
| Boulders | Over 12 in. (300 mm) |
| Cobbles | 12 in. to 3 in. (300mm to 75mm) |
| Gravel | 3 in. to #4 sieve (75mm to 4.75 mm) |
| Sand | #4 to #200 sieve (4.75mm to 0.075mm) |
| Silt or Clay | Passing #200 sieve (0.075mm) |

RELATIVE PROPORTIONS OF FINES

| Descriptive Term(s) of other constituents | Percent of Dry Weight |
|---|-----------------------|
| Trace | < 5 |
| With | 5 - 12 |
| Modifier | > 12 |

PLASTICITY DESCRIPTION

| Term | Plasticity Index |
|-------------|------------------|
| Non-plastic | 0 |
| Low | 1 - 10 |
| Medium | 11 - 30 |
| High | > 30 |



UNIFIED SOIL CLASSIFICATION SYSTEM

| Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^A | | | | Soil Classification | | |
|--|---|--|--|---|-----------------------------------|---------------------------------|
| | | | | Group Symbol | Group Name ^D | |
| Coarse Grained Soils: More than 50% retained on No. 200 sieve | Gravels: More than 50% of coarse fraction retained on No. 4 sieve | Clean Gravels: Less than 5% fines ^C | $Cu \geq 4$ and $1 \leq Cc \leq 3$ ^E | GW | Well-graded gravel ^F | |
| | | | $Cu < 4$ and/or $1 > Cc > 3$ ^E | GP | Poorly graded gravel ^F | |
| | Sands: 50% or more of coarse fraction passes No. 4 sieve | Gravels with Fines: More than 12% fines ^C | | Fines classify as ML or MH | GM | Silty gravel ^{F,G,H} |
| | | | | Fines classify as CL or CH | GC | Clayey gravel ^{F,G,H} |
| | | Clean Sands: Less than 5% fines ^D | | $Cu \geq 6$ and $1 \leq Cc \leq 3$ ^E | SW | Well-graded sand ^I |
| | | | | $Cu < 6$ and/or $1 > Cc > 3$ ^E | SP | Poorly graded sand ^I |
| Sands with Fines: More than 12% fines ^D | | Fines classify as ML or MH | SM | Silty sand ^{G,H,I} | | |
| | | Fines Classify as CL or CH | SC | Clayey sand ^{G,H,I} | | |
| Fine-Grained Soils: 50% or more passes the No. 200 sieve | Silts and Clays: Liquid limit less than 50 | Inorganic: | $PI > 7$ and plots on or above "A" line ^J | CL | Lean clay ^{K,L,M} | |
| | | | $PI < 4$ or plots below "A" line ^J | ML | Silt ^{K,L,M} | |
| | | Organic: | Liquid limit - oven dried | < 0.75 | OL | Organic clay ^{K,L,M,N} |
| | | | Liquid limit - not dried | | OH | Organic silt ^{K,L,M,O} |
| | Silts and Clays: Liquid limit 50 or more | Inorganic: | PI plots on or above "A" line | CH | Fat clay ^{K,L,M} | |
| | | | PI plots below "A" line | MH | Elastic Silt ^{K,L,M} | |
| | | Organic: | Liquid limit - oven dried | < 0.75 | OH | Organic clay ^{K,L,M,P} |
| | | | Liquid limit - not dried | | OH | Organic silt ^{K,L,M,Q} |
| Highly organic soils: | Primarily organic matter, dark in color, and organic odor | | | PT | Peat | |

^A Based on the material passing the 3-in. (75-mm) sieve

^B If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

^C Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

^D Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

^E $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

^F If soil contains $\geq 15\%$ sand, add "with sand" to group name.

^G If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

^H If fines are organic, add "with organic fines" to group name.

^I If soil contains $\geq 15\%$ gravel, add "with gravel" to group name.

^J If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

^K If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

^L If soil contains $\geq 30\%$ plus No. 200 predominantly sand, add "sandy" to group name.

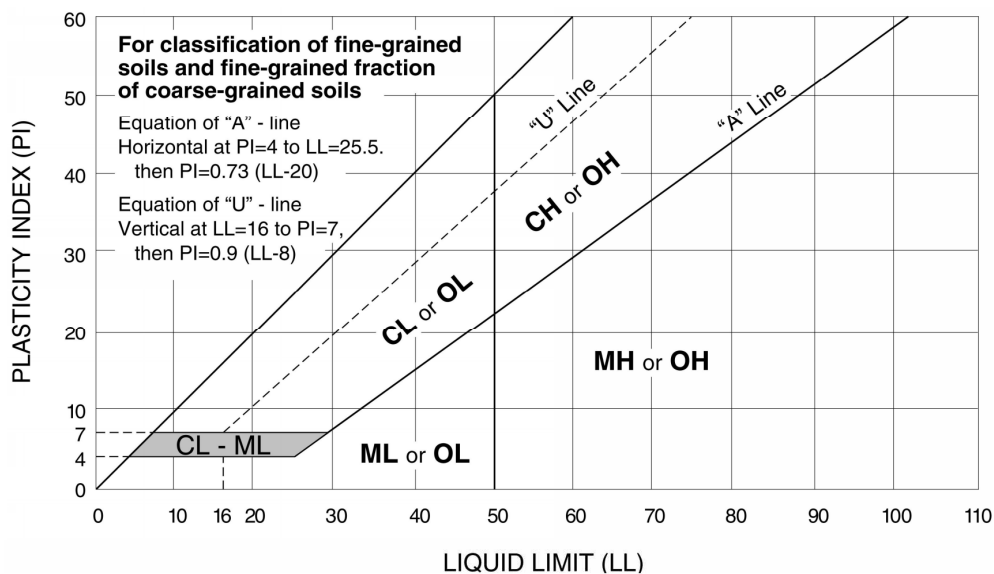
^M If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.

^N $PI \geq 4$ and plots on or above "A" line.

^O $PI < 4$ or plots below "A" line.

^P PI plots on or above "A" line.

^Q PI plots below "A" line.



BID FORM
STIPULATED SUM

Multiple Schools - Additions/Renovations

Highland Elementary School
Overhills Elementary School
Harnett Primary School

Harnett County, North Carolina

Date _____

The undersigned, as 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 bid or proposal; and that it is in all respects fair and in good faith without collusion or fraud.

The bidder further declares that he has examined the sites of the work and informed himself fully in regard to all conditions pertaining to the places where the work is to be done; that he has examined the Contract Documents relative thereto and he has taken special note that work shall be guaranteed for a period of one year after acceptance by Owner; and he has read all special provisions furnished prior to the opening of bids; that he has satisfied himself relative to the work to be performed.

The bidder proposes and agrees if this proposal is accepted to contract with the Owner in the form of contract specified, to furnish all necessary materials, equipment, machinery, tools, apparatus, means of transportation and labor necessary to complete the work as stated below in full and in complete accordance with the Contract Documents, as prepared by Sfl+a Architects, with a definite understanding that no money will be allowed for extra work except as set forth in the Contract Documents for the sum of:

BASE BID

_____ Dollars (\$ _____)

Plumbing Subcontractor _____ License No.: _____

Mechanical Subcontractor _____ License No.: _____

Electrical Subcontractor _____ License No.: _____

The bidder further proposes and agrees to commence work on a date to be specified in a written Notice to Proceed, estimated to be on or about October 17th, 2022, and shall be substantially complete with the Work by December 1st, 2023. The bidder also agrees to a Final Completion within 30 days from the date of the Certificate of Substantial Completion of each of the denoted substantial completion dates.

ALLOWANCES

The Base Bid for general construction Work is to include Allowances. The requirements for Allowances are as follows, and as further detailed in Section 01 21 00 - Allowances and the Contract Documents.

Unit Cost Allowances (UCA)

- UCA-1: Unit Masonry - BRK1\$300.00 per thousand**
- UCA-2: Unit Masonry - BRK2\$350.00 per thousand**
- UCA-3: Unit Masonry - BRK2\$350.00 per thousand**
- UCA-4: Unit Masonry - BRK3\$350.00 per thousand**

Stipulated Sum Allowances (SSA)

- SSA-1: Security System\$200,000.00**
- SSA-2: Fire Drive at Highland Elementary School Only\$200,000.00**

Quantity Allowances (QA)

- QA-1: Woven Geo-Textile Separation
and Stabilization Fabric In-Place500 Square Yards**
- QA-2: Removal of Unsuitable Soil (Bulk).....750 Cubic Yards**
- QA-3: Removal of Unsuitable Soil (Trench).....250 Cubic Yards**
- QA-4: Replacement of Removed Unsuitable Soils
or Rock with Off-Site Suitable Soils In-Place.....1,000 Cubic Yards**
- QA-5: Replacement of Removed Unsuitable Soils
or Rock with Off-Site Aggregate Base Course In-Place.....500 Cubic Yards**

Contingency Allowances (CA)

- CA-1: General Contingency Allowance:.....\$300,000.00**

ALTERNATES

Should any Alternates be accepted, the amounts written below shall be the amount to be added to or deducted from the Base Bid. The requirements for Alternates are as follows, and as further detailed in Section 01 23 00 - Alternates and the Contract Documents.

Alternate No. 1 - Lighting (Owner Preferred):

State the amount to be added to the Base Bid.

Add _____ Dollars (\$ _____)

Alternate No. 2 - Door Hardware.

Alternate No. 2A - Locks and Latches (Owner Preferred):

State the amount to be added to the Base Bid.

Add _____ Dollars (\$ _____)

Alternate No. 2B - Exit Devices (Owner Preferred):

State the amount to be added to the Base Bid.

Add _____ Dollars (\$ _____)

Alternate No. 2C - Closers (Owner Preferred):

State the amount to be added to the Base Bid.

Add _____ Dollars (\$ _____)

Alternate No. 2D - Continuous Hinges (Owner Preferred):

State the amount to be added to the Base Bid.

Add _____ Dollars (\$ _____)

Alternate No. 2E - Grand Master Key System (Owner Preferred):

State the amount to be added to the Base Bid.

Add _____ Dollars (\$ _____)

Alternate No. 3 - Plumbing Fixtures.**Alternate No. 3A - Faucets (Owner Preferred):**

State the amount to be added to the Base Bid.

Add _____ Dollars (\$ _____)

Alternate No. 3B - Flush Valves (Owner Preferred):

State the amount to be added to the Base Bid.

Add _____ Dollars (\$ _____)

Alternate No. 3C - Water Coolers (Owner Preferred):

State the amount to be added to the Base Bid.

Add _____ Dollars (\$ _____)

Alternate No. 4 - Composite Door Assemblies (Owner Preferred):

State the amount to be added to the Base Bid.

Add _____ Dollars (\$ _____)

Alternate No. 5 - HVAC Equipment (Owner Preferred):

State the amount to be added to the Base Bid.

Add _____ Dollars (\$ _____)

Alternate No. 6 - Plumbing Piping Valves (Owner Preferred):

State the amount to be added to the Base Bid.

Add _____ Dollars (\$ _____)

UNIT PRICES

Unit Prices quoted and accepted shall apply throughout the life of the contract, except as specifically noted. Unit Prices shall be applied, as appropriate, to compute the total value of changes in the scope of the Work in accordance with the Contract Documents. The requirements for Unit Prices are as follows, and as further detailed in Section 01 22 00 - Unit Prices and the Contract Documents.

- Unit Price No. 1: Exit Sign\$ _____ Each**
- Unit Price No. 2: Surface Mounted Speaker/Strobe\$ _____ Each**
- Unit Price No. 3: Smoke Detector\$ _____ Each**
- Unit Price No. 4: Wood Blocking Replacement\$ _____ Per 10 LF**
- Unit Price No. 5: Woven Geo-Textile
Separation and Stabilization Fabric In-Place\$ _____ Per SY**
- Unit Price No. 6: Removal of Unsuitable Soil (Bulk).....\$ _____ Per CY**
- Unit Price No. 7: Removal of Unsuitable Soil (Trench).....\$ _____ Per CY**
- Unit Price No. 8: Replacement of Removed Unsuitable
Soil or Rock with Off-Site Suitable Soil In-Place\$ _____ Per CY**
- Unit Price No. 9: Replacement of Removed Unsuitable
Soil or Rock with Off-Site Aggregate Base Course In-Place\$ _____ Per CY**

Provide on the Bid - Under GS 143-128.2(c) the undersigned bidder shall identify **on its bid** (Identification of Minority Business Participation form) the minority businesses that it will use on the Project with the total dollar value of the bids that will be performed by the minority businesses. **Also**, on **Affidavit (A)**, list the good faith efforts made to solicit minority participation in the bid effort.

NOTE: A Contractor that performs all the work with its own workforce may submit an **Affidavit (B)** to that effect in lieu of the **Affidavit (A)** required above. The MB Participation Form must still be submitted even if there is zero participation.

After the Bid Opening - The Owner will consider all Bids and Alternates and determine the lowest responsible, responsive bidder. Upon notification of being the apparent low bidder, the bidder shall then file within 72 hours of the notification of being the apparent lowest bidder, the following:

An **Affidavit (C)** that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total Contract Price, which is equal to or more than the 10% goal established. This Affidavit shall give rise to the presumption that the bidder has made the required good faith effort and **Affidavit (D)** is not necessary;

OR

If less than the 10% goal, **Affidavit (D)** of its good faith effort to meet the goal shall be provided. The document must include evidence of all good faith efforts that were implemented, including any advertisements, solicitations and other specific actions demonstrating recruitment and selection of minority businesses for participation in the contract.

NOTE: Bidders must always submit **with their bid** the Identification of Minority Business Participation listing all MB contractors, vendors and suppliers that will be used. If there is no MB participation, then enter zero on the form. **Affidavit (A) or Affidavit (B)**, as applicable, also must be submitted with the Bid. Failure to file a required Affidavit or documentation with the bid or after being notified apparent low bidder is grounds for rejection of the Bid.

PROPOSAL SIGNATURE PAGE

The undersigned further agrees that in the case of failure on his part to execute the said contract and the bonds within ten (10) consecutive calendar days after being given written notice of the award of contract, the certified check, cash or bid bond accompanying this bid shall be paid into the funds of the Owner's account set aside for the project as liquidated damages for such failure; otherwise, the certified check, cash or bid bond accompanying this proposal shall be returned to the undersigned.

Attach certified check, cash, or bid bond to this Proposal.

Respectfully submitted this _____ day of _____ 20 _____

(Name of Firm or Corporation Making Bid)

WITNESS: _____ By: _____

(Proprietorship or Partnership) Title: _____
(Owner, Partner, President or Vice President only)

Address: _____

License No.: _____

ATTEST:

By: _____

Title: _____
(Corporate Secretary or Assistant Secretary only)

(CORPORATE SEAL)

Addenda Received and Used in Computing Bids:

Addendum No. 1 Dated _____

Addendum No. 2 Dated _____

Addendum No. 3 Dated _____

Addendum No. 4 Dated _____

END OF BID FORM

Harnett County Schools-AFFIDAVIT A – Listing of Good Faith Efforts

County of Harnett

(Name of Bidder)

Affidavit of _____

I have made a good faith effort to comply under the following areas checked:

Bidders must earn at least 50 points from the good faith efforts listed for their bid to be considered responsive. (1 NC Administrative Code 30 I.0101)

- 1 – (10 pts)** Contacted minority businesses that reasonably could have been expected to submit a quote and that were known to the contractor, or available on State or local government maintained lists, at least 10 days before the bid date and notified them of the nature and scope of the work to be performed.
- 2 --(10 pts)** Made the construction plans, specifications and requirements available for review by prospective minority businesses, or providing these documents to them at least 10 days before the bids are due.
- 3 – (15 pts)** Broken down or combined elements of work into economically feasible units to facilitate minority participation.
- 4 – (10 pts)** Worked with minority trade, community, or contractor organizations identified by the Office of Historically Underutilized Businesses and included in the bid documents that provide assistance in recruitment of minority businesses.
- 5 – (10 pts)** Attended prebid meetings scheduled by the public owner.
- 6 – (20 pts)** Provided assistance in getting required bonding or insurance or provided alternatives to bonding or insurance for subcontractors.
- 7 – (15 pts)** Negotiated in good faith with interested minority businesses and did not reject them as unqualified without sound reasons based on their capabilities. Any rejection of a minority business based on lack of qualification should have the reasons documented in writing.
- 8 – (25 pts)** Provided assistance to an otherwise qualified minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letters of credit, including waiving credit that is ordinarily required. Assisted minority businesses in obtaining the same unit pricing with the bidder's suppliers in order to help minority businesses in establishing credit.
- 9 – (20 pts)** Negotiated joint venture and partnership arrangements with minority businesses in order to increase opportunities for minority business participation on a public construction or repair project when possible.
- 10 - (20 pts)** Provided quick pay agreements and policies to enable minority contractors and suppliers to meet cash-flow demands.

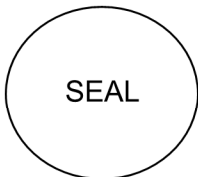
The undersigned, if apparent low bidder, will enter into a formal agreement with the firms listed in the Identification of Minority Business Participation schedule conditional upon scope of contract to be executed with the Owner. Substitution of contractors must be in accordance with GS143-128.2(d) Failure to abide by this statutory provision will constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of the minority business commitment and is authorized to bind the bidder to the commitment herein set forth.

Date: _____ Name of Authorized Officer: _____

Signature: _____

Title: _____



State of _____, County of _____

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

Notary Public _____

My commission expires _____

Harnett County Schools-AFFIDAVIT B-- Intent to Perform Contract with Own Workforce.

County of Harnett

Affidavit of _____

(Name of Bidder)

I hereby certify that it is our intent to perform 100% of the work required for the _____

_____ contract.

(Name of Project)

In making this certification, the Bidder states that the Bidder does not customarily subcontract elements of this type project, and normally performs and has the capability to perform and will perform all elements of the work on this project with his/her own current work forces; and

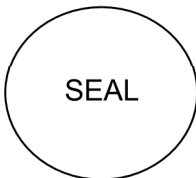
The Bidder agrees to provide any additional information or documentation requested by the owner in support of the above statement.

The undersigned hereby certifies that he or she has read this certification and is authorized to bind the Bidder to the commitments herein contained.

Date: _____ Name of Authorized Officer: _____

Signature: _____

Title: _____



State of _____, County of _____

Subscribed and sworn to before me this _____ day of _____ 20__

Notary Public _____

My commission expires _____

Do not submit with bid Do not submit with bid Do not submit with bid Do not submit with bid

Harnett County Schools - AFFIDAVIT C - Portion of the Work to be Performed by Minority Firms

County of Harnett

(Note this form is to be submitted only by the apparent lowest responsible, responsive bidder.)

If the portion of the work to be executed by minority businesses as defined in GS143-128.2(g) is equal to or greater than 10% of the bidders total contract price, then the bidder must complete this affidavit. This affidavit shall be provided by the apparent lowest responsible, responsive bidder within **72 hours** after notification of being low bidder.

Affidavit of _____ I do hereby certify that on the _____
(Name of Bidder)

_____ (Project Name)
Project ID# _____ Amount of Bid \$ _____

I will expend a minimum of _____% of the total dollar amount of the contract with minority business enterprises. Minority businesses will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below. Attach additional sheets if required

| Name and Phone Number | *Minority Category | Work description | Dollar Value |
|-----------------------|--------------------|------------------|--------------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

*Minority categories: Black, African American (**B**), Hispanic (**H**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**D**)

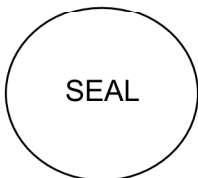
Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with Minority Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the bidder to the commitment herein set forth.

Date: _____ Name of Authorized Officer: _____

Signature: _____

Title: _____



State of _____, County of _____

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

Notary Public _____

My commission expires _____

Harnett County Schools AFFIDAVIT D – Good Faith Efforts

County of Harnett

(Note this form is to be submitted only by the apparent lowest responsible, responsive bidder.)

If the goal of 10% participation by minority business **is not** achieved, the Bidder shall provide the following documentation to the Owner of his good faith efforts:

Affidavit of _____ I do hereby certify that on the _____
 (Name of Bidder)

Project ID# _____ (Project Name) Amount of Bid \$ _____

I will expend a minimum of _____% of the total dollar amount of the contract with minority business enterprises. Minority businesses will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below. (Attach additional sheets if required)

| Name and Phone Number | *Minority Category | Work description | Dollar Value |
|-----------------------|--------------------|------------------|--------------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

*Minority categories: Black, African American (**B**), Hispanic (**H**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**D**)

Examples of documentation that may be required to demonstrate the Bidder's good faith efforts to meet the goals set forth in these provisions include, but are not necessarily limited to, the following:

- A. Copies of solicitations for quotes to at least three (3) minority business firms from the source list provided by the State for each subcontract to be let under this contract (if 3 or more firms are shown on the source list). Each solicitation shall contain a specific description of the work to be subcontracted, location where bid documents can be reviewed, representative of the Prime Bidder to contact, and location, date and time when quotes must be received.
- B. Copies of quotes or responses received from each firm responding to the solicitation.
- C. A telephone log of follow-up calls to each firm sent a solicitation.
- D. For subcontracts where a minority business firm is not considered the lowest responsible sub-bidder, copies of quotes received from all firms submitting quotes for that particular subcontract.
- E. Documentation of any contacts or correspondence to minority business, community, or contractor organizations in an attempt to meet the goal.
- F. Copy of pre-bid roster.
- G. Letter documenting efforts to provide assistance in obtaining required bonding or insurance for minority business.
- H. Letter detailing reasons for rejection of minority business due to lack of qualification.
- I. Letter documenting proposed assistance offered to minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letter of credit, including waiving credit that is ordinarily required.

Failure to provide the documentation as listed in these provisions may result in rejection of the bid and award to the next lowest responsible and responsive bidder.

Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with Minority Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

Do not submit with the bid Do not submit with the bid Do not submit with the bid Do not submit with the bid Do not submit with the bid

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the bidder to the commitment herein set forth.

Date: _____ Name of Authorized Officer: _____

Signature: _____

Title: _____



State of _____, County of _____

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

Notary Public _____

My commission expires _____

OWNER-CONTRACTOR AGREEMENT

PROJECT NUMBER: ()

SCHOOL NAME: ()

THIS AGREEMENT, in four (4) copies, made this () day of _____, Two Thousand and Twenty by and between _____ (herein referred to as the "Owner"), whose mailing address is _____ and _____. (herein referred to as the "Contractor"), whose mailing address is _____. Correspondence, submittals, and notices relating to or required under this Contract shall be sent in writing to the above addresses; unless either party is notified in writing by the other, of a change in address.

WITNESSETH:

WHEREAS, it is the intent of the Owner to obtain the services of the Contractor in connection with the new construction of () (hereinafter referred to as the "Project" or the "Work"); and

WHEREAS, the Contractor desires to perform such construction in accordance with the terms and conditions of this Agreement,

NOW, THEREFORE, in consideration of the promises made herein and other good and valuable consideration, the following terms and conditions are hereby mutually agreed to, by and between the Owner and Contractor:

Article 1

DEFINITIONS

- 1.1 All terms in this Agreement which are defined in the Information for Bidders and the General Conditions shall have the meanings designated therein.
- 1.2 The Contract Documents are as defined in the General Conditions. Such documents form the Contract, and all are as fully a part thereof as if attached to this Agreement or repeated herein. The Contract Documents consist of the Owner-Contractor Agreement, the General and Supplemental Conditions of the Contract, the Drawings, the Specifications, all Addenda issued prior to bidding, and all Modifications and Change Orders issued after execution of the Contract.

Article 2

STATEMENT OF THE WORK

- 2.1 The Project is the Work identified in the plans and specifications prepared by _____ dated _____, 2020 for _____ Board of Education, _____, including the following addenda:

()

A listing of the plans and specifications included in the Contract Documents is attached as

Exhibit A.

2.2 The Parties agree that the Project shall include the following alternates:

[REDACTED]

2.3 The Parties agree to the following modifications to the Project's plans and specifications, including the noted value engineering items:

List item(s) and proposed deduct/add(s). If none, delete this language list "None"

2.4 The Parties agree that the following allowances are included in the Contract Sum in Section 5.1 below:

List item(s) and proposed allowance(s). If none, delete this language list "None"

2.5 The Contractor shall provide and pay for all materials, tools, equipment, labor and professional and non-professional services, and shall perform all other acts and supply all other things necessary, to fully and properly perform and complete the Work, as required by the Contract Documents.

2.6 The Contractor shall further provide and pay for all related facilities described in any of the Contract Documents, including all work expressly specified therein and such additional work as may be reasonably inferred therefrom, saving and excepting only such items of work as are specifically stated in the Contract Documents not to be the obligation of the Contractor. The totality of the obligations imposed upon the contractor by this Article and by all other provisions of the Contract Documents, as well as the structures to be built and the labor to be performed, is herein referred to as the "Work".

Article 3

DESIGN CONSULTANT

3.1 The Design Consultant (as defined in the General Conditions) shall be ([REDACTED]) whose address is ([REDACTED]), however, that the Owner may, without liability to the Contractor, unilaterally amend this Article from time to time by designating a different person or organization to act as its Design Consultant and so advising the Contractor in writing, at which time the person or organization so designated shall be the Design Consultant for purposes of this Contract.

Article 4

TIME OF COMMENCEMENT AND COMPLETION

4.1 The Contractor shall commence the Work promptly upon the date established in the Notice to Proceed. If there is no Notice to Proceed, the date of commencement of the Work shall be the date of this Agreement or such other date as may be established herein.

4.2 Time is of the essence. The Contractor shall achieve Final Completion, as defined in the General Conditions on or before the date established for Final Completion in the Supplemental Conditions.

- 4.3 The Supplemental Conditions contains certain specific dates that shall be adhered to and are the last acceptable dates unless modified in writing by mutual agreement between the Contractor and the Owner. All dates indicate midnight unless otherwise stipulated. The only exceptions to this schedule are defined in the General Conditions under 8.3 DELAYS AND EXTENSIONS OF TIME.
- 4.4 Should the Contractor fail to complete the Work on or before the dates stipulated for Substantial Completion and/or Final Completion, or such later date as may result from an extension of time granted by the Owner, he shall pay the Owner, as liquidated damages the sums set forth in the General and Supplemental Conditions.

Article 5

CONTRACT SUM

- 5.1 Provided that the Contractor shall strictly and completely perform all of its obligations under the Contract Documents, and subject only to additions and deductions by Modification or as otherwise provided in the Contract Documents, the Owner shall pay to the Contractor, in current funds and at the time and in the installments hereinafter specified, the sum of [redacted] Dollars (\$ [redacted]) herein referred to as the "Contract Sum". This amount includes the base bid and the Alternates in Section 2.2
- 5.2 The Contract Sum includes the value engineering items and other contract modifications noted in Section 2.3 above that total \$_____.
- 5.3 Unit Prices are established as follows for the Project:

| | | |
|------------------|--|----|
| Unit Price No. 1 | | \$ |
| Unit Price No. 2 | | \$ |
| Unit Price No. 3 | | \$ |
| Unit Price No. 4 | | \$ |
| Unit Price No. 5 | | \$ |
| Unit Price No. 6 | | \$ |
| Unit Price No. 7 | | \$ |
| Unit Price No. 8 | | \$ |

Article 6

PROGRESS PAYMENTS

- 6.1 The Contractor hereby agrees that on or about the First day of the month for every month during the performance of the Work he will deliver to the Owner's Project Manager an Application for Payment in accordance with the provisions of Article 9 of the General Conditions. This date may be changed upon mutual agreement, stated in writing, between the Owner and Contractor. Payment under this Contract shall be made as provided in the General Conditions. Payments due and unpaid under the Contract Documents shall not bear interest.

Article 7

OTHER REQUIREMENTS

- 7.1 The Contractor shall submit the Performance Bond, Labor and Material Payment Bond and Certification of Insurance as required by the Contract Documents.
- 7.2 The Owner shall furnish to the Contractor one (1) set of drawings and one (1) set of specifications, at no extra cost, for use in the Construction of the Work. Additional sets of drawings or specifications may be obtained by the Contractor by paying the Owner for the costs of reproduction, handling and mailing.
- 7.3 The Contractor shall make a good faith effort to utilize Historically Underutilized Businesses (HUB's) per N.C. Gen. Stat. 143-128.2, and as described in the construction documents.
- 7.4 The General Conditions, Supplemental Conditions and the plans and specifications, including any addenda, are incorporated herein by reference.

IN WITNESS WHEREOF, _____ Board of Education (hereinbefore called the "Owner") has caused these presents to be signed and its corporate seal to be hereunto affixed, attested by its Chairperson and Secretary, and _____ (hereinbefore called "Contractor") has caused these presents to be signed by its President and its Corporate seal to be hereunto affixed, as hereinafter attested, all as of the day and year first above written.

_____ **BOARD OF EDUCATION**

Board Chairperson

ATTEST:

Superintendent

[Corporate Seal]

By: _____
_____, President or Vice-President
(Print Name)

ATTEST:

Corporate Secretary

[Corporate Seal]

This instrument has been preaudited in the manner required by the School Budget and Fiscal Control Act.

Finance Officer

Date

PERFORMANCE BOND

IT IS HEREBY AGREED that

(Insert full name and address of Contractor)

as Principal, hereinafter called Contractor, and,

(Insert full name and address of Surety)

as Surety, hereinafter called Surety, are held and firmly bound unto the

as Obligee, hereinafter called Owner, in the amount of _____ Dollars (\$ _____), for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these obligations.

WHEREAS, Contractor has by written agreement dated _____, 20____, entered into a contract with Owner for the construction of _____
(Insert the name of the Project)

in accordance with Drawings and Specifications prepared by _____
(Insert full name and address of Architect/Engineer)

which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Contractor shall promptly and faithfully perform said Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect. The Surety hereby waives notice of any alteration or extension of time made by the Owner.

Whenever Contractor shall be, and declared by Owner to be in default, under the Contract, the Owner having performed Owner’s obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

1. Complete the Contract in accordance with its terms and conditions, or
2. Obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, or, if the Owner elects, upon determination by the Owner and the Surety jointly of the lowest responsible bidder, arrange for a contract between such bidder and Owner, and make available as Work progresses (even though there should be a default

or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the contract price," as used in this paragraph, shall mean the total amount payable by Owner to Contractor under the Contract and any amendments thereto, less the amount properly paid by Owner to Contractor.

Any suit under this bond must be instituted before the expiration of any applicable statute of limitations under the Contract.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the Owner named herein or the heirs, executors, administrators or successors of the Owner.

Signed and sealed this ____ day of _____ 20____.

PRINCIPAL

[Affix corporate seal]

(Name) _____
(Title) _____

(Witness)

SURETY

[Affix corporate seal]

(Name) _____
(Title) _____

(Witness)

LABOR AND MATERIAL PAYMENT BOND

THIS BOND IS ISSUED SIMULTANEOUSLY WITH PERFORMANCE BOND IN FAVOR OF THE OWNER CONDITIONED ON THE FULL AND FAITHFUL PERFORMANCE OF THE CONTRACT

IT IS HEREBY AGREED that *(Insert full name and address of Contractor)*

as Principal, hereinafter called "Principal," and, *(Insert full name and address of Surety)*

as Surety, hereinafter called "Surety," are held and firmly bound unto the

as Obligee, hereinafter called Owner, for the use and benefit of claimants as hereinbelow defined, in the amount of _____ Dollars (\$ _____), for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these obligations.

WHEREAS, Principal has by written agreement dated _____, 20_____, entered into a contract with Owner for the construction of *(Insert the name of the Project)*

in accordance with Drawings and Specifications prepared by *(Insert full name and address of Architect/Engineer)*

which contract is by reference made a part hereof, and is hereinafter referred to as the "Contract."

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Principal shall promptly make payment to all claimants as hereinafter defined, for all labor and material used or reasonably required for use in the performance of the Contract, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

1. A claimant is defined as one having a direct contract with the principal or with a Subcontractor of the Principal for labor, material, or both, used or reasonably required for use in the performance of the Contract, labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment directly applicable to the Contract.
2. The above named Principal and Surety hereby jointly and severally agree with the Owner that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The Owner shall not be liable for the payment of any costs or expenses of any such suit.

3. No suit or action shall be commenced hereunder by any claimant:
 - a) Unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two of the following: the Principal, the Owner, or the Surety above named, within ninety (90) days, after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail; postage prepaid, in an envelope addressed to the Principal, Owner or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer.
 - b) After the expiration of one (1) year following the date on which Principal ceased Work on said Contract, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.
 - c) Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the Project, or any part thereof, is situated, or in the United States District Court for the district in which the Project, or any part thereof, is situated, and not elsewhere.
4. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed of record against said improvement, whether or not claim for the amount of such lien be presented under and against this bond.

Signed and sealed this ____ day of _____ 20 ____.

PRINCIPAL

[Affix corporate seal]

(Name) _____

(Title) _____

(Witness)

SURETY

[Affix corporate seal]

(Name) _____

(Title) _____

(Witness)



CERTIFICATE OF LIABILITY INSURANCE

8/15/22

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

| | | |
|--|---|------------------|
| PRODUCER ABC Insurance Agency Address 1 Address 2 City, State, Zip | CONTACT NAME: Name 1 | FAX: 000-000-000 |
| | PHONE: 000-000-000 (A/C, No, Ext): | (A/C, No): |
| | E-MAIL ADDRESS: | |
| | INSURER(S) AFFORDING COVERAGE | |
| | INSURER A : Insurance Company Name (not parent company) | NAIC # 12345 |
| INSURED ABC Company Address 1 Address 2 City, State, Zip | INSURER B : | |
| | INSURER C : | |
| | INSURER D : | |
| | INSURER E : | |
| | INSURER F : | |

COVERAGES CERTIFICATE NUMBER: REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

| INSR LTR | TYPE OF INSURANCE | ADDL INSD | SUBR WVD | POLICY NUMBER | POLICY EFF (MM/DD/YYYY) | POLICY EXP (MM/DD/YYYY) | LIMITS | |
|-------------------|--|--|---------------------------------------|---------------|-------------------------|-------------------------|--|--|
| A | <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR | <input checked="" type="checkbox"/> Y | | | | | EACH OCCURRENCE \$1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ MED EXP (Any one person) \$10,000 PERSONAL & ADV INJURY \$1,000,000 GENERAL AGGREGATE \$2,000,000 PRODUCTS - COMP/OP AGG \$2,000,000 | |
| | GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PRO- <input type="checkbox"/> LOC OTHER: | | | | | | | |
| | A | <input checked="" type="checkbox"/> AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS ONLY <input checked="" type="checkbox"/> NON-OWNED AUTOS ONLY | <input checked="" type="checkbox"/> Y | | | | | COMBINED SINGLE LIMIT (Ea accident) \$1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ |
| | | <input checked="" type="checkbox"/> UMBRELLA LIAB <input type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE | | | | | | EACH OCCURRENCE \$2,000,000 AGGREGATE \$2,000,000 |
| DED: RETENTION \$ | | | | | | | | |
| A | WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below | <input type="checkbox"/> Y / N <input type="checkbox"/> N / A | | | | | <input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$1,000,000 E.L. DISEASE - EA EMPLOYEE \$1,000,000 E.L. DISEASE - POLICY LIMIT \$1,000,000 | |
| | A A | Pollution Liability | | | | | Aggregate \$1,000,000 | |
| | | Builder's Risk | | | | | Project Limits \$4,500,000 | |

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Harnett County Board of Education is Additional Insured on the above referenced General Liability and Automobile Liability policies.

CERTIFICATE HOLDER

CANCELLATION

Harnett County Board of Education
PO Box 1029
1 W Harnett Street
Lillington, NC 27546

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

POLICY NUMBER:

COMMERCIAL AUTO
CA 20 48 10 13

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

DESIGNATED INSURED FOR COVERED AUTOS LIABILITY COVERAGE

This endorsement modifies insurance provided under the following:

- AUTO DEALERS COVERAGE FORM
- BUSINESS AUTO COVERAGE FORM
- MOTOR CARRIER COVERAGE FORM

With respect to coverage provided by this endorsement, the provisions of the Coverage Form apply unless modified by this endorsement.

This endorsement identifies person(s) or organization(s) who are "insureds" for Covered Autos Liability Coverage under the Who Is An Insured provision of the Coverage Form. This endorsement does not alter coverage provided in the Coverage Form.

This endorsement changes the policy effective on the inception date of the policy unless another date is indicated below.

| | |
|--|-----------------|
| Named Insured: | <h1>Sample</h1> |
| Endorsement Effective Date: | |
| <small>SCHEDULE</small> | |
| Name Of Person(s) Or Organization(s): | |
| Harnett County Board of Education | |
| Information required to complete this Schedule, if not shown above, will be shown in the Declarations. | |

Each person or organization shown in the Schedule is an "insured" for Covered Autos Liability Coverage, but only to the extent that person or organization qualifies as an "insured" under the Who Is An Insured provision contained in Paragraph **A.1.** of Section **II** – Covered Autos Liability Coverage in the Business Auto and Motor Carrier Coverage Forms and Paragraph **D.2.** of Section **I** – Covered Autos Coverages of the Auto Dealers Coverage Form.

POLICY NUMBER:

COMMERCIAL GENERAL LIABILITY
CG 20 26 04 13

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**ADDITIONAL INSURED – DESIGNATED
PERSON OR ORGANIZATION**

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s):

**Harnett County Board of Education
PO Box 1029
1 W Harnett Street
Lillington, NC 27546**

Sample

Information required to complete this schedule, not shown above, will be shown in the Declarations.

A. Section II – Who Is An Insured is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule, but only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by your acts or omissions or the acts or omissions of those acting on your behalf:

- 1. In the performance of your ongoing operations; or
- 2. In connection with your premises owned by or rented to you.

However:

- 1. The insurance afforded to such additional insured only applies to the extent permitted by law; and
- 2. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required by the contract or agreement to provide for such additional insured.

B. With respect to the insurance afforded to these additional insureds, the following is added to **Section III – Limits Of Insurance:**

If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance:

- 1. Required by the contract or agreement; or
- 2. Available under the applicable Limits of Insurance shown in the Declarations;

whichever is less.

This endorsement shall not increase the applicable Limits of Insurance shown in the Declarations.

GENERAL CONDITIONS

NOTICE OF DISCLAIMER

TAKE NOTICE, that these General Conditions may contain language and Article, Section or Paragraph headings or names which appear similar to or the same as the provisions of the "General Conditions of the Contract for Construction", published by the American Institute of Architects, AIA Document A-201.

TAKE NOTICE, however, that these General Conditions are substantially and materially different in many respects from the AIA Document A-201 and that certain additions, deletions or other modifications have been made to provisions similar to those contained in the AIA Document. This document, further, contains provisions, which do not appear in the AIA document.

The use of any language or Article or Paragraph format similar to or the same as AIA Document A-201 does not constitute an endorsement by the American Institute of Architects of this document.

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

TABLE OF ARTICLES

| | |
|--|---|
| <ul style="list-style-type: none"> 1. CONTRACT DOCUMENTS 2. DESIGN CONSULTANT 3. OWNER 4. CONTRACTOR 5. SUBCONTRACTORS 6. WORK BY OWNER OR BY SEPARATE CONTRACTORS 7. MISCELLANEOUS PROVISIONS 8. TIME | <ul style="list-style-type: none"> 9. PAYMENTS AND COMPLETION 10. PROTECTION OF PERSONS AND PROPERTY 11. INSURANCE 12. CHANGES IN THE WORK 13. UNCOVERING AND CORRECTION 14. TERMINATION OF THE CONTRACT 15. DISPUTE RESOLUTION 16. FEDERALLY FUNDED PROJECTS |
|--|---|

ARTICLE 1

CONTRACT DOCUMENTS

- 1.1 DEFINITIONS
 - 1.1.1 AS SHOWN, AS INDICATED, AS DETAILED: These words, and words of like implication, refer to information contained in Drawings and Specifications describing the Work, unless explicitly stated otherwise in the Contract Documents.
 - 1.1.2 CLAIM: A Claim as used in the Contract is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of contract terms, payment of money, a credit against the payment of money, extension of time or other relief with respect to the terms of the Contract. The term Claim also includes other disputes and matters in question between the parties to a contract involved in the Owner's construction and repair projects arising out of or relating to the Contract or the construction process.

- 1.1.3 **CONTRACT:** The Contract is the sum of all the Contract Documents. The Contract represents the entire and integrated agreement between the Owner and the Contractor and supersedes all prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification as defined in Paragraph 1.1.4. The Contract may also be referred to in the Contract Documents as “this Contract”, “this Agreement” or “the Agreement”.
- 1.1.4 **CONTRACT DOCUMENTS:** The Contract Documents consist of the Owner-Contractor Agreement, the Conditions of the Contract (General and Supplemental Conditions), the Plans, Drawings, and Specifications, and all Addenda thereto issued prior to and all Modifications thereto issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties; (2) a Change Order or a Construction Change Directive issued pursuant to the provisions of Article 12; (3) a written interpretation issued by the Design Consultant pursuant to Paragraph 2.2.7; or (4) a written order for a minor Change in the Work issued pursuant to Section 12.4. The Contract Documents do not include any other documents including but not limited to soils, geotechnical or other reports, surveys and analysis, which may be printed, bound or assembled with the Contract Documents, or otherwise made available to the Contractor for review or information under this Contract, unless specifically enumerated and directly incorporated by reference in the Contract Documents.
- 1.1.5 **HE/HIS:** The term He or His is not intended to be gender specific.
- 1.1.6 **MANUFACTURER:** An individual, company, or corporation who manufactures, fabricates, or assembles a standard product. A standard product is one that is not made to special design, and if furnished by either direct sale or by contract to the Contractor, Subcontractor or Vendor.
- 1.1.7 **MATERIAL SUPPLIER OR VENDOR:** A person or organization who supplies, but who is not responsible for the installation of, materials, products and equipment.
- 1.1.8 **NOTICE:** The term Notice as used herein shall mean and include written notice. Notice shall be deemed to have been given when delivered to the address of the person, firm or corporation for whom intended, or to his, their or its duly authorized agent, representative or officer; or when enclosed in a postage prepaid wrapper or envelope addressed to such person, firm or corporation at his, their or its Notice Address and deposited in a United States mailbox by registered or certified mail. To “Notify” means to give Notice. The Notice Addresses for the Owner and Contractor are stated in the Owner-Contractor Agreement and may be changed by a party by giving Notice to the other of such change.
- 1.1.9 **PLANS OR DRAWINGS:** All drawings or reproduction of drawings pertaining to the Work.
- 1.1.10 **PRODUCT:** The term Product includes materials, systems and equipment.
- 1.1.11 **PROJECT:** The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part.
- 1.1.12 **PROPOSAL:** A complete and properly signed document whereby the Contractor proposes to provide additional or a reduced scope of construction work on the Project for the sums stipulated therein, supported by data required by the Design Consultant or Owner.
- 1.1.13 **PROVIDE:** As a directive to the Contractor, and as pertaining to labor, materials or equipment, "provide" means "furnish and install completely".

- 1.1.14 SPECIFICATIONS: Descriptions, provisions and requirements, pertaining to method and manner of performing the Work, or to quantities and qualities of materials or equipment to be furnished under terms of the Contract.
- 1.1.15 WORK: The Work comprises the construction and services required of the Contractor by the Contract Documents and includes all labor, supplies and other facilities or things necessary to produce such construction, and all materials, equipment, and supplies incorporated or to be incorporated in such construction.
- 1.2 EXECUTION, CORRELATION AND INTENT
- 1.2.1 The Contractor and Owner acknowledge that neither these General Conditions, nor any other Contract Document shall be construed against the Owner due to the fact that they may have been drafted by the Owner or the Owner's agent. For the purposes of construing these General Conditions, and any other Contract Document, both the Contractor and the Owner shall be considered to have jointly drafted them.
- 1.2.2 The Owner-Contractor Agreement shall be signed in not less than three (3) copies by the Owner and Contractor, and each of which shall be deemed an original, but all of which shall constitute one and the same instrument.
- 1.2.3 By executing the Contract, the Contractor represents that he has visited the site, familiarized himself with the local conditions under which the Work is to be performed, and correlated his observations with the requirements of the Contract Documents.
- 1.2.4 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work. The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all. Performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the intended results. Words and abbreviations which have well-known technical or trade meanings are used in the Contract Documents in accordance with such recognized meanings unless otherwise specifically defined herein. The table of contents, titles, headings, running headlines and marginal notes contained herein and in said documents are solely to facilitate reference to various provisions of the Contract Documents and in no way affect, limit or cast light upon the interpretation of the provisions to which they refer.
- 1.2.5 The organization of the Specifications into divisions, sections and articles, and the arrangement of Drawings are for convenience only. The Contractor may subcontract the Work in such divisions as he sees fit consistent with applicable law and he is ultimately responsible for furnishing all of the Work.
- 1.2.6 Anything shown on the Drawings and not mentioned in the Specifications or mentioned in the Specifications and not shown on the Drawings shall have the same effect as if shown or mentioned respectively in both. Detailed specifications take priority over general specifications and detailed drawings take precedence over general drawings. Any Work shown on one drawing shall be construed to be shown in all drawings. If any portion of the Contract Documents shall be in conflict with any other portion, the various documents comprising the Contract Documents shall govern in the following order of precedence: The Owner-Contractor Agreement; the Supplemental Conditions; the General Conditions; the Specifications; the Drawings. The Contractor shall notify the Design Consultant and the Owner of all such

inconsistencies promptly. Any such conflict or inconsistency between or in the Drawings or Specifications shall be submitted by the Contractor promptly to the Owner and Design Consultant and the Design Consultant's decision thereon shall be final and conclusive.

- 1.2.7 The Contractor agrees that nothing contained in the Contract Documents or any contract between the Owner and the Design Consultant shall create any contractual relationship between the Design Consultant and the Contractor, or between the Design Consultant and any Subcontractor or Sub-subcontractors. The Contractor acknowledges and agrees that this Contract is not intended to create, nor shall any provision be interpreted as creating, any contractual relationship between the Owner or Contractor and any third parties.
- 1.2.8 The provisions of this Contract cannot be amended, modified, varied or waived in any respect except by a Modification. The Contractor is hereby given notice that no person has authority to orally waive, or to release the Contractor from any of the Contractor's duties or obligations under or arising out of this Contract. Any waiver, approval or consent granted by Modification to the Contractor shall be limited to those matters specifically and expressly stated thereby to be waived, approved or consented to and shall not relieve the Contractor of the obligation to obtain any future waiver, approval or consent.
- 1.2.9 Any material or operation specified by reference to published specifications of a Manufacturer, a society, an association, a code, or other published standard, shall comply with requirements of the listed document which is current on date the Owner received bids for the construction of the Project. In case of a conflict between referenced document and the Specifications, Specifications shall govern. In case of a conflict between such listed documents, the one having more stringent requirements shall govern.
- 1.2.10 The Contractor, if requested, shall furnish an affidavit from each or any Manufacturer certifying that materials or products delivered to the job meets requirements specified.
- 1.3 OWNERSHIP AND USE OF DOCUMENTS
- 1.3.1 All Drawings, Specifications and copies thereof furnished by the Design Consultant are and shall remain the property of the Owner. They are to be used by Contractor only with respect to the Project and are not to be used by Contractor on any other project. With the exception of one contract set for each party to the Contract, such documents are to be returned or suitably accounted for to the Owner on request at the completion of the Work. Submission or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of Owner's rights or the Design Consultant's common law copyright or other reserved rights.

ARTICLE 2

THE DESIGN CONSULTANT

- 2.1 DEFINITIONS
- 2.1.1 The term "Design Consultant" or "A/E" or "Architect" or "Engineer" as used or set forth in the Contract Documents, shall mean the entity and its consultants or agents, or their duly authorized representatives, that is responsible for designing or engineering the Work, and performing the activities specified herein, and in the Agreement for Design Consultant Services, including any consultants to said entity or firm acting within the scope of their agreements with the Design Consultant. Such firm or agency and its representatives shall act severally within the scope of

particular duties entrusted to them, unless otherwise provided for in the Contract Documents or in the Agreement for Design Consultant Services.

2.1.2 The Design Consultant may be identified in the Owner-Contractor Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The Design Consultant is further described as and, throughout this document, shall mean one or both of the following:

2.1.2.1 ARCHITECT, a person or other legal entity lawfully licensed to practice architecture in the State wherein the Project is located; or

2.1.2.2 ENGINEER, a person or other legal entity lawfully licensed to practice engineering in the State wherein the Project is located.

2.2 SERVICES OF THE DESIGN CONSULTANT

2.2.1 The Design Consultant will provide certain services as hereinafter described and further described in the Agreement for Design Consultant Services.

2.2.2 Should errors, omissions, or conflicts in the Drawings, Specifications, or other Contract Documents prepared by or on behalf of the Design Consultant be discovered, the Design Consultant will prepare such amendments or supplementary documents and provide consultation as may be required.

2.2.3 The Design Consultant will visit the site at intervals appropriate to the stage of construction to familiarize itself generally with the progress and quality of the Work and to determine in general if the Work is proceeding in accordance with the Contract Documents. The Design Consultant will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work, but it shall make as many inspections as may reasonably be required to fulfill its obligations to the Owner. On the basis of such on-site observations, the Design Consultant and his consultants shall endeavour to guard the Owner against defects and deficiencies in the Work. The Design Consultant will conduct the weekly construction meeting and shall be responsible for preparing accurate and complete minutes of all such meetings and other Project meetings and distributing same to all participants.

2.2.4 The Design Consultant will render written field reports to the Owner in the form required by the Owner relating to the periodic visits and inspections of the Project required by Paragraph 2.2.3.

2.2.5 The Design Consultant will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, and he will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. The Design Consultant will not be responsible for or have control or charge over the acts or omissions of the Contractor, Subcontractors, or any of their agents or employees, or any other persons performing any portion of the Work.

2.2.6 The Design Consultant shall at all times have access to the Work wherever it is in preparation or progress. The Contractor shall provide safe facilities for such access so the Design Consultant may perform his functions under the Contract Documents.

2.2.7 As required, the Design Consultant will render to the Owner, within a reasonable time,

- interpretations concerning the design and other technical aspects of the Work and the Contract Documents.
- 2.2.8 All communications, correspondence, submittals, and documents exchanged between the Design Consultant and the Contractor in connection with the Project shall be copied to the Owner, unless the Owner provides otherwise. Further, all communications, correspondence, submittals and documents transmitted from the Owner or Design Consultant will be directed to the Contractor and copied to the Owner or Design Consultant.
- 2.2.9 All interpretations and decisions of the Design Consultant shall be consistent with the intent of and reasonably inferable from the Contract Documents.
- 2.2.10 The Design Consultant's decisions in matters relating to artistic effect will be final if consistent with the intent of the Contract Documents.
- 2.2.11 If the Design Consultant observes any Work that does not conform to the Contract Documents, the Design Consultant shall report this observation to the Owner. The Design Consultant will prepare and submit to the Owner "punch lists" of the Contractor's work, which is not in conformance with the Contract Documents. The Owner will transmit such "punch lists" to the Contractor.
- 2.2.12 The Design Consultant has the authority to condemn or reject any or all of the Work on behalf of the Owner when, in its opinion, the Work does not conform to the Contract Documents. Whenever, in the Design Consultant's reasonable opinion, it is considered necessary or advisable for the implementation of the intent of the Contract Documents, the Design Consultant will have the authority to require special inspection or testing of any portion of the Work in accordance with the provisions of the Contract Documents whether or not such portion of the Work be then fabricated, installed or completed.
- 2.2.13 The Design Consultant will review the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for conformance with the design concept of the Work and for general compliance with the Contract Documents. Such action shall be taken within fourteen (14) days of receipt unless otherwise authorized by the Owner.
- 2.2.14 The Owner will establish with the Design Consultant procedures to be followed for review and processing of all Shop Drawings, catalogue submittals, project reports, test reports, maintenance manuals, and other necessary documentation, as well as requests for changes and applications for extensions of time.
- 2.2.15 The Design Consultant will prepare Change Orders and Construction Change Directives when requested by the Owner.
- 2.2.16 The Design Consultant and the Owner will conduct inspections to determine the dates of Substantial Completion and Final Completion. The Design Consultant will issue a final Certification of Payment.
- 2.2.17 The Design Consultant will prepare three (3) printed copies and one (1) electronic computer file compatible with the latest version of AutoCAD, or other program designated by Owner, showing significant Changes in the Work made during the construction process, based on neatly and clearly marked-up Drawings, prints, and other data furnished by the Contractor(s) and the applicable Addenda, clarifications and Change Orders which occurred during the Project. The Design Consultant will also provide the Owner assistance in the original operation of any

equipment or system such as initial start-up, testing, adjusting, and balancing.

- 2.2.18 In case of the termination of the employment of the Design Consultant, the Owner may appoint a Design Consultant whose status under the Contract Documents shall be that of the former Design Consultant.

ARTICLE 3

OWNER

3.1 DEFINITION

- 3.1.1 The Owner is the person or entity identified as such in the Owner-Contractor Agreement and may be referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Owner means the Owner or his authorized representative or agent. The phrase "Owner or its agent" as used in this Agreement, does not include the Separate Contractors or their Subcontractors.

3.2 INFORMATION, SERVICES AND RIGHTS OF THE OWNER

- 3.2.1 The Owner will provide administration of the Contract as herein described. The Design Consultant shall also provide aspects of administration of the Contract as herein described or as specified in the Agreement for Design Consultant Services.
- 3.2.2 The Owner shall at all times have access to the Work whenever it is in preparation or progress. The Contractor shall provide safe facilities for such access.
- 3.2.3 The Owner shall not be responsible for or have control or charge of the construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the Work, and will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents.
- 3.2.4 The Owner will have authority to require special inspection or testing of portions of the Work to the same extent as the Design Consultant in accordance with Paragraph 2.2.12 whether or not such portion of the Work be then fabricated, installed, or completed. However, neither the Owner's authority to act under Paragraph 3.2.4, nor any decision made by the Owner in good faith either to exercise or not to exercise such authority shall give rise to any duty or responsibility of the Owner to the Contractor, any Subcontractor, any of their agents or employees, or any other person performing any of the Work.
- 3.2.5 The Owner shall have the authority and discretion to call, schedule, and conduct job meetings to be attended by the Contractor, representatives of his Subcontractors, and the Design Consultant, to discuss such matters as procedures, progress, problems, and scheduling.
- 3.2.5.1 The Contractor is requested and required to attend weekly job site progress conferences as called by the Design Consultant. The Contractor shall be represented at these job progress conferences by project personnel authorized by the Contractor to make schedule and financial decision and by project personnel representatives. These meetings shall be open to Subcontractors, Material Suppliers, and any others who can contribute shall be encouraged by the Contractor to attend. It shall be the principal purpose of these meetings, or conferences, to affect coordination, cooperation and assistance in every practical way toward the end of maintaining progress of the Project on schedule and to complete the Project within the specified Contract Time. The

Contractor shall be prepared to assist progress of the Work as required in his particular contract and to recommend remedial measures for the correction of progress as may be appropriate. The Design Consultant shall be the coordinator of the conferences and shall preside as chairman.

- 3.2.5.2 If the Project is awarded as a single prime construction contract, the Design Consultant shall determine which, if any, Subcontractors and/or Material Suppliers shall be required to attend weekly job site progress conferences. The Contractor shall comply with this request and the meeting shall be conducted as described in Subparagraph 3.2.5.1.
- 3.2.6 The Owner will establish procedures to be followed for processing all Shop Drawings, catalogues, and other project reports, and other documentation, test reports, and maintenance manuals.
- 3.2.7 The Owner and Design Consultant will review all requests for changes and shall implement the processing of Change Orders, including applications for extension of the Contract Time.
- 3.2.8 The Owner, will not be responsible for the failure of the Contractor to plan, schedule, and execute the Work in accordance with the approved schedule or the failure of the Contractor to meet scheduled Completion Dates or the failure of the Contractor to schedule and coordinate the Work of his own trades and Subcontractors or to coordinate and cooperate with any Separate Contractors.
- 3.2.9 The Owner, in consultation with the Design Consultant, will review and process all Applications for Payment by the Contractor, including the final Application for Payment.
- 3.2.10 The Owner and Design Consultant shall not be responsible or liable to Contractor for the acts, errors or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons performing any of the Work or working on the Project.
- 3.2.11 The Owner shall furnish surveys describing the physical characteristics and legal limitations for the site of the Project, which are in its possession and are relevant to the Work.
- 3.2.12 The Owner shall secure and pay for necessary easements, required for permanent structures or for permanent changes in existing facilities.
- 3.2.13 The Owner shall furnish information or services under the Owner's control with reasonable promptness to avoid unreasonable delay in the orderly progress of the Work.
- 3.2.14 Unless otherwise provided in the Contract Documents, the Contractor will be furnished, free of charge, copies of Drawings and Specifications in accordance with the Supplemental Conditions.
- 3.2.15 The Owner will make reasonable efforts to make available for the Contractor's reasonable review, at the Owner's offices or together with the Contract Documents, certain boring logs, geotechnical, soils and other reports, surveys and analyses pertaining to the Project site of which the Owner is aware, has in its possession and are relevant to the Work. Any boring logs that are provided to the Contractor are only intended to reflect conditions at the locations of the borings and do not necessarily reflect site conditions at other locations. Any reports, surveys and analyses provided by Owner are for the Contractor's information only, and their accuracy and completeness are not guaranteed or warranted by the Owner or the Design Consultant, and such reports are not adopted by reference into, nor are they part of the Contract Documents. Notwithstanding any factual statement, conclusion, or any language or recommendations contained in such reports, the Contractor shall not rely upon the accuracy or completeness of

any reports surveys and analyses.

3.2.16 The foregoing rights are in addition to other rights of the Owner enumerated herein and those provided by law.

3.3 OWNER'S RIGHT TO STOP OR TO SUSPEND THE WORK

3.3.1 If the Contractor fails to correct defective Work as required by Section 13.2 or fails to carry out the Work or supply labor and materials in accordance with the Contract Documents, the Owner by a written Notice may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the Owner to stop the Work shall not give rise to any duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity.

3.3.2 The Owner may order the Contractor in writing to suspend, delay, or interrupt all or any part of the Work for such period of time as he may determine to be appropriate for the convenience of the Owner.

3.3.3 If the performance of all or any part of the Work (including the work of the Contractor and its Subcontractors) is, for an unreasonable period of time, suspended, delayed, or interrupted by an act of the Owner or the Design Consultant, or by failure of any one of them to act within the time specified in this Contract (or if no time is specified, within a reasonable time), an adjustment shall be made for an increase in the actual time required for performance of the Work by the Contractor, due solely to such unreasonable suspension, delay, or interruption and the Contract modified in writing accordingly. However, no Claim shall be made under this Paragraph for any suspension, delay, or interruption pursuant to Paragraph 3.4.1, or for which Claim is provided or excluded under any other provision of this Contract. No Claim under this Paragraph shall be allowed on behalf of the Contractor or its Subcontractors, unless within twenty (20) days after the act or failure to act involved, and for continuing or ongoing acts or failures to act within twenty (20) days of the first day of the act or failure to act, the Contractor submits to the Owner a written statement setting forth, as fully as then practicable, the extent of such Claim, and unless the Claim is asserted in writing within thirty (30) days after the termination of such suspension, delay, or interruption. For continuing or ongoing acts or failures to act, the Contractor shall update its written statement every twenty (20) days until the suspension, delay or interruption is terminated. The Contractor shall waive any and all Claims under this Paragraph 3.3.3 which are not filed in strict conformance with Paragraph 3.3.3. The Contractor shall indemnify, defend and hold the Owner harmless from any Claim by a Subcontractor that is waived because it is not filed in strict conformance with this Paragraph 3.3.3 or any other provision of the Contract regarding Claims.

3.3.4 In the event of a suspension of the Work or delay or interruption of the Work per Paragraph 3.3.3, the Contractor will and will cause his Subcontractors to protect carefully his, and their, materials and Work against damage, loss or injury from the weather and maintain completed and uncompleted portions of the Work as required by the Contract Documents. If, in the opinion of the Owner, any Work or material shall have been damaged or injured by reason of failure on the part of the Contractor or any of his Subcontractors to so protect same, such Work and materials shall be removed and replaced at the expense of the Contractor.

3.3.5 No Claim by the Contractor under Paragraph 3.3.3 shall be allowed if asserted after final payment under this Contract or if it is not asserted in strict conformance with Paragraph 3.3.3.

3.4 OWNER'S RIGHT TO CARRY OUT THE WORK

- 3.4.1 If the Contractor defaults or otherwise neglects to carry out the Work in accordance with the Contract Documents and fails within ten (10) days after the date written Notice is given by the Owner, with a copy of such Notice sent to the Contractor's Surety, to commence and continue remedy of such default or neglect with diligence and promptness, the Owner may, without prejudice to any other remedy he may have, make good such deficiencies and may further elect to complete all Work thereafter through such means as the Owner may select, including the use of a new contractor pursuant to Paragraph 3.4.2. In such case, the Owner shall provide Notice to the Contractor's Surety and an appropriate Change Order shall be issued deducting from the payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for the Design Consultant's additional services made necessary by such default, neglect or failure and any other damages suffered by Owner as a result of Contractor's breach, including but not limited to Owner's reasonable attorney's fees and litigation costs and expenses. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor or its Surety shall pay the difference to the Owner. Notwithstanding the Owner's right to carry out a portion of the Work, warranty, maintenance and protection of the Work remains the Contractor's and Surety's responsibility. Further, the provisions of this Paragraph do not affect the Owner's right to require the correction of defective or non-conforming Work in accordance with Section 13.2.
- 3.4.2 Whenever the Contractor shall be, and declared by the Owner to be in default under the Contract, the Owner having substantially performed Owner's obligations thereunder, the Surety shall promptly remedy the default, or shall be liable to Owner for damages pursuant to the Performance Bond and as provided by law. Any action by Surety or by Owner against the Surety shall not relieve Contractor of its duties, responsibilities and liabilities to Owner pursuant to the Contract or as allowed by law.

ARTICLE 4

CONTRACTOR

- 4.1 DEFINITION
- 4.1.1 The Contractor is the person or organization identified as such in the Owner-Contractor Agreement and may be referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Contractor means the Contractor or his authorized representative, who shall have authority to bind the Contractor in all matters pertinent to the Contract.
- 4.1.2 The Contract is not one of agency by the Contractor for Owner but one in which Contractor is engaged independently in the business of providing the services and performing the Work herein described as an independent contractor.
- 4.2 REVIEW OF CONTRACT DOCUMENTS
- 4.2.1 The Contractor represents that prior to executing this Contract, the Contractor carefully reviewed and studied the Contract Documents and notified the Owner and Design Consultant of any errors, inconsistencies or omissions of which the Contractor is aware. The Contractor agrees to continuously and carefully study and compare the Contract Documents after the execution of this Contract and shall at once report to the Owner and Design Consultant any error, inconsistency or omission he may discover, including, but not limited to, any requirement which may be contrary to any law, ordinance, rule, regulation, building code, or order of any

public authority bearing on the Work. If the Contractor has reported in writing an error, inconsistency or omission, has promptly stopped the affected Work until otherwise instructed, and has otherwise followed the instructions of the Owner, the Contractor shall not be liable to the Owner or the Design Consultant for any damage resulting from any such errors, inconsistencies or omissions in the Contract Documents. The Contractor shall perform no portion of the Work at any time without it being specified in Contract Documents and, where required, approved Shop Drawings, Product Data or Samples for such portion of the Work.

4.2.2 The Contractor and his Subcontractors shall keep at the site of the Work at least one copy of the Drawings and Specifications and shall at all times give the Owner, the Design Consultant, inspectors, as well as other representatives of the Owner access thereto.

4.3 SUPERVISION AND CONSTRUCTION PROCEDURES

4.3.1 The Contractor shall supervise and direct the Work, using his best skill and attention. He shall be solely responsible for and have control over all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract.

4.3.1.1 It shall be the Contractor's responsibility to schedule the Work; to maintain a progress schedule for the Project; and to notify the Design Consultant and the Owner of any changes in the progress schedule. He shall be responsible for providing adequate notice to all Subcontractors to insure efficient continuity of all phases of the Project. The Contractor is responsible for keeping the Owner and Design Consultant fully informed as to the work progress, including immediate notification of any work progress changes.

4.3.2 The Contractor shall be responsible to the Owner for the acts and omissions of his employees, Subcontractors and Sub-subcontractors, Suppliers, their agents and employees, and other persons performing any of the Work and for their compliance with each and every requirement of the Contract Documents, in the same manner as if they were directly contracted by the Contractor.

4.3.3 The Contractor shall not be relieved from his obligations to perform the Work in accordance with the Contract Documents either by the acts, failures to act or duties of the Owner or the Design Consultant in their administration of the Contract, or by inspections, tests or approvals (or the lack thereof) required or performed under Section 7.6 by persons other than the Contractor.

4.3.4 Before starting a section of the Work, the Contractor shall carefully examine all preparatory work that has been executed to receive his work to see that it has been completed in accordance with the Contract Documents. He shall check carefully, by whatever means are required, to ensure that his work and adjacent, related work will finish to proper and required standards for quality, contours, planes, and levels.

4.3.5 The Contractor understands and agrees that the Owner and Design Consultant will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, and they will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. The Owner and the Design Consultant will not be responsible for or have control or charge over the acts or omissions of the Contractor, Subcontractors, or any of their agents or employees, or any other persons performing any of the Work.

4.3.6 The Contractor shall not use or provide Subcontractor equipment, materials, methods or persons to which Owner and Design Consultant have a reasonable objection and shall remove no portion of the Work or stored materials from the site of the Work, except for defective Work the Contractor may be required to replace or repair as set forth herein.

4.3.7 The Contractor shall verify all grades, lines, levels and dimensions as indicated and shown on the Drawings and in the Specifications prior to beginning any portion of the Work and shall immediately report in writing any errors or inconsistencies to the Design Consultant before commencing that portion of the Work.

4.4. CONTRACTOR'S REPRESENTATIONS

4.4.1 By entering into this Contract with the Owner, the Contractor represents and warrants the following, together with all other representations and warranties in the Contract Documents:

- .1 That he is experienced in and competent to perform the type of work required and to furnish the Subcontractors, materials, supplies, equipment and services to be performed or furnished by him;
- .2 That he is financially solvent, able to pay his debts as they mature, and possessed of sufficient working capital to initiate and complete the Work required under the Contract;
- .3 That he is familiar with all Federal, State, County, municipal and department laws, ordinances, permits, regulations, building codes and resolutions which may in any way affect the Work or those employed therein, including but not limited to any special laws or regulations relating to the Work or any part thereof;
- .4 That such temporary and permanent Work required by the Contract Documents will be satisfactorily constructed and fit for use for its intended purpose and that such construction will not injure any person, or damage any property;
- .5 That he has carefully examined the Contract Documents and the site of the Work and that from his own investigations, he has satisfied himself and made himself familiar with: (1) the nature and location of the Work; (2) the character, quality and quantity of surface and subsurface materials likely to be encountered, including, but not limited to, all structures and obstructions on or at the Project site, both natural and man-made; (3) the character of equipment and other facilities needed for the performance of the Work; (4) the general and local conditions including without limitation its climatic conditions, the availability and cost of labor and the availability and cost of materials, tools and equipment; (5) the quality and quantity of all materials, supplies, tools, equipment, labor and professional services necessary to complete the Work in the manner required by the Contract Documents; and (6) all other matters or things which could in any manner affect the performance of the Work;
- .6 That he will fully comply with all requirements of the Contract Documents;
- .7 That he will perform the Work consistent with good workmanship, sound business practice, and in the most expeditious and economical manner consistent with the best interests of the Owner;
- .8 That he will furnish efficient business administration and experienced project management and supervision, and an adequate supply of workers, equipment, tools and

materials at all times;

- .9 That he has carefully reviewed the Work required and that the Work can be planned and executed in a normal and orderly sequence of Work and reasonably scheduled so as to ensure completion of the Work in accordance with the Contract Documents, allowing for normal and reasonably foreseeable weather, labor and other delays, interruptions and disruptions of the Work;
- .10 That he will complete the Work within the Contract Time and all portions thereof within any required Completion Dates;
- .11 That his Contract Sum is based upon the labor, materials, systems and equipment required by the Contract Documents, without exception; and
- .12 That he will make a good faith effort to utilize minority and Historically Underutilized Businesses (HUBs) as defined and required in N.C. Gen. Stat. 143-128.2 to -128.4, and as described in the Contract Documents.

4.5 LABOR AND MATERIALS

- 4.5.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all labor, materials, equipment, supplies, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary or proper for or incidental to the execution and completion of the Work required by and in accordance with the Contract Documents and any applicable code or statute, whether specifically required by the Contract Documents or whether their provision may reasonably be inferred as necessary to produce the intended results, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work. Final payment will not be made until the Work is so completed and Contractor has otherwise complied with the Contract Documents in full.
- 4.5.2 The Contractor shall at all times enforce strict discipline and good order among his employees and Subcontractors performing any of the Work and shall not employ or contract with on the Work any unfit person or entity or anyone not skilled in the task assigned to him. The Owner may, by Notice, require the Contractor to remove from the Work any employee or employee of a Subcontractor performing any of the Work, that the Owner deems incompetent, careless or otherwise objectionable.
- 4.5.3 The Contractor shall be responsible for ensuring that the Work is completed in a skilful and workmanlike manner.
- 4.5.4 All equipment, apparatus and/or devices of any kind to be incorporated into the Work that are shown or indicated on the Drawings or called for in the Specifications or required for the completion of the Work shall be entirely satisfactory to the Owner and the Design Consultant as regards operations, capacity and/or performance. No approval, either written or verbal, of any drawings, descriptive data or samples of such equipment, apparatus and/or device shall relieve the Contractor of his responsibility to turn over the same in good working order for its intended purpose at the completion of the Work in complete accordance with the Contract Documents. Any equipment, apparatus and/or device not fulfilling these requirements shall be removed and replaced by proper and acceptable equipment, etc. or put in good working order satisfactory to the Owner and Design Consultant without additional cost to the Owner.

4.6 WARRANTY

- 4.6.1 The Contractor warrants to the Owner and the Design Consultant that all materials and equipment furnished under this Contract will be new unless otherwise specified, and that all workmanship will be in accordance with generally accepted industry standards, free from faults and defects and in conformance with the Contract Documents and all other warranties and guaranties specified therein. Where no standard is specified for such workmanship or materials, they shall be the best of their respective kinds. All Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. If required by the Owner or the Design Consultant, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. This warranty is not limited by the provisions of Article 13.
- 4.6.2 The Contractor will be required to complete the Work specified and to provide all items needed for construction of the Project, complete and in good order.
- 4.6.3 The warranties set forth in this Section 4.6 and elsewhere in the Contract Documents shall survive Final Completion of the Work under Section 9.9.
- 4.6.4 The Contractor guarantees and warrants to the Owner all Work as follows:
- .1 That all materials and equipment furnished under this Contract will be new and the best of its respective kind unless otherwise specified;
 - .2 That all Work will be in accordance with generally accepted industry standards and free of omissions and faulty, poor quality, imperfect and defective material or workmanship;
 - .3 That the Work shall be entirely watertight and leak proof in accordance with all applicable industry customs and practices, and shall be free of shrinkage and settlement;
 - .4 That the Work, including but not limited to, mechanical and electrical machines, devices and equipment, shall be fit and fully usable for its intended and specified purpose and shall operate satisfactorily with ordinary care;
 - .5 That consistent with requirements of the Contract Documents, the Work shall be installed and oriented in such a manner as to facilitate unrestricted access for the operation and maintenance of fixed equipment;
 - .6 That the Work will be free of abnormal or unusual deterioration which occurs because of poor quality materials, workmanship or unsuitable storage; and
 - .7 That the products or materials incorporated in the Work will not contain asbestos.
- 4.6.5 All Work not conforming to guarantees and warranties specified in the Contract Documents, including substitutions not properly approved and authorized, may be considered defective. If required by the Design Consultant or Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.
- 4.6.5.1 The Contractor will submit a written affidavit certifying that none of the materials incorporated in the Project contain asbestos.

- 4.6.6 If, within one (1) year after the date of Substantial Completion of the Work or designated portion thereof as defined in Paragraph 8.1.3 or within such longer period of time as may be prescribed by law or by the terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be defective, not in accordance with the Contract Documents, or not in accordance with the guarantees and warranties specified in the Contract Documents, the Contractor shall correct it within five (5) working days or such other period as mutually agreed, after receipt of Notice from the Owner to do so. The Owner shall give such Notice with reasonable promptness after discovery of the condition. For items that remain incomplete or uncorrected on the date of Substantial Completion, the one (1) year warranty shall begin on the date of Final Completion of the Work or upon correction of the defective Work.
- 4.6.7 If at any time deficiencies in the Work are discovered which are found to have resulted from fraud or misrepresentation, or an intent or attempt to or conspiracy to defraud the Owner by the Contractor, any Subcontractor or Supplier, the Contractor will be liable for replacement or correction of such Work and any damages which Owner has incurred related thereto, regardless of the time limit of any guarantee or warranty.
- 4.6.8 Any materials or other portions of the Work, installed, furnished or stored on site which are not of the character or quality required by the Specifications, or are otherwise not acceptable to the Design Consultant or the Owner, shall be immediately removed and replaced by the Contractor to the satisfaction of the Design Consultant and Owner, when notified to do so by the Design Consultant or Owner.
- 4.6.9 If the Contractor fails to correct defective or non-conforming Work as required by Paragraph 4.6.6, or if the Contractor fails to remove defective or non-conforming Work from the site, as required by Paragraph 4.6.8, the Owner may elect to either correct such Work in accordance with Section 3.4 or remove and store materials and equipment at the expense of the Contractor. If the Contractor does not pay the cost of such removal and storage within ten (10) days thereafter, the Owner may upon ten (10) additional days written Notice sell such Work at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs that should have been borne by the Contractor, including compensation for the Design Consultant's additional services and Owner's reasonable attorney's fees made necessary thereby. If such proceeds of sale do not cover all costs, which the Contractor should have borne, the difference shall be charged to the Contractor and an appropriate Change Order shall be issued. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.
- 4.6.10 The Contractor shall bear the cost of making good all of the Work of the Owner, Separate Contractors or others, destroyed or damaged by such correction or removal required under this Article 4, Article 13 or elsewhere in the Contract Documents.
- 4.7 TAXES
- 4.7.1 The Contractor shall pay all sales, consumer, use and other similar taxes for the Work or portions thereof provided by the Contractor which are legally enacted at the time the Owner received bids for the construction of the Project, whether or not yet effective.
- 4.7.2 Sales and Use Tax. Contractor shall be responsible for complying with any applicable sales and use tax obligations imposed by Chapter 105, Article 5 of the North Carolina General Statutes. Where Contractor has been contracted with to oversee "new construction" or "reconstruction" as defined in G.S. 105-164.4H, Contractor shall be responsible for issuing and maintaining an Affidavit of Capital Improvement.

4.8 PERMITS, FEES AND NOTICES

- 4.8.1 The Owner shall be responsible for fees associated with permits and approval of the Drawings including but not limited to building permit, utility impact fees, stormwater permit and driveway permit.
- 4.8.2 The Contractor is responsible for all fees, permits and other costs associated with temporary utilities, including but not limited to installation, use, disconnection, removal and/or relocation.
- 4.8.3 The Contractor will pay for his own license, inspection and re-inspection fees for the proper execution and completion of the Work.
- 4.8.4 The Contractor shall give all notices and comply with all laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the performance of the Work, including but not limited to all applicable building codes. If Contractor believes that any part of the Drawings or Specifications are inconsistent with applicable laws, rules, regulations, lawful orders of public authorities or building codes, Contractor shall Notify the Owner and Design Consultant of such inconsistencies immediately.

4.9 ALLOWANCES

- 4.9.1 The Contractor shall include in the Contract Sum all Allowances stated in the Contract Documents. Items covered by these Allowances shall be supplied for such amount and by such persons as the Owner may direct, but the Contractor will not be required to employ persons against whom he makes a reasonable objection.
- 4.9.2 Unless otherwise provided in the Contract Documents:
- .1 Allowances for Work: These allowances shall cover the cost to the Contractor for the materials and equipment required by the allowance delivered at the site, all applicable taxes, unloading, uncrating and storage, protection from elements, labor, installation and finishing and other expenses and time required to complete the installation, and a fixed percentage for overhead and profit as defined in Article 12.
 - .2 Allowances for Products/Materials: Allowance includes the cost of the product, delivery to the site and applicable taxes. The Contractor's costs for unloading and handling on the site, labor, installation, time, overhead, profit and other expenses contemplated for the material allowance shall be included in the Contract Sum and not in the allowance;
 - .3 Whenever the cost is more than or less than the Allowance, the Contract Sum shall be adjusted accordingly by Change Order, the amount of which will recognize changes, if any, in handling costs on the site, labor, installation costs, overhead, profit and other expense.

4.10 SUPERINTENDENT

- 4.10.1 The Contractor shall employ, and have approved by the Owner, a competent superintendent and necessary assistants who shall be in attendance at the Project site during the progress of the Work. The superintendent shall represent the Contractor and all communications given to the superintendent shall be as binding as if given to the Contractor. If the Contractor employs more than a single individual in this role, the Owner shall be provided an organizational chart and

personnel listing for the staff performing the functions of a superintendent. In such event, all references to the superintendent elsewhere in the Contract Documents shall mean the staff performing the functions of a superintendent.

4.10.2 The superintendent shall be in attendance at the Project site not less than eight (8) hours per day, five (5) days per week, unless the job is closed down due to conditions beyond the control of the Contractor or until termination of the Contract in accordance with the Contract Documents. It is understood that such superintendent shall be acceptable to the Owner and shall be the one who will be continued in that capacity for the duration of the Project, unless he ceases to be on the Contractor's payroll or the Owner otherwise agrees. The superintendent shall not be employed on any other project for or by Contractor or any other entity during the course of the Work.

4.11 PROGRESS SCHEDULE

4.11.1 The Contractor shall prepare and submit to the Owner for the Owner's review and approval an estimated progress schedule for the Work.

4.12 RESPONSIBILITY FOR COMPLETION

4.12.1 The Contractor shall furnish such manpower, materials, facilities and equipment and shall work within the normal scheduled working hours to ensure the performance of the Work within the Completion Dates specified in the Owner-Contractor Agreement. If for any reason the Contractor must work outside of the normal scheduled working hours, a custodian employed by the Owner is required to be in attendance when accessing the work area. The Contractor agrees to reimburse the Owner for such custodian's time. The reimbursement is due with the subsequent payment application.

4.12.2 If it becomes apparent to the Design Consultant or Owner that the Work will not be completed within required Completion Dates, the Contractor agrees to undertake some or all of the following actions, at no additional cost to the Owner, in order to ensure, in the opinion of the Design Consultant and Owner, that the Contractor will comply with all Completion Date requirements:

- .1 Increase manpower, materials, crafts, equipment and facilities;
- .2 Increase the number of working hours per shift, shifts per working day, working days per week, or any combination of the foregoing, including but not limited to night shifts, overtime operations and Sundays and holidays;
- .3 Reschedule activities to achieve maximum practical concurrence of accomplishment of activities;
- .4 Require that his superintendent be at the Project site not less than ten (10) hours per day, six (6) days per week; and
- .5 Reimburse the Owner in accordance with Paragraph 4.12.1 above for all work performed outside of the normal scheduled work hours.

4.12.3 In undertaking the actions required under Paragraph 4.12.1, Contractor shall prepare and adhere to a recovery schedule if the Project is behind schedule by four (4) or more days.

- 4.12.4 If the actions taken by the Contractor are not satisfactory, the Design Consultant or Owner may direct the Contractor to take any and all actions necessary to ensure completion within the required Completion Dates, without additional cost to the Owner. In such event, the Contractor shall continue to assume responsibility for his performance and for completion within the required dates.
- 4.12.5 If, in the opinion of the Design Consultant or Owner, the actions taken by the Contractor pursuant to this Article or the progress or sequence of the Work are not accurately reflected on the construction schedule, the Contractor shall revise such schedule to accurately reflect the actual progress and sequence of the Work.
- 4.12.6 Failure of the Contractor to substantially comply with the requirements of this Article, may be considered grounds for a determination by the Owner, pursuant to Article 14, that the Contractor is failing to prosecute the Work with such diligence as will ensure its completion within the time specified.
- 4.12.7 The Owner may, at its sole discretion and for any reason, other than due to the fault of Contractor require the Contractor to accelerate the Work by providing overtime, Saturday, Sunday and/or holiday work and/or by having all or any Subcontractors designated by the Owner provide overtime, Saturday, Sunday, and/or holiday work. In the event that the Owner requires such acceleration a Change Order shall be issued in accordance with Article 12.
- 4.12.8 This Section 4.12 does not eliminate the Contractor's responsibility to comply with the local noise ordinances, all highway permit requirements and all other applicable laws, regulations, rules, ordinances, resolutions, and permit requirements.
- 4.12.9 The Contractor will provide the Owner assistance in the original operation of any equipment or system installed as Part of the Work, including initial start-up, testing, adjustment, and balancing.
- 4.13 DOCUMENTS AND SAMPLES AT THE SITE
- 4.13.1 The Contractor shall maintain at the site for the Owner one record copy of all Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to record all changes made during construction, and approved Shop Drawings, Product Data and Samples. These shall be delivered to the Design Consultant upon completion of the Work.
- 4.14 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES
- 4.14.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or any Subcontractor, Manufacturer, Supplier or distributor to illustrate some portion of the Work.
- 4.14.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate a material, product or system for some portion of the Work.
- 4.14.3 Samples are physical examples, which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.
- 4.14.4 Manuals are manufacturer's installation, start-up, operating, and maintenance and repair

instructions together with parts lists, pictures, sketches and diagrams, which set forth the manufacturer's requirements for the benefit of the Contractor and the Owner.

- 4.14.5 The Contractor shall prepare or have prepared at its expense and shall review, indicate approval thereupon, and submit, with reasonable promptness and in such sequence as to cause no delay in the Work or in the other work of the Owner or any Separate Contractor, all Shop Drawings, Product Data, Manuals and Samples required by the Contract Documents.
- 4.14.5.1 Unless otherwise directed in writing, the Contractor shall submit no less than three (3) copies of each Shop Drawing, Product Data, or Manuals to the Design Consultant. Routing of said submittals will be from the Contractor to the Design Consultant with a copy of the transmittal to the Owner. The Design Consultant will return one (1) copy of the reviewed submittal to the Contractor.
- 4.14.5.2 Where the Contract calls for the submittal of manufacturer's data to the Design Consultant for information only, such submittals shall be made before the commencement of any portion of the Work requiring such submission. Work performed without benefit of approved Shop Drawings for any portion of the Work is subject to removal and replacement at no cost to the Owner.
- 4.14.5.3 For standard manufactured items not requiring special Shop Drawings for manufacture, Contractor shall submit no less than three (3) copies of Manufacturer's catalogue sheets showing illustrated cuts of item to be furnished, scale details, sizes, dimensions, performance characteristics, capacities, wiring diagrams and controls, and all other pertinent information. One (1) copy of reviewed submissions will be returned to the Contractor.
- 4.14.5.4 Unless otherwise directed in writing, all other Shop Drawings, Contractor shall submit no less than three (3) legible copies of each drawing. Each drawing shall have a clear space for stamps. When phrase "by others" appears on Shop Drawings, the Contractor shall indicate on the Shop Drawing who is to furnish material or operations so marked before submittal. When the Shop Drawings are checked "revise and resubmit", the Contractor shall make corrections and submit new copies for review. The Shop Drawings shall contain the Contractor's "approval" and corrections.
- 4.14.5.5 For use of all trades, the Contractor shall provide such number of Shop Drawings as is required for field distribution.
- 4.14.5.6 The Design Consultant will review submittals and make marks to indicate corrections or revisions required and will stamp each submittal with an action stamp and will mark the stamp with the action required by the Contractor.
- 4.14.5.7 Contractor shall submit names of proposed Manufacturers, Material Suppliers, dealers, who are to furnish materials, fixtures, appliances or other fittings for approval as early as possible, to afford proper investigation and checking.
- 4.14.5.8 Transactions with manufacturers, or Subcontractors, shall be through Contractor.
- 4.14.5.9 Unless otherwise specified, Contractor shall submit samples in duplicate of adequate size showing quality, type, color range, finish, and texture as indicated in the Specifications.
- 4.14.5.10 Where Specifications require manufacturer's printed installation instructions, Contractor shall submit duplicate copies of such instructions for approval.

- 4.14.5.11 When several materials are specified by name for one use, Contractor shall select for use any of those so specified.
- 4.14.5.12 Whenever item or class of material is specified exclusively by trade name, manufacturer's name, or by catalogue reference, Contractor shall use only such item, unless written approval for substitution is secured, as outlined in the Specifications and in Section 4.15 of the General Conditions.
- 4.14.5.13 Contractor shall not order materials until receipt of written approval. Contractor shall furnish materials equal in every respect to approved samples.
- 4.14.6 By approving and submitting Shop Drawings, Product Data, Manuals and Samples, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. The Contractor shall adhere to any supplementary processing and scheduling instructions pertaining to Shop Drawings, which may be issued by the Design Consultant.
- 4.14.6.1 Parts and details not fully indicated on the Drawings shall be detailed by the Contractor in accordance with standard engineering practice. Dimensions on the Drawings, as well as detailed drawings themselves are subject in every case to measurements of existing, adjacent, incorporated and completed, which shall be taken by the Contractor before undertaking any Work dependent on such data.
- 4.14.7 The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Design Consultant's review of Shop Drawings, Product Data, Samples or Manuals under Paragraph 2.2.14 unless the Contractor has specifically informed the Design Consultant in writing of such deviation at the time of submission and the Design Consultant has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility to Owner for errors or omissions in the Shop Drawings, Product Data, Samples, or Manuals by virtue of the Design Consultant's review or approval thereof.
- 4.14.8 The Contractor shall make corrections required by the Design Consultant and shall resubmit the required number of corrected copies of Shop Drawings or new Product Data or Samples. The Contractor shall direct specific attention, in writing on resubmitted Shop Drawings, Product Data or Samples or Manuals, to revisions other than those requested by the Design Consultant on previous submittals. Re-submittals necessitated by required corrections due to Contractor's errors or omissions shall not be cause for extension of Contract Time or an increase in the Contract Sum.
- 4.14.8.1 No portion of the Work requiring submission of Shop Drawings, Product Data, Samples or Manuals shall be commenced until the submittal has been approved by the Design Consultant as provided in Article 2. All such portions of the Work shall be in accordance with approved submittals.
- 4.14.9 Shop Drawings, Product Data and Samples shall be dated and shall bear the name of the Project; a description or the names or equipment, materials and items; and complete identification of locations at which materials or equipment are to be installed. Shop Drawings shall be stamped and signed stating that the Contractor has determined and verified all materials, field measurements, and field construction criteria related thereto and that he has checked and

coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

4.14.10 Submittals of Shop Drawings, Product Data, Samples or Manuals shall be accompanied by a transmittal letter, in duplicate, containing the name of the Project, the Contractor's name, the number of Shop Drawings, Product Data, Samples, or Manuals, identification of Specification section and other pertinent data.

4.15 EQUAL PRODUCTS AND SUBSTITUTIONS

4.15.1 All materials, supplies and articles furnished under the Contract shall, whenever specified and otherwise practicable, be the standard products of recognized, reputable manufacturers. Unless otherwise specifically provided in the Contract Documents, the naming of a certain brand, make, manufacturer or article, device, product, material, fixture or type of construction shall convey the general style, type, character and standard of quality of the article desired and shall not be construed as limiting competition. The Contractor, in such cases, may with Owner's written approval, use any brand, make, manufacturer, article, device, product, material, fixture, form or type of construction which in the judgment of the Design Consultant is equal to that specified. An item may be considered equal to the item so named or described if, in the opinion of the Owner and Design Consultant (1) it is at least equal in quality, durability, appearance, strength, and design; (2) it will perform at least equally the specific function imposed by the general design for the Work being contracted for or the material being purchased; and (3) it conforms substantially, even with deviations, to the detailed requirements for the item in the Specifications. Approval by the Owner and Design Consultant will be granted based upon considerations of quality, workmanship, economy of operation, suitability for the purpose intended, warranty and acceptability for use on the Project.

4.15.2 To obtain such approval on makes or brands of material other than those specified in Contract Documents, and not previously approved at the time the Owner received bids for the construction of the Project, the Contractor's request for approval of any substitution shall include:

- .1 Complete data substantiating compliance of the proposed substitution with the Contract Documents;
- .2 Product identification including manufacturers' name, address, and phone number;
- .3 Manufacturer's literature showing complete product description, performance and test data, and all reference standards;
- .4 Samples and colors in the case of articles or products;
- .5 Names and addresses of similar projects on which the product was used and date of installation;
- .6 For construction methods, include a detailed description for the proposed method and drawings illustrating same;
- .7 Itemized comparison of proposed substitution with product or method specified and any cost reduction, which shall benefit the Owner;
- .8 Accurate cost data on proposed substitution in comparison with product or method

specified;

- .9 All directions, specifications, and recommendations by manufacturers for installation, handling, storing, adjustment, and operation; and
- .10 Item by item comparison of characteristics of substitution item with those items specified.

4.15.3 The Contractor shall also submit with his request for approval a sworn and notarized statement which shall include all of the following representations by the Contractor, namely that:

- .1 He has investigated the proposed product or method and determined that it is equal or better in all respects to that specified and that it fully complies with all requirements of the Contract Documents;
- .2 He will meet all contract obligations with regard to this substitution;
- .3 He will coordinate installation of accepted substitutions into the Work, making all such changes and any required schedule adjustments, at no additional cost to the Owner, as may be required for the Work to be complete in all respects;
- .4 He waives all Claims for additional costs and additional time related to substitutions, which consequently become apparent. He also agrees to hold the Owner harmless from Claims for extra costs and time incurred by other Subcontractors and suppliers, or additional services which may have to be performed by the Design Consultant, for changes for extra work that may, at some later date, be determined to be necessary in order for the Work to function in the manner intended in the Contract Documents;
- .5 He will provide the same warranty and guarantee, and perform any work required in accordance therewith, for the substitution that is applicable to the specified item for which the substitution is requested;
- .6 Material will be installed, handled, stored, adjusted, tested, and operated in accordance with the manufacturers' recommendation and as specified in the Contract Documents.
- .7 In all cases new materials will be used unless this provision is waived by Notice from the Owner or his Design Consultant, or unless otherwise specified in the Contract Documents;
- .8 All material and workmanship will be in every respect in accordance with that which, in the opinion of the Owner or Design Consultant, is in conformity with approved modern practice; and
- .9 He has provided accurate cost data on the proposed substitution in comparison with the product or method specified.

4.15.4 Subject to the provisions of any applicable laws, approval for substitutions or equal products shall be at the sole discretion of the Owner, shall be in writing to be effective, and the decision of the Owner shall be final. The Owner or Design Consultant may require tests of all materials proposed for substitution so submitted to establish quality standards, at the Contractor's expense. After approval of a substitution, if it is determined that the Contractor submitted defective information or data regarding the substitution upon which Owner's approval was based, and that unexpected or un contemplated extensive redesign or rework of the Project will be required in order to accommodate the substitution, or that the substituted item will not perform or function

as well as the specified item for which substitution was requested, the Contractor will be required to furnish the original specified item or obtain approval to use another substitution; the Contractor shall pay all costs, expenses or damages associated with or related to the unacceptability of such a substitution and the resultant utilization of another item and no time extension shall be granted for any delays associated with or related to such substitution.

4.15.5 If a substitution is approved, no further change in brand or make will be permitted unless satisfactory, written evidence is presented to and approved by the Owner that the manufacturer cannot make scheduled delivery of the approved substituted item. The Owner will not consider substitutions for approval if:

- .1 The proposed substitution is indicated or implied on the Contractor's Shop Drawing or product data submittal and has not been formally submitted for approval by the Contractor in accordance with the above-stated requirements, or
- .2 Acceptance of the proposed substitution will require substantial design revisions to the Contract Documents or is otherwise not acceptable to the Owner and Design Consultant.

4.15.6 Except as otherwise provided for by the provisions of any applicable laws, the Contractor shall not have any right of appeal from the decision of the Owner rejecting any materials submitted if the Contractor fails to obtain the approval for substitution under this Article.

4.16 USE OF SITE

4.16.1 The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits, easements, right-of-way agreements and within the limits of construction as shown on the Contract Documents. The Contractor shall not unreasonably encumber the site, in the opinion of the Owner, with any materials, equipment or trailers nor shall he block the entrances or otherwise prevent reasonable access to the site, other working and parking areas, completed portions of the Work and/or properties, storage areas, areas of other facilities that are adjacent to the worksite. If the Contractor fails or refuses to move said material, equipment or trailers within twenty four (24) hours of notification by the Owner, to so do, the Owner shall have the right, without further notice, to remove, at the Contractor's expense, any material, equipment and/or trailers which the Owner deems are in violation of this Paragraph.

4.17 CUTTING AND PATCHING OF WORK

4.17.1 The Contractor shall be responsible for all cutting, fitting or patching that may be required to complete the Work or to make its several parts fit together properly and in accordance with the Contract Documents.

4.17.2 The Contractor shall not damage or endanger any portion of the Work or the work of the Owner or any Separate Contractors by cutting, patching or otherwise altering any work, or by excavation. The Contractor shall not cut or otherwise alter the work of the Owner or any Separate Contractor except with the written consent of the Owner and of such Separate Contractor. The Contractor shall not unreasonably withhold from the Owner or any Separate Contractor his consent to cutting or otherwise altering the Work. The Owner shall not be required to accept work with a cut, splice, or patch when such cut, splice or patch is not generally accepted practice for the particular work involved or is otherwise unworkmanlike in the opinion of the Design Consultant or the Owner.

4.17.3 Existing structures and facilities including but not limited to building, utilities, topography,

streets, curbs, walks, etc., that are damaged or removed due to required excavations or other construction work, shall be patched, repaired or replaced by the Contractor to satisfaction of the Design Consultant and the Owner of such structures and facilities and authorities having jurisdiction. In event the local jurisdictional authorities require that such repairing and patching be done with their own labor and materials, the Contractor shall abide by such regulations and pay for such work with no increase in the Contract Sum.

4.18 CLEANING UP

4.18.1 The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operations. At the completion of the Work and before final payment is made, he shall remove all his waste materials and rubbish from and about the Project as well as all his tools, construction equipment, machinery and surplus materials.

4.18.2 If the Contractor fails to clean up during or at the completion of the Work, the Owner may do so as provided in Section 6.3 and the cost thereof shall be charged to the Contractor.

4.19 COMMUNICATIONS

4.19.1 All communications from the Contractor relating to the Contract Documents or the construction schedule will be directed to the Design Consultant and copied to the Owner. Similarly, all correspondence from the Owner or Design Consultant will be directed to the Contractor and copied to the Owner or Design Consultant.

4.20 ROYALTIES AND PATENTS

4.20.1 The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights arising out of the Work and shall save the Owner harmless from loss on account thereof.

4.21 INDEMNIFICATION

4.21.1 To the fullest extent permitted by law, the Contractor shall, at its sole cost and expense, indemnify, defend, and hold harmless the Owner and its agents, representatives, and employees from and against all claims, actions, judgments, costs, liabilities, penalties, damages, losses and expenses, including but not limited to attorneys' fees, arising out of and/or resulting from the performance of the Work, provided that any such claim, action, judgment, cost, liability, penalty, damage, loss or expense is caused by any negligent act, error or omission of the Contractor, any Subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be legally liable. The above obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this Section 4.21.1. The parties agree that this indemnification clause is an "evidence of indebtedness" for purpose of N.C. Gen. Stat. § 6-21.2. The parties also specifically acknowledge that the Owner is a public body and it is the intent of the parties that the Owner not incur any expenses when the Contractor is solely responsible for the claims.

4.21.2 In any and all claims against the Owner or the Design Consultant or any of their agents, representatives, or employees by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this Section 4.21 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for

the Contractor or any Subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

4.21.3 No provision of this Section 4.21 shall give rise to any duties on the part of the Design Consultant or the Owner, or any of their agents, representatives, or employees.

4.22 PERSONS AUTHORIZED TO SIGN DOCUMENTS

4.22.1 The Contractor, within five (5) days after the earlier of the date of a Notice to Proceed or the date of the Owner-Contractor Agreement, shall file with the Owner a list of all persons who are authorized to sign documents such as contracts, certificates, and affidavits on behalf of the Contractor and to fully bind the Contractor to all the conditions and provisions of such documents, except that in the case of a corporation he shall file with the Owner a certified copy of a resolution of the Board of Directors of the corporation in which are listed the names and titles of corporation personnel who are authorized to sign documents on behalf of the corporation and to fully bind the corporation to all the conditions and provisions of such documents.

4.23 CONDITIONS AFFECTING THE WORK

4.23.1 The Contractor shall be responsible for taking all steps necessary to ascertain the nature and location of the Work and the general and local conditions that can affect the Work or the cost thereof. Failure by the Contractor to fully acquaint himself with conditions which may affect the Work, including, but not limited to conditions relating to transportation, handling, storage of materials, availability of labor, water, roads, weather, topographic and subsurface conditions, Multi-Prime Contract conditions, applicable provisions of law, and the character and availability of equipment and facilities needed prior to and during the execution of the Work, shall not relieve the Contractor of his responsibilities under the Contract Documents and shall not constitute a basis for an adjustment in the Contract Sum or the Contract Time under any circumstances. The Owner assumes no responsibility for any understanding or representation about conditions affecting the Work made by any of his officers, employees, representatives, or agents prior to the execution of the Contract, unless such understandings or representations are expressly stated in the Contract Documents.

4.23.2 If in the execution of the Work any valuable items or materials of any kind are discovered buried or hidden within the Work, such items or materials shall be the property of the Owner. The Contractor shall take reasonable precautions to prevent any persons from removing or damaging such items or materials and shall immediately upon discovery thereof and before removal, acquaint the Owner or the Design Consultant with such discovery and carry out, at the expense of the Owner, the Owner's or the Design Consultant's orders as to disposal of the same.

4.24 COMPLIANCE WITH BOARD POLICIES AND PROCEDURES

The Contractor acknowledges that Board policies are available for review at the Owner's website and agrees to comply with the policies. The Contractor also agrees to comply with the following provisions:

4.24.1 The Contractor, its Subcontractors and employees shall not possess or carry, whether openly or concealed, any gun, rifle, pistol, or explosive on any property owned by the Owner. This includes firearms locked in containers, vehicles or firearm racks within vehicles. The Contractor, its Subcontractors and employees shall not cause, encourage or aid a minor, who

- is less than 18 years old to possess or carry, whether openly or concealed, any weapons on any property owned by the Owner.
- 4.24.2 The Contractor, its Subcontractors and employees, are prohibited from profane, lewd, obscene or offensive conduct or language, including engaging in sexual harassment.
- 4.24.3 The Contractor and its Subcontractors shall not manufacture, transmit, conspire to transmit, possess, use or be under the influence of any alcoholic or other intoxicating beverage, narcotic drug, hallucinogenic drug, amphetamine, barbiturate, marijuana or anabolic steroids, or possess, use, transmit or conspire to transmit drug paraphernalia on any property owned by the Owner.
- 4.24.4 The Contractor and its Subcontractors may not at any time use or display tobacco or nicotine-containing products, including but not limited to electronic cigarettes (e-cigarettes), on school premises, both indoor and outdoor. The prohibition of the display of tobacco or nicotine products shall not extend to a display that has a legitimate instructional or pedagogical purpose. For purposes of this Contract, “tobacco product” is defined to include cigarettes, cigars, blunts, bidis, pipes, chewing tobacco, snuff, and any other items containing or reasonably resembling tobacco, tobacco products, or any facsimile thereof. “Tobacco use” includes smoking, chewing, dipping, or any other use of tobacco products.
- 4.24.5 The Contractor, its Subcontractors and employees shall not solicit from or sell to students or staff within the Owner’s facilities or campuses, and shall not give gifts of any value to school system employees.
- 4.24.6 Operators of all commercial vehicles on any property owned by the Owner shall be subject to post-accident, random, reasonable suspicion and follow-up testing for drugs and alcohol.
- 4.24.7 The Contractor, its Subcontractors and employees are prohibited from using access to the site pursuant to this Agreement as a means to date, court, or enter into a romantic or sexual relationship with any student enrolled in the Owner’s schools. The Contractor agrees to indemnify the Owner for claims against the Owner resulting from relationships which have occurred or may occur between a student and an employee of the Contractor or Subcontractor.
- 4.24.8 Lunsford Act/Criminal Background Checks. The Contractor shall conduct at its own expense sexual offender registry checks on each of its owners, employees, agents, or Subcontractors (“contractual personnel”) who will engage in any service on or delivery of goods to school system property or at a school-system sponsored event, except checks shall not be required for individuals who are solely delivering or picking up equipment, materials, or supplies at: (1) the administrative office or loading dock of a school; (2) non-school sites; (3) schools closed for renovation; or (4) school construction sites.. The checks shall include at a minimum checks of the State Sex Offender and Public Protection Registration Program, the State Sexually Violent Predator Registration Program, and the National Sex Offender Registry (“the Registries”). For the Contractor’s convenience only, all of the required registry checks may be completed at no cost by accessing the United States Department of Justice Sex Offender Public Website at [http:// www.nsopw.gov/](http://www.nsopw.gov/). The Contractor shall provide certification that the registry checks were conducted on each of its contractual personnel providing services or delivering goods under this Agreement prior to the commencement of such services or the delivery of such goods. The Contractor shall conduct a current initial check of the registries (a check done more than 30 days prior to the date of this Agreement shall not satisfy this contractual obligation).

- In addition, Contractor agrees to conduct the registry checks and provide a supplemental certification before any additional contractual personnel are used to deliver goods or provide services pursuant to this Agreement. Contractor further agrees to conduct annual registry checks of all contractual personnel and provide annual certifications at each anniversary date of this Agreement. Contractor shall not assign any individual to deliver goods or provide services pursuant to this Agreement if said individual appears on any of the listed registries. Contractor agrees that it will maintain all records and documents necessary to demonstrate that it has conducted a thorough check of the registries as to each contractual personnel, and agrees to provide such records and documents to the school system upon request. Contractor specifically acknowledges that the school system retains the right to audit these records to ensure compliance with this Section at any time in the school system's sole discretion. Failure to comply with the terms of this provision shall be grounds for immediate termination of the Agreement. In addition, the Owner may conduct additional criminal records checks at the Owner's expense. If the school system exercises this right to conduct additional criminal records checks, Contractor agrees to provide within seven (7) days of request the full name, date of birth, state of residency for the past ten years, and any additional information requested by the school system for all contractual personnel who may deliver goods or perform services under this Agreement. Contractor further agrees that it has an ongoing obligation to provide the school system with the name of any new contractual personnel who may deliver goods or provide services under the Agreement. The Owner reserves the right to prohibit any contractual personnel of Contractor from delivering goods or providing services under this Agreement if the Owner determines, in its sole discretion, that such contractual personnel may pose a threat to the safety or well-being of students, school personnel or others.
- 4.24.9 Contractor shall not employ any individuals to provide services to the Owner who are not authorized by federal law to work in the United States. Contractor represents and warrants that it is aware of and in compliance with the Immigration Reform and Control Act and North Carolina law (Article 2 of Chapter 64 of the North Carolina General Statutes) requiring use of the E-Verify system for employers who employ twenty-five (25) or more employees and that it is and will remain in compliance with these laws at all times while providing services pursuant to this Agreement. Contractor shall also ensure that any of its Subcontractors (of any tier) will remain in compliance with these laws at all times while providing subcontracted services in connection with this Agreement. Contractor is responsible for providing affordable health care coverage to all of its full-time employees providing services to the School System. The definitions of "affordable coverage" and "full-time employee" are governed by the Affordable Care Act and accompanying IRS and Treasury Department regulations.
- 4.24.10 The Contractor, its Subcontractors and employees shall not interact with any students. Nothing in Paragraph 4.24 shall be construed to prevent the Contractor, its Subcontractors and employees from taking necessary measures to protect students, staff or other employees.
- 4.24.11 The Contractor shall at all times enforce strict discipline and good order among its employees and shall not employ any unfit person or anyone not skilled in the task assigned to it. The Owner may require the Contractor to remove any employee the Owner deems incompetent, careless or otherwise objectionable.
- 4.24.12 All agents and workers of the Contractor and its Subcontractors shall wear identification badges provided by the Contractor at all times they are on the Owner's property. The identification badges shall at a minimum display the company name, telephone number, employee name and

a picture of the employee.

- 4.24.13 The Contractor shall comply with the Owner’s site or school building access procedures when working on any existing school campus.
- 4.24.14 Anti-Nepotism. The Contractor warrants that, to the best of its knowledge and in the exercise of due diligence, none of its corporate officers, directors, or trustees and none of its employees who will directly provide services under this Agreement are immediate family members of any member of the Owner’s Board of Education or of any principal or central office staff administrator employed by the Owner. For purposes of this provision, “immediate family” means spouse, parent, child, brother, sister, grandparent, or grandchild, and includes step, half, and in-law relationships. Should Contractor become aware of any family relationship covered by this provision or should such a family relationship arise at any time during the term of this Agreement, Contractor shall immediately disclose the family relationship in writing to the Superintendent. Unless formally waived by the Owner, the existence of a family relationship covered by this Agreement is grounds for immediate termination by Owner without further financial liability to Contractor.
- 4.24.15 Restricted Companies Lists. Contractor represents that as of the date of this Agreement, Contractor is not included on the Final Divestment List created by the North Carolina State Treasurer pursuant to N.C. Gen. Stat. § 147-86.58. Contractor also represents that as of the date of this Agreement, Contractor is not included on the list of restricted companies determined to be engaged in a boycott of Israel created by the North Carolina State Treasurer pursuant to N.C. Gen. Stat. § 147-86.81.

ARTICLE 5

SUBCONTRACTORS

- 5.1 DEFINITION
- 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform any of the Work at the site. The term Subcontractor may be referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Subcontractor or his authorized representative. The term Subcontractor does not include any Separate Contractor or his subcontractors.
- 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform any of the Work at the site or who contracts to perform or supply any of the Work under the scope of a Subcontractor’s subcontract. The term Sub-subcontractor may be referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Sub-subcontractor or an authorized representative thereof.
- 5.1.3 Nothing contained in the Contract Documents is intended to, nor shall it create, any contractual relationship between the Owner, the Design Consultant, or any of their agents, consultants, employees, independent contractors, or representatives and any Subcontractor, Sub-subcontractor, Supplier or Vendor of the Contractor, except the relationship between Owner and Contractor, but the Owner shall be entitled to performance of all obligations intended for his benefit, and to enforcement thereof.
- 5.1.4 The Owner and Design Consultant will not deal directly with any Subcontractor, Sub-subcontractor or Material Supplier. Communication will be made only through the Contractor.

Subcontractor, Sub-subcontractors or Material Suppliers shall route requests for information or clarification through the Contractor to the Design Consultant.

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.1 The Contractor, in compliance with the requirements of the Contract Documents and within ten (10) days after the Notice to Proceed, shall furnish in writing to the Owner the names of the persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each of the principal portions of the Work. The Owner will promptly reply to the Contractor in writing stating whether or not the Owner, after due investigation, has reasonable objection to any such proposed person or entity. Failure of the Owner to reply within a reasonable time shall constitute notice of no reasonable objection. The Contractor understands and agrees that no contractual agreement exists for any part of the Work under this Contract between the Owner and any of the Contractor's Subcontractors or Sub-subcontractors. Further, the Contractor understands and agrees that he alone is responsible to the Owner for the Work under this Contract and that any review of Subcontractors or Sub-subcontractors by the Owner will not in any way make the Owner responsible to any Subcontractor, nor responsible for the actions or failures of any Subcontractor or Sub-subcontractor.

5.2.1.1 The Contractor shall identify in the list of names of the Subcontractors proposed, those Subcontractors that are minority or Historically Underutilized Businesses (HUBs) and indicate the portion of the Work that each Subcontractor will perform.

5.2.2 The Contractor shall not contract with any such proposed person or entity to whom the Owner has made reasonable objection under the provisions of Paragraph 5.2.1. The Contractor shall not be required to contract with anyone to whom he has a reasonable objection.

5.2.3 If the Owner has reasonable objection to any proposed person or entity under Paragraph 5.2.1, the Contractor shall name a substitute to whom the Owner has no reasonable objection. The Contract Sum shall be increased or decreased by the difference in cost occasioned by such substitution and an appropriate Change Order shall be issued, subject to an audit of said difference by the Owner; provided, however, that no increase in the Contract Sum shall be allowed for any such substitution unless the Contractor has acted promptly and responsively in submitting names as required by Paragraph 5.2.1 and the original proposed Subcontractor was: (i) able to carry out his work under his proposed subcontract, (ii) able to comply with all applicable laws, (iii) was an ongoing business in the field of his proposed subcontract, and (iv) had a labor force, capital and a means of supply compatible with the scope of his proposed subcontract.

5.2.4 If the Owner requires a change of any proposed Subcontractor or person or organization previously accepted by him on the Project, the Contract Sum shall be increased or decreased by the difference in cost occasioned by such change and an appropriate Change Order shall be issued, subject to an audit by Owner.

5.2.5 The Contractor shall notify the Owner and the Design Consultant of any substitution for any Subcontractor identified in accordance with Subparagraph 5.2.1.1. The Contractor shall make no substitution for any Subcontractor, person or entity previously selected if the Owner or the Design Consultant makes reasonable objection to such substitution. Also, Contractor may make no substitution of Subcontractors in violation of applicable law.

5.2.6 If during the duration of the Project, the Contractor effects a substitution for any Subcontractor per Paragraph 5.2.5, or if additional subcontract opportunities become available, the Contractor shall make a good faith effort to utilize minority and Historically Underutilized Businesses (HUBs).

5.3 SUBCONTRACTUAL RELATIONS

5.3.1 By an appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by these Contract Documents, assumes toward the Owner. Said agreement shall preserve and protect the rights of the Owner under the Contract Documents with respect to the Work to be performed by the Subcontractor so that the subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the agreement between the Contractor and Subcontractor, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by these Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with his Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract, copies of the Contract Documents to which the Subcontractor will be bound by this Section 5.3, and identify to the Subcontractor any terms and conditions of the proposed Subcontract which may be at variance with the Contract Documents. Each Subcontractor shall similarly make copies of such Contract Documents available to his Sub-subcontractors.

5.3.2 The provisions herein regarding Subcontractor approvals shall in no way affect the liability of the Contractor to the Owner regarding performance of all obligations by or payment of Subcontractors. Approval to subcontract with any given Subcontractor shall not to any degree relieve the Contractor of his obligation to perform or have performed to the full satisfaction of the Owner the Work required by this Contract.

5.3.3 The Contractor shall submit Notice to the Owner of any Claims by Subcontractors for which the Owner is believed to be responsible, in strict conformance with the same time requirements and other procedures established for the submission of the Contractor's Claims to the Owner.

5.4 QUALIFICATION SUBMITTALS

5.4.1 Specific qualification submittals may be required of Subcontractors, installers and suppliers for certain critical items of the Work. Required qualification submittals are set forth in detail in the Specifications and shall be collected and submitted by the Contractor for review and approval by the Design Consultant. All information required of a single Subcontractor, installer or supplier shall be contained in a single, complete submittal. The Contractor shall submit the required qualification information within ten (10) days after receipt of the Design Consultant's request.

5.4.2 The Owner and Design Consultant shall reject any proposed Subcontractor, installer or supplier, or any qualification submittals related thereto, for the following reasons:

- .1 The Contractor's failure to submit requested information within the specified time; or
- .2 The Contractor's failure to provide all of the requested information; or

- .3 The Contractor's submission of a Subcontractor, installer or supplier, or qualifications thereof, which are unacceptable in the judgment of the Owner or Design Consultant.
- 5.4.3 Should the Owner or Design Consultant have reasonable objection to any proposed Subcontractor, installer or supplier, the Contractor shall submit another person or firm who are reasonably acceptable to the Owner and Design Consultant.
- 5.5 PREPARATORY WORK
- 5.5.1 Before starting a portion of the Work, the Contractor and the responsible Subcontractor shall carefully examine all preparatory work that has been executed to receive his work. The Subcontractor shall check carefully, by whatever means are required, to ensure that his work and adjacent related work will finish to proper contours, planes and levels. He shall promptly notify the Contractor and the Design Consultant of any defects or imperfections in preparatory work, which will, in any way, affect satisfactory completion of his work. Absence of such notification will be construed as an acceptance of preparatory work and later Claims of defects therein will not be recognized.
- 5.5.2 Under no conditions shall a portion of the Work proceed prior to preparatory work having been completed, cured, dried, and otherwise made satisfactory to receive such related work. Responsibility for timely installation of all materials rests solely with the Contractor, who shall maintain coordination control at all times.

ARTICLE 6

WORK BY OWNER OR BY SEPARATE CONTRACTORS

- 6.1 OWNER'S RIGHT TO PERFORM WORK AND TO AWARD SEPARATE CONTRACTS
- 6.1.1 The Owner reserves the right to perform work related to the Project with his own forces, and to award separate contracts in connection with other portions of the Project or other work on the site under these or similar conditions of the Contract.
- 6.1.2 When separate contracts are awarded for different portions of the Project or other work on the site, the term Contractor in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.
- 6.2 MUTUAL RESPONSIBILITY
- 6.2.1 The Contractor shall afford Separate Contractors and the Owner reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work and shall properly connect and coordinate the Work with that of the Owner and other contractors to store his apparatus, materials, supplies and equipment in such orderly fashion at the site of the Work as will not unduly or unreasonably interfere with the progress of the Work or the work of any other contractors.
- 6.2.1.1 If the execution or result of any part of the Work depends upon any work of the Owner or of any Separate Contractor, the Contractor shall, prior to proceeding with the Work, inspect and promptly report to the Owner in writing any apparent discrepancies or defects in such work of the Owner or of any Separate Contractor that render it unsuitable for such proper execution or result of any part of the Work.

- 6.2.1.2 Failure of the Contractor to so inspect and report shall constitute an acceptance of the Owner's or Separate Contractor's work as fit and proper to receive the Work, except as to defects which may develop in the Owner's or Separate Contractor's work after completion of the Work and which the Contractor could not have discovered by its inspection prior to completion of the Work.
- 6.2.2 Should the Contractor cause damage to the Work or property of the Owner or of any Separate Contractor on the Project, or to other work on the site, or delay or interfere with the Owner's work on ongoing operations or facilities or adjacent facilities or said Separate Contractor's work, the Contractor shall be liable for the same; and, in the case of another contractor, the Contractor shall attempt to settle said Claim with such other contractor prior to such other contractor's institution of litigation or other proceedings against the other contractor.
- 6.2.2.1 Should a Separate Contractor be declared in default by the Owner, the Owner shall not be obligated to hire a contractor to perform the work of the Separate Contractor during the time the Separate Contractor's surety is remediating the default pursuant to Paragraph 3.4.2.
- 6.2.2.2 If such Separate Contractor sues the Owner or Design Consultant on account of any damage, delay or interference cause or alleged to have been caused by the Contractor, the Owner shall notify the Contractor, who shall defend the Owner and Design Consultant in such proceedings at the Contractor's expense. If any judgment or award is entered against the Owner or Design Consultant in such proceedings, the Contractor shall satisfy the same and shall reimburse the Owner and Design Consultant for all damages, expenses, attorney's fees and other costs which the Owner or Design Consultant incurs as a result thereof.
- 6.2.3 Should a Separate Contractor cause damage to the Work or to the property of the Contractor or cause delay or interference with the Contractor's performance of the Work, the Contractor shall present directly to said Separate Contractor any Claims it may have as a result of such damage, delay or interference (with an information copied to the Owner) and shall attempt to settle its Claim against said Separate Contractor prior to the institution of litigation or other proceedings against said Separate Contractor.
- 6.2.3.1 In no event shall the Contractor seek to recover from the Owner or the Design Consultant, and the Contractor hereby waives any Claims against the Owner and Design Consultant relating to any costs, expenses (including, but not limited to, attorney's fees) or damages or other losses incurred by the Contractor as a result of any damage to the Work or property of the Contractor or any delay or interference caused by any Separate Contractor.
- 6.2.4 Whenever Contractor receives items from another contractor or from Owner for storage, erection or installation, the Contractor receiving such items shall give receipt for items delivered, and thereafter will be held responsible for care, storage and any necessary replacing of item or items received.
- 6.2.5 When certain items of equipment and other work are indicated as "NIC" (not in contract), or to be furnished and installed under other contracts, any requirements set forth in the Contract Documents for preparation of openings, provision of backing, etc., for receipt of such "NIC" work will be furnished upon written request of the Contractor who shall properly form and otherwise prepare his work in a satisfactory manner to receive such "NIC" work.

6.3 OWNER'S RIGHT TO PERFORM DISPUTED WORK

6.3.1 If a dispute arises between the Contractor and Separate Contractors as to their responsibility for cleaning up as required by Section 4.18 or for accomplishing coordination or doing required cutting, filling, excavating or patching as required by Section 4.17, the Owner may carry out such work and charge the cost thereof to the responsible party as the Owner shall determine to be just.

6.4 COORDINATION OF THE WORK

6.4.1 By entering into this Contract, Contractor acknowledges that there may be other contractors on the site whose work will be coordinated with that of his own. Contractor expresses, warrants and guarantees that he will cooperate with other contractors and will do nothing to delay, hinder or interfere with the work of other Separate Contractors, the Owner or Design Consultant. Contractor also expressly agrees that, in the event his work is hindered, delayed, interfered with or otherwise affected by a Separate Contractor, his sole remedy will be a direct action against the Separate Contractor as described in this Article 6. Contractor will have no remedy, and hereby expressly waives any remedy, against the Owner and/or the Design Consultant on account of delay, hindrance, interference or other event caused by a Separate Contractor.

ARTICLE 7

MISCELLANEOUS PROVISIONS

7.1 GOVERNING LAW

7.1.1 This Contract shall be governed by the laws of the State of North Carolina.

7.1.2 Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included herein. If through mistake or otherwise, any such provision is not inserted or is not correctly or fully inserted, then upon the application of either party, the Contract shall forthwith be physically amended to make such insertion.

7.2 SUCCESSORS AND ASSIGNS

7.2.1 The Owner and the Contractor each binds himself, his partners, successors, assigns and legal representatives to the other party hereto and to the partners, successors, assigns and legal representatives of such other party in respect to all covenants, agreements and obligations contained in the Contract Documents. The Contractor shall not assign the Contract or sublet it as a whole without the written consent of the Owner, nor shall the Contractor assign any moneys due or to become due to him hereunder, without the previous written consent of the Owner and the Contractor's Surety.

7.3 CLAIMS AND DAMAGES

7.3.1 Should the Contractor, Subcontractor or any Sub-subcontractor suffer injury or damage to person or property because of any act or omission of the Owner or Design Consultant, or of any of their employees, agents or others for whose acts either is legally liable, the Claim on behalf of the Contractor its Subcontractors or Sub-subcontractors shall be made by giving Notice to the Owner, as provided in Article 15 ; otherwise, the Contractor, Subcontractors and Sub-subcontractors shall have waived any and all rights he may have against the Owner or the Design

Consultant, or their employees, representatives and agents. The Contractor shall indemnify, defend and hold the Owner harmless from any Claim by a Subcontractor that is waived because it is not filed in strict conformance with this Paragraph or any other provision of the Contract regarding Claims.

7.4 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

7.4.1 The Contractor shall furnish bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder in a form and with a Surety satisfactory to the Owner.

7.4.2 The Contractor is required to furnish in duplicate a Performance Bond and a Labor and Material Payment Bond, each in the amount of one hundred percent (100%) of the Contract Sum, written by a surety company licensed to do business in North Carolina and with a minimum AM Best "A" rating or comparable rating from another service reasonably acceptable to Owner.

7.5 RIGHTS AND REMEDIES

7.5.1 The duties and obligations of the Contractor imposed by the Contract Documents and the rights and remedies of the Owner available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

7.5.2 Except as may be specifically agreed in writing, the failure of the Owner or the Design Consultant to insist in any one or more instances upon the strict performance of any one or more of the provisions of the Contract, or to exercise any right herein contained or provided by law, shall not be construed as a waiver or relinquishment of the performance of such provisions or right(s) or of the right to subsequently demand such strict performance or exercise such right(s), and the rights shall continue unchanged and remain in full force and effect.

7.5.3 The Contractor agrees that he can be adequately compensated by money damages for any breach of the Contract which may be committed by the Owner and hereby agrees that no default, act, or omission of the Owner or the Design Consultant, except for failure to make progress payments as required by the Contract Documents, shall constitute a material breach of the Contract entitling the Contractor to cancel or rescind the provisions of the Contract or (unless the Owner shall so consent or direct in writing) to suspend or abandon performance of all or any part of the Work. The Contractor hereby waives any and all rights and remedies to which he might otherwise be or become entitled, save only his right to money damages.

7.6 TESTS AND INSPECTIONS

7.6.1 If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any portion of the Work to be inspected, tested, or approved, the Contractor shall give the Owner and Design Consultant timely Notice of its readiness so the Design Consultant and the Owner may observe such inspection, testing or approval. Unless otherwise specifically provided in the Contract Documents, the Contractor shall bear all costs of such inspections, tests or approvals, except that Owner shall pay for "special inspections" as defined and required in Section 1704, the North Carolina State Building Code, or successor section. In the event that such "special inspections" reveal a failure of the Work to comply with the Contract Documents or applicable laws, ordinances, regulations or orders of public authorities having jurisdiction, Contractor shall reimburse the Owner for the costs of such "special inspections".

- 7.6.1.1 Unless otherwise stipulated in the Contract Documents, the Contractor shall pay for all utilities required for testing of installed equipment of all of his work and work of each Subcontractor. Boiler fuel other than gas shall be provided by Subcontractor furnishing boilers. Labor and supervision required for making such tests shall be provided at no additional cost to the Owner.
- 7.6.2 If the Design Consultant or the Owner determines that any portion of the Work requires additional inspection, testing, or approval which Paragraph 7.6.1 does not include, the Owner will instruct the Contractor to order such additional inspection, testing or approval, and the Contractor shall give Notice as provided in Paragraph 7.6.1. If such additional inspection or testing reveals a failure of any portion of the Work to comply (1) with the requirements of the Contract Documents, or (2) with respect to the performance of the Work, with laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction, the Contractor shall bear all costs thereof, including compensation for the Design Consultant's and Owner's additional construction management expenses made necessary by such failure.
- 7.6.3 With regard to inspections and tests, the costs of which the Owner is responsible for paying, they will be made by a pre-qualified, independent testing agency selected by the Owner. The cost of the initial services of such agency will be paid by the Owner. When the initial tests indicate non-compliance with the Contract Documents, any subsequent testing occasioned by non-compliance shall be performed by the same agency and the cost thereof shall be borne by the Contractor. Representatives of the testing agency shall have access to the Work at all times. The Contractor shall provide facilities for such access in order that the agency may properly perform its functions.
- 7.6.4 The independent testing agency, contracted by the Owner, shall prepare the test reports, logs, and certificates applicable to the specific inspections and tests and promptly deliver the specified number of copies to the designated parties. Certificates of inspection, testing or approval required by public authorities shall be secured by the Contractor and promptly delivered by him to the Owner, in adequate time to avoid delays in the Work or final payment therefore.
- 7.6.5 If the Design Consultant or the Owner is to observe the inspections, tests or approvals required by the Contract Documents, laws, ordinances, rules, regulations, or order of any public authority having jurisdiction or that are required to establish compliance with the Contract Documents, he will do so promptly and, where practicable, at the normal place of testing.
- 7.6.6 The Contractor shall pay for and have sole responsibility for inspections or testing performed exclusively for his own convenience.
- 7.7 UNENFORCEABILITY OF ANY PROVISION
- 7.7.1 If any provision of this Contract is held as a matter of law to be unenforceable or unconscionable, the remainder of the Contract shall be enforceable without such provision.
- 7.8 ATTORNEYS' FEES AND OTHER EXPENSES
- 7.8.1 The Contractor hereby agrees that he will not submit, assert, litigate or otherwise pursue any frivolous or unsubstantiated Claims or Claims he has specifically waived under the terms of the Contract Documents. In the event that the Contractor's or its Subcontractor's or Sub-subcontractor's Claims, or any separate item of a Claim, is without substantial justification, the Contractor shall reimburse the Owner or Design Consultant for all costs and expenses associated with defending such Claim or separate item, including but not limited to, attorneys' fees, audit costs, accountants' fees, expert witness' fees, additional Design Consultant expenses, additional

construction management expenses, or services and any other consultant costs.

- 7.8.2 If the Contractor breaches any obligation under the Contract Documents, the Contractor shall reimburse the Owner and Design Consultant for all costs and expenses incurred by the Owner relating to such breach, including but not limited to attorneys' fees, audit costs, accountants' fees, expert witness' fees, additional Design Consultant expenses, additional construction management expenses, and any other consultant costs.
- 7.8.3 If the Owner or Design Consultant substantially prevails in a Claim brought against the Contractor, or in defending a Claim brought by the Contractor, including but not limited to, Claims for fraud or misrepresentation, overpayment, defective work, delay damages, and recovery of termination expenses, the Contractor shall reimburse the Owner and/or Design Consultant for all costs and expenses incurred by them relating to such Claim, including but not limited to attorneys' fees, audit costs, accountants' fees, expert witness' fees, additional Design Consultant expenses, additional construction management expenses, and any other consultant costs.

ARTICLE 8

TIME

8.1 DEFINITIONS

- 8.1.1 Unless otherwise provided, the Contract Time is the period of time allotted in the Contract Documents for Final Completion of the Work as defined in Paragraph 8.1.4, including authorized adjustments thereto. The Contractor shall achieve Final Completion within the Contract Time.
- 8.1.2 The date of commencement of the Work is the date established in the Notice to Proceed. If there is no Notice to Proceed, it shall be the date of the Owner-Contractor Agreement or such other date as may be established therein. The Contractor shall not commence work or store materials or equipment on site until written Notice to Proceed is issued or until the Contractor otherwise receives the Owner's written consent.
- 8.1.3 The date of Substantial Completion of the Work or designated portion thereof is the date certified by the Design Consultant and the Owner when the Work or a designated portion thereof is sufficiently complete, in accordance with the Contract Documents, so the Owner can fully and legally occupy and utilize the Work or designated portion thereof for the use for which it is intended, with all of the parts and systems operable as required by the Contract Documents, including a preliminary test and balance report for the mechanical system. Only incidental corrective work and any final cleaning beyond that needed for the Owner's full use may remain for Final Completion. The Contractor acknowledges and agrees that the intercom, telephone, data security, building automation system (including functional graphics at the site), MATV, and other educational operational systems are required for the Owner's use of the building for its intended purpose. The Contractor shall provide operation and maintenance manuals to the Owner as required by the Contract Documents prior to Substantial Completion and shall provide the required training on the operation of the equipment and systems within two weeks of Substantial Completion. The Contractor shall achieve Substantial Completion by the date specified in the Supplemental Conditions including authorized adjustments thereto. The Owner's occupancy of incomplete work shall not alter the Contractor's responsibilities pursuant to this paragraph. Only incidental corrective work and any final cleaning beyond that needed for the Owner's full use may remain for Final Completion. The issuance of a temporary or final

certificate of occupancy shall not, in itself, constitute Substantial Completion.

8.1.4 Final Completion of the Work occurs on the date certified by the Design Consultant and the Owner when the Work is totally complete, to include punch list work, in accordance with the Contract Documents and the Owner may fully occupy and utilize the Work for the use for which it is intended. The issuance of a temporary or final certificate of occupancy shall not, in itself, constitute Final Completion.

8.1.5 The term Day as used in the Contract Documents shall mean calendar day unless otherwise specifically designated. All dates shall mean midnight of the indicated day unless otherwise stipulated.

8.1.6 Completion Dates shall mean the dates set forth in the Supplemental Conditions for Substantial Completion and Final Completion.

8.2 PROGRESS AND COMPLETION

8.2.1 All time limits stated in the Contract Documents are of the essence of the Contract with respect to the Contractor's performance.

8.2.2 The Contractor shall begin the Work on the date of commencement as defined in Paragraph 8.1.2. He shall carry the Work forward expeditiously with adequate forces and shall achieve Substantial Completion and Final Completion within the time frames stated in the Contract Documents.

8.2.3 Attention is directed to the fact that the Work is urgently needed by the Owner; for this reason, it shall be agreed that the Contractor and its Subcontractors will achieve Substantial Completion of the Work under the Contract within the time established under Paragraph 8.2.4 of the Supplemental Conditions after award of Contract, or Notice to Proceed, and that he will achieve Final Completion of the Work in all its details for final acceptance within the time established under Paragraph 8.2.4 of the Supplemental Conditions.

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1 The time during which the Contractor or any of the Subcontractors is delayed in the performance of the Work by the issuance of any required permits, acts of god, excessive inclement weather, fires, floods, epidemics, quarantine restrictions, strikes, riots, civil commotions or freight embargoes, or other conditions beyond the Contractor's or the Subcontractors' control and which the Contractor or the Subcontractors could not reasonably have foreseen and provided against, except for delays caused solely by the Owner, Design Consultant or their consultants, shall be added to the time for completion of the Work stated in the Contract. Neither the Owner nor the Design Consultant shall be obligated or liable to the Contractor or the Subcontractors for indirect or direct damages, costs or expenses of any nature which the Contractor, the Subcontractors, or any other person may incur as a result of any of the delays, interferences, changes in sequence in the Work included in this Section 8.3.1. The Contractor hereby expressly waives any Claims against the Owner and the Design Consultant on account of any indirect or direct damages, lost profits, costs or expenses of any nature which the Contractor, the Subcontractors or any other person may incur as a result of any delays, interferences, changes in sequence or the like, and it is understood and agreed that the Contractor's sole and exclusive remedy in any such events shall be an extension of the Contract time in accordance with the Contract Documents.

- 8.3.2 In the event Project delays arise from or out of any act or omission of the Owner, Design Consultant or their consultants, the time during which the Project is delayed shall be added to the Contract and the Contractor may be reimbursed for its direct Project damages, excluding general overhead expenses and indirect costs, if the Contractor strictly complies with this Article 8.3. Notwithstanding the previous sentence, if the Contractor or Subcontractor in any way shares in responsibility for the delay, neither the Owner nor the Design Consultant shall be obligated or liable to the Contractor or the Subcontractors for indirect or direct damages, costs or expenses of any nature which the Contractor, the Subcontractors, or any other person may incur as a result of any of the delays, interferences, changes in sequence of the Work, and the Contractor's sole remedy, if any, shall be an extension of the Contract time.
- 8.3.3 In the event Project delays arise solely from or out of any act or omission of the Contractor, Subcontractors or their agents, the Contractor shall not be entitled to extension of the Contract time and shall be subject to the payment of Liquidated Damages as provided in this Contract.
- 8.3.4 The Contract time shall be adjusted only for changes pursuant to section 12.1, suspension of the Work pursuant to paragraph 3.3.2 or paragraph 3.3.3, and excusable delays pursuant to paragraph 8.3.4. In the event the Contractor requests an extension of the Contract time or files a Claim related to any form of delay, it shall furnish such justification and supporting evidence as the Owner may deem necessary for a determination of whether or not the Contractor is entitled to an extension of time under the provisions of the Contract, and shall further conform to all of the requirements of the specifications and the Contract regarding construction schedules and reports. The burden of proof to substantiate a Claim shall rest with the Contractor, including evidence that the cause was beyond its control. The Owner shall base its findings of fact and decision on such justification and supporting evidence, including a finding that the alleged delay impacted the Project's critical path, and shall advise the Contractor in writing thereof. If the Owner finds that the Contractor is entitled to any extension of the Contract time, the Owner's determination of the total number of days of extension shall be based upon the currently approved progress schedule and on all data relevant to the extension. Such data will be incorporated into the schedule in the form of a revision thereto, accomplished in a timely manner. The Contractor acknowledges and agrees that actual delays (due to said changes, suspension of Work or excusable delays) in activities which, according to the schedule, do not affect the Contract time, do not have any effect upon the Contract time and therefore will not be the basis for a change therein. The Contractor acknowledges and agrees that time extensions will be granted only to the extent that excusable delays exceed the available float in the critical path activities in the Contractor's currently approved schedule.
- 8.3.4.1 Extensions in the Contract time by Change Orders are subject to extension-in-time audit by the Owner as follows:
- 8.3.4.1.1 The Contractor agrees that, even though the Owner, Contractor and Design Consultant have previously signed a Change Order containing an extension-in-time resulting from a change in or addition to the Work that said extension in the Contract time may be adjusted by an audit after the fact by the Owner. If such an audit is to be made, the Owner must undertake the audit and make a ruling within thirty (30) days after the completion of the Work under the Change Order.
- 8.3.4.1.2 The Contractor agrees that any extension of the Contract time to which it is entitled arising out of a Change Order undertaken on a force accounting (labor and materials) basis, shall be determined by an extension-in-time audit by the Owner after the Work of the Change Order is completed. Such rulings shall be made by the Owner within thirty (30) days after a request for

same is made by the Contractor or Design Consultant, except said thirty (30) days will not start until the Work under the Change Order is completed.

- 8.3.4.1.3 Should a time extension be granted for Substantial Completion the date for Final Completion shall be appropriately adjusted unless specifically stated otherwise.
- 8.3.4.2 Subject to other provisions of the Contract, the Contractor may be entitled to an extension of the Contract time (but no increase in the Contract sum) for delays arising from unforeseeable causes beyond the control and without the fault or negligence of the Contractor, the Subcontractors or suppliers as follows:
- 8.3.4.2.1 Labor disputes and strikes (including strikes affecting transportation), that do, in fact, directly delay the progress of the Work on the critical path; however, an extension of Contract time on account of an individual labor strike shall not exceed the number of days of said strike;
- 8.3.4.2.2 Acts of nature: tornado, fire, hurricane, blizzard, earthquake, or flood that damage Work in place or stored materials or adversely impact the schedule's critical path;
- 8.3.4.2.3 Excessive inclement weather; however, the Contract time will not be extended due to reasonably anticipated inclement weather or for delays in the aftermath of inclement weather, reasonably anticipated or excessive. The time for performance of this Contract, as stated in the Contract Documents, includes an allowance for calendar days which may not be available for construction out-of-doors; for the purposes of this Contract, the Contractor agrees that the number of calendar days per month based on a five-year average shall be considered reasonably anticipated inclement weather and planned for in the construction schedule and the Contract Documents. Unless the Contractor can substantiate to the satisfaction of the Owner that there was greater than the reasonably anticipated inclement weather considering the time from the notice-to-proceed until the date established for Substantial Completion using data from the national weather service station identified in the Supplemental Conditions, or a weather station acceptable to the Owner and that such alleged greater than reasonably anticipated inclement weather actually delayed the Work or portions thereof which had an effect upon the Contract time, the Contractor shall not be entitled to an extension of time.

Also the Contractor agrees that the calculation of the number of excessive inclement weather days shall be the number of days in excess of the five-year average for each month, in which precipitation exceeded one tenth (.10) inch, or in which the highest temperature was 32 degrees F or less as recorded at the approved weather station. Rain days from hurricanes and tropical storms not causing damage in the county in which the project is located shall be deemed inclement weather days.

If the total accumulated number of calendar days lost to excessive inclement weather, from the notice-to-proceed until the date established for Substantial Completion, exceeds the total accumulated number to be reasonably anticipated for the same period from the table above, time for completion will be extended by the number of calendar days needed to include the excess number of calendar days lost. No extension of time will be made for days due to excessive inclement weather occurring after the date established for Substantial Completion. No change in Contract sum will be authorized because of adjustment of Contract time due to excessive inclement weather; and

- 8.3.4.2.4 Delays in the issuance of the building permit required for construction of the Project, acts of the public enemy, acts of the State, Federal or local government in its sovereign capacity, and acts of another Contractor in the performance of a Contract with the Owner relating to the Project.

- 8.3.5 If the Contractor shall neglect, fail or refuse to complete the Work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor does hereby agree, as a part consideration for the awarding of this Contract, to pay the Owner the amount specified in the Contract, not as a penalty but as Liquidated Damages for such breach of Contract as hereinafter set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the Contract for completing the Work. The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, and said amount is agreed to be the amount of damages which the Owner would sustain and said amount shall be retained from time to time by the Owner from current periodical estimates.
- 8.3.6 The Contractor and the Subcontractors shall not be entitled to and hereby expressly waive any extension of time resulting from any condition or cause unless said Claim for extensions of time is made in writing to the Owner within ten (10) days of the first instance of delay for all delays, except excessive inclement weather which shall be made in writing to the Owner within forty-five (45) days after the date established for Substantial Completion. Circumstances and activities leading to such Claim shall be indicated or referenced in a daily field inspection report for the day(s) affected. In every such written Claim, the Contractor shall provide the following information:
- 8.3.6.1 Nature of the delay;
- 8.3.6.2 Date (or anticipated date) of commencement of delay;
- 8.3.6.3 Activities on the progress schedule affected by the delay, and/or new activities created by the delay and their relationship with existing activities;
- 8.3.6.4 Identification of person(s) or organization(s) or event(s) responsible for the delay;
- 8.3.6.5 Anticipated extent of the delay; and
- 8.3.6.6 Recommended action to avoid or minimize the delay.
- 8.3.7 If no schedule or agreement is made stating the dates upon which written interpretations as set forth in Section 2.2 shall be furnished, then no Claim for delay shall be allowed on account of failure to furnish such interpretations until twenty (20) days after request is made for them, and not then unless such Claim is reasonable.
- 8.3.8 No Claim by the Contractor for an extension of time for delays will be considered unless made in strict compliance with the requirements of this Article. All Claims not filed in accordance with this paragraph shall be waived by the Contractor.
- 8.4 RESPONSIBILITY FOR COMPLETION
- 8.4.1 The Contractor shall be responsible for completion in accordance with Paragraph 4.12.1.
- 8.4.2 The Owner may require the Contractor to submit a recovery schedule demonstrating his program and proposed plan to make up the lag in scheduled progress and to ensure completion of the Work within the Contract Time if the Project is behind schedule by four (4) or more days. If the Owner finds the proposed plan not acceptable, he may require the Contractor to submit a

new plan. If the actions taken by the Contractor or the second plan proposed are not satisfactory, the Owner may require the Contractor to take any of the actions set forth in Paragraph 4.12.2 without additional cost to the Owner, to make up the lag in scheduled progress.

8.4.3 Failure of the Contractor to substantially comply with the requirements of this Section 8.4 may be considered grounds for a determination by the Owner, pursuant to Section 14.3, that the Contractor is failing to prosecute the Work with sufficient diligence to ensure its completion within the Contract Time.

8.5 LIQUIDATED DAMAGES FOR DELAY

8.5.1 Owner and Contractor agree that the damages incurred by the Owner due to the Contractor's failure to achieve Substantial Completion by the date specified in the Supplemental Conditions for Substantial Completion, including any extensions thereof, shall be in the amounts set forth in the Supplemental Conditions, for each consecutive day beyond the date of Substantial Completion that Contractor achieves Substantial Completion, and that the damages incurred by the Owner due to the Contractor's failure to achieve Final Completion by the date specified in the Supplemental Conditions for Final Completion, including any extensions thereof, shall be in the amount set forth in the Supplemental Conditions for each consecutive day beyond the date of Final Completion that Contractor achieves Final Completion. The Liquidated Damages are a reasonable estimate by Contractor and Owner of the damages to be suffered by Owner and are not to be construed as a penalty, it being recognized by the Owner and the Contractor that the injury to the Owner which could result from a failure of the Contractor to complete on schedule is uncertain and cannot be computed exactly or that it would be unreasonably expensive for Owner to calculate its damages exactly.

8.5.2 The amount specified for Substantial Completion is the minimum measure of damages the Owner will sustain due to delay in the completion of the Work, which shall include, but not be limited to the loss of use of the facilities, the relocation of students and services, the cost of the Owner's time and resources, damage to the Owner's reputation, and storage of furniture and other materials. The amount specified for Final Completion is a reasonable and proper measure of the damages the Owner will sustain due to the delay in the completion of remedial work. This amount includes the disruption to the school and the learning environment, the cost of the Owners time and resources, damage to the Owner's reputation, and the inability to fully use the facilities. The inability of the Owner to quantify actual damages shall not prevent the recovery of Liquidated Damages.

8.5.3 Notwithstanding any other provisions of these General Conditions, if there is concurrent delay in the completion of the Work, the Contractor shall be liable for Liquidated Damages as specified in the General Conditions and Supplemental Conditions during such period of concurrent delay. For the purpose of this Paragraph, concurrent delay means (a) a delay event caused in part by the Owner or its agent and in part by the Contractor or its agents, Subcontractors or Sub-subcontractors, or (b) one or more delay event caused solely by the Owner, its agents, or the Design Consultant, and one or more delay event caused in part by the Contractor, its agents, Subcontractors or Sub-subcontractors, each of which would have resulted in a delay without the other and which delays run concurrently, or at the same time. In the event that the foregoing provision making the Contractor liable for Liquidated Damages during a period of concurrent delay is found to be unenforceable, then the parties agree that in the event of a concurrent delay, the extent of the delay will be apportioned between the Owner and the Contractor, and the Contractor will be responsible for Liquidated Damages as set forth in the General Conditions and Supplemental Conditions for those portions of the delay which are apportioned to the Contractor, its agent, Subcontractors, Sub-subcontractors, or Material

Suppliers.

- 8.5.4 The provisions for Liquidated Damages do not bar or limit Owner's other rights and remedies against Contractor, for damages other than for failure to achieve the Substantial Completion date or the Final Completion date as required. The amount of Liquidated Damages set forth in Section 8.5 shall not include additional legal or design professional costs that may result from the Contractor's default. If such legal or design professional costs are incurred by the Owner, the Contractor shall be liable to the Owner for those costs in addition to the Liquidated Damages amount set forth in Section 8.5.
- 8.5.5 The Liquidated Damages assessed for failure to meet Substantial Completion by the specified date and the Liquidated Damages assessed for failure to meet Final Completion by the specified date shall be assessed cumulatively.

ARTICLE 9

PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

- 9.1.1 The Contract Sum is stated in the Owner-Contractor Agreement and, including authorized adjustments thereto, is the total amount payable by the Owner to the Contractor for the performance of the Work under the Contract Documents.

9.2 SCHEDULE OF VALUES

- 9.2.1 Before the first Application for Payment, the Contractor shall submit to the Owner a schedule of values allocated to the various portions of the Work and supported by such data to substantiate its accuracy as the Owner may require. This schedule, unless objected to by the Owner, shall be used as a basis for the Contractor's Applications for Payment and only for this purpose. If approved by the Owner, the Contractor may include in his schedule of values a line item for mobilization which shall include a reasonable amount of mobilization for the Contractor and his Subcontractors. The Contractor shall not front-end load his schedule of values.

9.3 APPLICATIONS FOR PAYMENT

- 9.3.1 Prior to the date for each progress payment established in the Owner-Contractor Agreement, the Contractor shall submit to the Design Consultant an itemized Application for Payment, notarized if required, supported by such data substantiating the Contractor's right to payment as the Design Consultant and the Owner may require, including but not limited to the Contractor's certification that all work for which payment is requested has been completed in full in accordance with the Contract Documents, and reflecting retainage, if any, as provided elsewhere in the Contract Documents. If requested by the Owner, the Contractor shall also certify that he has paid all due and payable amounts for which previous Applications for Payment were issued and payments received from the Owner, by providing waivers of liens for said payments.
- 9.3.1.1 The Contractor shall submit with the Application for Payment a list of those minority and Historically Underutilized Businesses (HUBs) Subcontractors whose work is included in the application and the amount due each. In addition, the minority and Historically Underutilized Business (HUBs) must itself perform satisfactory work or services or provide supplies under the Contract and not act as a mere conduit.

- 9.3.2 The Owner will withhold retainage from Contractor on all Applications for Payment to the maximum extent and in the maximum amount allowed by law (currently codified at N.C.G.S. 143-134.1) and in accordance with that statute or applicable successor statute. In the event that N.C.G.S 143-134.1 or applicable successor statute are not in effect or do not apply at the time the Contract is executed, Owner will retain five percent (5%) of the amount of each Application for Payment from the Contractor as retainage, until Contractor achieves Final Completion, whether or not the Owner has occupied any or all of the Project before such time. However, if the Owner, at any time after fifty percent (50%) of the Work has been completed, finds that satisfactory progress is being made, he may authorize payment to the Contractor in full of each Progress Payment for work performed beyond the fifty percent (50%) stage of completion. If a reduction in retainage has been made, the Owner may increase the retainage back to original percentage at any time if the Owner concludes that the Contractor is not progressing with the Work in a timely or satisfactory manner.
- 9.3.3 Payments may be made by the Owner, at its sole discretion, on account of materials or equipment not incorporated in the work but delivered and suitably stored at the site or in a bonded warehouse by the Contractor. Payments for materials or equipment stored shall only be considered upon submission by the Contractor of satisfactory evidence (for example, releases or paid invoices from the seller) that the Contractor has acquired title to such material, that it will be utilized on the work under this Contract and that it is satisfactorily stored, protected, and insured or that other procedures satisfactory to the Owner that will protect the Owner's interests have been taken. In the event the materials are stored in a bonded warehouse that is not located in the county of the project, the Contractor shall reimburse the travel cost and hourly billing expenses incurred by the Design Consultant for travel to view and assess whether the materials meet the requirements of the Contract Documents. Materials once paid for by the Owner become the property of the Owner and may not be removed from the work site or bonded warehouse, other than to be delivered from the warehouse to the site, without the Owner's written permission. Responsibility for such stored materials and equipment shall remain with the Contractor regardless of ownership.
- 9.3.3.1 Owner will not make payment to the Contractor on account of materials or equipment not incorporated in the Work but delivered and stored at the site if the Contractor, in his schedule of values, does not include line items for such delivered and stored materials or equipment.
- 9.3.3.2 It is specifically understood and agreed that an inspection and approval of the materials by the Owner, the Design Consultant or any agency retained by any of them shall not in any way subject the Owner to pay for the said materials or any portion thereof, even though incorporated in the Work, if said materials shall in fact turn out to be unfit to be used in the Work, nor shall such inspection be considered as any waiver of objection to the Work on account of the unsoundness or imperfection of the material used.
- 9.3.4 The Contractor warrants that title to all work, materials and equipment covered by an Application for Payment will pass to the Owner either by incorporation in the construction or upon the receipt of payment by the Contractor, whichever occurs first, free and clear of all liens, claims, security interests or encumbrances, hereinafter referred to in this Article 9 as "liens"; and that no work, materials or equipment covered by an Application for Payment will have been acquired by the Contractor, or by any other person performing work at the site or furnishing materials and equipment for the Project, subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person.
- 9.3.5 The Contractor shall submit with the Application for Payment a notarized Contractor's Sales

Tax Report of N.C. State and County sales taxes paid during the payment period with respect to building materials, supplies, fixtures, and equipment that have become a part of, or annexed to, a building or structure erected, altered or repaired for the Owner. The Sales Tax Report shall include the vendor from whom the property was purchased, the dates and number of invoices covering the purchase, the total amount of the invoices of each vendor, the North Carolina State and County sales and use tax paid thereof, and the cost of the property withdrawn from the warehouse stock and North Carolina sales or use taxes paid thereof. Items that should not be included are: scaffolding, forms for concrete, fuel for operation of machinery and equipment, tools, equipment, equipment repair parts and equipment rentals.

9.3.6 Unless an interest rate is required by law, Owner shall not pay any interest on an amount owed to Contractor. No interest shall accrue on amounts Owner is authorized by law or by the Contract to withhold or backcharge to Contractor.

9.4 CERTIFICATION OF PAYMENT

9.4.1 The Design Consultant will, after receipt of the Contractor's Application for Payment either issue a Certification of Payment to the Owner, with a copy to the Contractor, for such amount as the Design Consultant determines is properly due, or notify the Contractor in writing of their reasons for withholding a Certification as provided in Paragraph 9.6.1.

9.4.2 The submission and approval of the progress schedule and monthly updates thereof as required by the Contract Documents shall be an integral part and basic element of the application upon which progress payment shall be made. The Contractor shall be entitled to progress payments only as determined from the currently approved and updated schedule.

9.4.3 The signing of a Certification of Payment will constitute a representation by the Design Consultant to the Owner, based on their observations at the site pursuant to their agreements with the Owner, and the data comprising the Application for Payment, that the Work has progressed to the point indicated; that, to the best of their knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to the results of any subsequent tests required by or performed under the Contract Documents, to minor deviations from the Contract Documents correctable prior to completion, and to any specific qualifications stated in their Certification); and that the Contractor is entitled to payment in the amount certified. However, by signing a Certification of Payment, the Design Consultant shall not thereby be deemed to represent that it has made exhaustive or continuous on-site inspections to check the quality or quantity of the Work or that it has reviewed the construction means, methods, techniques, sequences, or procedures, or that it has made any examination to ascertain how or for what purpose the Contractor has used the moneys previously paid on account of the Contract Sum.

9.5 PROGRESS PAYMENTS

9.5.1 After a Certification of Payment has been issued, the Owner shall make payment in the manner and within the time provided in the Contract Documents, unless Contractor is in breach of the Contract or otherwise owes the Owner, in which case Owner may withhold an appropriate amount.

9.5.2 The Contractor shall promptly pay each Subcontractor (including suppliers, laborers, and material-men) performing labor or furnishing material or equipment for the Work, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such

Subcontractor's work, the amount to which said Subcontractor is entitled, reflecting the percentage actually retained, if any, from payments to the Contractor on account of such Subcontractor's work. The Contractor shall, by an appropriate agreement with each Subcontractor, also require each Subcontractor to make payments to his Sub-subcontractors in similar manner. The Owner may at any time require proof of payment to a Subcontractor or Sub-subcontractor for work paid by the Owner. Notwithstanding any other provision of the General Conditions, no Contractor, Subcontractor, Sub-subcontractor or Material Supplier shall have any Claim against the Owner, by virtue of the Contract, under any theory, including breach of contract, or third party beneficiary. The Owner shall not be in privity of any contract with any Subcontractor, Sub-subcontractor or Material Supplier pertaining to the Work, the Project and these General Conditions. Also, neither the Contractor, or any Subcontractor or Sub-subcontractor shall have any right to assert a lien on Owner's real property or on any funds held by Owner.

- 9.5.3 The Owner may, on request and at his discretion, furnish to any Subcontractor, if practicable, information regarding the percentages of completion or the amounts applied for by the Contractor and the action taken thereon by the Design Consultant on account of work done by such Subcontractor.
- 9.5.4 Neither the Owner nor the Design Consultant shall have any obligation to pay or to see to the payment of any moneys to any Subcontractor except as may otherwise be required by law.
- 9.5.5 No Certification for a progress payment, nor any progress payment or final payment, nor any partial or entire use or occupancy of the Project by the Owner, shall constitute an acceptance of any Work not in accordance with the Contract Documents.
- 9.5.6 The Contractor agrees to keep the Work and the site of the Project free and clear of all liens related to labor and materials furnished in connection with the Work. Furthermore, pursuant to and in compliance with requirements of Paragraph 9.3.4, the Contractor waives any right he may have to file any type of lien in connection with the Work. Notwithstanding anything to the contrary contained in the Contract Documents, if any such lien is filed or there is evidence to believe that any lien may be filed at any time during the progress of the Work or within the duration of this Contract, the Owner may refuse to make any payment otherwise due the Contractor or may withhold from any payment due the Contractor a sum sufficient in the opinion of the Owner to pay all obligations and expenses necessary to satisfy such lien or the underlying claim represented by such lien. The Owner may withhold such payment unless or until the Contractor, within ten (10) days after demand thereof by the Owner, shall furnish satisfactory evidence that the indebtedness and any lien in respect thereof has been satisfied, discharged and released of record, or that the Contractor has legally caused such lien to be released of record pending the resolution of any dispute between the Contractor and the person or persons filing such lien. If the Contractor shall fail to furnish such satisfactory evidence within ten (10) days of the demand thereof, the Owner may discharge such indebtedness and deduct the amount thereof, together with any and all losses, costs, damages and attorney's fees suffered or incurred by the Owner from any sum payable to the Contractor under the Contract Documents, including but not limited to final payment and retained percentage. This Paragraph 9.5.6 shall be specifically included in all Subcontracts and purchase orders entered into by the Contractor. Notwithstanding any other provision of the Contract, nothing in the Contract shall affect the rights of Subcontractors, Sub-subcontractors, Material Suppliers and Vendors from enforcing any lien rights they have against parties other than the Owner.

9.6 PAYMENTS WITHHELD

9.6.1 The Design Consultant may decline to certify payment and may withhold their Certification of Payment in whole or in part, to the extent necessary to reasonably protect the Owner, if in the Design Consultant's opinion it is unable to make representations to the Owner as provided in Paragraph 9.4.3. If the Design Consultant is unable to make representations to the Owner as provided in Paragraph 9.4.3 and to certify payment in the amount of the Application for Payment, it will notify the Contractor as provided in Paragraph 9.4.1. If the Contractor and the Design Consultant cannot agree on a revised amount, the Design Consultant will promptly issue a Certification of Payment for the amount for which it is able to make such representations to the Owner. The Design Consultant may also decline to certify payment because of subsequently discovered evidence or subsequent observations that may nullify the whole or any part of any Certification of Payment previously issued to such extent as may be necessary in its opinion to protect the Owner from loss, because of:

- .1 Defective Work not remedied,
- .2 Third party claims filed, whether in court, in arbitration or otherwise, or reasonable evidence indicating probable filing of such claims,
- .3 Failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment,
- .4 Reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum,
- .5 Damage to the Owner or another contractor,
- .6 Reasonable evidence that Contractor will not achieve Substantial Completion and/or Final Completion by the dates specified in the Supplemental Conditions.
- .7 Failure or refusal of the Contractor to carry out the Work in accordance with or to otherwise substantially or materially comply with the Contract Documents,
- .8 Liens filed or reasonable evidence that a lien may be filed for any portion of the Work,
- .9 Failure or refusal of the Contractor to properly schedule and coordinate the Work, to provide progress schedules, reports and updates, or to provide and adhere to a recovery schedule as required by the Contract Documents,
- .10 Failure or refusal of the Contractor to fully comply with the provisions of Section 6.2 requiring the Contractor to direct certain Claims to Separate Contractors and to defend and indemnify the Owner and/or the Design Consultant in the event Separate Contractors file certain Claims,
- .11 Failure or refusal of the Contractor to submit the required information on minority and Historically Underutilized Businesses (HUBs),
- .12 Failure or refusal of the Contractor to submit a notarized North Carolina State and County Sales Tax Report,
- .13 Any other breach of the Contract by Contractor which has or is likely to cause monetary

damages or loss to Owner, or

.14 Any other reason authorized by the Contract Documents or by law.

9.6.2 When the above grounds in Paragraph 9.6.1 are removed to the Design Consultant's and Owner's satisfaction, payment shall be made for amounts withheld because of them.

9.7 FAILURE OF PAYMENT

9.7.1 If the Owner does not make payment to the Contractor within the forty-five (45) calendar days after receipt of the Contractor's approved Application for Payment from the Design Consultant through no fault of the Contractor, and the Owner otherwise not being entitled under the Contract Documents or applicable law to withhold payment, then the Contractor may, upon seven (7) additional days' Notice to the Owner, stop the Work until payment of the amount owed according to the Contract Documents has been received. In such event, the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, which shall be effected by appropriate Change Order as provided herein.

9.8 SUBSTANTIAL COMPLETION

9.8.1 When the Contractor considers that the Work, or a designated portion thereof which is acceptable to the Owner, is substantially complete as defined in Paragraph 8.1.3, the Contractor shall prepare for submission to the Owner a list of items which in his opinion are to be completed or corrected and shall request in writing that the Design Consultant and the Owner perform a Substantial Completion inspection. The Design Consultant and the Owner shall review the Contractor's list and shall compile a punch list of items to be corrected and completed. The failure to include any items on such list does not alter the responsibility of the Contractor to complete the Work in accordance with the Contract Documents. When the Design Consultant and the Owner on the basis of an inspection jointly determine that the Work or designated portion thereof is substantially complete, they will then prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion, shall state the responsibilities of the Owner and the Contractor for security, maintenance, heat, utilities, damage to the Work, and insurance, and shall fix the time within which the Contractor shall complete the items listed therein. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. The Certificate of Substantial Completion shall be submitted to the Owner and the Contractor for their written acceptance of the responsibilities assigned to them in such Certificate.

9.8.2 Upon Substantial Completion of the Work or designated portion thereof and upon application by the Contractor and certification by the Design Consultant, the Owner shall make payment, except retainage held pursuant to Paragraph 9.3.2, for such work or portion thereof, as provided in the Contract Documents unless Contractor is in breach of the Contract in which case Owner may withhold an appropriate amount.

9.8.3 The acceptance of Substantial Completion payment shall constitute a waiver of all Claims by the Contractor and its Subcontractors and Sub-subcontractors except those previously made in writing and identified by the Contractor as unsettled at the time the Contractor submits the Application for Payment for Substantial Completion, and except for the retainage sums due at Final Completion. The Contractor shall indemnify and hold the Owner harmless against any Claims by its Subcontractors and Sub-subcontractors that are waived because they were not made in writing and identified by the Contractor as unsettled when the Contractor submitted the

Application for Payment for Substantial Completion.

- 9.8.4 The Owner shall have the option to correct or conclude any and all punch list items not completed by the Contractor to the satisfaction of the Design Consultant and the Owner within thirty (30) days from the actual date of Substantial Completion by utilizing its own forces or by hiring others. The cost of such correction of remaining punch list items by the Owner or others shall be deducted from the final payment to the Contractor. If Contractor does not complete certain punch list items within this time period, specified in Paragraph 9.8.4, all warranties and guarantees for such incomplete punch list items shall become effective upon issuance of final payment for the Project. Paragraph 9.8.4 does not limit the Liquidated Damages provisions related to failure to reach Final Completion by the date stipulated in the Contract Documents.
- 9.8.5 The issuance of the Certificate of Substantial Completion does not indicate final acceptance of the Project by the Owner, and the Contractor is not relieved of any responsibility for the Project except as specifically stated in the Certificate of Substantial Completion.
- 9.8.6 Should the Design Consultant and the Owner determine that the Work or a designated portion thereof is not substantially complete, they shall inform the Contractor in writing stating why the Project or designated portion is not substantially complete. The Contractor shall expeditiously complete the Work and shall re-request in writing that the Design Consultant and the Owner perform a Substantial Completion inspection. Costs, if any, associated with such inspection shall be assessed to the Contractor.
- 9.8.7 Certificate of Substantial Completion will not be issued until the following is completed by Contractor:
- .1 Submit Contractor's list of work not yet complete with proposed time for completion signed by Contractor's project superintendent;
 - .2 Submit Certificate of Occupancy;
 - .3 Submit record drawings, maintenance manuals, final project photos, property surveys;
 - .4 Deliver tools, spare parts, extra stock and similar items;
 - .5 Submit warranties, bonds, maintenance agreements and final certifications;
 - .6 Complete start-up testing of all systems and instruction of the Owner's personnel;
 - .7 Coordinate and complete final changeover of permanent locks and transmit keys to Owner;
 - .8 Discontinue and remove temporary facilities from the site;
 - .9 Complete final cleaning;
 - .10 Advise the Owner of pending insurance changeover requirements;
 - .11 Coordinate and complete changeover of security, telephone, cable and other services; and
 - .12 Submit pay application showing 100% complete for work claimed to be substantially complete.

9.8.8 The Contractor acknowledges that the Design Consultant and its consultants are only required to conduct up to two (2) comprehensive substantial completion inspections as part of its basic services. If more than two (2) substantial completion inspections are required through no fault of the Design Consultant, the cost of the additional inspections shall be paid by the Contractor.

9.9 FINAL COMPLETION AND FINAL PAYMENT

9.9.1 Upon receipt of the documentation required by Section 9.8, and of written Notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Design Consultant and the Owner will promptly make such inspection and, when they find the Work acceptable under the Contract Documents and the Contract fully performed, the Design Consultant shall issue a final Certification of Payment stating that to the best of their knowledge, information and belief, and on the basis of their observations and inspections, the Work has been completed in accordance with the terms and conditions of the Contract Documents. The final Certification of Payment will constitute that the conditions precedent to the Contractor's being entitled to final payment as set forth in Section 9.8 have been fulfilled. Payment shall be made to the Contractor in the amount certified by the Design Consultant within forty five (45) calendar days after receipt by the Owner of the final Certification of Payment except for any Work for which the Owner is entitled a credit under the Contract Documents.

9.9.1.1 The Contractor acknowledges that the Design Consultant and its consultants are only required to conduct up to two (2) comprehensive final completion inspections as part of its basic services. If more than two (2) final completion inspections are required through no fault of the Design Consultant, the cost of the additional inspections shall be paid by the Contractor.

9.9.2 Neither the final payment nor the remaining retained percentage shall become due until the Work is free and clear of any and all liens and the Contractor submits to the Owner:

- .1 An affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or his property might in any way be responsible, have been paid or otherwise satisfied;
- .2 Consent of Surety to final payment;
- .3 If required by the Owner, other data establishing payment or satisfaction of all such obligations, such as receipts, releases and waivers of liens arising out of the Contract, to the extent and in such form as may be designated by the Owner; and
- .4 A written certification that:
 - .1 The Contractor has reviewed the requirements of the Contract Documents,
 - .2 The Work has been inspected by the Contractor for compliance with all requirements of the Contract Documents,
 - .3 Pursuant to this inspection, the Contractor certifies and represents that the Work complies in all respects with the requirements of the Contract Documents,
 - .4 The Contractor further certifies and represents that all equipment and systems have been installed in accordance with the Contract Documents and have been tested in accordance with the Specification requirements and are operational, and

- .5 The Contractor hereby certifies and represents that the Work is complete in all respects and ready for final inspection.
- 9.9.3 If any Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify him against any loss. If any such lien or claim remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all moneys that the latter may be compelled to pay in discharging such lien or claims, including all costs and reasonable attorney's fees. The Owner may withhold from the final payment any sum that the Owner has reason to believe may be needed to satisfy any lien, claim or threat of lien arising from the Work. The Owner may deduct from the final payment an amount equal to any costs, expenses and attorney's fees incurred by the Owner in removing or discharging any liens or claim arising from the Work.
- 9.9.4 If, after Substantial Completion of the Work, Final Completion thereof is materially delayed through no fault of the Contractor or by the issuance of Change Orders affecting Final Completion, and the Owner so confirms, the Owner shall, upon application by the Contractor and certification by the Design Consultant, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for the portion of the Work not fully completed or corrected is less than the retainage stipulated in the Contract Documents, and if bonds have been furnished as provided in Section 7.4, the written consent of the Surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Design Consultant prior to certification of such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.
- 9.9.5 The making of final payment shall constitute a waiver of all Claims by the Owner against the Contractor except those arising from:
- .1 Unsettled liens, and claims against the Owner or the Design Consultant, or their employees, agents, or representatives;
 - .2 Faulty, defective or non-conforming Work;
 - .3 Failure of the Work to comply with the requirements of the Contract Documents;
 - .4 Terms of any warranties contained in or required by the Contract Documents;
 - .5 Damages incurred by the Owner resulting from lawsuits brought against the Owner, the Design Consultant, or their agents, employees or representatives because of failures or actions on the part of the Contractor, his Subcontractors, Sub-subcontractors, or any of their employees, agents or representatives;
 - .6 Fraud or bad faith committed by the Contractor or any Subcontractor or supplier during performance of the Work but discovered by Owner after final payment; or
 - .7 Claims about which Owner did not have actual knowledge or which increase in scope or amount at the time of final payment.
- 9.9.6 The acceptance of final payment shall constitute a waiver of all Claims by the Contractor except those previously made in writing and identified by the Contractor as unsettled at the time of the final Application for Payment.

- 9.9.6.1 Notwithstanding any other provision of the Contract, Owner may withhold from Contractor payment otherwise due, as a result of any losses, expenses costs or damages suffered or anticipated to be suffered by Owner as a result of Contractor's breach of any provision of the Contract, including but not limited to Liquidated Damages or backcharges against Contractor.
- 9.10 OWNER'S RIGHT TO OCCUPY INCOMPLETE WORK
- 9.10.1 Should the Project, or any portion thereof, be incomplete for Substantial or Final Completion at the scheduled date or dates, the Owner shall have the right to occupy any portion of the Project. In such an event, the Contractor shall not be entitled to any extra compensation on account of said occupancy by the Owner or by the Owner's use of the Project, nor shall the Contractor interfere in any way with said use of the Project. Further, in such an event, the Contractor shall not be entitled to any extra compensation on account of the Owner's occupancy and use of the Project, nor shall the Contractor be relieved of any responsibilities of the Contract including the required times of completion. Such occupancy by the Owner shall not, in itself, constitute Substantial or Final Completion.
- 9.10.2 If the Owner exercises his rights under the foregoing and occupies the full Project, then there shall be no Liquidated Damages on account of failure on the Contractor's part to reach Substantial Completion from that date forward. This provision does not affect, however, any Liquidated Damages that would be assessed for any period of time between the contractual date of Substantial Completion and the date of any such occupancy. Further, this provision would have no effect on Liquidated Damages assessed on account of late Final Completion.

ARTICLE 10

PROTECTION OF PERSONS AND PROPERTY

- 10.1 SAFETY PRECAUTIONS AND PROGRAMS
- 10.1.1 The Owner, the Design Consultant, or their agents, employees or representatives are not responsible for the means, methods, techniques, sequences or procedures utilized by the Contractor, or for safety precautions and programs in connection with the Work. The Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. This requirement applies continuously throughout the Contract performance, until final payment is made and all punch list and warranty work is performed properly, and is not limited to regular working hours.
- 10.2 SAFETY OF PERSONS AND PROPERTY
- 10.2.1 The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:
- .1 All employees on the Work and all other persons who may be affected thereby;
 - .2 All the Work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the Contractor or any of his Subcontractors or Sub-subcontractors, machinery, equipment and all hazards shall be guarded or eliminated in accordance with all applicable safety regulations; and
 - .3 Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks,

pavements, roadways, structures and overhead or underground utilities not designated for removal, relocation or replacement in the course of construction.

- 10.2.2 The Contractor shall give all notices and comply with all applicable laws, ordinances, permits, rules, regulations and lawful orders of any public authority bearing on the safety or persons or property or their protection from damage, injury or loss.
- 10.2.2.1 The Contractor shall at all times safely guard the Owner's property from injury or losses in connection with the Contract. He shall at all times safely guard and protect his own work and adjacent property as provided by law and the Contract Documents, from damage. All passageways, guard fences, lights and other facilities required for protection by applicable safety regulations must be provided and maintained.
- 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities.
- 10.2.4 When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.
- 10.2.5 The Contractor shall promptly remedy at his own cost and expense all damage or loss to any property referred to in Subparagraphs 10.2.1.2 and 10.2.1.3 caused by the Contractor, any Subcontractor, any Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable and for which the Contractor is responsible under Subparagraphs 10.2.1.2 and 10.2.1.3, except damage or loss attributable solely to the acts or omissions of the Owner or Design Consultant or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to his obligations under Section 4.21. The Contractor shall perform such restoration by underpinning, repairing, rebuilding, replanting, or otherwise restoring as may be required or directed by the Owner, or shall make good such damage in a satisfactory and acceptable manner. In case of failure on the part of the Contractor to promptly restore such property or make good such damage, the Owner may, upon two (2) calendar days Notice, proceed to repair, rebuild or otherwise restore such property as may be necessary and the cost thereof, or a sum sufficient in the judgment of the Owner to reimburse the owners of property so damaged, will be deducted from any monies due or to become due the Contractor under the Contract.
- 10.2.6 The Contractor is responsible for the proper packing, shipping, handling and storage (including but not limited to shipment or storage at the proper temperature and humidity) of materials to be incorporated in the Work, so as to insure the preservation of the quality and fitness of the material for proper installation and incorporation in the Work, as required by the Contract Documents. For example, but not by way of limitation, Contractor shall, when necessary, place material on wooden platforms or other hard and clean surfaces and not on the ground and/or place such material under cover in any appropriate shelter or facility. Stored materials or equipment shall be located so as to facilitate proper inspection. Material and equipment which is delivered crated shall remain crated until ready for installation. Lawns, grass plots or other private property shall not be used for storage purposes without the written permission of the Owner or lessee unless otherwise within the terms of the easements obtained by the Owner.

- 10.2.6.1 It shall be the responsibility of the Contractor in his preparation of phasing schedule of work operations after consulting with the other Prime Contractors to designate areas in which each Prime Contractor may store materials. Areas designed shall meet with the approval of the Design Consultant.
- 10.2.7 The Contractor shall give notice in writing at least forty eight (48) hours before breaking ground, to all persons, public utility companies, owners of property having structures or improvements in proximity to site of the Work, superintendents, inspectors, or those otherwise in charge of property, streets, water pipes, gas pipes, sewer pipes, telephone cables, electric cables, railroads or otherwise, who may be affected by the Contractor's operation, in order that they may remove any obstruction for which they are responsible and have representative on site to see that their property is properly protected. Such notice does not relieve the Contractor of responsibility for all damages, claims, or defense or indemnification of all actions against Owner resulting from performance of such work in connection with or arising out of Contract.
- 10.2.8 The Contractor shall investigate, locate, mark and protect all utilities encountered or to be encountered while performing the Work, whether indicated on the Drawings or not. The Contractor shall maintain utilities in service until moved or abandoned. The Contractor shall exercise due care when excavating around utilities and shall restore any damaged utilities to the same condition or better as existed prior to starting the Work, at no cost to the Owner. The Contractor shall maintain operating utilities or other services, even if they are shown to be abandoned on the Contract Drawings, in service until new facilities are provided, tested and ready for use.
- 10.2.9 The Contractor shall return all improvements on or about the site and adjacent property which are not shown to be altered, removed or otherwise changed to conditions which existed prior to starting the Work. The Contractor shall video record all areas or otherwise document the conditions existing at the site and in and around existing buildings prior to starting the Work. Submit documentation to the Design Consultant prior to beginning the Work.
- 10.2.10 The Contractor shall protect the Work, including but not limited to, the site, stored materials and equipment, excavations, and excavated or stockpiled soil or other material, intended for use in the Work, and shall take all necessary precautions to prevent or minimize damage to same or detrimental effect upon his performance or that of his Subcontractors, caused by or due to rain, snow, ice, run-off, floods, temperature, wind, dust, sand and flying debris; for example, but not by way of limitation, Contractor shall, when necessary, utilize temporary dikes, channels or pumping to carry-off divert or drain water, and shall as necessary tie-down or otherwise secure the Work and employ appropriate covers and screens.
- 10.2.11 The Contractor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents and the protection of material, equipment and property. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner.
- 10.2.12 The Contractor shall not load or permit any part of the Work to be loaded so as to endanger its safety.
- 10.2.13 Notification to the Contractor by the Owner or the Design Consultant of a safety violation will in no way relieve the Contractor of sole and complete responsibility for the correctness of said violation or of sole liability for the consequences of said violation.

10.3 EMERGENCIES

- 10.3.1 In any emergency affecting the safety of persons or property, the Contractor shall act, at his discretion, to prevent threatened damage, injury or loss. The Contractor shall notify the Owner of the situation and all actions taken immediately thereafter. If, in the opinion of the Contractor, immediate action is not required, the Contractor shall notify the Owner of the emergency situation and proceed in accordance with the Owner's instructions. Provided, however, if any loss, damage, injury or death occurs that could have been prevented by the Contractor's prompt and immediate action, the Contractor shall be fully liable for all costs, damages, claims, actions, suits, attorney's fees and all other expenses arising therefrom or relating thereto.

ARTICLE 11

INSURANCE

11.1 CONTRACTOR'S LIABILITY INSURANCE

- 11.1.1 The Contractor shall purchase and maintain in companies properly licensed by the Insurance Department of the State of North Carolina and acceptable to the Owner such insurance as will protect him, the Owner, and the Owner's agents, representatives, and employees from claims set forth below which may arise out of or result from the Contractor's operations under the Contract, whether such operations be by himself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- .1 Claims under workers' or workmen's compensation, disability benefit and other similar employee benefit acts (with Workmen's Compensation and Employer's Liability Insurance in amounts not less than those necessary to meet the statutory requirements of the state(s) having jurisdiction over any portion of the Work);
- .2 Claims for damages because of bodily injury, sickness or disease, or death of his employees; the Contractor will require his Subcontractors to similarly provide Workmen's Compensation Insurance for all of the latter's employees;
- .3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;
- .4 Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or (2) by any other person;
- .5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom; and
- .6 Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

- 11.1.2 The insurance required by Paragraph 11.1.1 shall be primary and non-contributing to any insurance possessed or procured by the Owner, and limits of liability shall be not less than those set forth in these General Conditions of the Contract or required by law, whichever is greater.

- 11.1.3 The insurance required by the Contract shall include contractual liability insurance applicable to the Contractor's obligations under the Contract

- 11.1.4 Without limiting the above during the term of the Contract, the Contractor and each Subcontractor shall, at their own expense, purchase and maintain the following insurance with companies properly licensed by the Insurance Department of the State of North Carolina and satisfactory to the Owner.
- .1 Worker's Compensation including Occupational Disease and Employer's Liability Insurance.
 - .1 Statutory - Amount and coverage as required by State of North Carolina Worker's Compensation laws.
 - .2 Employer's Liability
 - \$1,000,000 Each Accident
 - \$1,000,000 Policy Limit
 - \$1,000,000 Each Employee
 - .2 Commercial General Liability (Occurrence Form) - The Contractor shall provide during the life of the Contract such Commercial General Liability (Occurrence Form) Insurance as shall protect him and any Subcontractor performing work under the Contract from claims for damages for Bodily Injury including accidental death, as well as from claims for Property Damage which may arise from operations under the Contract, whether such operations be by himself or by any Subcontractor or by anyone directly or indirectly employed by either of them. This insurance shall be on the Standard Insurance Services Office, Inc. (ISO) Commercial Liability Occurrence Form or other form reasonable acceptable to Owner. The Contractor shall procure insurance coverage for direct operations, sublet work, elevators, contractual liability and completed operations with limits not less than those stated below:
 - .1 A Combined Single Limit for Bodily Injury, Property Damage and Personal Injury of:
 - Limits of Insurance
 - \$2,000,000 General Aggregate (except Products – Completed Operations) Limit
 - \$2,000,000 Products – Completed Operations Aggregate Limit
 - \$1,000,000 Personal and Advertising Injury Limit
 - \$1,000,000 Each Occurrence Limit
 - .3 Property Damages, including Broad Form Property Damage and Explosion, Collapse, Underground property damage coverages, and blasting, where necessary;
 - .4 Completed Operations Liability: Continuous coverage in force for one year after completion of the Work;
 - .5 Commercial Automobile Insurance, including coverage for owned, non-owned and hired vehicles - with limits not less than those stated below:
 - .1 A Combined Single Limit for Bodily Injury and Property Damage of \$1,000,000.
 - .6 Umbrella Liability Insurance: Policy to "pay on behalf of the Insured"
 - Limits of Liability:
 - .1 Contract Amount: \$1,000,000-\$2,000,000:

Requires Umbrella Liability Insurance Limit of \$1,000,000.

.2 Contract Amount: \$2,000,000 and above:
Requires Umbrella Liability Insurance Limit of \$2,000,000.

- 11.1.5 The insurance required by Section 11.1 shall be written for not less than any limits of liability specified in the Contract Documents, or required by law, whichever is greater.
- 11.1.6 Certificates of Insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work. These Certificates shall contain a provision that coverages afforded under the policies will not be canceled until at least thirty (30) days' prior written Notice has been given to the Owner. Failure to provide such Notice shall not limit the liability of the Insurer, its agents or representatives.
- 11.1.7 All insurance policies required in this Article, except Worker's Compensation and Commercial Automobile, shall name the Owner as additional named insured for the insurance.
- 11.1.8 The Contractor shall not commence the Work under the Contract until he has obtained all the insurance required hereunder and such insurance has been approved by the Owner, nor shall the Contractor allow any Subcontractor to commence work on his subcontract until all similar insurance required of the Subcontractor has been so obtained and approved. Approval of the insurance by the Owner shall not relieve or decrease the liability of the Contractor hereunder.
- 11.1.9 The Commercial General Liability and Workers Compensation Policies provided by the Contractor shall have endorsements waiving subrogation against the Owner.
- 11.2 PROPERTY INSURANCE
- 11.2.1 The Contractor shall purchase and at all times maintain such insurance as will protect the Contractor, the Owner, Subcontractors and Sub-subcontractors from loss or damage to the Work or property in the course of construction, including all machinery, materials and supplies on the premises or in transit thereto and intended to become a part of the finished Work until Final Completion. This insurance shall be in the form of "Builders Risk Covered Cause of Loss Form", or equivalent form, to include but not limited to theft, collapse, earth movement, flood, and portions of the Work stored on site, off site and in transit. Any deductible provision in such insurance shall not exceed ten thousand dollars (\$10,000). Notwithstanding any such deductible provision, the Contractor shall remain solely liable for the full amount of any item covered by such insurance. Such insurance shall be in the initial Contract Sum and shall be increased at Contractor's expense in the amount of all additions to the Contract Sum. Such insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.
- 11.2.2 Any loss insured under Paragraph 11.2.1 is to be adjusted with the Owner and made payable to the Owner as trustee for the insureds, as their interests may appear, subject to the requirements of Paragraph 11.2.4. The Contractor shall pay each Subcontractor a just share of any insurance moneys received by the Contractor, and by appropriate agreement, written where legally required for validity, shall require each Subcontractor to make payments to his Sub-subcontractors in similar manner.
- 11.2.3 The Owner and Contractor waive all rights against each other for damages caused by fire or other perils to the extent their Claims are covered by insurance obtained pursuant to this Section 11.2, or any other property insurance applicable to the Work, except such rights as they may

have to the proceeds of such insurance. The Contractor shall require, by appropriate agreement, written where legally required for validity, similar waivers in favor of the Owner and the Contractor by Subcontractors and Sub-subcontractors. With respect to the waiver of rights of recovery, the term Owner shall be deemed to include, to the extent covered by property insurance applicable thereto, his consultants, employees, and agents and representatives. The Contractor waives as against any Separate Contractor described in Article 6, all rights for damages caused by fire or other perils in the same manner as is provided above as against the Owner. The Owner shall require, by appropriate agreement, written where legally required for validity, similar waivers in favor of the Contractor by any Separate Contractor and his subcontractors and sub-subcontractors.

11.2.4 The Owner as trustee shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within five (5) days after the occurrence of loss to the Owner's exercise of this power, and if such objection is made, the matter shall be decided by a court of competent jurisdiction or as the parties in interest otherwise agree. The Owner as trustee shall, in that case, make settlement with the insurers in accordance with the orders of the court or as otherwise agreed by the parties in interest.

11.2.5 If the Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion thereof, such occupancy or use shall not commence prior to a time mutually agreed to by the Owner and Contractor and to which the insurance company or companies providing the property insurance have consented by endorsement to the policy or policies. This insurance shall not be canceled or lapsed on account of such partial occupancy or use. Consent of the Contractor and of the insurance company or companies to such occupancy or use shall not be unreasonably withheld.

11.2.6 The Contractor bears the risk of loss or damage to the Work, the Project, materials stored on site or off site, and Owner's improvements and property under Contractor's control, both during construction and prior to Substantial Completion.

11.3 EFFECT OF SUBMISSION OF CERTIFICATES

11.3.1 The Owner shall be under no obligation to review any Certificates of Insurance provided by the Contractor or to check or verify the Contractor's compliance with any and all requirements regarding insurance imposed by the Contract Documents. The Contractor is fully liable for the amounts and types of insurance required herein and is not excused should any policy or certificate of insurance provided by the Contractor not comply with any and all requirements regarding insurance imposed by the Contract Documents.

11.4 FAILURE OF COMPLIANCE

11.4.1 Should the Contractor fail to provide and maintain in force any and all insurance, or insurance coverage required by the Contract Documents or by law, or should a dispute arise between Owner and any insurance company of Contractor over policy coverage or limits of liability as required herein, the Owner shall be entitled to recover from the Contractor all amounts payable, as a matter of law, to Owner or any other parties, had the required insurance or insurance coverage been in force. Said recovery shall include, but is not limited to interest for the loss of use of such amounts of money, plus all attorney's fees, costs and expenses incurred in securing such determination and any other consequential damages arising out of the failure of the Contractor or insurance company to comply with the provisions of the Contract Documents, or any policy required hereby, or any other requirements regarding insurance imposed by law. Nothing herein shall limit any damages for which Contractor is responsible as a matter of law.

11.5 OWNER'S INSURANCE

11.5.1 Property Insurance: The Owner, at his option, may purchase and maintain such insurance as will insure him against loss of use of his property due to fire or other hazards, however caused.

11.5.2 Commercial Public Liability Insurance: The Owner, at his option, may purchase and maintain insurance which will insure and protect him against claims involving bodily injury and property damage to the public. The Owner does not request his insurer to waive any right of subrogation against the Contractor from claims under this coverage.

11.6 LICENSED INSURANCE COMPANIES

11.6.1 All insurance companies providing the above insurance shall be licensed by the Insurance Department of the State of North Carolina and have a minimum AM Best "A" rating or similar rating from another rating agency reasonably acceptable to Owner.

ARTICLE 12

CHANGES IN THE WORK

12.1 GENERAL PROVISIONS RELATED TO CHANGES

12.1.1 A Construction Change Directive is a document issued pursuant to this Paragraph 12.1.1. The Owner may, at any time, without the agreement of the Contractor, by written order signed by the Owner and Design Consultant designated or indicated to be a Construction Change Directive, make any Changes in the Work or add to or subtract from the Work within the general scope of the Contract. A Change in the Work is defined as changes within the general scope of the Contract, including, but not limited to changes:

- .1 In the Specifications or Drawings;
- .2 In the sequence, method or manner of performance of the Work;
- .3 In the Owner-furnished facilities, equipment, materials, services or site; or
- .4 Directing acceleration in the performance of the Work.

12.1.2 A Change Order is a document executed pursuant to this Paragraph 12.1.2. The Owner and Contractor may agree to Changes in the Work, the Contract Sum, the Contract Time and any other change in the Contract by written agreement signed by Owner, Contractor and Design Consultant designated or indicated to be a Change Order. If the Contractor, subsequent to the issuance of a Construction Change Directive, agrees to its terms including any applicable adjustment to the Contract Sum and Contract Time, Contractor shall sign it and it shall become a Change Order.

12.1.3 The Contractor shall not be entitled to any amount for indirect costs, damages or expenses of any nature, including, but not limited to, so-called "impact" costs, labor inefficiency, wage, material or other escalations beyond the prices upon which the Proposal is based and to which the parties have agreed pursuant to the provisions of Article 12, and which the Contractor, its Subcontractors or Sub-subcontractors or any other person may incur as a result of delays, interferences, suspensions, changes in sequence or the like, for whatever cause, whether

reasonable or unreasonable, foreseeable or unforeseeable, or avoidable or unavoidable, arising from the performance of any and all Changes in the Work performed pursuant to this Article 12, unless the delay is caused solely by the Owner or its agent. It is understood and agreed that the Contractor's sole and exclusive remedy in the event the delay is caused solely by the Owner or its agent shall be recovery of his direct costs as compensable hereunder and an extension of the Contract Time, but only in accordance with the provisions of the Contract Documents. The phrase "Owner or its agent" as used in the Contract, does not include the Prime Contractors or their Subcontractors.

- 12.1.4 No Claim by the Contractor shall be allowed if asserted after final payment under this Contract. No Claim relating to or flowing from a particular change shall be allowed after execution of the Change Order relating to that change or commencement of the change by the Contractor except as specifically provided in Paragraph 12.2.4.
- 12.1.5 If any dispute should arise between the parties with respect to an increase or decrease in the Contract Sum or an expansion or contraction in the Contract Time as a result of a Change in the Work, the Contractor shall not suspend performance of a Change in the Work or the Work itself unless otherwise so ordered by the Owner in writing. The Owner shall, however, pay to the Contractor up to the Owner's reasonable estimated value of the Change in the Work, regardless of the dispute, if said Change in the Work will result in an increase in the Contract Sum; and the Owner shall have the right to withhold payment from the Contractor in an amount up to the Owner's reasonable estimated value of the Change in the Work, regardless of the dispute, if said Change in the Work will result in a decrease in the Contract Sum.
- 12.1.6 No Change in the Work shall be performed without a fully executed Change Order to the Contract a fully executed Construction Change Directive or other Modification to the Contract.
- 12.1.7 If the Contractor intends to assert a Claim under this Article, he must, within ten (10) days after receipt of a Construction Change Directive, Notify the Owner by written statement setting forth the specific nature and cost of such Claim, unless this period is extended by the Owner. The statement of Claim shall include all direct, indirect and impact costs associated with the change, as well as the Contractor's estimate of the schedule impact of the change, if any. The Contractor and its Subcontractors shall not be entitled to reimbursement for any Claims that are not submitted in strict conformance with the Contract. The Contractor shall indemnify and hold the Owner harmless against any Claims by Subcontractors that are waived because they are not submitted in strict conformance with the Contract.
- 12.2 OWNER DIRECTED CHANGES REQUIRING AN INCREASE IN CONTRACT SUM.
(For decreases in Contract Sum, refer to Section 12.6)
- 12.2.1 If the Change in the Work will result in an increase in the Contract Sum, the Owner shall have the right to require the performance thereof on a lump sum basis, a unit price basis or a time and material basis, all as hereinafter more particularly described (the right of the Owner as aforesaid shall apply with respect to each such Change in the Work).

If the Owner elects to have the Change in the Work performed on a lump sum basis, its election shall be based on a lump sum Proposal which shall be submitted by the Contractor to the Owner within ten (10) days of the Contractor's receipt of a request therefore (but the Owner's request for a lump sum Proposal shall not be deemed an election by the Owner to have the Change in the Work performed on a lump sum basis). The Contractor's Proposal shall be itemized and segregated by labor and materials for the various components of the Change in the Work (no aggregate labor total will be acceptable) and shall be accompanied by signed Proposals of any

Subcontractors who will perform any portion of the Change in the Work and of any persons who will furnish materials or equipment for incorporation therein. The Proposal shall also include the Contractor's estimate of the time required to perform said changes. The Contractor shall provide any documentation that may be requested by the Owner or Design Consultant to support the change proposal, including but not limited to payroll records, insurance rates, material quotes, and rental quotes.

The portion of the Proposal relating to labor, whether by the Contractor's forces or the forces of any of its Subcontractors, may include reasonably anticipated gross wages of job site labor, including foremen, who will be directly involved in the Change in the Work (for such time as they will be so involved), plus payroll costs (including premium costs of overtime time, if overtime is anticipated, Social Security, Federal or State unemployment insurance taxes and fringe benefits required by collective bargaining agreements entered into by the Contractor or any such Subcontractor in connection with such labor) and up to fifteen percent (15%) of such anticipated gross wages, but not payroll costs, as overhead and profit for the Contractor or any such Subcontractor, as applicable (said overhead and profit to include all supervision except foremen). Payroll costs are limited to 39% of the net pay of the worker.

The portion of the Proposal relating to materials may include the reasonably anticipated direct costs to the Contractor or to any of its Subcontractors of materials to be purchased for incorporation in the Change in the Work, plus transportation and applicable sales and use taxes and up to fifteen percent (15%) of said direct material costs as overhead and profit for the Contractor or any such Subcontractor (said overhead and profit to include all small tools), and may further include the Contractor's and any of its Subcontractor's reasonably anticipated rental costs in connection with the Change in the Work (either actual or discounted local published rates), plus up to eight percent (8%) thereof as overhead and profit for the Contractor or any such Subcontractors, as applicable. The Contractor shall provide an itemized breakdown of all transportation and shipping costs, including receipts documenting the expenses. Notwithstanding the above, overhead and profit shall not be applied to any sales tax paid for any purpose or to any transportation or shipping costs incurred by the Contractor or any subcontractor. If any of the items included in the lump sum Proposal are covered by unit prices contained in the Contract Documents, the Owner may, if it requires the Change in the Work to be performed on a lump sum basis, elect to use these unit prices in lieu of the similar items included in the lump sum Proposal, in which event an appropriate deduction will be made in the lump sum amount prior to the application of any allowed overhead and profit percentages. No overhead and profit shall be applied to any unit prices.

The lump sum Proposal may include up to eight percent (8%) of the amount which the Contractor will pay to any of its Subcontractors for Changes in the Work as overhead and profit for the Contractor. The Contractor shall not be reimbursed for the costs of the Subcontractors' Payment and Performance Bonds, as such bonding is not required by the Owner.

- 12.2.2 In the event that the Contractor fails to submit his Proposal within the designated period, the Owner may order the Contractor to proceed with the Change to the Work and the Contractor shall so proceed. The Owner shall unilaterally determine the reasonable cost and time to perform the Work in question, which determination shall be final and binding upon the Contractor. The Contractor may dispute such action in accordance with the Article 15.
- 12.2.3 In the event that the parties are unable to agree as to the reasonable cost and time to perform the Change in the Work based upon the Contractor's Proposal and the Owner does not elect to have the Change in the Work performed on a time and material basis, the Owner may choose to make a determination of the reasonable cost and time to perform the Change in the Work, based upon

its own estimates, the Contractor's submission or a combination thereof. A Construction Change Directive shall be issued in this case for the amounts of cost and time determined by the Owner and shall become final and binding upon the Contractor, subject to Contractor's right to dispute such action in accordance with Article 15. Owner has the right to direct by Construction Change Directive a Change in the Work, which is the subject of such Change Order. Failure of the parties to reach agreement regarding the cost and time of the performing the Construction Change Directive, shall not relieve the Contractor from performing the Change in the Work promptly and expeditiously.

12.2.3.1 The Owner reserves the right to reject the Contractor's Proposal for a Change in the Work and to elect to perform said Work using a Separate Contractor. Under such circumstances, all provisions of Article 6 shall be in force.

12.2.4 If the Owner elects to have the Change in the Work performed on a time and material basis, the same shall be performed, whether by the Contractor's forces or the forces of any of its Subcontractors or Sub-subcontractors, at actual cost to the entity performing the Change in the Work (without any charge for administration, clerical expense, supervision or superintendence of any nature whatsoever, including foremen, or the cost, use or rental of tools or plant), plus fifteen percent (15%) thereof as the total overhead and profit (except that said fifteen percent (15%) shall not be applied against any payroll costs, as set forth in Paragraph 12.2.1.) The Contractor shall submit to the Owner daily time and material tickets, on a daily basis to include the identification number assigned to the Change in the Work, the location and description of the Change in the Work, the classification of labor employed (and names and social security numbers), the materials used, the equipment rented (not tools) and such other evidence of cost as the Owner may require. The Owner may require authentication of all time and material tickets and invoices by persons designated by the Owner for such purpose. The failure of the Contractor to secure any required authentication shall, if the Owner elects to treat it as such, constitute a waiver by the Contractor of any Claim for the cost of that portion of the Change in the Work covered by a non-authenticated ticket or invoice; provided, however, that the authentication of any such ticket or invoice by the Owner shall not constitute an acknowledgment by the Owner that the items thereon were reasonably required for the Change in the Work.

12.2.5 No overhead and profit will be paid by the Owner on account of a Change in the Work except as specifically provided in Section 12.2. Overhead and profit, as allowed under Section 12.2, shall be deemed to include all costs and expenses which the Contractor or any of its Subcontractors may incur in the performance of a Change in the Work and which are not otherwise specifically recoverable by them pursuant to Section 12.2.

12.3 CONTRACTOR NOTICE OF CHANGE

12.3.1 If the Contractor or any of its Subcontractors asserts that any event or occurrence has caused a Change in the Work which change causes an increase or decrease in the Contractor's or its Subcontractors cost or the time required for the performance of any part of the Work under the Contract, including Work not affected directly by the change, the Contractor shall, within ten (10) days of such event, give the Owner written Notice as herein required. Said Notice shall include the instructions or circumstances that are the basis of the Claim and the Contractor's best estimate of the cost and time involved.

12.4 MINOR CHANGES IN THE WORK

12.4.1 The Owner shall have authority to order minor Changes in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time and not inconsistent with the intent of

the Contract Documents. Such changes shall be effected by written order, and shall be binding on the Owner and the Contractor. The Contractor shall carry out such written orders promptly.

12.4.2 The Contractor shall not perform any Changes in the Work unless authorized in writing by the Design Consultant or Owner.

12.5 DIFFERING SITE CONDITIONS

12.5.1 Should the Contractor encounter subsurface and/or latent conditions at the site materially differing from those shown on the Drawings or indicated in the Specifications or differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this Contract, or different from that shown on surveys or tests provided in the bid materials at the time the Owner solicited bids from the construction of the Project, he shall immediately give Notice to the Owner of such conditions before they are disturbed. The Owner and the Design Consultant shall thereupon promptly investigate the conditions and if they find that they materially differ from those shown on the Drawings or indicated in the Specifications, they shall at once make such changes in the Drawings and/or Specifications as they may find necessary. Any increase or decrease of cost resulting from such changes shall be adjusted in the manner provided herein for adjustments as to extra and/or additional work and changes. However, neither the Owner nor the Design Consultant shall be liable or responsible for additional work, costs or Changes to the Work due to material differences between actual conditions and any geotechnical, soils and other reports, surveys and analyses made available for the Contractor's review at the time the Owner solicited bids for the construction of the Project.

12.6 OWNER DIRECTED CHANGES REQUIRING A DECREASE IN CONTRACT SUM.

12.6.1 If the Change in the Work will result in a decrease in the Contract Sum, the Owner may request a quotation by the Contractor of the amount of such decrease. The following provisions shall apply:

The portion of the Proposal relating to labor, whether by the Contractor's forces or the forces of any of its Subcontractors, shall include reasonably anticipated gross wages of job site labor, including foremen, who would have been directly involved in the Work that has been deleted from the Contract, (for such time as they would have been so involved), plus payroll costs (including premium costs of overtime time, if overtime was anticipated, Social Security, Federal or State unemployment insurance taxes and fringe benefits required by collective bargaining agreements entered into by the Contractor or any such Subcontractor in connection with such labor) and seven percent (7%) of such anticipated gross wages, but not payroll costs, as overhead and profit not incurred or earned by the Contractor or any such Subcontractor, as applicable (said overhead and profit to include all supervision except foremen).

The portion of the Proposal relating to materials shall include the reasonably anticipated direct costs which would have been incurred by the Contractor or to any of its Subcontractors of materials which would have been purchased for incorporation in the Work but which has been deleted from the Contract, plus transportation and applicable sales and use taxes which will be avoided and seven percent (7%) of said direct material costs as overhead and profit not incurred or earned by the Contractor or any such Subcontractor (said overhead and profit to include all small tools), and shall further include the Contractor's and any of its Subcontractor's reasonably anticipated rental costs which will be avoided (either actual or discounted local published rates), plus five percent (5%) thereof as overhead and profit not incurred or earned by the Contractor or any such Subcontractors, as applicable. If any of the items included in the lump sum Proposal

are covered by unit prices contained in the Contract Documents, the Owner may elect to use these unit prices in determining the amount of reduction to the Contract Sum as a result of a deletion of Work from the Contract. No overhead and profit shall be applied to any unit prices for purposes of calculation such reduction in the Contract Sum.

The lump sum Proposal for Work which would have been performed by any Subcontractors shall include four percent (4%) of that amount as an estimate of the Contractor's overhead and profit that will not be earned by Contractor due to the decrease in the Contract Sum.

The Contractor's quotation shall be forwarded to the Owner within ten (10) days of the Owner's request and, if acceptable to the Owner, shall be incorporated in the Change Order. If not acceptable, the parties shall make every reasonable effort to agree as to the amount of such decrease, which may be based on a lump sum properly itemized, on unit prices stated in the Contract Documents and/or on such other basis as the parties may mutually determine. If the parties are unable to so agree, the amount of such decrease shall be the total of the estimated reduction in actual cost of the Work, as determined by the Owner in its reasonable judgment, plus overhead and profits stated above. This shall become final and binding upon the Contractor, subject to Contractor's right to dispute such action in accordance with the Article 15.

ARTICLE 13

UNCOVERING AND CORRECTION OF WORK

13.1 UNCOVERING OF WORK

13.1.1 If any portion of the Work is covered contrary to the request of the Owner or the Design Consultant or to requirements specifically expressed in the Contract Documents or to requirements of applicable construction permits, it must, if required in writing by the Owner, be uncovered for his observation and shall be replaced at the Contractor's expense.

13.1.2 If any other portion of the Work has been covered which the Design Consultant or the Owner has not specifically requested to observe prior to being covered, either may request to see such portion of the Work and it shall be uncovered by the Contractor. If such Work be found in accordance with the Contract Documents, the cost of uncovering and replacement shall, by appropriate Change Order, be charged to the Owner. If such Work be found not in accordance with the Contract Documents, the Contractor shall pay such costs unless it is found that this condition was caused by the Owner, in which event the Owner shall be responsible for the payment of such costs. If such condition was caused by a Separate Contractor, Contractor may proceed against and only against, said Separate Contractor as provided in Article 6. Any costs to the Owner pursuant to this Paragraph shall be determined in accordance with the provisions of Article 12.

13.2 CORRECTION OF WORK

13.2.1 The Contractor shall promptly reconstruct, replace or correct portions of the Work rejected by the Design Consultant or Owner as defective or as failing to conform to the Contract Documents or as not in accordance with the guarantees and warranties specified in the Contract Documents whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such rejected portions of the Work, including compensation for the Design Consultant's and the Owner's additional construction management services made necessary thereby.

- 13.2.2 The Contractor, unless removal is waived by the Owner, shall remove from the site all portions of the Work which are defective or non-conforming, or if permitted or required, he shall correct such portions of the Work in place at his own expense promptly after receipt of Notice, and such rejected Work shall not thereafter be tendered for acceptance unless the former rejection or requirement for correction is disclosed.
- 13.2.3 If the Contractor does not proceed with the correction of such defective or non-conforming portions of the Work within a reasonable time fixed by written Notice from the Owner or Design Consultant, the Owner may either (1) by separate contract or otherwise replace or correct such portions of the Work and charge the Contractor the cost incurred by the Owner thereby and remove and store the materials or equipment at the expense of the Contractor, or (2) terminate this Contract for default as provided in Section 14.3, or both, or take any other measure allowed by law.
- 13.2.4 The Contractor shall bear the cost of making good all work of the Owner or Separate Contractors destroyed or damaged by such correction or removal.
- 13.2.5 Nothing contained in this Section 13.2 shall be construed to establish a period of limitation with respect to any other obligation which the Contractor might have under the Contract Documents, including Section 4.6 hereof. The establishment of the time period of one year after the date of Substantial Completion or such longer period of time as may be prescribed by law or by the terms of any warranty required by the Contract Documents relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which his obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to his obligations.
- 13.3 ACCEPTANCE OF DEFECTIVE OR NON-CONFORMING WORK
- 13.3.1 If the Owner prefers to accept defective or non-conforming Work, he may do so instead of requiring its removal and correction, in which case a Change Order will be issued to reflect a reduction in the Contract Sum where appropriate and equitable, or the Owner may elect to accept payment in materials or services, in lieu of a reduction in the Contract Sum. If the amount of a reduction is determined after final payment, it shall be paid to the Owner by the Contractor.

ARTICLE 14

TERMINATION OF THE CONTRACT

- 14.1 TERMINATION BY THE CONTRACTOR
- 14.1.1 If the Work is stopped for a period of one hundred twenty (120) days by the Owner or under an order of any court or other public authority having jurisdiction, or as a result of an act of government, such as a declaration of a national emergency making materials unavailable, and through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing any of the Work under a contract with the Contractor, then the Contractor may, upon seven (7) additional days' written Notice to the Owner and the Design Consultant, terminate the Contract and recover from the Owner payment on a quantum merit basis, for all Work executed for which Contractor has not previously been paid, less any amounts Contractor may owe Owner under the Contract Documents and less any amounts Owner is entitled to withhold from Contractor or backcharge to the Contractor under the Contract Documents or pursuant to law. The Contractor shall not be entitled to collect and hereby

expressly waives any overhead or profit on Work not performed and any damages related to that portion of the Contract which has been terminated.

14.2 TERMINATION FOR CONVENIENCE OF THE OWNER

14.2.1 The Owner may, at any time upon ten (10) days written Notice to the Contractor and to the Contractor's Surety, which Notice shall specify that portion of the Work to be terminated and the date said termination is to take effect, terminate (without prejudice to any right or remedy of the Owner) the whole or any portion of the Work for the convenience of the Owner. The Contractor's sole remedy, in the event of such termination, will be the allowable termination costs permitted by Section 14.4. Contractor shall include termination clauses identical to Article 14 in each of his subcontracts.

14.3 DEFAULT TERMINATION

14.3.1 Ten (10) days after written Notice is mailed to the Contractor and to the Contractor's Surety, the Owner may terminate (without prejudice to any right or remedy of the Owner or any subsequent buyer of any portion of the Work) the employment of the Contractor and his right to proceed either as to the whole or any portion of the Work required by the Contract Documents and may take possession of the Work and complete the Work by contract or otherwise in any one of the following circumstances:

- .1 If the Contractor or its Surety refuses or fails to prosecute the Work or any separable part thereof with such diligence as will ensure the Substantial and Final Completion of the Work by the dates specified in the Supplemental Conditions for Substantial and Final Completion or fails to complete the Work or remedy a default within said period;
- .2 If the Contractor is in material default in carrying out any provisions of the Contract;
- .3 If the Contractor fails to supply a sufficient number of properly skilled workers or proper equipment or materials;
- .4 If the Contractor fails to make prompt payment to Subcontractors or for materials or labor, unless he otherwise provides the Owner satisfactory evidence that payment is not legally due;
- .5 If the Contractor disregards laws, permits, ordinances, rules, regulations or orders of any public authority having jurisdiction, or fails to follow the instructions of the Owner;
- .6 If the Contractor substantially violates any provisions of the Contract Documents; or
- .7 If the Contractor refuses or fails to properly schedule, plan, coordinate and execute the Work, as specified herein, so as to perform the Work within the specified Completion Dates, or to provide scheduling or related information, revisions and updates as required by the Contract Documents.

14.3.2 The right of the Contractor to proceed shall not be so terminated under this Section 14.3 if the delays in the completion of the Work are due to unforeseeable causes beyond the control and without the fault or negligence of the Contractor or his Subcontractors as specifically set forth in Section 8.3 hereof.

14.3.3 If, after the Contractor has been terminated for default pursuant to Section 14.3, it is determined

that none of the circumstances set forth in Paragraph 14.3.1 exist, then such termination shall be considered a termination for convenience pursuant to Section 14.2. In such case, the Contractor's sole remedy will be the costs permitted by Section 14.4.

- 14.3.4 If the Owner so terminates the employment of the Contractor due to the Contractor's default, the Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the compensation to be paid to the Contractor hereunder shall exceed the expense of so completing the Work (including compensation for additional managerial, administrative, consultant and inspection services, attorney's fees and any damages for delay) such excess shall be paid to the Contractor.
- 14.3.5 If such expenses referenced in Paragraph 14.3.1, shall exceed the unpaid balance, the Contractor and his sureties shall be liable to the Owner for such excess. If the right of the Contractor to proceed with the Work is partially or fully terminated, the Owner may take possession of and utilize in completing the Work such materials, appliances, supplies, plant and equipment as may be on the site of the terminated portion of the Work and necessary for the completion of the Work. If the Owner does not fully terminate the right of the Contractor to proceed, the Contractor shall continue to perform the part of the Work that is not terminated.
- 14.3.6 If the Owner terminates the whole or any part of the Work pursuant to Section 14.3, the Owner may procure, upon such terms and in such manner as the Owner may deem appropriate, supplies or services similar to those so terminated, and the Contractor shall be liable to the Owner for any excess costs for such similar supplies or services. The Contractor shall continue the performance of the Contract to the extent not terminated hereunder.

14.4 ALLOWABLE TERMINATION COSTS

- 14.4.1 If the Owner terminates the whole or any portion of the Work pursuant to Section 14.2, then the Owner shall only be liable to the Contractor for those costs reimbursable to the Contractor in accordance with Paragraph 14.4.2, plus a markup of ten percent (10%) for profit and overhead on the actual fully accounted costs specified under Paragraph 14.4.2; provided however, that if there is evidence that the Contractor would have sustained a loss on the entire Contract had it been completed, no profit or overhead shall be included or allowed hereunder for the Work performed and an appropriate adjustment shall be made reducing the amount of the settlement to reflect the indicated rate of loss. Under no circumstances shall the Contractor be entitled to any loss profit on the Work terminated pursuant to Section 14.2.
- 14.4.1.1 After receipt of a Notice of Termination, the Contractor shall submit to the Owner his termination Claim, in the form and with certification prescribed by the Owner. Such Claim shall be submitted promptly but in no event later than three (3) months from the effective date of termination, unless one or more extensions in writing are granted by the Owner upon request of the Contractor made in writing within such three (3) month period or authorized extension thereof. However, if the Owner determines that the facts justify such action, he may receive and evaluate any such termination Claim at any time after such three (3) month period or any extension thereof. Upon failure of the Contractor to submit his termination Claim within the time allowed, the Owner may determine, on the basis of information available to him, the amount, if any, due to the Contractor by reason of the termination and such termination shall be final and binding on the Contractor.
- 14.4.2 If the Owner terminates the whole or any portion of the Work pursuant to Section 14.2, the Owner shall pay the Contractor an amount for supplies, services, or property accepted by the Owner, and which is in accordance with the Contract Documents, in an amount as if the Contract

had not been terminated. In addition, in such event, the Owner shall pay to Contractor an amount representing Contractor's actual cost, excluding any overhead and profit for the items and things specified in Subparagraph 14.5.1.6 and not heretofore paid for, appropriately adjusted for any saving of freight or other charges. Under no circumstances shall the Contractor be entitled to any loss profit on the Work terminated pursuant to Section 14.2.

14.4.2.1 The Contractor agrees that neither the Owner nor the Design Consultant will be liable for payments to Contractors or Subcontractors pursuant to Section 14.4.2 unless each contract and subcontract contains termination provisions identical to those set forth in this Article 14. The Owner and the Design Consultant will not be liable to the Contractor or any of the Subcontractors for any costs associated with termination if the contract or subcontract of the party involved does not include the required termination language.

14.4.3 In arriving at any amount due the Contractor pursuant to Section 14.4, there shall be deducted the following:

- .1 All unliquidated advance or other payments on account theretofore made to the Contractor applicable to the terminated portion of the Contract;
- .2 Any Claim which the Owner may have against the Contractor;
- .3 Such amount as the Owner determines to be necessary to protect the Owner against loss because of outstanding or potential liens or claims; and
- .4 The agreed price for, or the proceeds of sale of, any materials, supplies or other things acquired by the Contractor sold, pursuant to the provisions of Subparagraph 14.5.1.7, and not otherwise recovered by or credited to the Owner, or returned for a refund by the Contractor.
- .5 All other amounts the Owner is entitled to withhold from the Contractor or charge to the Contractor pursuant to the Contract or as allowed by applicable law.

14.4.4 The total sum to be paid to the Contractor under Section 14.4 shall not exceed the Contract Sum as reduced by the amount of payments otherwise made or to be made for Work not terminated and as otherwise permitted by the Contract. Except for normal spoilage, and except to the extent that the Owner shall have otherwise expressly assumed the risk of loss, there shall be excluded from the amounts payable to the Contractor, as provided in Paragraph 14.4.2, the fair value, as determined by the Owner, of property which is destroyed, lost, stolen or damaged so as to become undeliverable to the Owner, or to a buyer pursuant to Subparagraph 14.5.1.7.

14.5 GENERAL TERMINATION PROVISIONS

14.5.1 After receipt of a Notice of termination from the Owner, pursuant to Section 14.2 or 14.3, and except as otherwise directed by the Owner, the Contractor shall:

- .1 Stop work under the Contract on the date and to the extent specified in the Notice of termination;
- .2 Place no further orders or subcontracts for materials, services or facilities, except as may be necessary for completion of such portion of the Work under the Contract as is not terminated;

- .3 Terminate all orders and subcontracts to the extent that they relate to the performance of the Work terminated by the Notice of termination;
- .4 At the option of the Owner, and in lieu of terminating such orders and subcontracts, assign to the Owner in the manner, at the times and to the extent directed by the Owner in writing, all of the rights in the such orders and subcontracts,
- .5 Settle all outstanding liabilities and all Claims arising out of such termination or orders and subcontracts, with the approval or ratification of the Owner in writing, to the extent he may require, which approval or ratification shall be final for all the purposes of this Article;
- .6 Transfer title and deliver to the entity or entities designated by the Owner, in the manner, at the times and to the extent directed by the Owner to the extent specifically produced or specifically acquired by the Contractor for the performance of such portion of the Work as had been terminated, the following:
 - (1) The fabricated or unfabricated parts, Work in process, partially completed supplies and equipment, materials, parts, tools, dies, jigs and other fixtures, completed Work, supplies and other material produced as part of, or acquired in connection with the performance of, the Work terminated by the Notice of termination; and
 - (2) The completed or partially completed plans, drawings, information, releases, manuals and other property related to the Work and which, if the Contract had been completed, would have been required to be furnished to the Owner;
- .7 Use his best efforts to return for a refund or sell, in the manner, at the times, to the extent and at the price or prices directed or authorized by the Owner, any property of the types referred to in Subparagraph 14.5.1.6; provided, however, that the Contractor:
 - (1) Shall not be required to extend credit to any buyer, and
 - (2) May acquire any such property under the conditions prescribed by and at a price or prices approved by the Owner in writing; and provided further that the proceeds of any such transfer or disposition shall be applied in reduction of any payments to be made by the Owner to the Contractor under the Contract or shall otherwise be credited to the Contract Sum covered by the Contract or paid in such other manner as the Owner may direct;
- .8 Complete performance of such part of the Work as shall not have been terminated by the Notice of termination;
- .9 Take such action as may be necessary, or as the Owner may direct, for the protection and preservation of the property related to the Contract which is in the possession of the Contractor and in which the Owner has or may acquire an interest; and
- .10 Otherwise mitigate any damages Contractor claims to suffer as a result of a termination.

14.5.2 The Contractor shall, from the effective date of termination until the expiration of three (3) years after final settlement under the Contract, preserve and make available to the Owner, at all reasonable times at the office of the Contractor, but without direct charge to the Owner, all his books, records, documents and other evidence bearing on the costs and expenses of the Contractor under the Contract and relating to the Work terminated hereunder, or, to the extent

approved by the Owner, photographs, micro-photographs or other authentic reproductions thereof.

- 14.5.3 If the termination, pursuant to Section 14.2, be partial, the Contractor may file with the Owner a Claim for an equitable adjustment of the price or prices specified in the Contract relating to the continued portion of the Contract (the portion not terminated by the Notice of termination), and such equitable adjustment as may be agreed upon shall be made in such price or prices. Any Claim by the Contractor for an equitable adjustment under this Paragraph must be asserted within thirty (30) days from the effective date of the Notice of termination.
- 14.5.4 The Contractor shall refund to the Owner any amounts paid by the Owner to the Contractor in excess of costs reimbursable under Section 14.4.
- 14.5.5 The Contractor shall be entitled to only those damages and that relief from termination by the Owner as specifically provided in Article 14.

ARTICLE 15

DISPUTE RESOLUTION

15.1 INITIATING CLAIMS

- 15.1.1 Claims must be initiated by written Notice to the Owner and to the party against whom the Claim is made with a copy to the Design Consultant. The responsibility to substantiate Claims shall rest with the party making the Claim.
- 15.1.2 Nothing in the Contract shall be construed as meaning that the Owner's assessment of Liquidated Damages is a Claim as defined herein, or that the Owner has the burden of proof to assess Liquidated Damages. Should the Owner assess Liquidated Damages, the burden of proving that such damages should not have been assessed shall rest upon the Contractor.

15.2 RESOLUTION OF CLAIMS AND DISPUTES BETWEEN CONTRACTOR AND OWNER

- 15.2.1 Claims by Contractor against Owner and by Owner against Contractor, including those alleging an error or omission by the Design Consultant shall be subject to the process set forth in this Section 15.2. Such Claims shall be referred initially to the Design Consultant for a decision. A final decision by the Design Consultant, or the failure of the Design Consultant to issue a final decision shall be required as a condition precedent to mediation or litigation of all such Claims arising prior to the date final payment is due. The Design Consultant will initially decide disputes between Owner and Contractor.
- 15.2.2 The Design Consultant will review Claims by Contractor and Owner against each other and within twenty (20) days of the receipt of the written Claim and take one or more of the following actions:
- .1 Request additional supporting data from the claimant or a response with supporting data from the other party;
 - .2 Reject the Claim in whole or in part;
 - .3 Approve the Claim;

- .4 Suggest a compromise; or
 - .5 Advise the parties that the Design Consultant is unable to resolve the Claim if the Design Consultant lacks sufficient information to evaluate the merits of the Claim or if the Design Consultant concludes that it would be inappropriate for the Design Consultant to resolve the Claim.
- 15.2.3 In evaluating Claims made under this Section 15.2, the Design Consultant may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who assist the Design Consultant in rendering a decision.
- 15.2.4 If the Design Consultant requests a party to provide a response to a Claim under this Section 15.2, or to furnish additional supporting data, such party shall respond, within ten (10) days after receipt of such request, and shall within such time period, either provide a response to the requested supporting data, advise the Design Consultant when the response or supporting data will be furnished, or advise the Design Consultant that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Design Consultant will either reject or approve the Claim in whole or in part.
- 15.2.5 The Design Consultant will approve or reject Claims under this Section 15.2 by written decision, which shall state the reason thereof and which shall notify the parties of any change in the Contract Sum or Contract Time or both. The approval or rejection of a Claim by the Design Consultant under this Section 15.2 shall be final and binding on the parties but subject to mediation and litigation.
- 15.2.6 When a written decision of the Design Consultant under this Section 15.2 states that the decision is final but subject to mediation, then a demand for mediation of a Claim covered by such decision must be made within thirty (30) days after the date on which the party making the demand receives the final written decision. Any failure to demand mediation within said thirty (30) days' period shall result in the Design Consultant's decision becoming final and binding to all parties. Claims not resolved in mediation shall be subject to litigation if in accordance with the applicable statutes of limitation and repose.
- 15.2.7 Upon receipt of a Claim under Section 15.2 against the Contractor or at any time thereafter, the Design Consultant or the Owner may, but is not obligated to, notify the Surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Design Consultant or the Owner may, but are not obligated to, notify the Surety and request the Surety's assistance in resolving the controversy.
- 15.2.8 If the Design Consultant deems that a Claim under this Section 15.2 is valid, the Design Consultant shall require all parties to the dispute to share the cost of the Design Consultant's review equitably. If the Design Consultant deems that a Claim under this Section 15.2 is invalid, the Design Consultant shall require the complaining party to bear the cost of the Design Consultant's review. In any event, the Design Consultant may require the complaining party to submit a deposit equivalent to the Design Consultant's hourly rate multiplied by the amount of time the Design Consultant estimates, in the Design Consultant sole discretion, that will be necessary to review the Claim. The Design Consultant shall return any unused portion of this initial deposit to the complaining party following the Design Consultant's completion of the Design Consultant's review of the Claim. Nothing in these procedures shall entitle the Design Consultant to compensation for additional services from the Owner that is not authorized pursuant to the terms and conditions of the Agreement for Design Consultant Services.

15.3 TIME LIMITS ON CLAIMS

15.3.1 Unless a shorter time is provided in the Contract Documents, Claims by Contractor or any party except Owner must be initiated within twenty (20) days after occurrence of the event giving rise to such Claim or within twenty (20) days after the claimant first recognizes the condition giving rise to the Claim, whichever is later. Claims against the Owner shall be initiated in strict conformance with the Contract Documents. Nothing in these procedures shall extend the period within or the manner in which Claims against the Owner must be submitted. Claims must be initiated by written Notice to the Owner and written notice to the other party and to the Design Consultant. Any Claim against the Owner that is not initiated within the applicable time period is waived. Claims by Owner may be made at any time within the applicable statute of limitations and repose.

15.4 CONTINUING CONTRACT PERFORMANCE

15.4.1 Pending final resolution of a Claim, the Contractor shall proceed diligently with the performance of the Contract, unless instructed otherwise in writing by the Owner.

15.5 MEDIATION

15.5.1 As required by N.C.G.S 143-128 (f1), any Claim as defined herein, which exceeds fifteen thousand dollars(\$15,000.00), and which concerns a party involved in the Project, including the Owner, Contractor, Design Consultant, any construction manager, Separate Contractors, or first and lower tier Subcontractors and which arise out of the Contract or the construction process, except those waived Claims shall, be subject to mediation as a condition precedent to the institution of legal proceedings by any party, except that any party may institute legal proceedings or perfect any mechanic's or materialmen's lien in order to meet any applicable statute of limitations or similar deadline prior to engaging in mediation.

15.5.2 The parties shall endeavor to resolve their Claims under this Section 15.5 by mediation which, unless the parties mutually agree otherwise, shall be in accordance with the rules established by the Owner.

15.5.3 The parties shall share cost of the mediation equally except that if the Owner is a party to the dispute, the Owner shall pay at least one third of the cost of the mediation.

15.5.4 The mediation shall be held in a place where the Project is located, unless another location is mutually agreed upon.

15.5.5 Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

ARTICLE 16

FEDERALLY FUNDED PROJECTS

The Contractor is notified that this project will be financed with federal funds. The Contractor shall ensure that all subcontracts and other contracts for goods and services for this project have the below provisions of this section their contracts. Contractor agrees to comply with the following provisions. Failure to comply with any and all provisions herein may be cause for the Owner to issue a cancellation notice to the Contractor.

16.1 REMEDIES FOR BREACH.

The Owner reserves all rights and privileges under the applicable laws and regulations with respect to this Agreement in the event of breach of contract by either party.

16.2 TERMINATION FOR CAUSE AND FOR CONVENIENCE BY OWNER.

The Owner reserves the right to immediately terminate this Agreement in the event of a breach or default of the agreement by Contractor, in the event Contractor fails to: (1) meet schedules, deadlines, and/or delivery dates within the time specified by this Agreement and/or an IPPA; (2) make any payments owed; or (3) otherwise perform in accordance with the Agreement and/or the IPPA. The Owner also reserves the right to terminate the Agreement immediately, with written notice to Contractor, for convenience, if the Owner believes, in its sole discretion that it is in the best interest of the Owner to do so. The Contractor will be compensated for work performed and accepted and goods accepted by the Owner as of the termination date if the Agreement is terminated for convenience of the Owner. The award of this Agreement is not exclusive and the Owner reserves the right to purchase goods and services from other vendors when it is in the best interest of the Owner.

16.3 EQUAL EMPLOYMENT OPPORTUNITY.

Except as otherwise provided under 41 CFR Part 60, when funds will be expended by the Owner pursuant to this Agreement that meet the definition of “federally assisted construction contract” in 41 CFR Part 60-1.3, Contractor certifies it will comply with the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, “Equal Employment Opportunity” (30 FR 12319, 12935, 3 CFR Part, 1964-1965 Comp., p. 339), as amended by Executive Order 11375, “Amending Executive Order 11246 Relating to Equal Employment Opportunity,” and implementing regulations at 41 CFR part 60, “Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor.”

16.4 DAVIS-BACON ACT, AS AMENDED (40 U.S.C. 3141-3148).

During the term of this Agreement, including any IPPAs issued pursuant to this Agreement, the Contractor certifies it will be in compliance with all applicable Davis-Bacon Act provisions. In accordance with the statute, Contractor shall pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, the Contractor shall pay wages not less than once a week, unless employees voluntarily agree to a different schedule. The Owner will report all suspected or reported violations to the Federal awarding agency. Contractor certifies it will comply with the Copeland “Anti-Kickback” Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, “Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States”). The Act provides that each vendor or subrecipient must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. The Owner will report all suspected or reported violations to the Federal awarding agency.

16.5 CONTRACT WORK HOURS AND SAFETY STANDARDS ACT (40 U.S.C. 3701-3708).

The Contractor certifies that during the term of an award for all contracts in excess of \$100,000 that involve the employment of mechanics or laborers, the Contractor will be in compliance with all applicable provisions of the Contract Work Hours and Safety Standards Act. Under 40 U.S.C. 3702 of the Act, each vendor must be required to compute the wages of every mechanic and laborer

on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

16.6 RIGHTS TO INVENTIONS MADE UNDER A CONTRACT OR AGREEMENT.

If the Federal award meets the definition of “funding agreement” under 37 CFR §401.2 (a) and Contractor wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that “funding agreement,” Contractor agrees to comply with the requirements of 37 CFR Part 401, “Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements,” and any implementing regulations issued by the awarding agency.

16.7 CLEAN AIR ACT (42 U.S.C. 7401-7671Q.) AND THE FEDERAL WATER POLLUTION CONTROL ACT (33 U.S.C. 1251-1387) COMPLIANCE.

The Contractor certifies that during the term of an award for all contracts by the Owner associated with this Agreement in excess of \$150,000, the Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251- 1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

16.8 DEBARMENT AND SUSPENSION.

Contractor certifies that during the term of an award for all contracts by the Owner associated with this Agreement, the Contractor certifies that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation by any federal department or agency.

16.9 COMPLIANCE WITH BYRD ANTI-LOBBYING AMENDMENT (31 U.S.C. 1352).

When federal funds are expended by the Owner for a contract exceeding \$100,000, the Contractor certifies that during the term and after the awarded term of all contracts by the Owner associated with this Agreement, the Contractor certifies that it is in compliance with all applicable provisions of the Byrd Anti-Lobbying Amendment (31 U.S.C. 1352). The Contractor further certifies that:

- (1) No Federal appropriated funds have been paid or will be paid for on behalf of the Contractor, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of congress, or an employee of a Member of Congress in connection with the awarding of a Federal contract, the making of a Federal grant, the making of a Federal loan, the entering into a cooperative agreement, and the extension, continuation, renewal, amendment, or modification of a Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of congress, or an employee of a Member of Congress in connection with this Federal grant or cooperative agreement, the undersigned

shall complete and submit Standard Form-LLL, “Disclosure Form to Report Lobbying”, in accordance with its instructions.

- (3) The Contractor shall require that the language of this certification be included in the award documents for all covered sub-awards exceeding \$100,000 in Federal funds at all appropriate tiers and that all subrecipients shall certify and disclose accordingly.

16.10 COMPLIANCE WITH SOLID WASTE DISPOSAL ACT.

In the event the Agreement involves the purchase of more than \$10,000 in items designed by guidelines of the Environmental Protection Agency at 40 C.F.R. Part 247, Contractor agrees to comply with the requirements of section 6002 of the Solid Waste Disposal Act. In particular, the Contractor certifies that the percentage of recovered materials to be used in the performance of the Agreement will be at least the amount required by applicable specifications or other contractual requirements.

16.11 PROHIBITION ON CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT.

As detailed in 2 CFR § 200.216, Contractor certifies that any equipment, services, or systems provided through this Agreement shall not use covered telecommunications equipment or services as a substantial or essential component of a system or as part of any system.

16.12 DOMESTIC PREFERENCE.

As detailed in 2 CFR § 200.322, as appropriate and to the extent consistent with law, Contractor certifies that, to the greatest extent practicable, the goods, products, or materials furnished through this award will be produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products).

16.13 RECORDS RETENTION REQUIREMENTS.

The Contractor certifies that it will comply with the record retention requirements detailed in 2 CFR § 200.334. The Contractor further certifies that Contractor will retain all records as required by 2 CFR § 200.334 for a period of three years after grantees or subgrantees submit final expenditure reports or quarterly or annual financial reports, as applicable, and all other pending matters are closed.

16.14 CERTIFICATION OF NON-COLLUSION STATEMENT.

Contractor certifies under penalty of perjury that its response to this procurement solicitation is in all respects bona fide, fair, and made without collusion or fraud with any person, joint venture, partnership, corporation or other business or legal entity.

16.15 PROHIBITION ON GIFTS.

Contractor certifies that it will comply with the prohibition against giving gifts, gratuities, favors or anything of monetary value to an officer, employee or agent of the School System. Contractor understands and agrees that violation of these standards will result in termination of the Agreement and may result in ineligibility for future contract awards.

END OF GENERAL CONDITIONS

SECTION SC**SUPPLEMENTAL CONDITIONS**

GENERAL CONDITIONS

Document GC, GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, constitutes the General Conditions of this Contract, and is hereinafter called "General Conditions." The General Conditions are further revised and supplemented by the provisions of these Supplemental Conditions. The General Conditions and the Supplemental Conditions are applicable to all of the Work under this contract and shall apply to the Contractor and all Subcontractors and Sub-subcontractors.

SUPPLEMENTS:

The following supplements modify, change, delete, or add to the General Conditions. Where any article of the General Conditions is modified or any paragraph deleted, subparagraph or clause thereof is modified, or deleted by these supplements, the unaltered provisions of such article, paragraph, subparagraph or clause shall remain in effect. If there is a discrepancy between the General Conditions and these Supplemental Conditions, the Supplemental Conditions shall control.

ARTICLE 1 - CONTRACT DOCUMENTS

ADD THE FOLLOWING TO 1.3.1:

1.3.1.1 The Contractor will be furnished with one set drawings and specifications for free.

ARTICLE 2 - ARCHITECT

ADD THE FOLLOWING TO PARAGRAPH 2.1:

Design Consultant:

SfL+a Architects
333 Fayetteville Street
Suite 225
Raleigh, NC 27601
(919) 573-6350

ARTICLE 4 – CONTRACTOR

ADD THE FOLLOWING AFTER THE FIRST SENTENCE OF PARAGRAPH 4.24:

The Owner's policies are available for review at <https://boardpolicyonline.com/bl/?b=harnett>

ARTICLE 7 – MISCELLANEOUS PROVISIONS

ADD THE FOLLOWING TO THE END OF 7.1.1

The Contractor and Owner agree that Harnett County, North Carolina shall be the proper venue for any litigation arising out of this Agreement.

ARTICLE 8 - TIME

ADD THE FOLLOWING TO PARAGRAPH 8.2:

- 8.2.4 The schedule below contains certain specific dates in addition to date of Notice to Proceed and Time for Completion. These dates shall be adhered to and are the last acceptable dates unless modified by mutual agreement between the Contractor and the Owner. All dates indicate midnight unless otherwise stipulated. The only exceptions to this schedule are defined in the General Conditions and Supplemental Conditions under Paragraph 8.3 DELAYS AND EXTENSIONS OF TIME.

Notice of Intent to Award – September 26, 2022

Return of Owner Contractor Agreement by Contractor – October 3, 2022

Notice to Proceed – October 17, 2022

Substantial Completion – December 1, 2023

Final Completion – January 1, 2024

- 8.2.4.1 The Owner reserves the right to withhold the issuance of Notice to Proceed by up to forty-five (45) days. For each day that Notice to Proceed is withheld pursuant to this Subparagraph, the dates established for Substantial Completion and Final Completion shall be adjusted. The contractor shall not be entitled to additional compensation if the owner withholds the issuance of Notice to Proceed pursuant to this Subparagraph.

ADD THE FOLLOWING AS A NEW SECOND SENTENCE TO PARAGRAPH 8.3.1:

The Contractor acknowledges that the coronavirus (COVID-19) pandemic has impacted businesses across the country.

ADD THE FOLLOWING TO THE END OF THE FIRST PARAGRAPH IN 8.3.4.2.3:

The Parties agree that the weather station applicable to this Project shall use data from the Procure automatic weather tracking system (EDMS) as documented on daily reports.

ADD THE FOLLOWING TO PARAGRAPH 8.5.1:

- 8.5.1.1 Substantial Completion Liquidated Damages shall be the sum of One Thousand Five Hundred dollars (\$1,500.00) per calendar day, and this amount shall be assessed in accordance with Subparagraph 8.5.1 of the General Conditions.
- 8.5.1.2 Final Completion Liquidated Damages shall be the sum of Seven Hundred Fifty dollars (\$750.00) per calendar day, and this amount shall be assessed in accordance with Subparagraph 8.5.1 of the General Conditions.

ARTICLE 9 - PAYMENTS AND COMPLETION

ADD THE FOLLOWING TO PARAGRAPH 9.6:

- 9.6.3 Additional services and dispute resolution services by the Design Consultant shall be paid by the Contractor at the rate of Two Hundred Seventy Five dollars (\$275.00) per hour.

ARTICLE 11 – INSURANCE

ADD THE FOLLOWING NEW PARAGRAPH TO THE END OF SECTION 11.1.4

- 11.1.4.7 The Contractor shall obtain and maintain in effect during the term of this Agreement a policy of pollution liability in the minimum amount of \$1,000,000 each claim, \$1,000,000 policy pollution policy aggregate. This coverage may be placed via combined contractor's professional and pollution liability policy, separate contractor's pollution liability policy or by use of the limited jobsite pollution liability endorsement to the commercial general liability policy. Continuous coverage shall be maintained in force for a period of six (6) years following the date of final completion of the work. Contractor shall be responsible for any applicable deductible. If the project includes any environmental abatement or remediation work (e.g. asbestos, mold, lead paint, or UST), the Contractor shall obtain and maintain in effect during the term of this Agreement policies for pollution liability covering this specific type of work, which policies shall protect the Owner and Contractor from claims in an amount not less than \$1,000,000 for each claim. Coverage may be procured directly by the Contractor or through policy placed on behalf of the environmental abatement subcontractor.

ARTICLE 15 – DISPUTE RESOLUTION

ADD THE FOLLOWING NEW PARAGRAPH 15.6:

- 15.6 The Owner's Dispute Resolution Policy required by N.C.G.S. § 143-128(f1) is contained in Policy 6420 (<https://boardpolicyonline.com/bl/?b=harnett#&&hs=TOC%3a6>). The Dispute Resolution Policy is also included in the bid and contract documents.

END OF SUPPLEMENTAL CONDITIONS

SECTION 01 10 00**SUMMARY****PART 1 GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
1. Contract description.
 2. Work by Owner or others.
 3. Owner-furnished products.
 4. Contractor's use of site and premises.
- B. Specification Conventions:
1. These specifications are written in imperative mood and streamlined form. This imperative language is directed to the Contractor, unless specifically noted otherwise. The words "shall," or "shall be," or "shall comply with," depending on context, are included by inference where a colon (:) is used within sentences or phrases.
 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

1.3 CONTRACT DESCRIPTION

- A. Work of the Project includes construction of the project identified in the Contract Documents.
- B. The Project includes Work required at three (3) separate Work Sites.
1. Work Site Names:
 - a. Highland Elementary School (HES)
 - b. Overhills Elementary School (OES)
 - c. Harnett Primary School (HPS)
 2. The specifications apply to all three (3) of the Work Sites except as follows:
 - a. Select specifications are noted to be required at only one (1) or two (2) of the Work Sites. These select specifications are noted (marked) in the upper-right corner of the specification header by the mark "Only: (*Work Site Name*)".
 - 1) Examples:
 - a) "Only: Highland ES"
 - b) "Only: Highland ES & Overhills ES"
- C. Perform Work of Contract under contract with the Owner for:
1. Stipulated Sum Contract.
- D. Coordinate Work with utilities of Owner, and utilities of public and private agencies.
- E. Permits: Acquire and furnish all necessary permits for the Work.
- F. Contract Work Includes:

1. Work as indicated in the Project Manual, on Drawings and all other Contract Documents.

1.4 WORK BY OWNER OR OTHERS

- A. Coordinate Work with work provided by Owner to facilitate work sequencing and scheduling to include, but not limited to, Owner provided inspection services and utilities of Owner and public or private agencies.
- B. NIC (Not in Contract): Items noted NIC (Not in Contract), will be furnished and installed by Owner after substantial completion or prior to substantial completion when Work sequence requires or allows such coordination between Contractor and Owner.

1.5 OWNER-FURNISHED PRODUCTS

- A. Items noted in the Contract Documents as to be furnished by the Owner:
 1. Owner's Responsibilities:
 - a. Arrange for and deliver Owner-reviewed Shop Drawings, Product Data, and Samples, to Contractor.
 - b. Arrange and pay for delivery to site.
 - c. On delivery, inspect products jointly with Contractor.
 - d. Submit claims to Owner's provider for transportation damage and replace damaged, defective, or deficient items.
 - e. Arrange for manufacturers' warranties, inspections, and service as may be required from Owner's provider.
 2. Contractor's Responsibilities:
 - a. Review Owner-reviewed Shop Drawings, Product Data, and Samples.
 - b. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
 - c. Handle, store, install and finish products.
 - d. Repair or replace items damaged after receipt.
 3. Products furnished to site and installed by Owner:
 - a. As indicated in the Contract Documents.
 4. Items furnished by Owner for installation by Contractor:
 - a. As indicated in the Contract Documents.

1.6 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Access to Work Area of Site: Limited to Contractors, Owner, Authorities Having Jurisdiction, Emergency Response Entities, Architect and Consultants.
- B. Tobacco and Related Products Restriction:
 1. Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor-air intakes.
 2. Use of any form of tobacco and related product is not permitted on the construction site or any school property.
- C. Electronic Smoking Devices Restriction: Use of electronic smoking and vapor devices are not permitted on the construction site or any school property.
- D. Firearms Restriction: Firearms are prohibited on the construction site. As minimum, signs indicating restriction are to be posted at entrances to construction site and at contractor's onsite office site trailer.

- E. Restriction Signage: As minimum, signs indicating all site restrictions are to be posted at entrances to construction site and at contractor's onsite office site trailer. Comply with other site signage requirements as may be indicated.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01 21 00**ALLOWANCES****PART 1 GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
 - 1. Certain items are specified in the Contract Documents by Allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.
- B. Allowance Types include the following:
 - 1. Unit Cost Allowances.
 - 2. Stipulated Sum Allowances
 - 3. Quantity Allowances.
 - 4. Contingency Allowances.
- C. Related Requirements:
 - 1. Division 01 Section "Unit Prices" for requirements related to Unit Prices.
 - 2. Division 01 Section "Alternates" for requirements related to Alternates.
 - 3. Division 01 Section "Contract Modification Procedures".
 - 4. Division 01 Section "Quality Requirements" for procedures governing the use of allowances for testing and inspection.
 - 5. Divisions 03 through 33 Sections for items of work covered by allowances.

1.3 ALLOWANCES - CONTRACT SUM

- A. Include in the Contract Sum all Allowances stated in the Contract Documents.

1.4 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product and system described by an allowance must be completed to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the work.
- C. Purchase products and systems selected by Architect from the designated supplier and perform allowance work requirements.

1.5 ACTION SUBMITTALS

- A. Submit proposals for allowance work requirements included in allowances. Refer to Section 01 26 00 - Contract Modification Procedures.
 - 1. Include product data, shop drawing, and sample submittals for allowance items in same manner as for other portions of the Work.

1.6 INFORMATIONAL SUBMITTALS

- A. Submit invoices and delivery slips to show actual costs, and actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for services, and installation costs of allowance items that include installation as part of the allowance.

1.7 COORDINATION

- A. Contractor:
 - 1. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.
 - 2. Include each allowance as separate line item in the Schedule of Values.
 - 3. Assist Architect in selection of products, suppliers, and installers.
 - 4. Obtain suppliers' and installers' cost data. Submit lump sum cost proposals for the work to Architect and offer recommendations. Refer to Section 01 26 00 - Contract Modifications: Proposal procedures.
 - a. Include itemized explanation and documentation of proposed costs.
 - b. Cost is to be based upon completing the work within the Contract Time.
 - 5. Owner written approval is required prior to allowance work and use of allowance funds.
 - a. Progress payments for allowance work are not to be requested until Owner has provided written approval of the Contractor's proposal for the allowance work.
 - 6. Upon Architect's notification of Owner approval, execute purchase agreement with designated supplier and installer.
 - 7. Obtain and process shop drawings, product data, and samples.
 - 8. Provide for delivery and, upon delivery, promptly inspect products for completeness, damage, and defects. Submit claims for transportation damage to supplier and delivery service.
- B. Architect:
 - 1. Consult with Contractor regarding consideration and selection of products, suppliers, and installers.
 - 2. Consult with Owner to acquire Owner decisions and transmit decisions to Contractor.
 - 3. Prepare approval notification indicating the appropriate allowance and the amount authorized to be used with attached approved proposals and work descriptions. Distribute for authorization by Contractor and Owner.

1.8 UNUSED MATERIALS

- A. After allowance work has been completed and accepted, return unused materials purchased to supplier for credit to Owner and document the credit back to the allowance line item on the next Application for Payment.
 - 1. If requested by Owner, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed by Owner.

1.9 CHANGES TO ALLOWANCES

- A. Remaining allowance amounts will be credited to Owner by Change Order at closeout of Contract.
 - 1. Owner may choose to require credit for remaining amount, or portion thereof, prior to closeout of Contract.
- B. Change to an Allowance Amount:
 - 1. In the event of a variance between an allowance amount and the approved actual cost, submit a Change Order proposal requesting a change in the Contract Sum.

- a. Unit Cost Allowances: Change amount is to be the actual unit cost difference multiplied by the bid quantity.
 - b. Stipulated Sum Allowances: Change amount is to be the difference between the stipulated sum and the approved actual cost.
 - c. Quantity Allowances: Change amount is to be the actual quantity difference multiplied by the apportioned unit cost that was included in the Contract Sum.
 - 1) Exception: Contractor provided bid unit prices for Division 01 Section "Unit Prices" will be the multiplier for quantities greater or less than the allowance quantity when such corresponding work is indicated in "Unit Prices".
 - d. Contingency Allowances: Change amount is to be the difference between the allowance sum and the approved actual costs.
- C. Include itemized explanation and documentation to substantiate changes.
 - D. No change to Contractor's indirect expense is permitted for selection of higher- or lower-cost materials or systems of the same scope and nature as originally indicated.
 - E. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
 - F. Change in Allowance Scope:
 - 1. Submit documentation of a claim for change in scope of allowance work described in the Contract Documents.
 - 2. Do not include Contractor's or subcontractor's indirect expense in the Change Order proposal cost amount unless you have clearly documented that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.

1.10 UNIT COST ALLOWANCES (UCA)

- A. Included in Unit Cost Allowance:
 - 1. Purchase and Delivery Costs: Costs to Contractor including purchase of materials and equipment, delivery to site, and required purchase taxes, less applicable trade discounts.
- B. Other related costs not included in allowance but to be included in Contract Sum:
 - 1. Installation and Other Related Costs: Costs to Contractor including handling, unloading, storage, protection, services, installation and finishing, overhead, profit, bonding, insurance, payroll taxes, rental equipment, incidentals, and other expenses required to complete the installation.
- C. Use information indicated in the Contract Documents to determine bid quantities.
- D. Schedule of Unit Cost Allowances indicated in Part 3 of this Section.

1.11 STIPULATED SUM ALLOWANCES (SSA)

- A. Included in Stipulated Sum Allowance:
 - 1. All costs to Contractor including purchase of materials and equipment, delivery to site, taxes, handling, unloading, storage, protection, services, installation and finishing, overhead, profit, bonding, insurance, payroll taxes, rental equipment, incidentals, and other expenses required to complete the installation.
- B. Schedule of Stipulated Sum Allowances indicated in Part 3 of this Section.

1.12 QUANTITY ALLOWANCES (QA)

- A. Included in Quantity Allowance:

1. All costs to Contractor including purchase of materials and equipment, delivery to site, taxes, handling, unloading, storage, protection, services, installation and finishing, overhead, profit, bonding, insurance, payroll taxes, rental equipment, incidentals, and other expenses required to complete the installation.
- B. Schedule of Quantity Allowances indicated in Part 3 of this Section.

1.13 CONTINGENCY ALLOWANCES (CA)

- A. Included in Contingency Allowances:
 1. All costs to Contractor including purchase of materials and equipment, delivery to site, taxes, handling, unloading, storage, protection, services, installation and finishing, overhead, profit, bonding, insurance, payroll taxes, rental equipment, incidentals, and other expenses required to complete the installation.
- B. Schedule of Contingency Allowances indicated in Part 3 of this Section.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 GENERAL

- A. Allowance work requirements to be same as similar work type requirements indicated in the Contract Documents unless indicated otherwise.

3.2 SCHEDULE - UNIT COST ALLOWANCES (UCA)

- A. **UCA-1: Unit Masonry - BRK1.**
 1. Unit Cost: \$300.00 per thousand units.
 2. Include the stated unit cost for purchase and delivery for face brick. Installation and all other related costs to be included in Contract Sum.
 3. Refer to Section 04 20 00 - Unit Masonry.
- B. **UCA-2: Unit Masonry - BRK2.**
 1. Unit Cost: \$350.00 per thousand units.
 2. Include the stated unit cost for purchase and delivery for face brick. Installation and all other related costs to be included in Contract Sum.
 3. Refer to Section 04 20 00 - Unit Masonry.
- C. **UCA-3: Unit Masonry - BRK3.**
 1. Unit Cost: \$350.00 per thousand units.
 2. Include the stated unit cost for purchase and delivery for face brick. Installation and all other related costs to be included in Contract Sum.
 3. Refer to Section 04 20 00 - Unit Masonry.
- D. **UCA-4: Unit Masonry - BRK4.**
 1. Unit Cost: \$350.00 per thousand units.
 2. Include the stated unit cost for purchase and delivery for face brick. Installation and all other related costs to be included in Contract Sum.
 3. Refer to Section 04 20 00 - Unit Masonry.

3.3 SCHEDULE - STIPULATED SUM ALLOWANCES (SSA)**A. SSA-1: Security System.**

1. Stipulated Sum: \$200,000.
2. Include the stated stipulated sum for purchase, delivery, installation, and all other related costs for various technology equipment.
 - a. Equipment types may include the following:
 - 1) Cameras.
 - 2) Security.
 - 3) Electronic security door hardware.
 - 4) Associated equipment.
3. Allowance is for work in addition to base bid work indicated in Contract Documents.
4. Locations to be indicated by Architect.

B. SSA-2: Fire Drive at Highland ES Only.

1. Stipulated Sum: \$200,000.
2. Include the stated stipulated sum for purchase, delivery, installation, and all other related costs for improvements to the existing fire drive as recommended by the AHJ following the issuance of Substantial Completion Certificate at Highland ES Only.
 - a. Improvements may include the following:
 - 1) Widening of existing gravel driveways to meet County standards.
 - 2) Additional layer of ABC.
3. Allowance is for work in addition to base bid work indicated in Contract Documents.
4. Locations to be approved by AHJ and indicated by Architect.

3.4 SCHEDULE - QUANTITY ALLOWANCES (QA)**A. QA-1: Woven Geo-Textile Separation and Stabilization Fabric In-Place.**

1. Quantity: 500 square yards.
2. Include the stated quantity of work for purchase, delivery, installation, and all other related costs.
3. Coordinate with Division 01 Section "Unit Prices".
4. Locations to be approved by Site Design Engineer.

B. QA-2: Removal of Unsuitable Soil (Bulk).

1. Quantity: 750 cubic yards.
2. Include the stated quantity of work for purchase, delivery, installation, and all other related costs.
3. Coordinate with Division 01 Section "Unit Prices".
4. Locations to be approved by Site Design Engineer.

C. QA-3: Removal of Unsuitable Soil (Trench).

1. Quantity: 250 cubic yards.
2. Include the stated quantity of work for purchase, delivery, installation, and all other related costs.
3. Coordinate with Division 01 Section "Unit Prices".
4. Locations to be approved by Site Design Engineer.

D. QA-4: Replacement of Removed Unsuitable Soils or Rock with Off-Site Suitable Soils In-Place.

1. Quantity: 1,000 cubic yards.
2. Include the stated quantity of work for purchase, delivery, installation, and all other related costs.
3. Coordinate with Division 01 Section "Unit Prices".
4. Locations to be approved by Site Design Engineer.

- E. **QA-5: Replacement of Removed Unsuitable Soils or Rock with Off-Site Aggregate Base Course In-Place.**
1. Quantity: 500 cubic yards.
 2. Include the stated quantity of work for purchase, delivery, installation, and all other related costs.
 3. Coordinate with Division 01 Section "Unit Prices".
 4. Locations to be approved by Site Design Engineer.

3.5 SCHEDULE - CONTINGENCY ALLOWANCES (CA)

- A. **CA-1: General Contingency Allowance.**
1. Stipulated Sum: \$300,000.00.
 2. Include the stated stipulated sum for use as directed by Owner.

END OF SECTION

SECTION 01 22 00**UNIT PRICES****PART 1 GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Unit price requirements for use in preparing Bids.
 - 2. Measurement and payment criteria applicable to Work performed under a unit price payment method and associated Bid requirements.
 - 3. Defect assessment and non-payment for rejected Work.
 - 4. Schedule of Unit Prices.
- B. Related Requirements:
 - 1. Bidding Documents and Forms: Instructions for preparation of pricing for Unit Prices.
 - 2. Drawing and Specification requirements related to the work type indicate by the items listed in this Section under the Schedule of Unit Prices.

1.3 COSTS INCLUDED IN UNIT PRICES

- A. Unit Prices included on the Bid Form shall include full compensation per unit of Work including, but not limited to, all required labor, overhead, profit, products, tools, equipment, plant fees, excavation, disposal fees, loading, transportation, services, incidentals, erection, application, and installation of a unit of the Work.

1.4 UNIT QUANTITIES SPECIFIED

- A. Quantities indicated in the bidding documents and forms are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

1.5 MEASUREMENT OF QUANTITIES

- A. Measurement methods delineated in the individual specification Sections complement the criteria of this Section. In the event of conflict, the requirements of the individual specification Section govern.
 - 1. Measurement for replacement fill of authorized excavated voids shall be based on volume of void to be filled with compacted fill.
 - 2. Measurement for fabric and sheet products installed horizontally, is not to include excess and/or overlaps.
 - 3. Measurement for other types of Work is indicated within the individual Unit Price requirement in the Schedule of Unit Prices at the end of this Section.
- B. Take all measurements and compute quantities. Maintain records.
 - 1. Measurements and quantities will be verified by a soils and materials engineer employed by the Owner.
- C. Assist by providing necessary equipment, workers, and survey personnel as required.
- D. Measurement Devices:

1. Weigh Scales: Inspected, tested, and certified by the applicable State department within the past year.
 2. Platform Scales: Of sufficient size and capacity to accommodate the conveying vehicle. Certified by the applicable State department within the past year.
 3. Metering Devices: Inspected, tested, and certified by the applicable State department within the past year.
- E. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.
- F. Measurement by Volume: Measured by cubic dimension using mean length, width, and height or thickness.
- G. Measurement by Area: Measured by square dimension using mean length and width or radius.
- H. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.
- I. Stipulated Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.

1.6 PAYMENT

- A. Payment for Work governed by unit prices will be made based on the actual measurements and quantities of Work that is incorporated into or made necessary by the Work.
- B. Payment will not be made for any of the following:
1. Products wasted or disposed of in a manner that is not acceptable.
 2. Products determined as unacceptable before or after placement.
 3. Products not completely unloaded from the transporting vehicle.
 4. Products placed beyond the lines and levels of the required Work.
 5. Products remaining on hand after completion of the Work.
 6. Loading, hauling, and disposing of rejected Products.

1.7 DEFECT ASSESSMENT

- A. Replace Work, or portions of the Work, not conforming to specified requirements.
- B. If, in the opinion of Owner, it is not practical to remove and replace the Work, Owner will direct remedies as follows:
1. The defective Work will remain or be partially repaired to the instruction of the Owner, and at the discretion of the Owner, the unit price will be adjusted as follows:
 - a. Reduced to a new unit price.
 2. The authority of Owner to assess the defect, direct remedies, and establish adjustment in unit price and payment is final.
- C. The Contract, General Conditions of the Contract, Supplementary General Conditions, or individual specification Sections may modify these options or may identify a specific formula or percentage price reduction.

1.8 DOCUMENTATION

- A. Section 01 32 00 - Construction Progress Documentation: Reports.
- B. Maintain record of delivery tickets for replacement fill materials delivered to the jobsite. Indicate date, time, origin location, hauler, material description, quantities, and weight.

PART 2 PRODUCTS (NOT USED)**PART 3 EXECUTION****3.1 SCHEDULE OF UNIT PRICES**

- A. Provide unit prices for the following Work in compliance with the Contract Documents for similar Work and as directed by Architect.
1. Refer to "Costs Included in Unit Prices" article in this Section.
 2. Purpose:
 - a. To adjust the contract sum if the Owner requires construction in addition to that indicated in the Contract Documents.
 - b. To adjust the contract sum for approved variance in quantities indicated for the Quantity Allowances as indicated in Division 01 Section "Allowances".
- B. **Unit Price No. 1 - Exit Sign.**
1. Include circuitry and hardware. Conduits and boxes to be concealed and recessed.
 2. Unit Price: Provide bid price per each.
- C. **Unit Price No. 2 - Surface Mounted Speaker/Strobe.**
1. Include circuitry and hardware. Conduits and boxes to be concealed and recessed.
 2. Unit Price: Provide bid price per each.
- D. **Unit Price No. 3 - Smoke Detector.**
1. Include circuitry and hardware. Conduits and boxes to be concealed and recessed.
 2. Unit Price: Provide bid price per each.
- E. **Unit Price No. 4 - Wood Blocking Replacement.**
1. Include removal of wood blocking and replacement with pressure treated wood blocking at window and door heads and miscellaneous wood blocking assemblies.
 2. Unit Price: Provide bid price per 10 lineal feet of 2 x 4 inches wood blocking.
- F. **Unit Price No. 5 - Woven Geo-Textile Separation and Stabilization Fabric In-Place.**
1. Unit Price: Provide bid price per square yard.
 2. Quantity Allowance: Contractor shall include an allowance price in the Base Bid for quantity indicated in Schedule - Quantity Allowances in Division 01 Section "Allowances".
 - a. Coordinate unit price with quantity allowance price.
 - b. Refer to requirements in Division 01 Section "Allowances".
- G. **Unit Price No. 6 - Removal of Unsuitable Soils (Bulk).**
1. Disposal to be on-site.
 2. Unit Price: Provide bid price per cubic yard.
 3. Quantity Allowance: Contractor shall include an allowance price in the Base Bid for quantity indicated in Schedule - Quantity Allowances in Division 01 Section "Allowances".
 - a. Coordinate unit price with quantity allowance price.
 - b. Refer to requirements in Division 01 Section "Allowances".
- H. **Unit Price No. 7 - Removal of Unsuitable Soils (Trench).**
1. Disposal to be on-site.
 2. Unit Price: Provide bid price per cubic yard.
 3. Quantity Allowance: Contractor shall include an allowance price in the Base Bid for quantity indicated in Schedule - Quantity Allowances in Division 01 Section "Allowances".
 - a. Coordinate unit price with quantity allowance price.

- b. Refer to requirements in Division 01 Section "Allowances".

I. Unit Price No. 8 - Replacement of Removed Unsuitable Soils or Rock with Off-Site Suitable Soils In-Place.

1. Suitable soil fill approval required. Moisture control and compaction required.
2. Do not include costs related to the removal of unsuitable soils or rock. Unit price for removal is provided for in other Unit Price item in this Section.
3. Unit Price: Provide bid price per cubic yard.
4. Quantity Allowance: Contractor shall include an allowance price in the Base Bid for quantity indicated in Schedule - Quantity Allowances in Division 01 Section "Allowances".
 - a. Coordinate unit price with quantity allowance price.
 - b. Refer to requirements in Division 01 Section "Allowances".

J. Unit Price No. 9 - Replacement of Removed Unsuitable Soils or Rock with Off-Site Aggregate Base Course In-Place.

1. Aggregate fill approval required and is to be Certified ABC material. Compaction required.
2. Do not include costs related to the removal of unsuitable soils or rock. Unit price for removal is provided for in other Unit Price item in this Section.
3. Unit Price: Provide bid price per cubic yard.
4. Quantity Allowance: Contractor shall include an allowance price in the Base Bid for quantity indicated in Schedule - Quantity Allowances in Division 01 Section "Allowances".
 - a. Coordinate unit price with quantity allowance price.
 - b. Refer to requirements in Division 01 Section "Allowances".

END OF SECTION

SECTION 01 23 00**ALTERNATES****PART 1 GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Alternates.
 - 2. Schedule of Alternates.
- B. Related Requirements:
 - 1. Bidding Documents and Forms: Instructions for preparation of pricing for Alternates.
 - 2. Drawing and Specification requirements related to the work type indicate by the items listed in this Section under the Schedule of Alternates.

1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, manufacturer, or installation methods described in the Contract Documents.
 - 1. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Agreement.
 - 2. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 3. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule of Alternates:
 - 1. Schedule of Alternates included in Part 3 of this Section.

PART 2 PRODUCTS (Not Used)**PART 3 EXECUTION****3.1 SCHEDULE OF ALTERNATES**

- A. Alternate No. 1 - Lighting (Owner Preferred):**
1. Refer to Section 26 51 16 - Lighting.
 2. Provide 2x4 Lay-In Fixtures: Lithonia CPX 2X4 4000LM M2 for fixtures A1 and A1E, no substitutions.
- B. Alternate No. 2 - Door Hardware.**
1. Refer to Section 08 71 00 - Door Hardware.
 2. **Alternate No. 2A - Locks and Latches (Owner Preferred):**
 - a. Provide Locks and Latches: Best, no substitutions.
 - b. Includes interchangeable cores.
 3. **Alternate No. 2B - Exit Devices (Owner Preferred):**
 - a. Provide Exit Devices: Precision, no substitution.
 4. **Alternate No. 2C - Closers (Owner Preferred):**
 - a. Provide Closers: Best HD8000 series, no substitutions.
 5. **Alternate No. 2D - Continuous Hinges (Owner Preferred):**
 - a. Provide Continuous Hinges: Select, no substitutions.
 6. **Alternate No. 2E - Grand Master Key System (Owner Preferred):**
 - a. Provide Grand Master Key System: Best, no substitutions.
- C. Alternate No. 3 - Plumbing Fixtures.**
1. Refer to Plumbing Schedules on Drawings.
 2. **Alternate No. 3A - Faucets (Owner Preferred):**
 - a. Provide Plumbing Fixture Faucets: TOTO EcoPower , no substitutions.
 3. **Alternate No. 3B - Flush Valves (Owner Preferred):**
 - a. Provide Plumbing Fixture Flush Valves: TOTO EcoPower Hydroelectric, no substitutions.
 4. **Alternate No. 3C - Water Coolers (Owner Preferred):**
 - a. Provide Plumbing Fixture Water Coolers: Elkay, no substitutions.
- D. Alternate No. 4 - Composite Door Assemblies (Owner Preferred):**
1. Refer to Section 08 17 43 - Integrated Composite Door Opening Assemblies.
 2. Provide Integrated Composite Door Opening Assemblies: Special-Lite, no substitutions.
- E. Alternate No. 5 - HVAC Equipment (Owner Preferred):**
1. Refer to Division 23 - HVAC Equipment.
 2. Provide HVAC Equipment: Trane, no substitutions.
- F. Alternate No. 6 - Plumbing Piping Valves (Owner Preferred):**
1. Refer to Section 22 11 00 - Domestic Water Systems.
 2. Provide Plumbing Valves: Apollo, no substitutions.

END OF SECTION

SECTION 01 26 00
CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
1. Division 01 Section "Product Requirements" for administrative procedures for handling requests for substitutions made after the Contract award.

1.3 PROPOSAL REQUESTS

- A. Owner Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
1. Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 2. Within 15 days after receipt of Proposal Request, submit a quotation indicating the net cost and net time adjustments to the Contract Sum and the Contract Time necessary to execute the change. The terms "net cost" and "net time" as used herein shall mean the difference between the additions and deductions of all properly applied cost and time.
 - a. Document each quotation for change in net cost or net time with sufficient data to allow evaluation of quotation.
 - b. Include a list of quantities and prices of products and materials required or eliminated, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - c. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - d. Include costs of labor and supervision directly attributable to the change.
 - e. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- B. Contractor Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
1. Include a statement outlining reasons for the proposed change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 2. The terms "net cost" and "net time" as used herein shall mean the difference between the additions and deductions of all properly applied cost and time.
 - a. Document each quotation for change in net cost or net time with sufficient data to allow evaluation of quotation.

- b. Include a list of quantities and prices of products and materials required or eliminated, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
- c. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
- d. Include costs of labor and supervision directly attributable to the change.
- e. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- f. Comply with requirements in Division 01 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

1.4 MINOR CHANGES IN THE WORK

- A. Architect will issue to Contractor supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710 Architect's Supplemental Instructions.

1.5 ADMINISTRATIVE CHANGE ORDERS

- A. Allowance Adjustment: See Division 01 Section "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.
- B. Unit-Price Adjustment: See Division 01 Section "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

1.6 CHANGE ORDER PROCEDURES

- A. Submittals: Submit name of individual authorized to receive change documents.
- B. Contractor is responsible for informing others in Contractor's employ, subcontractors, and suppliers of approved changes to the Work.
- C. Stipulated Sum Change Order: Based on Proposal Request and Contractor's fixed price quotation or Contractor's request for Change Order as approved by Owner and Architect.
- D. Unit Price Change Order: For contract unit prices and quantities, the Change Order will be executed on fixed unit price basis. For unit costs and quantities of units of work which are not pre-determined, execute Work under Construction Change Directive.
- E. Construction Change Directive: Architect may issue directive, on AIA Form G714 Construction Change Directive signed by Owner, instructing Contractor to proceed with change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining and change in Contract Sum or Contract Time. Promptly execute change.
- F. Execution of Change Orders: Architect will issue Change Orders on AIA Document G701 for signatures by parties as provided in Conditions of the Contract.
- G. Correlation of Contractor Submittals:
 - 1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Sum.
 - 2. Promptly revise construction schedule to reflect changes in the work and its effect on other items of work affected by the changes, and resubmit.

3. Promptly enter changes in Project Record Documents.

1.7 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 1. Construction Change Directive contains a description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 1. After completion of directed change, submit an itemized accounting and supporting data necessary to substantiate cost and time adjustments to the Contract. Approved changes to the Contract will be authorized by Change Order.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01 29 00
PAYMENT PROCEDURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes: Administrative and procedural requirements.
1. Schedule of Values.
 2. Applications for Payment.
- B. Related Requirements:
1. Division 01 Section "Allowances" for procedural requirements governing the handling and processing of Allowances.
 2. Division 01 Section "Unit Prices" for administrative requirements governing the use of Unit Prices.
 3. Division 01 Section "Alternates" for administrative requirements governing the Alternates.
 4. Division 01 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 5. Division 01 Section "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 DEFINITIONS

- A. Contract Start Date: The date of Commencement of the Work as established by the provisions of the Contract.
- B. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with continuation sheets.
 - b. Submittal schedule.
 - c. Items required to be indicated as separate activities in Contractor's construction schedule.
 2. Submit the schedule of values in duplicate to Architect within fifteen (15) days after Contract Start Date.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Architect.

- c. Architect's project number.
- d. Contractor's name and address.
- e. Date of submittal.
2. Arrange schedule of values consistent with format of AIA Document G703.
3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
 - a. Include separate line items under principal subcontracts for project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
 - 1) If LEED or other sustainable design requirements are included in the project, include line items for such documentation.
 - b. Include the following costs as separate line items:
 - 1) Site mobilization.
 - 2) Bonds.
 - 3) Insurance.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
6. Divide each part of the Work into separate line items in the schedule of values that indicate the following for individual parts of the Work:
 - a. Cost of materials.
 - b. Cost of installation.
7. Allowances:
 - a. Provide a separate line item in the schedule of values for each allowance.
 - b. For unit cost allowances, show line item value as a product of the unit cost, multiplied by bid quantity. Use information indicated in the Contract Documents to determine bid quantities.
8. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.
9. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
10. For each application for payment period, add line items to the schedule of value indicating change orders approved after the previous period.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid by Owner.
- B. Payment Period: Submit at monthly intervals or as otherwise stipulated in the Agreement.
 1. Submit draft copy of Application for Payment seven (7) days prior to due date for review by Architect.
- C. Application for Payment Forms:

1. AIA Document G702, "Application and Certificate for Payment".
 2. AIA Document G703, "Continuation Sheet for G702".
 3. Other forms required at appropriate times include the following. Forms for the same purpose indicated here may be superseded by other forms if indicated otherwise in the Contract:
 - a. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims".
 - b. AIA Document G706A, "Contractor's Affidavit of Release of Liens".
 - c. AIA Document G707, "Consent of Surety to Final Payment".
 - d. AIA Document G707A, "Consent of Surety to Reduction in or Partial Release of Retainage".
- D. Application Preparation: Complete every entry on form. Certification of Application to be by a person authorized to sign legal documents on behalf of Contractor. Certification to be Notarized. Architect will return incomplete applications without action.
1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 3. Include amounts of approved Change Orders and Construction Change Directives issued before last day of construction period covered by application.
 4. Include retainage requirements indicated in the Contract Documents.
- E. Substantiating Data: When Architect requires substantiating information, submit data justifying dollar amounts in question.
- F. Payroll Reports: Submit data for projects requiring compliance with or reporting for the following:
1. Davis Bacon Act, as Amended.
 2. Government Grant funding programs.
- G. Stored Materials: Provisions for progress payment for stored materials are indicated in the General Conditions of the Contract. Such provisions are subject to modifications that may be indicated in the Owner/Contractor Agreement or Supplementary General Conditions. Additional provisions are as follows:
1. Provide a summary report documenting stored materials indicating the following:
 - a. Differentiate between items stored on-site and items stored off-site.
 - b. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - c. Value of previously stored materials installed as part of the Work after date of previous Application for Payment and on or before date of current Application for Payment.
 - d. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
 - e. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 2. Materials Stored Off-Site: When approvals are granted by Owner and other required parties, approvals are to be acquired by Contractor in writing prior to inclusion in next Application for Payment and such written approvals are to be included with the Application for Payment. Payment requests are to match the written approvals. The written approvals are to include all supporting documentation that was submitted for review to gain approval. Such supporting documentation may include, but not be

- limited to, certificates of insurance, bonds, paid invoices and consent of surety to payment.
- H. Transmittal: Submit four signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt. One copy shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
 2. Submit with transmittal letter as specified for Submittals in Section 01 33 00 - Submittal Procedures.
- I. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from Contractor, subcontractors, sub-subcontractors, suppliers of materials and equipment, and all performers of Work, labor or services for construction period covered by the previous application.
1. Include AIA Document G706A, "Contractor's Affidavit of Release of Liens" with supporting documentation referenced as attached thereto.
 2. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 3. When an application shows completion of an item, submit conditional final or full waivers.
 4. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 5. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
- J. Initial Application for Payment: Administrative actions and submittals that must precede submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of values.
 3. Contractor's construction schedule requirements.
 4. Products list requirements.
 5. Schedule of unit prices.
 6. Submittal schedule requirements.
 7. List of Contractor's staff assignments.
 8. List of Contractor's principal consultants.
 9. Copies of building permits.
 10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 11. Initial progress report.
- K. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work certified as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- L. Final Payment Application: After completing all Project Work and Closeout Requirements, submit final Application for Payment with required releases and supporting documentation not previously submitted and accepted, including, but not limited to, the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.

3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.
8. Final Documentation for Minority Business Enterprise.
9. Final liquidated damages settlement statement.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01 30 00**ADMINISTRATIVE REQUIREMENTS****PART 1 GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. General Coordination Procedures.
 - 2. Coordination Drawings.
 - 3. Building Information Model (BIM).
 - 4. Requests for Information (RFIs).
 - 5. Project Meetings.

1.3 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entities performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including Contractor's Project Manager, On-Site Superintendent, and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
 - 1. Post copies of list in project meeting room, in temporary field office, and by each temporary tele-phone. Always maintain list as current.

1.4 GENERAL COORDINATION PROCEDURES

- A. Electronic Document Management Service (EDMS): Comply with Section 01 31 26 - Electronic Communication Protocols. Provide an internet-based EDMS for electronic construction management document control, processing, review actions, reporting, communications, and other project documentation.
- B. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.

- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 1. Preparation of Contractor's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Project meetings.
 6. Startup and adjustment of systems.
 7. Project closeout activities and requirements.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 COORDINATION AND PROJECT CONDITIONS

- A. Coordinate scheduling, submittals, and Work of various sections of Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing operating equipment in service.
- C. Coordinate space requirements, supports, and installation of mechanical and electrical Work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. Coordination Meetings: In addition to other meetings specified in this Section, Contractor is to conduct coordination meetings with personnel and Subcontractors to ensure coordination of Work.
- E. Coordinate work as to conceal pipes, ducts, electrical conduit and wiring within construction and in a manner as to not be seen. Exceptions are mechanical rooms and electrical rooms and as otherwise approved in writing by Architect.
- F. Coordinate locations of fixtures, outlets, and electrical and data devices with finish elements.
- G. Coordinate completion and clean-up of Work of separate Sections in preparation for Substantial Completion.
- H. After Owner occupancy of premises, coordinate access to Site for correction of defective Work and Work not complying with Contract Documents, to minimize disruption of Owner's activities.

3.2 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and re-solve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
 - b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
 - c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - d. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
 - e. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawings Organization: Organize coordination drawings as follows:
1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
 2. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
 3. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
 4. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
 5. Mechanical and Plumbing Work: Show the following:
 - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
 - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts, and electrical distribution equipment.
 - c. Fire-rated enclosures around ductwork.
 6. Electrical Work: Show the following:
 - a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
 - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
 - c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.

- d. Location of pull boxes and junction boxes dimensioned from column center lines.
7. Fire-Protection System: Show the following:
 - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
8. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make changes as directed and resubmit.
9. Coordination Drawings Submittal: Prepare coordination drawings according to requirements and with descriptive titles with logical sequencing numbers. Submit coordination drawings to Architect as follows and in format acceptable to Architect.
 - a. Printed Submittal: Submit three (3) paper copies of drawings to Architect as indicated for submittals in Division 01 Section "Submittal Procedures."
 - b. Digital Submittal: Submit drawings via the Contractor provided Electronic Document Management Service (EDMS) as digital formatted files. This Digital Submittal is in addition to the Printed Submittal and only applies when the Contract Documents require the Contractor to provide an Electronic Document Management Service (EDMS).

3.3 BUILDING INFORMATION MODEL (BIM)

- A. Contractor is to produce a Building Information Model (BIM) for the entire project. Architect's model can be used as a base on which the Contractor's BIM can be developed, updated, and integrated into Contractor's EDMS.
- B. Contractor's BIM is to be completed within the following number of days:
 1. Thirty (30) days after the Contract Start Date.
- C. Contractor's BIM shall be used to interpret the construction documents and analyze all elements of the Coordination Drawing tasks, especially related to clash analysis and systems coordination.
- D. Contractor's BIM shall be made available to Architect and its consultants, contractors, and sub-contractors for daily use in the field during construction tasks.
- E. Contractor's BIM is to be incorporated and integrated into the Contractor's EDMS - BIM integration program (i.e. "ASSEMBLE", or equal program, compatible with the project's Electronic Document Management Service EDMS).

3.4 REQUESTS FOR INFORMATION (RFIs)

- A. Requests for Information are to be submitted by the Contractor for Designer's action via the Contractor's Electronic Document Management Service (EDMS).
- B. Definition: An RFI is a request seeking one of the following:
 1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, assembly, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in the Contract Documents.
 2. A resolution to an issue which has arisen due to field conditions and affects design intent.

- C. Whenever timely and possible, request clarifications at the next appropriate project progress meeting, with response recorded in meeting minutes, rendering unnecessary the submittal of an RFI.
- D. Acceptable Uses for RFIs: Contractor good faith effort to determine resolution from Contract Documents.
 - 1. Prior to submitting an RFI, carefully study all Contract Documents to confirm that sufficient information for interpretation is not included in Contract Documents.
- E. Unacceptable Uses for RFIs: Architect will return unacceptable RFIs without review action. Unacceptable RFIs include the following:
 - 1. Request for approval of submittals (see Section 01 33 00 - Submittal Procedures).
 - 2. Request for approval of substitutions (see Section 01 60 00 - Product Requirements).
 - 3. Request for approval of Contractor means and methods (Contractor's responsibility).
 - 4. Requests for coordination information already indicated in the Contract Documents.
 - 5. Changes in the Work requirements, Contract Time, or Contract Sum (see Section 01 26 00 - Contract Modification Procedures).
 - 6. Request from other entities controlled by Contractor. Do not forward requests which solely require internal coordination between Contractor its contract entities.
 - 7. Improper RFIs: Requests not prepared in conformance to requirements of this section, and/or missing key information required to render an actionable response.
 - 8. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, the Contract Documents, with no additional input required to clarify the question.
 - a. The Owner reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Architect, and any of its consultants, due to processing of such RFIs.
- F. Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 - 1. RFI Form: AIA Document G716 with supporting attachments; combined into single PDF format electronic file.
 - 2. Coordinate and submit RFIs in a prompt manner as to avoid delays in the Work. Failure to submit an RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
- G. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 - 1. Project name and Architect's Project Number.
 - 2. Date.
 - 3. Name of Contractor.
 - 4. Name of Architect.
 - 5. RFI number, numbered sequentially.
 - 6. RFI subject.
 - 7. Specification Section number and title and related paragraphs, as appropriate.
 - 8. Drawing number and detail references, as appropriate.
 - 9. Field dimensions and conditions, as appropriate.
 - 10. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 - 11. Contractor's certification signature attesting to Contractor's good faith effort to determine from the Contract Documents information requiring interpretation.
 - 12. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

- a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- H. Architect's Action: Allow seven (7) working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. on a working day will be considered as received the following working day.
 - 1. Content of Architect's response to RFIs will not constitute, in any manner, a directive or authorization to perform extra work or delay the project. If Contractor believes the Architect's response is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Proposal (see Section 01 26 00 - Contract Modification Procedures).
 - 2. Architect's action may include a request for additional information from Contractor, in which case Architect's time for response will date from time of receipt of additional information.
- I. RFI Log: Maintain current status of RFI's via the Contractor provided Electronic Document Management Service (EDMS).
- J. Promptly review Architect's response action and provide direction to the affected parties.
 - 1. If an additional or corrected response is required, notify Architect within seven (7) calendar days of the Architect's response action, by submitting to Architect an amended version of the original RFI, identified as specified above.

3.5 PROJECT MEETINGS - GENERAL

- A. Contractor is to schedule and conduct meetings and conferences at Project site unless otherwise indicated or agreed upon by Contractor, Owner and Architect.
- B. Attendees: Inform participants and others involved, and individuals whose presence is required, of the date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
- C. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
- D. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to relevant parties, including Owner and Architect, within three (3) days of the meeting.
- E. Project meetings include, but are not limited to, the following and are indicated with more detail further in this Section.
 - 1. Preconstruction Meeting.
 - 2. Site Mobilization Meeting.
 - 3. Progress Meetings.
 - 4. Pre-Installation Meetings.
 - 5. Closeout Meeting.

3.6 PRECONSTRUCTION MEETING

- A. Contractor is to schedule and conduct a Preconstruction Meeting before starting construction, at a time convenient to Owner and Architect, but no later than fifteen (15) days after execution of the Agreement.
- B. Attendees: Participants are to be familiar with the project and authorized to conduct matters related to the Work and project. Attendees include representatives of the following:
 - 1. Owner and others that may be designated by Owner.
 - 2. Architect.
 - 3. Architect's Consultants.
 - 4. Contractor Project Manager and On-Site Superintendent.

5. Major Subcontractors.
 6. Major Suppliers.
 7. Commissioning Authority (if commissioning is required for project).
 8. Relevant Utility Providers.
 9. Relevant Regulatory Agencies Having Jurisdiction.
- C. Agenda: Discuss items of significance that could affect progress and quality of the Work, including the following:
1. Designation of key personnel and their duties.
 2. Identification of Contractor's Safety Officer.
 3. Lines of communications.
 4. Status of Owner-Contractor Agreement, Bonds and Insurance Certificates.
 5. Status of Building Permits.
 6. Distribution of the Contract Documents.
 7. Owner's occupancy requirements.
 8. Limits of construction areas and restrictions for environmentally protected areas.
 9. Restrictions regarding on-site presence of firearms and use of tobacco products.
 10. Working restrictions.
 11. Working hours.
 12. Tentative construction schedule, including Contract Start Date, Contract Milestones and Contract Completion Date.
 13. Procedures for processing field decisions and Change Orders.
 14. Procedures for RFIs.
 15. Procedures for testing and inspecting.
 16. Commissioning activities (if commissioning is required for project).
 17. Procedures for processing Applications for Payment.
 18. Submittal schedule and procedures.
 19. Critical work sequencing and long-lead items.
 20. Responsibility for temporary facilities and controls.
 21. Procedures for moisture and mold control.
 22. Construction waste management and recycling.
 23. Office, work, parking, staging and storage areas.
 24. Equipment deliveries and priorities.
 25. On-Site and Site Access Traffic Control.
 26. Protocol for emergency events and first aid.
 27. Security.
 28. Progress cleaning.
 29. Procedures for maintaining Contractor as-built drawings and specifications documentation.
 30. Project closeout and submission of closeout items and record documents.

3.7 SITE MOBILIZATION MEETING

- A. Contractor is to schedule and conduct a Site Mobilization Meeting before Contractor occupancy of site. If Owner and Contractor agree, meeting may be conducted jointly within the Preconstruction Meeting.
- B. Attendees: Participants are to be familiar with the project and authorized to conduct matters related to the Work and project. Attendees include representatives of the following:
1. Owner and others that may be designated by Owner.
 2. Architect.
 3. Contractor Project Manager and On-Site Superintendent.
 4. Major Subcontractors.
 5. Commissioning Authority (if commissioning is required for project).
 6. Relevant Utility Providers, (if services required during mobilization).

7. Relevant Regulatory Agencies Having Jurisdiction.
- C. Agenda: Discuss items of significance and including the following:
1. Mobilization schedule.
 2. Use of premises by Owner and Contractor.
 3. Owner requirements.
 4. Site access.
 5. Erosion control including measures at site entrances.
 6. Construction facilities and controls.
 7. Temporary utilities.
 8. Survey and building layout.
 9. Security and housekeeping procedures.
 10. Procedures for testing.
 11. Procedures for maintaining Contractor as-built (record) drawings and specifications documentation.
 12. Requirements for start-up of equipment.
 13. Inspection and acceptance of equipment put into service during construction period.

3.8 PROGRESS MEETINGS

- A. Contractor is to schedule and conduct Progress Meetings throughout progress of the Work at regularly scheduled interval as follows:
1. Once monthly.
- B. Attendees: Participants are to be familiar with the project and authorized to conduct matters related to the Work and project. Attendees include representatives of the following:
1. Owner and others that may be designated by Owner.
 2. Architect.
 3. Architect's Consultants.
 4. Contractor's Project Manager and On-Site Superintendent.
 5. Other relevant parties involved or concerned with current Work progress, or involved in planning, coordination, or performance of future activities. Depending on scheduled activities and phase of Work types, such parties may include the following:
 - a. Major Subcontractors.
 - b. Major Suppliers.
 - c. Commissioning Authority (if commissioning is required for project).
 - d. Relevant Utility Providers.
 - e. Relevant Regulatory Agencies Having Jurisdiction.
- C. Agenda: Include topics for discussion as appropriate to status of Project.
1. Review and correct or approve minutes of previous progress meeting.
 2. Review of Work progress.
 - a. Review pertinent videos/photographs of the Work.
 - b. Review construction schedule and completion.
 - c. Review corrective action planned to recover activities that are behind schedule.
 - d. Review planned progress during succeeding work period.
 - e. Coordination of projected progress.
 3. Review Owner provided work and items.
 4. Field observation reports.
 5. Status of corrections to deficient Work.
 6. Progress cleaning.
 7. Identification of problems that impede, or will impede, planned progress.
 8. Review status of submittals, requests for information, supplemental information, change proposals, change orders and pending claims/disputes.
 9. Maintenance of quality and work standards.

10. Effect of proposed changes on construction schedule and coordination.
 11. Other contract related activities.
- D. Drone Aerial Flight Video: For each Progress Meeting, Contractor is to produce and provide for viewing, an aerial video of the project indicating progress, status, and pertinent aspects of the Work. Video is to be produced from a choreographed camera-equipped drone flight, produced no more than two (2) days prior to the Progress Meeting. The video is to be used at each meeting in conjunction with specific area photographs to provide an overview of the project status and progress. Video is to be uploaded to the EDMS for archive and viewing by Owner, Architect, and Architect's consultants.

3.9 PRE-INSTALLATION MEETINGS

- A. Contractor is to schedule and conduct pre-installation meetings at project site prior to commencing Work of specific section. Work requiring pre-installation meeting is indicated in individual specification sections.
- B. Require attendance of parties directly affecting, or affected by, Work of specific section.
- C. Notify Owner and Architect seven (7) days in advance of meeting date.
- D. Prepare agenda and conduct meeting:
 1. Review conditions for installation, preparation, and installation procedures.
 2. Review coordination with related and adjacent work.

3.10 CLOSEOUT MEETING

- A. Contractor is to schedule and conduct Project Closeout Meeting sufficiently advanced in time to prepare for requesting Substantial Completion Inspection.
- B. Attendees: Participants are to be familiar with the project and authorized to conduct matters related to the Work and project. Attendees include representatives of the following:
 1. Owner and others that may be designated by Owner.
 2. Architect.
 3. Architect's Consultants.
 4. Contractor Project Manager and On-Site Superintendent.
 5. Commissioning Authority (if commissioning is required for project).
 6. Others appropriate to closeout matters.
- C. Agenda: Items to review include, but are not limited to, the following:
 1. Review Section 01 77 00 - Closeout Procedures.
 2. Contractor's inspection of Work.
 3. Start-up of facilities and systems.
 4. Commissioning of Work and systems (if commissioning is required for project).
 5. Testing, adjusting, and balancing.
 6. System demonstration and training for Owner.
 7. Inspections by authorities having jurisdiction.
 8. Final surveys.
 9. Certificate of Occupancy from Authority Having Jurisdiction.
 10. Transfer of insurance responsibilities.
 11. Final cleaning.
 12. Closeout Submittals: Including, but not limited to, the following:
 - a. Project Record Documents.
 - b. Architect's and Owner's disposition regrading approved physical samples.
 - c. Operating and Maintenance Manuals.
 - d. Warranties Manual.
 - e. Spare parts, special tools, operating, maintenance, and extra stock materials.

- f. Keys.
- g. Affidavits.
- 13. Contractor preparation and distribution of Contractor's comprehensive punch list.
- 14. Procedure to request Architect inspection to determine date of Substantial Completion.
- 15. Completion time for correcting deficiencies.
- 16. Partial release of retainage.
- 17. Preparation for final inspection.
- 18. Final Application for Payment package components including affidavits and other require documents.
- 19. Contractor's demobilization from Site.
- 20. Archiving and submittal of data using the Contractor provided Electronic Documents Management Service (EDMS).
- 21. Maintenance.

END OF SECTION

SECTION 01 31 26**ELECTRONIC COMMUNICATION PROTOCOLS****PART 1 GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Electronic Document Management Service (EDMS).

1.3 DEFINITIONS

- A. EDMS: Electronic Document Management Service. EDMS is a system for electronic document management, control, and communications between the Contractor, Owner, Architect, Architect's consultants, and other project-related consultants approved by the Owner.
- B. PDF: Portable Document Format electronic file.
- C. Post: To transmit, upload or submit, data or documents to the EDMS for the purposes of review, review actions, record maintenance, logging, documentation, or other reasons for making the information available for remote access electronically.

1.4 SUBMITTALS

- A. Product Data: A minimum of five (5) days prior to the Preconstruction Meeting, submit data describing the EDMS. Include information regarding the navigation dashboard and various logs; notification features; procedures regarding upload of files, data, and review actions; log types; accessibility; archive download procedures and navigation functionality of the archive product; video illustrating basic features and usage; and user instruction manual.

1.5 CLOSEOUT SUBMITTALS

- A. After project acceptance and prior to final payment, submit a digital archive of the EDMS in accordance with requirements indicated in the DIGITAL ARCHIVE article in this Section.

1.6 COORDINATION

- A. At the Preconstruction Meeting, Contractor is to provide to Owner and Architect a list of persons (users) Contractor will be providing access to and usage of the EDMS. List is to include user's name, company name, trade, email address, phone number and purpose for providing user access to EDMS. At minimum, this will include the Contractor's Project Manager, Superintendent(s) and other technical staff as required. These personnel shall have sufficient computer skills required to access, use, and troubleshoot the Contractor provided EDMS. Within the list, identify the Contractor's primary and secondary persons that users are to contact with questions and requests regarding the EDMS.
 - 1. Owner and Architect will follow-up by providing Contractor with list of persons and consultants whose rolls will require access to and usage of the EDMS.

PART 2 PRODUCTS**2.1 ELECTRONIC DOCUMENT MANAGEMENT SERVICE (EDMS)**

- A. "PROCORE" project management software application.

PART 3 EXECUTION**3.1 ELECTRONIC DOCUMENT MANAGEMENT SERVICE (EDMS)**

- A. The Contractor is to provide an Electronic Document Management Service (EDMS) for electronic construction management document control and communications between the Contractor, Owner, Architect, and other project-related consultants. Unless otherwise designated by the Owner, the system will be maintained and owned by the Contractor but operated collaboratively by the approved users. The EDMS that the Contractor provides must be approved by the Owner and Architect. The Contractor is responsible for providing training for all approved users on how to use the EDMS at no additional costs to the Contract.
- B. The Contractor is to work collaboratively with the Architect to set up and configure the EDMS system to set up project folders and access consistent with the Architect's desired project management structure.
- C. The Contractor is primarily responsible for the scanning, uploading, and logging of all electronic documents for the project.
- D. The Contractor is to provide sufficient personnel and equipment as required by its staff, subcontractors, suppliers, etc., to electronically submit and upload all necessary documents. This requirement includes personnel and equipment as required for field/jobsite execution.
- E. Project Management Software Application(s):
 - 1. Provide web-based EDMS for digital access to project management information associated with the project, including, but not limited to, the following:
 - a. Submittals, Shop Drawings, and Samples.
 - b. Requests for Information.
 - c. Supplemental Instructions.
 - d. Requests for Proposals.
 - e. Change Proposals.
 - f. Change Orders and Allowance Disbursement Documentation.
 - g. All Meeting Reports.
 - h. All Agency Reports.
 - i. Safety Logs
 - j. Payment Applications
 - k. Monthly Weather Reports
 - l. Deficiency Reports
 - m. Designer Field Observation Reports.
 - n. Punch Lists
 - o. Construction Documents.
 - p. Specifications.
 - q. Project Drawings.
 - r. Progress Schedules.
 - s. Project Photographs and Videos.
 - t. Contractor's Building Information Model (BIM).
 - u. Other pertinent information associated with the Contract Documents.

- v. Project Closeout Documents: Digital version (duplication) of required closeout documentation. This digital version archive does not relieve Contractor from providing all physical paper copy and manual submissions of closeout documentation indicated in the Contract Documents.
 - w. Other documentation as may be required by Architect or Owner.
 - 2. The Contractor shall provide adequate programming expertise to organize and manage the EDMS program and contents.
- F. Documents posted are to be in PDF format and posted to EDMS that receives, logs and stores documents; provides for review processing and markup actions; electronic action stamping and signatures; and provides email notifications to responsible parties of posted documents available and requiring actions of responsible parties in the work-flow sequence.
 - 1. Establish the types and categories of documentation (logs) that will be maintained on the web-based submittal service. Logs will include those indicated in this Section and other logs may be added as may be required by the Architect or Owner.
 - 2. It is Contractor's responsibility to submit documents in PDF format.
 - 3. Contractor, Subcontractors, Suppliers, Owner, Architect and Architect's consultants are to be permitted to use the submittal service at no extra charge.
 - 4. Users of the project management software need an email address, internet access, and PDF review software that includes ability to mark-up and apply electronic action stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the submittal service provider.
 - 5. Submitted paper documents and emailed documents will not be reviewed unless Architect has pre-approved, in writing, that select and specific submittals are to be submitted in a manner other than the EDMS. In such case of Architect's written approval, the submitted documents and review results are still to be documented by Contractor in proper sequence within the EDMS as a matter of record.
 - 6. In the case of submissions of physical samples for product characteristic selections (e.g. colors, finishes and other characteristics), the items are to be physically shipped to the required recipient and, on the same day, Contractor is to upload a detailed description of the items and Contractor's review actions to the appropriate EDMS log for tracking and documentation purposes. Same-day EDMS logging and physical shipping is important for accuracy of tracking.
 - 7. Cost: The cost of the EDMS is to be paid by Contractor.
 - a. Contractor to pay all licensing and access fees, and distribute the required software for individual access to the following:
 - 1) Owner's Representatives (3 persons).
 - 2) Architect (3 persons).
 - 3) Architect's Structural Consultant (2 persons).
 - 4) Architect's MEP/FP Consultant (4 persons).
 - 5) Architect's Civil/Site Consultant (2 persons).
 - 6) Technology Consultant (2 persons).
 - 7) Architect's Kitchen Equipment Consultant (1 person).
 - 8) Commissioning Authority (1 person).
 - 9) Others that may be required by Architect or Owner (3 persons).
 - b. Contractor to acquire email addresses from proposed users for the purpose of establishing user access and usability.
 - 8. Training: Contractor to provide, schedule and participate in a two (2) hour, web-based training session for all users; further training is the responsibility of the individual user of the service.

3.2 DIGITAL ARCHIVE

- A. After Project Completion and prior to Final Payment, submit a digital archive of the historical documentation maintained on the EDMS to Owner and Architect for their separate records.
1. Prior to digital archive download process:
 - a. Verify that logs are complete with all final documents and reviews having been uploaded.
 - b. Coordinate with the Architect and Owner to verify that the documentation is ready for archiving process.
 - c. Do not terminate the Owner's and Architect's user access to the EDMS until verification that both have received the fully operational digital archive.
 2. Coordinate with EDMS technical support to acquire comprehensive download of digital archive files, logs and navigational portal (dashboard).
 3. Submission Format: DVD disk or other larger capacity digital archive storage device acceptable to Owner.
 - a. Label disk to include Owner name, project name, Owner's project number, Contractor's name and contact information, Architect company name, EDMS company name and contact information, date and time the archive was downloaded, and list of logs included on disk.
 - b. Digital archive shall include a HTML file that provides a navigation portal (dashboard) that operates and appears the same as did the web-based service user portal. The navigation portal shall include a hyperlinked list of all logs for Activity Summary view and Full Log view and shall include hyperlinks to view the Project Team view and Event History view. The views for each of the logs shall include viewing windows, with hyperlinks to the documentation files, as it appeared in the respective log views on the web-based service.
 - c. Digital archive shall include all documentation, data, hyperlinks, and navigational portal to operate on a PC based system and without additional applications, software, or internet access.
 4. Submit the digital archive to the Owner and Architect and verify that each digital archive is operating properly prior to termination of the EDMS. Acquire written approval from Owner for termination of the EDMS.

END OF SECTION

SECTION 01 32 00
CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
1. Administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - a. Startup Construction Schedule.
 - b. Contractor's Construction Schedule.
 - c. Schedule Updating.
 - d. Daily Construction Reports.
 - e. Site Condition Reports.
- B. Related Requirements:
1. Division 01 Section "Administrative Requirements".

1.3 DEFINITIONS

- A. Activity: A distinct part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 2. Predecessor Activity: An activity that precedes another activity in the network.
 3. Successor Activity: An activity that follows another activity in the network.
- B. Contract Start Date: The date of Commencement of the Work as established by the provisions of the Contract.
- C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- E. Event: The starting or ending point of an activity.
- F. Float: The measure of leeway in starting and completing an activity.
1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

1.4 INFORMATIONAL SUBMITTALS

- A. All schedules, reports, and submittals to be uploaded to the Contractor provided Electronic Documents Management Service (EDMS) at times indicated.
 - 1. Refer to Division 01 Sections “Administrative Requirements” and “Electronic Communication Protocols” regarding EDMS.
- B. Format for Submittals: Submit required submittals in the following format:
 - 1. Working electronic copy of schedule file.
 - 2. PDF electronic file.
 - 3. Color paper copy where hard copy indicated.
- C. Startup Construction Schedule.
 - 1. For scheduling that requires cost-loaded activities, the Startup Construction Schedule will not constitute approval of schedule of values for cost-loaded activities.
- D. Contractor's Construction Schedule: Submit as indicated in the CONTRACTOR’S CONSTRUCTION SCHEDULE article of this Section.
- E. Construction Schedule Updating Reports: Submit as indicated in the CONTRACTOR’S CONSTRUCTION SCHEDULE article of this Section.
- F. Daily Construction Reports: Maintain on site; to be submitted upon request from Owner or Architect.
- G. Site Condition Reports: Submit at time of discovery of differing site conditions.

1.5 QUALITY ASSURANCE

- A. Scheduler: Contractor's personnel or consultant specializing in CPM scheduling with five (5) years minimum experience in scheduling construction work of complexity comparable to this Project and having use of computer facilities capable of delivering detailed graphic printout and electronic upload within 48 hours of request.
- B. Contractor's Administrative Personnel: Two years minimum experience in using and monitoring CPM schedules on comparable projects.

1.6 COORDINATION

- A. Coordinate Contractor's Construction Schedule with the schedule of values, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

1.7 SCHEDULING REQUIREMENTS

- A. Time Frame:
 - 1. Extend schedule from Contract Start Date to Date of Substantial Completion.
 - a. Further extend schedule to indicate activities required from Substantial Completion to Final Completion.
 - b. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Network Analysis Diagrams: Prepare diagrams using activity-on-node (AON) format.
- C. Use "one day" as the unit of time for individual activities. Indicate nonworking days and holidays scheduled within the Contract Time.

- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Prepare a network analysis diagram to identify probable critical paths.
1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include, without limitation, the following activities with estimated time durations:
 - a. Preparation and processing of submittals.
 - b. Mobilization and demobilization.
 - c. Purchase of materials.
 - d. Delivery.
 - e. Fabrication.
 - f. Utility interruptions.
 - g. Installation.
 - 1) Installation durations exceeding 21 days are to be divided into multiple activities as logical construction portions of installation.
 - h. Work by Owner that may affect or be affected by Contractor's activities.
 - i. Testing and commissioning.
 - 1) Provide sufficient duration for testing and certification of commissioning requirements to be completed prior to Substantial Completion.
 - j. Inspections by Authorities Having Jurisdiction.
 - k. Certificate of Occupancy.
 - l. Closeout Activities.
 - m. Preparation and submittal of closeout and record documents.
 - n. Substantial Completion Inspection.
 - o. Certification of Substantial Completion.
 - p. Completion of incomplete Work and deficiencies.
 - q. Final Inspection.
 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
 4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
- E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall project schedule.
- F. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start - total float". Identify critical activities. Prepare tabulated reports showing the following:
1. Contractor or subcontractor and the Work or activity.
 2. Description of activity.
 3. Main events of activity.
 4. Immediately preceding and succeeding activities.
 5. Early and late start dates.
 6. Early and late finish dates.
 7. Activity duration in days.
 8. Total float or slack time.
 9. Average size of workforce.
 10. Dollar value of activity (coordinated with the schedule of values).

- G. Schedule Updating: Concurrent with revising the schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
 2. Changes in early and late start dates.
 3. Changes in early and late finish dates.
 4. Changes in activity durations in days.
 5. Changes in the critical path.
 6. Changes in total float or slack time.
 7. Changes in the Contract Time.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 STARTUP CONSTRUCTION SCHEDULE

- A. Within ten (10) days of the Contract Start Date, Contractor is to prepare and submit Startup Construction Schedule, including network diagram. Outline significant construction activities for the first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
1. Submit updated startup construction schedule with each Application for Payment.
 2. Submit number of opaque reproductions Contractor requires, plus two copies Architect will retain.

3.2 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Prepare and submit Contractor's Construction Schedule, including a time-scaled CPM network analysis diagram for the Work.
- B. Within thirty (30) days of the Contract Start Date, prepare and submit a draft of proposed Contractor's Construction Schedule for review. Include written certification that major subcontractors have reviewed and accepted proposed schedule.
- C. Within fifty (50) days of the Contract Start Date, prepare and submit the final Contractor's Construction Schedule including completed network analysis consisting of network diagrams and mathematical analysis. Include written certification that major subcontractors have reviewed and accepted proposed schedule.
- D. Failure to include any work item required for performance of the Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's or Owner's review of the schedule.
- E. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
- F. Establish procedures for monitoring, recording progress and updating Contractor's Construction Schedule.
- G. Construction Schedule Updating Reports: At monthly intervals, update schedule to reflect actual construction progress and activities. Submit updated schedule one week before each project Progress Meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Submit updated schedule concurrently with the report of each such meeting and include updated schedule in submittal of each Application for Payment.

2. As the Work progresses, indicate final completion percentage for each activity.
- H. Distribution:
1. Submit approved schedule to parties requiring schedule information and to Owner, Architect, testing and inspecting agencies, and other parties identified by Owner.
 2. Post paper color copies in project meeting room(s) and temporary field offices.
 3. When revisions are made, submit updated schedules to the same parties and post in the same locations referenced above.
 4. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

3.3 REPORTS

- A. Maintain and submit as indicated in this Section.
- B. Daily Construction Reports: Prepare and maintain on site a daily construction report recording the following information concerning events at Project site:
1. List of subcontractors at Project site.
 2. Approximate count of personnel at Project site.
 3. Equipment at Project site.
 4. Material deliveries.
 5. High and low temperatures, general weather conditions and precipitation amounts.
 6. Accidents.
 7. Meetings and significant decisions.
 8. Unusual events.
 9. Stoppages, delays, shortages, and losses.
 10. Emergency procedures.
 11. Orders and requests of authorities having jurisdiction.
 12. Testing scheduled; indicate results and cancelations.
 13. Inspections scheduled; indicated results and cancelations.
 14. Change Orders received and implemented.
 15. Construction Change Directives received and implemented.
 16. Utility services connected and disconnected.
 17. Equipment or system tests and startups.
 18. Partial completions and occupancies.
 19. Substantial Completion certification.
- C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit as a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

END OF SECTION

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative, procedural, and other requirements that include:
1. Submittal Schedule.
 2. Submittal Administrative Requirements.
 3. Submittal Procedures.
 4. Types of Submittals.
 5. Delegated Design Services.
- B. Related Requirements:
1. Division 01 Section "Electronic Communication Protocols".
 2. Division 01 Section "Payment Procedures" for submitting Applications for Payment and the schedule of values.
 3. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including project construction schedule.
 4. Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 5. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 6. Division 01 Section "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is for the Contractor to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals.
1. The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and one of the following written authorizations:
 - a. The Architect has given written approval to the specific deviation as a minor change in the Work.

- b. A Change Order or Construction Change Directive has been issued authorizing the deviation.
- 2. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.
- D. Contract Start Date: The date of Commencement of the Work as established by the provisions of the Contract.
- E. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users can access files.
- F. Portable Document Format (PDF): An open standard file format used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 SUBMITTAL SCHEDULE

- A. Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
 - 1. Coordinate Submittal Schedule with list of subcontracts, the schedule of values, and construction schedule.
 - 2. Initial Submittal: Submit concurrently with submittal of the Startup Construction Schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 - 3. Final Submittal: Submit concurrently with the submittal of Contractor's Construction Schedule.
 - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
 - 4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal category: Action; informational.
 - d. Name of subcontractor and/or supplier.
 - e. Description of the Work covered.
 - f. Scheduled date for Architect's final release or approval.
 - g. Scheduled date of fabrication.
 - h. Scheduled dates for purchasing.
 - i. Scheduled dates for installation.
 - j. Progress Schedule construction activity description and number.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Comply with 01 31 26 - Electronic Communication Protocols regarding electronic submission requirements for submittals indicated in this Section.
- B. Transmit/post each submittal with Architect accepted form.
- C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
 5. All submittals requiring color and finish selections will not receive Architect's review action until all such submittals (e.g. material, color, finishes samples and other related requested information) have been received by the Architect.
 - a. Architect will assemble final color board(s) for Owner's approval of exterior and interior materials and color schemes prior to Architect's issuance of review action to Contractor.
- D. Processing Time: Allow time for submittal review, including time for resubmittals. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Single Reviewer: Allow 15 days for each review of each submittal, and each resubmittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Sequential Reviewers: Allow 21 days for each review of each submittal, and each resubmittal when sequential review of submittals by Architect's consultants, Owner, or other parties is required.
 3. Submittals Requiring Color Selection: Coordinate and provide timely submission of all submittals requiring color selection for the project's exterior and interior. Architect's review of such submittal will not be completed until all such submittals are received. The purpose is to promote a fully coordinated color/finish scheme for the overall project. Where color selection charts are allowable for Initial Selection, such materials shall be manufacturer's original printed material.
 4. In submittal log, provide review action column for each required reviewer such as Architect's consultants and other parties. Position the Architect's consultant review action columns in the log prior to the Architect's review action column, reflecting the sequence of reviews.
- E. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed/bookmarked file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 2. Name file with submittal number or other unique identifier, including revision identifier.
 - a. File name shall use abbreviated project identifier; hyphen and Specification Section number; hyphen and two-digit sequential number; hyphen and two-digit resubmittal sequential number. (e.g. MBMS-013300-01-00).
 3. Apply Contractor review action stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction

- Work, and coordination of information is in accordance with requirements of the Work, Contract Documents, and the Submittal requirements.
4. Provide means for insertion to permanently record review and approval markings of Contractor and action taken by Architect.
 5. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Architect, containing the following information:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name of Contractor.
 - e. Names of subcontractor, manufacturer, and supplier.
 - f. Category and type of submittal.
 - g. Submittal purpose and description.
 - h. Specification Section number and title.
 - i. Specification paragraph number or drawing designation and generic name for each of multiple items.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Related physical samples submitted directly.
 - m. Transmittal number, numbered consecutively.
 - n. Submittal and transmittal distribution record.
 - o. Other necessary identification.
 - p. Remarks.
 - F. Options: Identify options requiring selection by Architect.
 - G. Deviations: Conspicuously mark deviations, including minor variations and limitations, from the Contract Documents to include an itemization number. On an attached separate sheet, prepared on Contractor's letterhead, record each deviation itemization number and provide an explanation for each deviation and its impact on the Work and the Contract Documents.
 - H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
 - I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
 - J. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval action stamp from Contractor and Architect.

PART 2 PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 1. Upload/post electronic submittals as PDF electronic files directly to the Contractor provided internet-based submittal service specifically established for Project.

- a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
 2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Statement of compliance with specified referenced standards.
 - d. Testing by recognized testing agency.
 - e. Application of testing agency labels and seals.
 - f. Notation of coordination requirements.
 - g. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 5. Submit Product Data before or concurrent with Samples.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
- D. Samples: Submit actual physical Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - e. Specification paragraph number and generic name of each item.
 3. For projects requiring electronic submittals, provide (upload) corresponding electronic version of the physical submittal that is transmitted to Architect. This purpose is to

- provide continuity and completeness of the electronic recording and tracking of project submittals. The electronic upload is to include digital image files of all materials and data (including copy of the transmittal) as was transmitted to Architect. Include digital images of the physical items submitted and the identification information for record.
4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 5. Samples for Initial Selection: Submit manufacturer's color charts or samples consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected and retain one sample for record.
 - b. Finish Characteristics Options: Options include ranges of colors, textures, patterns, and other finish appearance characteristics. Contract sum is to include Architect or Owner selections from ranges indicated to be submitted.
 - 1) Full Range: Includes all finish characteristics available except Custom options. Full range includes Standard and Premium finish characteristics.
 - 2) Custom Options: All finish characteristics available and includes Custom finishes.
 6. Samples for Verification: Submit samples of the Architect's initial selection action for the Architect to make final selection action. Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: Partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned to Contractor.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
- F. Comply with requirements indicated in the Contract Documents regarding the following:
1. Coordination Drawing Submittals.
 2. Contractor's Construction Schedule.
 3. Application for Payment and Schedule of Values.
 4. Test and Inspection Reports and Schedule of Tests and Inspections Submittals.

5. Closeout Submittals and Maintenance Material Submittals.
 6. Maintenance Data.
 7. LEED and/or Other Sustainable Design Submittals.
- G. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- H. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- I. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- J. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- K. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- L. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- M. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- N. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- O. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
1. Name of evaluation organization.
 2. Date of evaluation.
 3. Time period when report is in effect.
 4. Product and manufacturers' names.
 5. Description of product.
 6. Test procedures and results.
 7. Limitations of use.
- P. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- Q. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

- R. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- S. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.
- T. Other Submittal Requirements: Include requirements indicated in specific Sections.

2.2 DELEGATED DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.
 - 2. The responsible design professional shall be licensed to provide the related design services in the State in which the project is located.

PART 3 EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. For submittals that are compliant with the contract requirements, mark with approval stamp before submitting to Architect.
 - 1. Exception: If project is being constructed by Construction Manager delivery, submit to Construction Manager. Construction Manager is to complete its review approval prior to submitting to Architect.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Division 01 - General Requirements regarding project closeout and maintenance material submittals.
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval indicating and certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

- A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action. The Architect will review and approve,

or take other appropriate action upon, submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the submittals shall not relieve the Contractor of compliance with the requirements of the Contract Documents. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

- B. Informational Submittals: Architect will review each submittal and will not return it; or, will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- C. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review. Submittals that are not marked as approved by the Contractor are incomplete submittals.
- D. Submittals not required by the Contract Documents may be returned by the Architect without action.
- E. Architect requires all exterior and interior material color samples to be submitted prior to final approval of color choices on the project. Exterior color samples will be reviewed and approved separately from interior color samples. Contractor must review all color sample submittal format and requirements to avoid resubmittals. Delays due to the failure to procure and submit color samples is the responsibility of the Contractor.

END OF SECTION

SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
1. Specific quality assurance and quality control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 2. Specified tests, inspections, and related actions do not limit Contractor's other quality assurance and quality control procedures that facilitate compliance with the Contract Document requirements.
 3. Requirements for Contractor to provide quality assurance and quality control services required by Architect, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Requirements:
1. Division 01 Section "Allowances" for testing and inspecting allowances.
 2. Divisions 03 through 33 Sections for specific test and inspection requirements.

1.3 REFERENCES

- A. Referenced Standards: For products or workmanship specified by reference to a document or documents not included in the Project Manual, comply with requirements of the standard, except when more rigid and/or stringent requirements are specified or are required by applicable codes. Such specified exceptions and applicable codes do not nullify requirement for compliance with other requirements within the referenced standard. Documents referred to are product or workmanship standards established by and published by Associations, Trades, Organizations, or other groups that establish consensus quality standards.
- B. Issuance Date of Reference Standards: Comply with reference standard by date of issue current on date of Contract Documents, except where specific date is established by applicable code. Issuance date is also known as edition date or version date.
1. Reapproved and Reapproval Dates: Comply with all the changes, amendments, modifications, and other such requirements established as part of the reapproved Reference Standard.
- C. When specified reference standard conflicts with Contract Documents, request clarification from Architect before proceeding.
- D. Neither contractual relationships, duties, or responsibilities of parties in Contract nor those of Architect shall be altered from Contract Documents by mention or inference otherwise in reference standard documents.

1.4 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum number (as indicated in individual specification sections) of previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
 - 1. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
 - 2. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes, doors, windows, millwork, casework, specialties, furnishings and equipment, and lighting.
- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- E. Product Testing: Tests and inspections that are performed by a Nationally Recognized Testing Laboratory (NRTL), a National Voluntary Laboratory Accreditation Program (NVLAP), or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Quality Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

- G. Quality Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.
- H. Source Quality Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- I. Field Quality Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- J. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.6 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality Control Plan: For quality assurance and quality control activities and responsibilities.
- B. Qualification Data: For Contractor's quality control personnel.
- C. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- D. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 1. Specification Section number and title.
 2. Entity responsible for performing tests and inspections.
 3. Description of test and inspection.
 4. Identification of applicable standards.
 5. Identification of test and inspection methods.
 6. Number of tests and inspections required.
 7. Time schedule or time span for tests and inspections.
 8. Requirements for obtaining samples.
 9. Unique characteristics of each quality control service.

1.7 CONTRACTOR'S QUALITY CONTROL PLAN

- A. Quality Control Plan, General: Submit quality control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality assurance and quality control responsibilities. Coordinate with Contractor's construction schedule.
- B. Quality Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality assurance and quality control procedures similar in nature and extent to those required for Project.
 1. Project quality control manager shall not have other Project responsibilities.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
 1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.

2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
 3. Owner-performed tests and inspections indicated in the Contract Documents, including tests and inspections indicated to be performed by the Commissioning Authority.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.8 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
1. Date of issue.
 2. Project title and number.
 3. Name, address, and telephone number of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of technical representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of factory-authorized service representative making report.
 2. Statement that equipment complies with requirements.

3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 4. Statement whether conditions, products, and installation will affect warranty.
 5. Other required items indicated in individual Specification Sections.
- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.9 TESTING AND INSPECTION SERVICES

- A. Owner will employ and pay for specified services of an independent firm to perform testing and inspection unless noted otherwise.
- B. The independent firm will perform tests, inspections and other services specified in individual specification sections and as required by Owner or Architect.
1. Laboratory: Authorized to operate at Project location.
 2. Laboratory Staff: Maintain full time registered Engineer on staff to review services.
 3. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to National Bureau of Standards or accepted values of natural physical constants.
- C. Testing, inspections, and source quality control may occur on or off project site. Perform off-site testing as required by Owner or Architect.
- D. Reports will be submitted by independent firm to Owner, Contractor and Architect in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents. Also, independent firm will submit reports to Authorities Having Jurisdiction (AHJ) when required by AHJ's.
1. Submit final report indicating correction of Work previously reported as non-compliant.
- E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
1. Notify Architect and independent firm 24 hours prior to expected time for operations requiring services.
 2. Make arrangements with independent firm and pay for additional samples and test required for Contractor's use.
- F. Testing and employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work in accordance with requirements on Contract Documents.
- G. Contractor is to monitor costs incurred for testing and inspections services by the Owner's hired third-party entity(s). When project Work is 75 percent complete, provide written notification to Owner and Architect indicating the following:
1. Percentage of project Work completed.
 2. Total amount Owner has incurred for testing and inspection services to date.
 3. List of additional testing and inspections Contractor expects to be required, along with estimated costs, for completion of the project Work.
- H. Re-testing or re-inspection required because of non-conformance to specified requirements shall be performed by same independent firm on instructions by Owner or Architect. Payment for re-testing or re-inspections will be charged to Contractor by deducting testing charges, and other costs directly related to re-testing or re-inspection, from Contractor's Contract Sum/Price.
- I. Agency Responsibilities:

1. Test samples of mixes submitted by Contractor.
 2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 3. Perform specified sampling and testing of products in accordance with specified standards.
 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 5. Promptly notify Owner, Architect and Contractor of observed irregularities or non-conformance of Work products.
 6. Perform additional tests required by Owner or Architect.
 7. Attend preconstruction meetings and progress meetings.
- J. Agency Reports: After each test or inspection, promptly submit reports by way of electronic or hard-copy transmission to Owner, Contractor and Architect. Also, submit reports to Authorities Having Jurisdiction (AHJ's) when required by AHJ's. Reports are to include the following:
1. Date issued.
 2. Project title and number.
 3. Name of inspector.
 4. Date and time of sampling or inspection.
 5. Identification of product, specifications section and other related Contract requirements.
 6. Location in Project.
 7. Type of inspection or test.
 8. Date of test.
 9. Results of test.
 10. Conformance with Contract Documents.
 11. When requested by Owner or Architect, provide a more detailed interpretation of test or inspection results.
- K. Limits On Testing Authority:
1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency or laboratory may not approve or accept any portion of the Work.
 3. Agency of laboratory may not assume duties of Contractor.
 4. Agency or laboratory has no authority to stop the Work.

1.10 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those

- performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections may require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. Labeling: Attach label from agency approved by authority having jurisdiction for products, assemblies, and systems required to be labeled by applicable code.
1. Label Information: Include manufacturer's or fabricator's identification, approved agency identification, and the following information, as applicable, on each label.
 - a. Model number.
 - b. Serial number.
 - c. Performance characteristics.
- K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
 2. Notify Architect seven (7) days in advance of dates and times when mockups will be constructed.
 3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.
 4. Demonstrate the proposed range of aesthetic effects and workmanship.
 5. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
 - a. Allow seven (7) days for initial review and each re-review of each mockup.
 6. Maintain approved mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 7. Where mockup has been accepted by Architect and is specified in product specification sections to be removed; remove mockup and clear area when directed to do so by Architect.

1.11 QUALITY CONTROL

- A. Owner Responsibilities: Where explicitly indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform quality control services including, but not limited to, tests and inspections.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Where not explicitly indicated as Owner's responsibility, Contractor will engage a qualified testing agency to perform quality control services including, but not limited to, tests and inspections. Also, Contractor is to perform additional quality control activities required to verify that the Work complies with requirements, whether specified or not.
1. Unless otherwise indicated, provide quality control services specified and those required by authorities having jurisdiction. Perform quality control services required of Contractor by authorities having jurisdiction, whether specified or not.
 2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 3. Notify testing agencies at least 48 hours in advance of time when Work that requires testing or inspecting will be performed.
 4. Where quality control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality control service.
 5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."
- D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- E. Re-testing/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- F. Testing Agency Responsibilities: Cooperate with Architect, Commissioning Authority and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Owner, Architect, Commissioning Authority, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.

4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform any duties of Contractor.
- G. Tolerances: Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
1. Comply with manufacturers' tolerances. When manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
 2. Adjust products to appropriate dimensions; position before securing products in place.
- H. Quality Control of Work and Installation: Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
1. Comply with manufacturers' instructions, including each step, in sequence.
 2. When manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
 3. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
 4. Perform Work by persons qualified to produce required and specified quality.
 5. Verify field measurements prior to fabrication of products.
 6. Verify field measurements are as required prior to beginning installation of Work.
 7. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
- I. Coordination: Coordinate sequence of activities to accommodate required quality assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
- J. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare and maintain a record of tests and inspections that includes the following:
1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Owner's and Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched

areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Cutting and patching requirements are to comply with the Contract Documents.

- B. Protect construction exposed by or for quality control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality control services.

END OF SECTION

SECTION 01 45 00.10
INSPECTION REQUIREMENTS

PART 1 GENERAL

Architect of Record: Thomas Hughes, AIA REFP, LEED AP – SfL+a Architects, PA
Structural Engineer of Record: Robert E. Lasater, Jr., P.E. – LHC Structural Engineers, P.C.
Building Official: Harnett County

This Statement of Inspections is submitted as a condition for permit issuance in accordance with the Special Inspection requirements of the 2018 North Carolina State Building Code. It includes a Schedule of Special Inspection Services applicable to this project. The name of the Inspector(s) and the identity of other approved agencies intended to be retained for conducting these inspections will be released by the owner following the bid opening.

The Inspector(s) shall keep records of all inspections and shall furnish inspection reports to the Owner, Structural Engineer, and Architect of Record. A copy of all reports shall be kept on site at the contractor's trailer. Discovered discrepancies shall be brought to the immediate attention of the Contractor for correction. If such discrepancies are not corrected, the discrepancies shall be brought to the attention of the Owner, Structural Engineer and Architect of Record. The Inspections program does not relieve the Contractor of his or her supervision or inspection responsibilities.

The Contractor is responsible for notifications to Inspector and/or other agencies as required at least two days in advance. The Contractor is responsible for all additional costs incurred by failure to meet requirements or pass any/all inspections and/or testing as required in this section.

Interim reports shall be submitted to the Owner, Structural Engineer and Architect of Record.

Interim Report Frequency: Monthly

A Final Report of Inspections documenting completion of all required Special Inspections and correction of any discrepancies should be submitted prior to issuance of a Certificate of Use and Occupancy.

Job Site safety and means and methods of construction are solely the responsibility of the Contractor.

1.1 Items Requiring NORTH CAROLINA STATE BUILDING CODE CHAPTER 17 Inspections/VERIFICATIONS

- A. 2018 North Carolina State Building Code required inspections include, but are not limited to, the following:
- 110.3.1 Footing or foundation inspection
 - 110.3.2 Concrete slab or under-floor inspection
 - 110.3.3 Lowest floor elevation
 - 110.3.4 Frame Inspections
 - 110.3.5 Lath or gypsum board inspection
 - 110.3.6 Fire-resistant penetrations

It is appropriate to take special note of the required energy efficiency compliance inspections. Ensuring compliance with ANSI/ASHRAE/IESNA Standard 90.1 – 2004 is a critical part of the inspection process and MUST be specifically addressed. The

American Society of Heating and Air Conditioning Engineers (ASHRAE) is the foremost technical society in the fields of heating, ventilation, air conditioning and refrigeration. ASHRAE Standard 90.1 is an ANSI approved national consensus standard co-sponsored by ASHRAE and the Illuminating Engineering Society of North America (IESNA). The Standard provides minimum energy efficiency requirements for the design and construction of new buildings and new construction in existing buildings. In particular, it applies to new buildings and their systems, building additions and their systems, and new systems and equipment in existing building.

The scope of the requirements of Standard 90.1 covers the design of the building envelope, the lighting systems, HVAC systems and other energy using equipment. For the OSF Approved Inspector, the 90.1 User's Manual is the best available source of information, worksheets and checklists for the purpose of ensuring compliance with Standard 90.1. These forms cannot be reproduced here due to the copyright restrictions. However, the 90.1 User's Manual can be obtained from the American Society of Heating and Air Conditioning Engineers, Incorporated, 1791 Tullie Circle, Atlanta, Georgia 30329. The telephone number is 404-636-8400. On the net they can be reached at ashrae.org.

Specifically, we refer you to the following in the Standard 90.1 User Manual:

1. Building Envelope Compliance Forms, page 5-71;
2. HVAC Compliance Forms, pages 6-79 through 6-80;
3. Service Water Heating Compliance Forms; page 7-17; and
4. Lighting Compliance Forms, page 9-34.

These forms MUST be submitted to OSF at the final review stage. The Chapter 1 inspector shall request these forms be provided at the initial pre-construction meeting. The design professional shall have them available for that meeting.

909.3 Special inspection and test requirements (smoke control systems)

- B. Mechanical Code: M107.1. Required inspections
1. Underground inspection shall be made after trenches or ditches are excavated and bedded, piping installed, and before backfill is put in place.
 2. Rough-in inspection shall be made after the roof, framing, fireblocking and bracing are in place and all ducting and other components to be concealed are complete, and prior to the installation of wall or ceiling membranes.
- C. Plumbing Code: P107.1 Required inspections and testing
1. Underground inspection shall be made after trenches or ditches are excavated and bedded, piping installed, and before any backfill is put in place.
 2. Rough-in inspection shall be made after the roof, framing, fireblocking, firestopping, draftstopping and bracing is in place and all sanitary, storm and water distribution piping is roughed-in and prior to the installation of wall or ceiling membranes.
- D. Electrical Code:
1. Underground inspection shall be made after trenches or ditches are excavated and bedded, conduit installed, and before backfill is placed.
 2. Rough-in inspection shall be made after the roof, framing, fireblocking and bracing are in place and other components to be concealed are complete, and prior to the installation of concealing construction.

- E. National Fire Alarm Code: Section 4.5:
1. The installing contractor shall furnish a written statement stating that the system has been installed in accordance with approved plans and tested in accordance with the manufacturer's published instructions and the appropriate NFPA requirements (Section 4.5.1.2).
 2. This shall be accompanied by the record of completion form (Figure 4.5.2.1) Verification of compliance of the completed installation shall be included in the responsibilities of the Chapter 1 inspector (Section 4.5.2.4).

1.2 ITEMS REQUIRING NORTH CAROLINA STATE BUILDING CODE, CHAPTER 17 SPECIAL INSPECTIONS

- A. 2018 North Carolina State Building Code Chapter 17 requires special inspections including the following items as defined by their respective sections as noted:

IT-1 SPECIAL CASES (Refer to NCBC Section 1705.1.1)

IT-2 STEEL CONSTRUCTION (Refer to Section 1705.2 and the Exception; Table 1705.2.3)

IT-3 CONCRETE CONSTRUCTION (Refer to NCBC Section & Table 1705.3; Ch. 19)

IT-4 MASONRY (Refer to NCBC Section 1705.4)

IT-5 WOOD (Refer to NCBC Section 1705.5)

IT-6 SOILS (Refer to NCBC Table 1705.6 & Section 1705.6)

IT-7 DRIVEN DEEP FOUNDATIONS (Refer to NCBC Section 1705.7)

IT 8 CAST-IN-PLACE DEEP FOUNDATIONS (Refer to NCBC Section 1705.8)

IT 9 HELICAL PILES (Refer to NCBC Sections 1705.9)

IT 10 FABRICATED ITEMS (Refer to NCBC Sections 1705.10 & 1704.2.5)

IT 11 WIND RESISTANCE (Refer to NCBC Sections 1705.11; 1705.11.1 – 1705.11.3; & 1609.3.1)

IT-12 SEISMIC RESISTANCE (Refer to NCBC Sections 1705.12)

IT 13 TESTING FOR SEISMIC RESISTANCE (Refer to Section 1705.13)

IT-14 SPRAYED FIRE-RESISTANT MATERIALS (Refer to NCBC Sections 1705.14)

IT 15 MASTIC AND INTUMESCENT FIRE-RESISTANT COATING 1705.15

IT-16 EXTERIOR INSULATION & FINISH SYSTEM (EIFS)

IT 17 FIRE-RESISTANT PENETRATIONS AND JOINTS (Refer to NCBC Sections 1705.17; 1705.17.1; & 1705.17.2)

IT-18 SMOKE CONTROL (Refer to NCBC Section 1705.18)**1.3 REPORTING SERVICES**

- A. It is the inspectors' responsibility to verify that the contractor conforms to this section of the code. Furthermore, it is vital to understand that mechanical, electrical and plumbing seismic and vibration analysis and inspections are required and must include the seismic protection for electrical raceways, and equipment; plumbing, piping and related equipment; and, seismic protection for mechanical systems.
- B. Testing, inspections and source quality control may occur on or off project site. Perform off-site testing as required by Architect or Owner.
- C. Reports will be submitted by independent firm to Architect, Contractor, and authority having jurisdiction, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
 - 1. Submit final report indicating correction of Work previously reported as non-compliant.
- D. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
 - 1. Notify Architect and independent firm 48 hours prior to expected time for operations requiring services.
 - 2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
- E. Testing and employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- F. Re-testing or re-inspection required because of non-conformance to specified requirements shall be performed by same independent firm on instructions by Architect. Payment for re-testing or re-inspection will be charged to Contractor by deducting testing charges from Contract Sum/Price.
- G. Agency Responsibilities:
 - 1. Test samples of mixes submitted by Contractor.
 - 2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 - 3. Perform specified sampling and testing of products in accordance with specified standards.
 - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 5. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
 - 6. Perform additional tests required by Architect.
 - 7. Attend preconstruction meetings and progress meetings.
- H. Agency Reports: After each test, promptly submit two copies of report to Architect, Contractor, and authority having jurisdiction. When requested by Architect, provide interpretation of test results. Include the following:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Name of inspector.
 - 4. Date and time of sampling or inspection.
 - 5. Identification of product and specifications section.
 - 6. Location in Project.

7. Type of inspection or test.
 8. Date of test.
 9. Results of tests.
 10. Conformance with Contract Documents.
- I. Limits On Testing Authority:
1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency or laboratory may not approve or accept any portion of the Work.
 3. Agency or laboratory may not assume duties of Contractor.
 4. Agency or laboratory has no authority to stop the Work.

1.4 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Architect 30 days in advance of required observations.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- D. Refer to Section 01 33 00 - Submittal Procedures, MANUFACTURERS' FIELD REPORTS article.

1.5 PRODUCTS

Not Used.

1.6 EXECUTION

Not Used.

SCHEDULE OF INSPECTION AND TESTING AGENCIES

This Statement of Special Inspections / Quality Assurance Plan includes the following building systems:

- | | |
|--|---|
| <input checked="" type="checkbox"/> Soils and Foundations | <input type="checkbox"/> Spray Fire Resistant Material |
| <input checked="" type="checkbox"/> Cast-in-Place Concrete | <input checked="" type="checkbox"/> Special Inspections for Wind Resistance |
| <input type="checkbox"/> Precast Concrete | <input type="checkbox"/> Exterior Insulation and Finish System |
| <input checked="" type="checkbox"/> Masonry | <input checked="" type="checkbox"/> Mechanical & Electrical Systems |
| <input checked="" type="checkbox"/> Structural Steel | <input checked="" type="checkbox"/> Architectural Systems |
| <input type="checkbox"/> Cold-Formed Steel Framing | <input checked="" type="checkbox"/> Seismic Requirements |
| <input checked="" type="checkbox"/> Retaining Walls Taller than 5' | <input type="checkbox"/> Other |
| <input type="checkbox"/> Deep Foundations | |

| Special Inspection Agencies | Firm | Address, Telephone, e-mail |
|----------------------------------|---|---|
| 1. Special Inspections | <i>SI</i> | <i>OWNER TO PROVIDE</i> |
| 2. Structural Engineer of Record | <i>LHC Structural Engineers Robert E. Lasater</i> | <i>5430 Wade Park Blvd, Suite 400 Raleigh, NC 27607 919.832.5587 blasater@bennett-pless.com</i> |
| 3. Testing Laboratory | <i>ITL</i> | <i>OWNER TO PROVIDE</i> |
| 6. Other | | |

Note: The inspectors and testing agencies shall be engaged by the Owner or the Owner’s Agent, and not by the Contractor or Subcontractor whose work is to be inspected or tested. Any conflict of interest must be disclosed to the Building Official, prior to commencing work.

QUALITY ASSURANCE PLAN**Quality Assurance for Seismic Resistance**

| | |
|-------------------------|----------|
| Seismic Design Category | <i>C</i> |
|-------------------------|----------|

Quality Assurance for Wind Requirements

| | |
|----------------------------------|----------------|
| Basic Wind Speed (3 second gust) | <i>125 mph</i> |
| Wind Exposure Category | <i>C</i> |

Statement of Responsibility

Each contractor responsible for the construction of a main wind- or seismic-force-resisting system, designated seismic system or a wind- or seismic-resisting component listed in the statement of special inspections shall submit a written statement of responsibility to the building official and the owner prior to the commencement of work on the system or component. The contractor's statement of responsibility shall contain the following:

- a. Acknowledgment of awareness of the special requirements contained in the statement of special inspections;
- b. Acknowledgment that control will be exercised to obtain conformance with the construction documents approved by the building official;
- c. Procedures for exercising control within the contractor's organization, the method and frequency of reporting and the distribution of the reports; and
- d. Identification and qualifications of the person(s) exercising such control and their position(s) in the organization.

SCHEDULE OF SPECIAL INSPECTIONS**Legend**

ITL - Inspections Testing
Laboratory

SER - Structural Engineer of
Record

SI - Special Inspections

IT-# - Inspection Type

C - Continuous Special
Inspections

P - Periodic Special
Inspections

IT-1 SPECIAL CASES (Refer to NCBC Section 1705.1.1)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|-------------------------------------|-------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Construction materials and systems that are alternatives to materials and systems prescribed by the 2012 NCBC. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.1.1, #1 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Unusual design applications of materials described in the 2012 NCBC. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.1.1, #2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Materials and systems required to be installed in accordance with additional manufacturer's instructions that prescribe requirements not contained in this code or in standards referenced by this code. | | | NCBC 1705.1.1, #3 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Special Events (as decided / required by Code Enforcement). | <input type="checkbox"/> | <input type="checkbox"/> | Local Authority Having Jurisdiction | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Retaining Walls. | <input type="checkbox"/> | <input type="checkbox"/> | | |

IT-2 STEEL CONSTRUCTION (Refer to Section 1705.2 and the Exception; Table 1705.2.3)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|-------------------------------------|--|--------------------------|-------------------------------------|---|---------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Structural Steel. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | AISC 360 | NCBC 1705.2.1 & Exception |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Cold-formed Steel Deck. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | SDI QA/QC | NCBC 1705.2.2 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Open-web Steel Joists and Joist Girders. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | | NCBC 1705.2.3 & Table |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1. Installation of open-web steel joists and joist girders. a. End connections - welding or bolted. | | <input checked="" type="checkbox"/> | SJI specifications listed in Section 2207.1 | |
| | | | b. Bridging - horizontal or diagonal. | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | i. Standard bridging. | | <input checked="" type="checkbox"/> | SJI specifications listed in Section 2207.1 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | ii. Bridging that differs from the SJI specifications listed in Section 2207.1 | | <input checked="" type="checkbox"/> | | Uplift Bridging |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Cold-formed steel trusses spanning 60 feet or greater | | <input type="checkbox"/> | | NCBC 1705.2.4 |

IT-3 CONCRETE CONSTRUCTION (Refer to NCBC Section & Table 1705.3; Ch. 19)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|-------------------------------------|---|--------------------------|-------------------------------------|--|-------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1. Inspect reinforcement, including pre-stressing tendons and verify placement. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | ACI 318 Ch 20, 25.2, 25.3, 26.6.1 – 26.76.3; & NCBC 1908.4 | |

| | | | | | | | |
|--------------------------|--------------------------|-------------------------------------|---|-------------------------------------|-------------------------------------|---|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 2. Reinforcing Bar welding: a. Verify weldability of reinforcing bars other than ASTM A706. b. Inspect single-pass fillet welds, maximum 5/16". c. Inspect all other welds. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | AWS D1.4; ACI 318:26.6.4 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 3. Inspect anchors cast in concrete. | | <input checked="" type="checkbox"/> | ACI 318: 17.8.2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 4. Inspect anchors post-installed in hardened concrete members. a. Adhesive anchors installed in horizontally or upwardly inclined orientations to resist sustained tension loads. b. Mechanical anchors and adhesive anchors not defined in 4.a. | <input checked="" type="checkbox"/> | | ACI 318: 17.8.2.4 ACI 318: 17.8.2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 5. Verify use of required design mix. | | <input checked="" type="checkbox"/> | ACI 318: Ch. 19, 26.4.3, 26.4.4, NCBC 1904.1, 1904.2. 1908.2, 1908.3 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 6. Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete. | <input checked="" type="checkbox"/> | | ASTM C 172; ASTM C 31; ACI 318: 26.4, 26.12 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 7. Inspect concrete and shotcrete placement for proper application techniques. | <input type="checkbox"/> | | ACI 318: 26.5, NCBC 1908.6, 1908.7. 1908.8 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 8. Verify maintenance of specified curing temperature and techniques | | <input checked="" type="checkbox"/> | ACI 318: 26.5.3-26.5.5 NCBC 1908.9 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 9. Inspect of pre-stressed concrete for: a. Application of pre-stressing forces; and b. Grouting of bonded pre-stressing tendons. | <input type="checkbox"/> | <input type="checkbox"/> | ACI 318: 26.10 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 10. Inspect erection of precast concrete members | | <input type="checkbox"/> | ACI 318: Ch. 26.8 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 11. Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs. | | <input type="checkbox"/> | ACI 318: 26.11.2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 12. Inspect formwork for shape, location and dimensions of the concrete members being formed. | | <input checked="" type="checkbox"/> | ACI 318:26.11.1.2(b) | |

IT-4 MASONRY (Refer to NCBC Section 1705.4)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|-------------------------------------|---|-------------------------------------|-------------------------------------|---|----------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Masonry Construction. | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | TMS 402/ ACI 530/ ASCE 5 and TMS 602/ACI 530.1/ASCE 6, | See NCBC 1705.4 Exceptions |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Empirically designed masonry (per 2109), glass unit masonry (per 2110) or masonry veneer (per Ch 14) in Risk Category IV. | <input type="checkbox"/> | <input type="checkbox"/> | TMS 402/ ACI 530/ ASCE 5, Level B Quality Assurance | |

IT-5 WOOD (Refer to NCBC Section 1705.5)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|------------------------|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Prefabricated wood structural elements and assemblies to be in accordance with the requirements set forth in NCBC Section 1704.2.5. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1704.2.5 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | High Load Diaphragms. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.5.1 & 1704.2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Temp & permanent bracing on metal-plate-connected trusses spanning ≥ 60 ft. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.5.2 | |

IT-6 SOILS (Refer to NCBC Table 1705.6 & Section 1705.6)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|-------------------------------------|--------------------------|-------------------------------------|--|-------------------------------------|-------------------------------------|---|---------------------------|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1. Verify materials below shallow foundation are adequate to achieve the design bearing capacity. | | <input checked="" type="checkbox"/> | NCBC 1705.6; geotechnical report & construction documents from RDPIRC | See NCBC 1705.6 exception |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 2. Verify excavations are extended to proper depth and have reached proper material. | | <input checked="" type="checkbox"/> | NCBC 1705.6; geotechnical report & construction documents from RDPIRC | |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 3. Perform classification and testing of compacted fill materials. | | <input checked="" type="checkbox"/> | NCBC 1705.6; geotechnical report & construction documents from RDPIRC | |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill. | <input checked="" type="checkbox"/> | | NCBC 1705.6; geotechnical report & construction documents from RDPIRC | |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 5. Prior to placement of compacted fill, inspect sub-grade and verify that site has been prepared properly. | | <input checked="" type="checkbox"/> | NCBC 1705.6; geotechnical report & construction documents from RDPIRC | |

IT-7 DRIVEN DEEP FOUNDATIONS (Refer to NCBC Section 1705.7)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|--|--------------------------|---|---|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. Verify element materials sizes and lengths comply with the requirements. | <input type="checkbox"/> | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. Determine capacities of test elements and conduct additional load tests as required. | <input type="checkbox"/> | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. Inspect driving operations and maintain complete and accurate records for each element. | <input type="checkbox"/> | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |

| | | | | | | | |
|--------------------------|--------------------------|--------------------------|---|--------------------------|--|---|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4. Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and document any damage to foundation element. | <input type="checkbox"/> | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 5. For steel elements, perform additional inspections in accordance with Section 1705.2. | | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 6. For concrete elements and concrete-filled elements, perform tests and additional special inspections in accordance with Section 1705.2. | | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 7. For specialty elements, perform additional inspections as determined by the registered design professional in responsible charge. | | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |

IT 8 CAST-IN-PLACE DEEP FOUNDATIONS (Refer to NCBC Section 1705.8)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|---|--------------------------|---|---|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. Inspect drilling operations and maintain complete and accurate records for each element. | <input type="checkbox"/> | | NCBC 1705.8; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end-bearing strata capacity. Record concrete or grout volumes. | <input type="checkbox"/> | | NCBC 1705.8; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. For concrete elements, perform tests and additional special inspections in accordance with section 1705.3. | <input type="checkbox"/> | | NCBC Section 1705.8; geotechnical report & construction documents from RDPIRC | |

IT 9 HELICAL PILES (Refer to NCBC Sections 1705.9)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|---|--------------------------|---|---|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Inspect during installation. Record: 1. Installation equipment used. 2. Pile dimensions. 3. Tip elevations. 4. Final depth. 5. Final installation torque. 6. Other pertinent installation data as req'd by RDPIRC. | <input type="checkbox"/> | | NCBC Section 1705.9; geotechnical report & construction documents from RDPIRC | |

IT 10 FABRICATED ITEMS (Refer to NCBC Sections 1705.10 & 1704.2.5)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|-----|-----|----|-----------------|---|---|----------|------------------|
|-----|-----|----|-----------------|---|---|----------|------------------|

| | | | | | | | |
|--------------------------|--------------------------|-------------------------------------|---|--------------------------|-------------------------------------|-----------------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Inspect during fabrication. 1. Structural, 2. Load-bearing or 3. Lateral load-resisting members or assemblies. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | NCBC Section 1705.10 or 1704.2.5. | SI are not required if the fabricator meets 1704.2.5, #1 or #2; or if the fabricator is approved per 1704.2.5.1 |
|--------------------------|--------------------------|-------------------------------------|---|--------------------------|-------------------------------------|-----------------------------------|---|

IT 11 WIND RESISTANCE (Refer to NCBC Sections 1705.11; 1705.11.1 – 1705.11.3; & 1609.3.1)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|-------------------------------------|--|--------------------------|--|----------------|--|
| | | | Only required in the following instances: 1. In wind Exposure Category B, where <i>Vasd</i> is \geq 120 MPH (per 1609.3.1), or 2. In wind Exposure Category C or D, where <i>Vasd</i> is \geq 110 MPH (per 1609.3.1). | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Structural Wood. 1. Gluing elements of the main wind force-resisting system. 2. Nailing, bolting, anchoring, etc. of elements of the main wind force-resisting system. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.11.1 | Not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other elements of the MWR system, where the fastener spacing of the sheathing is > 4" o.c. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Cold-formed steel light frame construction. 1. Welding operations of elements of the MWRS 2. Screw attachment, bolting, anchoring and other fastening of elements of the MWRS including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs | | <input type="checkbox"/> <input checked="" type="checkbox"/> | NCBC 1705.11.2 | Not required for shear walls and diaphragms, where either of the following applies: #1. Sheathing is gypsum bd or fiberboard; #2. Sheathing is wood structural panel or steel sheets on one side of the shear wall, panel or diaphragm assembly and the fastener spacing of the sheathing is > 4" o.c. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Wind-resisting components 1. Roof covering, roof deck and roof framing connections 2. Exterior wall covering and wall connections to roof and floor diaphragms and framing | | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> | NCBC 1705.11.3 | |

IT-12 SEISMIC RESISTANCE (Refer to NCBC Sections 1705.12)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|-------------------------------|---|
| | | | SI in sections 1705.12.1 – 1705.12.9 are not required for structures designed and constructed in accordance with one of the following: 1. Structure is light-frame construction, S_{DS} is not greater than 0.5; and building height is not greater than 35'. 2. SFRS of the structure is reinforced masonry or reinforced concrete, S_{DS} is not greater than 0.5; and building height is not greater than 25'. | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Structural steel in the seismic force-resisting systems of buildings and structures assigned to SDC B, C, D, E or F. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.12.1.1; AISC 341 | Not required in the SFRS of buildings or structures in SDC B or C not specifically detailed for seismic resistance, with response modification coefficient, $R, \leq 3$ |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Structural steel elements in the seismic force-resisting systems of buildings or structures assigned to SDC B, C, D, E or F other than those covered in Section 1705.12.1.1, including struts, chords and foundation elements. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.12.1.2; AISC 341 | Not required in the SFRS of buildings and structures in SDC B or C with response modification coefficient, $R, \leq 3$ |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Structural Wood in the seismic force-resisting systems of structures assigned to SDC C, D, E or F. | <input type="checkbox"/> | | NCBC 1705.12.2 | These SI are not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other elements of the SFRS when the fastener spacing of the sheathing is > 4" o.c. Includes wood shear walls, wood diaphragms, drag struts braces, panels & hold-down's. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. Field gluing operations of elements of seismic force-resisting system 2. Nailing, bolting, anchoring and other fastening of elements of the seismic force-resisting system | | <input type="checkbox"/> | | |

| | | | | | | | |
|--------------------------|--------------------------|-------------------------------------|--|--------------------------|-------------------------------------|------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <p>Cold-formed steel light frame construction in the SFRS of structures in SDC C, D, E, or F.</p> <ol style="list-style-type: none"> 1. Welding operations of elements of the SFRS 2. Screw attachment, bolting, anchoring, and other fastening of elements of the SFRS including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.12.3 | <p>Not required for shear walls and diaphragms, including screw installation, bolting, anchoring and other fastening to components of the SFRS where either of the following applies: #1. Sheathing is gypsum bd or fiberboard; #2. Sheathing is wood structural panel or steel sheets on one side of the shear wall, panel or diaphragm assembly and the fastener spacing of the sheathing is > 4”o.c</p> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>Designated seismic systems for structures assigned to Seismic Design Category C, D, E or F. Verify the label, anchorage and mounting conform to the certificate of compliance</p> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | ASCE 7, Section 13.2.2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <p>Architectural components – erection and fastening of exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer in structures assigned to Seismic Design Category D, E or F</p> | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.12.5 | <p>Not required for: #1. Exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer ≤ 30’ in height above grade or walking surface. #2. Exterior cladding and interior and exterior veneer weighing 5 psf or less. #3. Interior nonbearing walls weighing 15 psf or less.</p> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <p>Access floors - anchorage in structures assigned to Seismic Design Category D, E or F.</p> | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.12.5.1 | |

| | | | | | | |
|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Plumbing, Mechanical and electrical components: Seismic Design Categories C, D, E or F: 1. Anchorage of electrical equipment for emergency and standby power. 2. Installation and anchorage of piping systems for Hazardous materials and associated mechanical units. 3. Installation and anchorage of ductwork for Hazardous materials. 4. Installation and anchorage of vibration isolation systems where the required clearance is $\leq 1/4"$ between the equipment support frame and restraint. | <input type="checkbox"/> | NCBC 1705.12.6, #1 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | NCBC 1705.12.6, #3 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | NCBC 1705.12.6, #4 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | NCBC 1705.12.6, #5 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Seismic Design Categories E or F: 1. Anchorage of other electrical equipment. | <input type="checkbox"/> | NCBC 1705.12.6, #2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Storage racks $\geq 8'$ in height in Seismic Design Categories D, E or F. | <input type="checkbox"/> | NCBC 1705.12.7 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Seismic isolation systems in seismically isolated structures assigned to SDC B, C, D, E, or F. | <input type="checkbox"/> | NCBC 1705.12.8 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Installation of cold-formed steel special bolted moment frames in the SFRS of structures assigned to SDC D, E, or F. | <input type="checkbox"/> | NCBC 1705.12.9 | |

IT 13 TESTING FOR SEISMIC RESISTANCE (Refer to Section 1705.13)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Structural Steel. 1. Nondestructive testing for seismic resistance for SFRS for buildings assigned to SDC B, C, D, E or F. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.13.1 NCBC 1705.13.1.1 or AISC 341 | Exception: SDC B or C buildings with a response modification coefficient ≤ 3 . |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Structural Steel Elements. 1. Nondestructive testing for seismic resistance of structural steel elements in the SFRS of buildings and structures assigned to SDC B, C, D, E or F if not covered in 1705.13.1.1. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.13.1.2 AISC 341 | Exception: SDC B or C buildings with a response modification coefficient ≤ 3 . |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Nonstructural Components for structures assigned to SDC B, C, D, E or F where the requirements of Section 13.2.1 of ASCE 7 for nonstructural components, supports or attachments are met by seismic qualification as specified in Item 2 therein, the RDPIRC shall specify on the approved construction documents the requirements for seismic qualification by analysis, testing or experience data. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.13.2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Designated seismic systems for structures assigned to SDC C, D, E or F that are subject to the requirements of Section 13.2.2 of ASCE 7 for certification, the RDPIRC shall specify on the approved construction documents the requirements to be met by analysis, testing or experience data. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.13.3 | |

| | | | | | | | |
|--------------------------|--------------------------|--------------------------|--|--|--|---|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Seismic Isolation Systems in Seismically isolated structures assigned to SDC B, C, D, E, or F. | | | NCBC 1705.13.4; ASCE 7, section 17.8 | |
|--------------------------|--------------------------|--------------------------|--|--|--|---|--|

IT-14 SPRAYED FIRE-RESISTANT MATERIALS (Refer to NCBC Sections 1705.14)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|---------------------------------|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sprayed fire-resistant materials. | | | NCBC 1705.14.4.2 & ASTM E605 | 4/1000sf |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. Floor, roof and wall assemblies | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.3 | 4 @12"x12" |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. Cellular Decks | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.4 | 4 @12"x12" |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. Fluted Decks | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.5 | 25% |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4. Structural members | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.6 | 9@12" |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 5. Beams and Girders | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.7 | 7@12" |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 6. Joists and Trusses | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.8 | 12@12" |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 7. Wide-flanged columns | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.9 | 4@12" |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 8. Hollow structural section and pipe columns | <input type="checkbox"/> | <input type="checkbox"/> | | |

IT 15 MASTIC AND INTUMESCENT FIRE-RESISTANT COATING 1705.15

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|----------------------------|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Mastic and Intumescent fire-resistant coating applied to structural elements and decks. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.15; AWCI 12-B | |

IT-16 EXTERIOR INSULATION & FINISH SYSTEM (EIFS)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | EIFS application. | <input type="checkbox"/> | <input type="checkbox"/> | | Not required for: 1. EIFS applications installed over a water-resistive barrier that drains to the exterior. 2. EIFS applications installed over masonry or concrete walls. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Water-resistive barrier coating when installed over a sheathing substrate. | <input type="checkbox"/> | <input type="checkbox"/> | ASTM E2570 | |

IT 17 FIRE-RESISTANT PENETRATIONS AND JOINTS (Refer to NCBC Sections 1705.17; 1705.17.1; & 1705.17.2)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|-----|-----|----|-----------------|---|---|----------|------------------|
|-----|-----|----|-----------------|---|---|----------|------------------|

| | | | | | | |
|-------------------------------------|--------------------------|--|--|--------------------------|-------------------------------------|--|
| | | Applies to all new high-rise buildings and all new buildings in Risk Category III or IV. Additions, Changes of Use, NCEBC Ch 14 evaluated buildings and Level 3 Alterations within existing high-rises and / or Risk Category III or IV buildings will also require these special inspections. | | | | |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>Inspection of tested and listed penetration firestop systems:</p> <p>1. Through penetrations:</p> <p>a. Verify materials before installation.</p> <p>b. Verify against design (Cutsheet or EJ).</p> <p>c. For each type of firestop:</p> <p>i. Witness 10% of installations, or</p> <p>ii. Destructive testing on 2% of installations.</p> <p>d. Verify all firestops are installed.</p> <p>2. Membrane penetrations:</p> <p>a. Verify materials before installation.</p> <p>b. Verify against design (Cutsheet or EJ).</p> <p>c. For each type of firestop:</p> <p>i. Witness 10% of installations or</p> <p>ii. Destructive testing on 2% of installations.</p> <p>d. Verify all firestops are installed.</p> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>NCBC 1705.17.1; ASTM E2174-10ae1</p> <p>10% of installations per floor or per area. Area = 1 sf – 10,000 sf.</p> <p>2% of installations per floor or per area. Area = 1 sf – 10,000 sf</p> <p>10% of installations per floor or per area. Area = 1 sf – 10,000 sf</p> <p>2% of installations per floor or per area. Area = 1 sf – 10,000 sf</p> |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>Installation of tested and listed fire-resistant joint systems:</p> <p>1. Verify materials before installation.</p> <p>2. Verify against design (cutsheet or EJ) .</p> <p>3. For each type of joint system:</p> <p>a. Witness installation of 5% min of total lineal feet of joint system being installed, or</p> <p>b. Destructive testing, disassembly or visual inspection at the rate of at least 1 sample for every 500 lineal feet of the joint system.</p> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>NCBC 1705.17.2; ASTM E2393-10a</p> |

IT-18 SMOKE CONTROL (Refer to NCBC Section 1705.18)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Inspection of smoke control system. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.18 | |

FINAL REPORT OF SPECIAL INSPECTIONS

Project: *Highland Elementary School Addition & Renovation*

Location: *Sanford, NC*

Owner: *Harnett County Schools*

Design Professional in Responsible Charge: *Thomas Hughes, AIA, LEED AP*

To the best of my information, knowledge and belief, the Special Inspections required for this project, and itemized in the State of Special Inspections submitted for permit, have been performed and all discovered discrepancies have been reported and resolved other than the following:

Comments:

(Attach continuation sheets if required to complete the description of corrections).

Interim reports submitted prior to this final report form a basis for and are to be considered an integral part of this final report.

Respectfully submitted,
Special Inspector

Licensed Professional Seal

Signature

Date

AGENTS FINAL REPORT OF SPECIAL INSPECTIONS

AGENTS FINAL REPORT

Project: *Highland Elementary School Addition & Renovation*

Location: *Sanford, NC*

Owner: *Harnett County Schools*

Design Professional in Responsible Charge: *Thomas Hughes, AIA, LEED AP*

To the best of my information, knowledge and belief, the Special Inspections or testing required for this project, and designated for this Agent in the *Statement of Special Inspections* submitted for permit, have been performed and all discovered discrepancies have been reported and resolved other than the following:

Comments:

(Attach continuation sheets if required to complete the description of corrections).

Interim reports submitted prior to this final report form a basis for and are to be considered an integral part of this final report.

Respectfully submitted,

Agent of the Special Inspector

Licensed Professional Seal

Signature

Date

END OF SECTION

SECTION 01 45 00.20
INSPECTION REQUIREMENTS

PART 1 GENERAL

Architect of Record: Thomas Hughes, AIA REFP, LEED AP – SfL+a Architects, PA
Structural Engineer of Record: Robert E. Lasater, Jr., P.E. – LHC Structural Engineers, P.C.
Building Official: Harnett County

This Statement of Inspections is submitted as a condition for permit issuance in accordance with the Special Inspection requirements of the 2018 North Carolina State Building Code. It includes a Schedule of Special Inspection Services applicable to this project. The name of the Inspector(s) and the identity of other approved agencies intended to be retained for conducting these inspections will be released by the owner following the bid opening.

The Inspector(s) shall keep records of all inspections and shall furnish inspection reports to the Owner, Structural Engineer, and Architect of Record. A copy of all reports shall be kept on site at the contractor's trailer. Discovered discrepancies shall be brought to the immediate attention of the Contractor for correction. If such discrepancies are not corrected, the discrepancies shall be brought to the attention of the Owner, Structural Engineer and Architect of Record. The Inspections program does not relieve the Contractor of his or her supervision or inspection responsibilities.

The Contractor is responsible for notifications to Inspector and/or other agencies as required at least two days in advance. The Contractor is responsible for all additional costs incurred by failure to meet requirements or pass any/all inspections and/or testing as required in this section.

Interim reports shall be submitted to the Owner, Structural Engineer and Architect of Record.

Interim Report Frequency: Monthly

A Final Report of Inspections documenting completion of all required Special Inspections and correction of any discrepancies should be submitted prior to issuance of a Certificate of Use and Occupancy.

Job Site safety and means and methods of construction are solely the responsibility of the Contractor.

1.1 Items Requiring 2018 NCSBC CHAPTER 17 Inspections/VERIFICATIONS

- A. 2018 North Carolina State Building Code required inspections include, but are not limited to, the following:
- 110.3.1 Footing or foundation inspection
 - 110.3.2 Concrete slab or under-floor inspection
 - 110.3.3 Lowest floor elevation
 - 110.3.4 Frame Inspections
 - 110.3.5 Lath or gypsum board inspection
 - 110.3.6 Fire-resistant penetrations

It is appropriate to take special note of the required energy efficiency compliance inspections. Ensuring compliance with ANSI/ASHRAE/IESNA Standard 90.1 – 2004 is a critical part of the inspection process and MUST be specifically addressed. The American Society of Heating and Air Conditioning Engineers (ASHRAE) is the foremost

technical society in the fields of heating, ventilation, air conditioning and refrigeration. ASHRAE Standard 90.1 is an ANSI approved national consensus standard co-sponsored by ASHRAE and the Illuminating Engineering Society of North America (IESNA). The Standard provides minimum energy efficiency requirements for the design and construction of new buildings and new construction in existing buildings. In particular, it applies to new buildings and their systems, building additions and their systems, and new systems and equipment in existing building.

The scope of the requirements of Standard 90.1 covers the design of the building envelope, the lighting systems, HVAC systems and other energy using equipment. For the OSF Approved Inspector, the 90.1 User's Manual is the best available source of information, worksheets and checklists for the purpose of ensuring compliance with Standard 90.1. These forms cannot be reproduced here due to the copyright restrictions. However, the 90.1 User's Manual can be obtained from the American Society of Heating and Air Conditioning Engineers, Incorporated, 1791 Tullie Circle, Atlanta, Georgia 30329. The telephone number is 404-636-8400. On the net they can be reached at ashrae.org.

Specifically, we refer you to the following in the Standard 90.1 User Manual:

1. Building Envelope Compliance Forms, page 5-71;
2. HVAC Compliance Forms, pages 6-79 through 6-80;
3. Service Water Heating Compliance Forms; page 7-17; and
4. Lighting Compliance Forms, page 9-34.

These forms MUST be submitted to OSF at the final review stage. The Chapter 1 inspector shall request these forms be provided at the initial pre-construction meeting. The design professional shall have them available for that meeting.

909.3 Special inspection and test requirements (smoke control systems)

- B. Mechanical Code: M107.1. Required inspections
1. Underground inspection shall be made after trenches or ditches are excavated and bedded, piping installed, and before backfill is put in place.
 2. Rough-in inspection shall be made after the roof, framing, fireblocking and bracing are in place and all ducting and other components to be concealed are complete, and prior to the installation of wall or ceiling membranes.
- C. Plumbing Code: P107.1 Required inspections and testing
1. Underground inspection shall be made after trenches or ditches are excavated and bedded, piping installed, and before any backfill is put in place.
 2. Rough-in inspection shall be made after the roof, framing, fireblocking, firestopping, draftstopping and bracing is in place and all sanitary, storm and water distribution piping is roughed-in and prior to the installation of wall or ceiling membranes.
- D. Electrical Code:
1. Underground inspection shall be made after trenches or ditches are excavated and bedded, conduit installed, and before backfill is placed.
 2. Rough-in inspection shall be made after the roof, framing, fireblocking and bracing are in place and other components to be concealed are complete, and prior to the installation of concealing construction.
- E. National Fire Alarm Code: Section 4.5:

1. The installing contractor shall furnish a written statement stating that the system has been installed in accordance with approved plans and tested in accordance with the manufacturer's published instructions and the appropriate NFPA requirements (Section 4.5.1.2).
2. This shall be accompanied by the record of completion form (Figure 4.5.2.1) Verification of compliance of the completed installation shall be included in the responsibilities of the Chapter 1 inspector (Section 4.5.2.4).

1.2 ITEMS REQUIRING NORTH CAROLINA STATE BUILDING CODE, CHAPTER 17 SPECIAL INSPECTIONS

- A. 2018 North Carolina State Building Code Chapter 17 requires special inspections including the following items as defined by their respective sections as noted:

IT-1 SPECIAL CASES (Refer to NCBC Section 1705.1.1)

IT-2 STEEL CONSTRUCTION (Refer to Section 1705.2 and the Exception; Table 1705.2.3)

IT-3 CONCRETE CONSTRUCTION (Refer to NCBC Section & Table 1705.3; Ch. 19)

IT-4 MASONRY (Refer to NCBC Section 1705.4)

IT-5 WOOD (Refer to NCBC Section 1705.5)

IT-6 SOILS (Refer to NCBC Table 1705.6 & Section 1705.6)

IT-7 DRIVEN DEEP FOUNDATIONS (Refer to NCBC Section 1705.7)

IT 8 CAST-IN-PLACE DEEP FOUNDATIONS (Refer to NCBC Section 1705.8)

IT 9 HELICAL PILES (Refer to NCBC Sections 1705.9)

IT 10 FABRICATED ITEMS (Refer to NCBC Sections 1705.10 & 1704.2.5)

IT 11 WIND RESISTANCE (Refer to NCBC Sections 1705.11; 1705.11.1 – 1705.11.3; & 1609.3.1)

IT-12 SEISMIC RESISTANCE (Refer to NCBC Sections 1705.12)

IT 13 TESTING FOR SEISMIC RESISTANCE (Refer to Section 1705.13)

IT-14 SPRAYED FIRE-RESISTANT MATERIALS (Refer to NCBC Sections 1705.14)

IT 15 MASTIC AND INTUMESCENT FIRE-RESISTANT COATING 1705.15

IT-16 EXTERIOR INSULATION & FINISH SYSTEM (EIFS)

IT 17 FIRE-RESISTANT PENETRATIONS AND JOINTS (Refer to NCBC Sections 1705.17; 1705.17.1; & 1705.17.2)

IT-18 SMOKE CONTROL (Refer to NCBC Section 1705.18)**1.3 REPORTING SERVICES**

- A. It is the inspectors' responsibility to verify that the contractor conforms to this section of the code. Furthermore, it is vital to understand that mechanical, electrical and plumbing seismic and vibration analysis and inspections are required and must include the seismic protection for electrical raceways, and equipment; plumbing, piping and related equipment; and, seismic protection for mechanical systems.
- B. Testing, inspections and source quality control may occur on or off project site. Perform off-site testing as required by Architect or Owner.
- C. Reports will be submitted by independent firm to Architect, Contractor, and authority having jurisdiction, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
 - 1. Submit final report indicating correction of Work previously reported as non-compliant.
- D. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
 - 1. Notify Architect and independent firm 48 hours prior to expected time for operations requiring services.
 - 2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
- E. Testing and employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- F. Re-testing or re-inspection required because of non-conformance to specified requirements shall be performed by same independent firm on instructions by Architect. Payment for re-testing or re-inspection will be charged to Contractor by deducting testing charges from Contract Sum/Price.
- G. Agency Responsibilities:
 - 1. Test samples of mixes submitted by Contractor.
 - 2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 - 3. Perform specified sampling and testing of products in accordance with specified standards.
 - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 5. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
 - 6. Perform additional tests required by Architect.
 - 7. Attend preconstruction meetings and progress meetings.
- H. Agency Reports: After each test, promptly submit two copies of report to Architect, Contractor, and authority having jurisdiction. When requested by Architect, provide interpretation of test results. Include the following:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Name of inspector.
 - 4. Date and time of sampling or inspection.
 - 5. Identification of product and specifications section.
 - 6. Location in Project.
 - 7. Type of inspection or test.

8. Date of test.
 9. Results of tests.
 10. Conformance with Contract Documents.
- I. Limits On Testing Authority:
1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency or laboratory may not approve or accept any portion of the Work.
 3. Agency or laboratory may not assume duties of Contractor.
 4. Agency or laboratory has no authority to stop the Work.

1.4 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Architect 30 days in advance of required observations.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- D. Refer to Section 01 33 00 - Submittal Procedures, MANUFACTURERS' FIELD REPORTS article.

1.5 PRODUCTS

Not Used.

1.6 EXECUTION

Not Used.

SCHEDULE OF INSPECTION AND TESTING AGENCIES

This Statement of Special Inspections / Quality Assurance Plan includes the following building systems:

- | | |
|--|---|
| <input checked="" type="checkbox"/> Soils and Foundations | <input type="checkbox"/> Spray Fire Resistant Material |
| <input checked="" type="checkbox"/> Cast-in-Place Concrete | <input checked="" type="checkbox"/> Special Inspections for Wind Resistance |
| <input type="checkbox"/> Precast Concrete | <input type="checkbox"/> Exterior Insulation and Finish System |
| <input checked="" type="checkbox"/> Masonry | <input checked="" type="checkbox"/> Mechanical & Electrical Systems |
| <input checked="" type="checkbox"/> Structural Steel | <input checked="" type="checkbox"/> Architectural Systems |
| <input type="checkbox"/> Cold-Formed Steel Framing | <input checked="" type="checkbox"/> Seismic Requirements |
| <input checked="" type="checkbox"/> Retaining Walls Taller than 5' | <input type="checkbox"/> Other |
| <input type="checkbox"/> Deep Foundations | |

| Special Inspection Agencies | Firm | Address, Telephone, e-mail |
|----------------------------------|---|---|
| 1. Special Inspections | <i>SI</i> | <i>OWNER TO PROVIDE</i> |
| 2. Structural Engineer of Record | <i>LHC Structural Engineers Robert E. Lasater</i> | <i>5430 Wade Park Blvd, Suite 400 Raleigh, NC 27607 919.832.5587 blasater@bennett-pless.com</i> |
| 3. Testing Laboratory | <i>ITL</i> | <i>OWNER TO PROVIDE</i> |
| 6. Other | | |

Note: The inspectors and testing agencies shall be engaged by the Owner or the Owner's Agent, and not by the Contractor or Subcontractor whose work is to be inspected or tested. Any conflict of interest must be disclosed to the Building Official, prior to commencing work.

QUALITY ASSURANCE PLAN**Quality Assurance for Seismic Resistance**

| | |
|-------------------------|----------|
| Seismic Design Category | <i>B</i> |
|-------------------------|----------|

Quality Assurance for Wind Requirements

| | |
|----------------------------------|----------------|
| Basic Wind Speed (3 second gust) | <i>126 mph</i> |
| Wind Exposure Category | <i>C</i> |

Statement of Responsibility

Each contractor responsible for the construction of a main wind- or seismic-force-resisting system, designated seismic system or a wind- or seismic-resisting component listed in the statement of special inspections shall submit a written statement of responsibility to the building official and the owner prior to the commencement of work on the system or component. The contractor's statement of responsibility shall contain the following:

- a. Acknowledgment of awareness of the special requirements contained in the statement of special inspections;
- b. Acknowledgment that control will be exercised to obtain conformance with the construction documents approved by the building official;
- c. Procedures for exercising control within the contractor's organization, the method and frequency of reporting and the distribution of the reports; and
- d. Identification and qualifications of the person(s) exercising such control and their position(s) in the organization.

SCHEDULE OF SPECIAL INSPECTIONS**Legend**

ITL - Inspections Testing
Laboratory

SER - Structural Engineer of
Record

SI - Special Inspections

IT-# - Inspection Type

C - Continuous Special
Inspections

P - Periodic Special
Inspections

IT-1 SPECIAL CASES (Refer to NCBC Section 1705.1.1)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|-------------------------------------|-----------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Construction materials and systems that are alternatives to materials and systems prescribed by the 2012 NCBC. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.1.1, #1 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Unusual design applications of materials described in the 2012 NCBC. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.1.1, #2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Materials and systems required to be installed in accordance with additional manufacturer's instructions that prescribe requirements not contained in this code or in standards referenced by this code. | | | NCBC 1705.1.1, #3 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Special Events (as decided / required by Code Enforcement). | <input type="checkbox"/> | <input type="checkbox"/> | Local Authority Having Jurisdiction | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Retaining Walls. | <input type="checkbox"/> | <input type="checkbox"/> | | |

IT-2 STEEL CONSTRUCTION (Refer to Section 1705.2 and the Exception; Table 1705.2.3)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|-------------------------------------|--|--------------------------|-------------------------------------|---|-----------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Structural Steel. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | AISC 360 | NCBC 1705.2.1 & Exception |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Cold-formed Steel Deck. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | SDI QA/QC | NCBC 1705.2.2 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Open-web Steel Joists and Joist Girders. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | | NCBC 1705.2.3 & Table |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1. Installation of open-web steel joists and joist girders. a. End connections - welding or bolted. | | <input checked="" type="checkbox"/> | SJI specifications listed in Section 2207.1 | |
| | | | b. Bridging - horizontal or diagonal. | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | i. Standard bridging. | | <input checked="" type="checkbox"/> | SJI specifications listed in Section 2207.1 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | ii. Bridging that differs from the SJI specifications listed in Section 2207.1 | | <input checked="" type="checkbox"/> | | Uplift Bridging |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Cold-formed steel trusses spanning 60 feet or greater | | <input type="checkbox"/> | | NCBC 1705.2.4 |

IT-3 CONCRETE CONSTRUCTION (Refer to NCBC Section & Table 1705.3; Ch. 19)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|-------------------------------------|---|--------------------------|-------------------------------------|--|-----------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1. Inspect reinforcement, including pre-stressing tendons and verify placement. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | ACI 318 Ch 20, 25.2, 25.3, 26.6.1 – 26.76.3; & NCBC 1908.4 | |

| | | | | | | | |
|--------------------------|--------------------------|-------------------------------------|---|-------------------------------------|-------------------------------------|---|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 2. Reinforcing Bar welding: a. Verify weldability of reinforcing bars other than ASTM A706. b. Inspect single-pass fillet welds, maximum 5/16". c. Inspect all other welds. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | AWS D1.4; ACI 318:26.6.4 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 3. Inspect anchors cast in concrete. | | <input checked="" type="checkbox"/> | ACI 318: 17.8.2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 4. Inspect anchors post-installed in hardened concrete members. a. Adhesive anchors installed in horizontally or upwardly inclined orientations to resist sustained tension loads. b. Mechanical anchors and adhesive anchors not defined in 4.a. | <input checked="" type="checkbox"/> | | ACI 318: 17.8.2.4 ACI 318: 17.8.2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 5. Verify use of required design mix. | | <input checked="" type="checkbox"/> | ACI 318: Ch. 19, 26.4.3, 26.4.4, NCBC 1904.1, 1904.2. 1908.2, 1908.3 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 6. Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete. | <input checked="" type="checkbox"/> | | ASTM C 172; ASTM C 31; ACI 318: 26.4, 26.12 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 7. Inspect concrete and shotcrete placement for proper application techniques. | <input type="checkbox"/> | | ACI 318: 26.5, NCBC 1908.6, 1908.7. 1908.8 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 8. Verify maintenance of specified curing temperature and techniques | | <input checked="" type="checkbox"/> | ACI 318: 26.5.3-26.5.5 NCBC 1908.9 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 9. Inspect of pre-stressed concrete for: a. Application of pre-stressing forces; and b. Grouting of bonded pre-stressing tendons. | <input type="checkbox"/> | <input type="checkbox"/> | ACI 318: 26.10 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 10. Inspect erection of precast concrete members | | <input type="checkbox"/> | ACI 318: Ch. 26.8 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 11. Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs. | | <input type="checkbox"/> | ACI 318: 26.11.2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 12. Inspect formwork for shape, location and dimensions of the concrete members being formed. | | <input checked="" type="checkbox"/> | ACI 318:26.11.1.2(b) | |

IT-4 MASONRY (Refer to NCBC Section 1705.4)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|-------------------------------------|---|-------------------------------------|-------------------------------------|---|----------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Masonry Construction. | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | TMS 402/ ACI 530/ ASCE 5 and TMS 602/ACI 530.1/ASCE 6, | See NCBC 1705.4 Exceptions |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Empirically designed masonry (per 2109), glass unit masonry (per 2110) or masonry veneer (per Ch 14) in Risk Category IV. | <input type="checkbox"/> | <input type="checkbox"/> | TMS 402/ ACI 530/ ASCE 5, Level B Quality Assurance | |

IT-5 WOOD (Refer to NCBC Section 1705.5)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|------------------------|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Prefabricated wood structural elements and assemblies to be in accordance with the requirements set forth in NCBC Section 1704.2.5. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1704.2.5 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | High Load Diaphragms. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.5.1 & 1704.2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Temp & permanent bracing on metal-plate-connected trusses spanning \geq 60 ft. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.5.2 | |

IT-6 SOILS (Refer to NCBC Table 1705.6 & Section 1705.6)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|-------------------------------------|--------------------------|-------------------------------------|--|-------------------------------------|-------------------------------------|---|---------------------------|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1. Verify materials below shallow foundation are adequate to achieve the design bearing capacity. | | <input checked="" type="checkbox"/> | NCBC 1705.6; geotechnical report & construction documents from RDPIRC | See NCBC 1705.6 exception |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 2. Verify excavations are extended to proper depth and have reached proper material. | | <input checked="" type="checkbox"/> | NCBC 1705.6; geotechnical report & construction documents from RDPIRC | |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 3. Perform classification and testing of compacted fill materials. | | <input checked="" type="checkbox"/> | NCBC 1705.6; geotechnical report & construction documents from RDPIRC | |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill. | <input checked="" type="checkbox"/> | | NCBC 1705.6; geotechnical report & construction documents from RDPIRC | |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 5. Prior to placement of compacted fill, inspect sub-grade and verify that site has been prepared properly. | | <input checked="" type="checkbox"/> | NCBC 1705.6; geotechnical report & construction documents from RDPIRC | |

IT-7 DRIVEN DEEP FOUNDATIONS (Refer to NCBC Section 1705.7)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|--|--------------------------|---|---|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. Verify element materials sizes and lengths comply with the requirements. | <input type="checkbox"/> | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. Determine capacities of test elements and conduct additional load tests as required. | <input type="checkbox"/> | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. Inspect driving operations and maintain complete and accurate records for each element. | <input type="checkbox"/> | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |

| | | | | | | | |
|--------------------------|--------------------------|--------------------------|---|--------------------------|--|---|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4. Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and document any damage to foundation element. | <input type="checkbox"/> | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 5. For steel elements, perform additional inspections in accordance with Section 1705.2. | | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 6. For concrete elements and concrete-filled elements, perform tests and additional special inspections in accordance with Section 1705.2. | | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 7. For specialty elements, perform additional inspections as determined by the registered design professional in responsible charge. | | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |

IT 8 CAST-IN-PLACE DEEP FOUNDATIONS (Refer to NCBC Section 1705.8)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|---|--------------------------|---|---|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. Inspect drilling operations and maintain complete and accurate records for each element. | <input type="checkbox"/> | | NCBC 1705.8; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end-bearing strata capacity. Record concrete or grout volumes. | <input type="checkbox"/> | | NCBC 1705.8; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. For concrete elements, perform tests and additional special inspections in accordance with section 1705.3. | <input type="checkbox"/> | | NCBC Section 1705.8; geotechnical report & construction documents from RDPIRC | |

IT 9 HELICAL PILES (Refer to NCBC Sections 1705.9)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|---|--------------------------|---|---|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Inspect during installation. Record: 1. Installation equipment used. 2. Pile dimensions. 3. Tip elevations. 4. Final depth. 5. Final installation torque. 6. Other pertinent installation data as req'd by RDPIRC. | <input type="checkbox"/> | | NCBC Section 1705.9; geotechnical report & construction documents from RDPIRC | |

IT 10 FABRICATED ITEMS (Refer to NCBC Sections 1705.10 & 1704.2.5)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|-----|-----|----|-----------------|---|---|----------|------------------|
|-----|-----|----|-----------------|---|---|----------|------------------|

| | | | | | | | |
|--------------------------|--------------------------|-------------------------------------|---|--------------------------|-------------------------------------|-----------------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Inspect during fabrication. 1. Structural, 2. Load-bearing or 3. Lateral load-resisting members or assemblies. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | NCBC Section 1705.10 or 1704.2.5. | SI are not required if the fabricator meets 1704.2.5, #1 or #2; or if the fabricator is approved per 1704.2.5.1 |
|--------------------------|--------------------------|-------------------------------------|---|--------------------------|-------------------------------------|-----------------------------------|---|

IT 11 WIND RESISTANCE (Refer to NCBC Sections 1705.11; 1705.11.1 – 1705.11.3; & 1609.3.1)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|-------------------------------------|--|--------------------------|-------------------------------------|----------------|--|
| | | | Only required in the following instances: 1. In wind Exposure Category B, where <i>Vasd</i> is \geq 120 MPH (per 1609.3.1), or 2. In wind Exposure Category C or D, where <i>Vasd</i> is \geq 110 MPH (per 1609.3.1). | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Structural Wood. 1. Gluing elements of the main wind force-resisting system. 2. Nailing, bolting, anchoring, etc. of elements of the main wind force-resisting system. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.11.1 | Not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other elements of the MWR system, where the fastener spacing of the sheathing is > 4" o.c. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Cold-formed steel light frame construction. 1. Welding operations of elements of the MWRS 2. Screw attachment, bolting, anchoring and other fastening of elements of the MWRS including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs | | <input type="checkbox"/> | NCBC 1705.11.2 | Not required for shear walls and diaphragms, where either of the following applies: #1. Sheathing is gypsum bd or fiberboard; #2. Sheathing is wood structural panel or steel sheets on one side of the shear wall, panel or diaphragm assembly and the fastener spacing of the sheathing is > 4" o.c. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Wind-resisting components 1. Roof covering, roof deck and roof framing connections 2. Exterior wall covering and wall connections to roof and floor diaphragms and framing | | <input checked="" type="checkbox"/> | NCBC 1705.11.3 | |

IT-12 SEISMIC RESISTANCE (Refer to NCBC Sections 1705.12)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|-------------------------------|---|
| | | | SI in sections 1705.12.1 – 1705.12.9 are not required for structures designed and constructed in accordance with one of the following: <ol style="list-style-type: none"> Structure is light-frame construction, S_{DS} is not greater than 0.5; and building height is not greater than 35’. SFRS of the structure is reinforced masonry or reinforced concrete, S_{DS} is not greater than 0.5; and building height is not greater than 25’. | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Structural steel in the seismic force-resisting systems of buildings and structures assigned to SDC B, C, D, E or F. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.12.1.1; AISC 341 | Not required in the SFRS of buildings or structures in SDC B or C not specifically detailed for seismic resistance, with response modification coefficient, $R, \leq 3$ |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Structural steel elements in the seismic force-resisting systems of buildings or structures assigned to SDC B, C, D, E or F other than those covered in Section 1705.12.1.1, including struts, chords and foundation elements. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.12.1.2; AISC 341 | Not required in the SFRS of buildings and structures in SDC B or C with response modification coefficient, $R, \leq 3$ |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Structural Wood in the seismic force-resisting systems of structures assigned to SDC C, D, E or F. | <input type="checkbox"/> | | NCBC 1705.12.2 | These SI are not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other elements of the SFRS when the fastener spacing of the sheathing is > 4” o.c. Includes wood shear walls, wood diaphragms, drag struts braces, panels & hold-down’s. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <ol style="list-style-type: none"> Field gluing operations of elements of seismic force-resisting system Nailing, bolting, anchoring and other fastening of elements of the seismic force-resisting system | | <input type="checkbox"/> | | |

| | | | | | | | |
|--------------------------|--------------------------|-------------------------------------|--|--------------------------|-------------------------------------|------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <p>Cold-formed steel light frame construction in the SFRS of structures in SDC C, D, E, or F.</p> <ol style="list-style-type: none"> 1. Welding operations of elements of the SFRS 2. Screw attachment, bolting, anchoring, and other fastening of elements of the SFRS including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.12.3 | <p>Not required for shear walls and diaphragms, including screw installation, bolting, anchoring and other fastening to components of the SFRS where either of the following applies: #1. Sheathing is gypsum bd or fiberboard; #2. Sheathing is wood structural panel or steel sheets on one side of the shear wall, panel or diaphragm assembly and the fastener spacing of the sheathing is > 4”o.c</p> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>Designated seismic systems for structures assigned to Seismic Design Category C, D, E or F. Verify the label, anchorage and mounting conform to the certificate of compliance</p> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | ASCE 7, Section 13.2.2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <p>Architectural components – erection and fastening of exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer in structures assigned to Seismic Design Category D, E or F</p> | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.12.5 | <p>Not required for: #1. Exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer ≤ 30’ in height above grade or walking surface. #2. Exterior cladding and interior and exterior veneer weighing 5 psf or less. #3. Interior nonbearing walls weighing 15 psf or less.</p> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <p>Access floors - anchorage in structures assigned to Seismic Design Category D, E or F.</p> | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.12.5.1 | |

| | | | | | | |
|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Plumbing, Mechanical and electrical components: Seismic Design Categories C, D, E or F: 1. Anchorage of electrical equipment for emergency and standby power. 2. Installation and anchorage of piping systems for Hazardous materials and associated mechanical units. 3. Installation and anchorage of ductwork for Hazardous materials. 4. Installation and anchorage of vibration isolation systems where the required clearance is $\leq 1/4"$ between the equipment support frame and restraint. | <input type="checkbox"/> | NCBC 1705.12.6, #1 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | NCBC 1705.12.6, #3 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | NCBC 1705.12.6, #4 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | NCBC 1705.12.6, #5 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Seismic Design Categories E or F: 1. Anchorage of other electrical equipment. | <input type="checkbox"/> | NCBC 1705.12.6, #2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Storage racks $\geq 8'$ in height in Seismic Design Categories D, E or F. | <input type="checkbox"/> | NCBC 1705.12.7 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Seismic isolation systems in seismically isolated structures assigned to SDC B, C, D, E, or F. | <input type="checkbox"/> | NCBC 1705.12.8 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Installation of cold-formed steel special bolted moment frames in the SFRS of structures assigned to SDC D, E, or F. | <input type="checkbox"/> | NCBC 1705.12.9 | |

IT 13 TESTING FOR SEISMIC RESISTANCE (Refer to Section 1705.13)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Structural Steel. 1. Nondestructive testing for seismic resistance for SFRS for buildings assigned to SDC B, C, D, E or F. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.13.1 NCBC 1705.13.1.1 or AISC 341 | Exception: SDC B or C buildings with a response modification coefficient ≤ 3 . |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Structural Steel Elements. 1. Nondestructive testing for seismic resistance of structural steel elements in the SFRS of buildings and structures assigned to SDC B, C, D, E or F if not covered in 1705.13.1.1. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.13.1.2 AISC 341 | Exception: SDC B or C buildings with a response modification coefficient ≤ 3 . |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Nonstructural Components for structures assigned to SDC B, C, D, E or F where the requirements of Section 13.2.1 of ASCE 7 for nonstructural components, supports or attachments are met by seismic qualification as specified in Item 2 therein, the RDPIRC shall specify on the approved construction documents the requirements for seismic qualification by analysis, testing or experience data. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.13.2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Designated seismic systems for structures assigned to SDC C, D, E or F that are subject to the requirements of Section 13.2.2 of ASCE 7 for certification, the RDPIRC shall specify on the approved construction documents the requirements to be met by analysis, testing or experience data. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.13.3 | |

| | | | | | | | |
|--------------------------|--------------------------|--------------------------|--|--|--|---|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Seismic Isolation Systems in Seismically isolated structures assigned to SDC B, C, D, E, or F. | | | NCBC 1705.13.4; ASCE 7, section 17.8 | |
|--------------------------|--------------------------|--------------------------|--|--|--|---|--|

IT-14 SPRAYED FIRE-RESISTANT MATERIALS (Refer to NCBC Sections 1705.14)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|---------------------------------|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sprayed fire-resistant materials. | | | NCBC 1705.14.4.2 & ASTM E605 | 4/1000sf |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. Floor, roof and wall assemblies | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.3 | 4 @12"x12" |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. Cellular Decks | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.4 | 4 @12"x12" |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. Fluted Decks | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.5 | 25% |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4. Structural members | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.6 | 9@12" |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 5. Beams and Girders | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.7 | 7@12" |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 6. Joists and Trusses | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.8 | 12@12" |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 7. Wide-flanged columns | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.9 | 4@12" |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 8. Hollow structural section and pipe columns | <input type="checkbox"/> | <input type="checkbox"/> | | |

IT 15 MASTIC AND INTUMESCENT FIRE-RESISTANT COATING 1705.15

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|----------------------------|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Mastic and Intumescent fire-resistant coating applied to structural elements and decks. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.15; AWCI 12-B | |

IT-16 EXTERIOR INSULATION & FINISH SYSTEM (EIFS)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | EIFS application. | <input type="checkbox"/> | <input type="checkbox"/> | | Not required for: 1. EIFS applications installed over a water-resistive barrier that drains to the exterior. 2. EIFS applications installed over masonry or concrete walls. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Water-resistive barrier coating when installed over a sheathing substrate. | <input type="checkbox"/> | <input type="checkbox"/> | ASTM E2570 | |

IT 17 FIRE-RESISTANT PENETRATIONS AND JOINTS (Refer to NCBC Sections 1705.17; 1705.17.1; & 1705.17.2)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|-----|-----|----|-----------------|---|---|----------|------------------|
|-----|-----|----|-----------------|---|---|----------|------------------|

| | | | | | | |
|-------------------------------------|--------------------------|--|--|--------------------------|-------------------------------------|--|
| | | Applies to all new high-rise buildings and all new buildings in Risk Category III or IV. Additions, Changes of Use, NCEBC Ch 14 evaluated buildings and Level 3 Alterations within existing high-rises and / or Risk Category III or IV buildings will also require these special inspections. | | | | |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>Inspection of tested and listed penetration firestop systems:</p> <p>1. Through penetrations:</p> <p>a. Verify materials before installation.</p> <p>b. Verify against design (Cutsheet or EJ).</p> <p>c. For each type of firestop:</p> <p>i. Witness 10% of installations, or</p> <p>ii. Destructive testing on 2% of installations.</p> <p>d. Verify all firestops are installed.</p> <p>2. Membrane penetrations:</p> <p>a. Verify materials before installation.</p> <p>b. Verify against design (Cutsheet or EJ).</p> <p>c. For each type of firestop:</p> <p>i. Witness 10% of installations or</p> <p>ii. Destructive testing on 2% of installations.</p> <p>d. Verify all firestops are installed.</p> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>NCBC 1705.17.1; ASTM E2174-10ae1</p> <p>10% of installations per floor or per area. Area = 1 sf – 10,000 sf.</p> <p>2% of installations per floor or per area. Area = 1 sf – 10,000 sf</p> <p>10% of installations per floor or per area. Area = 1 sf – 10,000 sf</p> <p>2% of installations per floor or per area. Area = 1 sf – 10,000 sf</p> |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>Installation of tested and listed fire-resistant joint systems:</p> <p>1. Verify materials before installation.</p> <p>2. Verify against design (cutsheet or EJ) .</p> <p>3. For each type of joint system:</p> <p>a. Witness installation of 5% min of total lineal feet of joint system being installed, or</p> <p>b. Destructive testing, disassembly or visual inspection at the rate of at least 1 sample for every 500 lineal feet of the joint system.</p> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>NCBC 1705.17.2; ASTM E2393-10a</p> |

IT-18 SMOKE CONTROL (Refer to NCBC Section 1705.18)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Inspection of smoke control system. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.18 | |

FINAL REPORT OF SPECIAL INSPECTIONS

Project: *Overhills Elementary School Classroom Addition*

Location: *Spring Lake, NC*

Owner: *Harnett County Schools*

Design Professional in Responsible Charge: *Thomas Hughes, AIA, LEED AP*

To the best of my information, knowledge and belief, the Special Inspections required for this project, and itemized in the State of Special Inspections submitted for permit, have been performed and all discovered discrepancies have been reported and resolved other than the following:

Comments:

(Attach continuation sheets if required to complete the description of corrections).

Interim reports submitted prior to this final report form a basis for and are to be considered an integral part of this final report.

Respectfully submitted,
Special Inspector

Licensed Professional Seal

Signature

Date

AGENTS FINAL REPORT OF SPECIAL INSPECTIONS

AGENTS FINAL REPORT

Project: *Overhills Elementary School Classroom Addition*

Location: *Spring Lake, NC*

Owner: *Harnett County Schools*

Design Professional in Responsible Charge: *Thomas Hughes, AIA, LEED AP*

To the best of my information, knowledge and belief, the Special Inspections or testing required for this project, and designated for this Agent in the *Statement of Special Inspections* submitted for permit, have been performed and all discovered discrepancies have been reported and resolved other than the following:

Comments:

(Attach continuation sheets if required to complete the description of corrections).

Interim reports submitted prior to this final report form a basis for and are to be considered an integral part of this final report.

Respectfully submitted,

Agent of the Special Inspector

Licensed Professional Seal

Signature

Date

END OF SECTION

SECTION 01 45 00.30
INSPECTION REQUIREMENTS

PART 1 GENERAL

Architect of Record: Thomas Hughes, AIA REFP, LEED AP – SfL+a Architects, PA
Structural Engineer of Record: Robert E. Lasater, Jr., P.E. – LHC Structural Engineers, P.C.
Building Official: Harnett County

This Statement of Inspections is submitted as a condition for permit issuance in accordance with the Special Inspection requirements of the 2018 North Carolina State Building Code. It includes a Schedule of Special Inspection Services applicable to this project. The name of the Inspector(s) and the identity of other approved agencies intended to be retained for conducting these inspections will be released by the owner following the bid opening.

The Inspector(s) shall keep records of all inspections and shall furnish inspection reports to the Owner, Structural Engineer, and Architect of Record. A copy of all reports shall be kept on site at the contractor's trailer. Discovered discrepancies shall be brought to the immediate attention of the Contractor for correction. If such discrepancies are not corrected, the discrepancies shall be brought to the attention of the Owner, Structural Engineer and Architect of Record. The Inspections program does not relieve the Contractor of his or her supervision or inspection responsibilities.

The Contractor is responsible for notifications to Inspector and/or other agencies as required at least two days in advance. The Contractor is responsible for all additional costs incurred by failure to meet requirements or pass any/all inspections and/or testing as required in this section.

Interim reports shall be submitted to the Owner, Structural Engineer and Architect of Record.

Interim Report Frequency: Monthly

A Final Report of Inspections documenting completion of all required Special Inspections and correction of any discrepancies should be submitted prior to issuance of a Certificate of Use and Occupancy.

Job Site safety and means and methods of construction are solely the responsibility of the Contractor.

1.1 Items Requiring 2018 NCSBC CHAPTER 17 Inspections/VERIFICATIONS

- A. 2018 North Carolina State Building Code required inspections include, but are not limited to, the following:
- 110.3.1 Footing or foundation inspection
 - 110.3.2 Concrete slab or under-floor inspection
 - 110.3.3 Lowest floor elevation
 - 110.3.4 Frame Inspections
 - 110.3.5 Lath or gypsum board inspection
 - 110.3.6 Fire-resistant penetrations

It is appropriate to take special note of the required energy efficiency compliance inspections. Ensuring compliance with ANSI/ASHRAE/IESNA Standard 90.1 – 2004 is a critical part of the inspection process and MUST be specifically addressed. The American Society of Heating and Air Conditioning Engineers (ASHRAE) is the foremost

technical society in the fields of heating, ventilation, air conditioning and refrigeration. ASHRAE Standard 90.1 is an ANSI approved national consensus standard co-sponsored by ASHRAE and the Illuminating Engineering Society of North America (IESNA). The Standard provides minimum energy efficiency requirements for the design and construction of new buildings and new construction in existing buildings. In particular, it applies to new buildings and their systems, building additions and their systems, and new systems and equipment in existing building.

The scope of the requirements of Standard 90.1 covers the design of the building envelope, the lighting systems, HVAC systems and other energy using equipment. For the OSF Approved Inspector, the 90.1 User's Manual is the best available source of information, worksheets and checklists for the purpose of ensuring compliance with Standard 90.1. These forms cannot be reproduced here due to the copyright restrictions. However, the 90.1 User's Manual can be obtained from the American Society of Heating and Air Conditioning Engineers, Incorporated, 1791 Tullie Circle, Atlanta, Georgia 30329. The telephone number is 404-636-8400. On the net they can be reached at ashrae.org.

Specifically, we refer you to the following in the Standard 90.1 User Manual:

1. Building Envelope Compliance Forms, page 5-71;
2. HVAC Compliance Forms, pages 6-79 through 6-80;
3. Service Water Heating Compliance Forms; page 7-17; and
4. Lighting Compliance Forms, page 9-34.

These forms MUST be submitted to OSF at the final review stage. The Chapter 1 inspector shall request these forms be provided at the initial pre-construction meeting. The design professional shall have them available for that meeting.

909.3 Special inspection and test requirements (smoke control systems)

- B. Mechanical Code: M107.1. Required inspections
1. Underground inspection shall be made after trenches or ditches are excavated and bedded, piping installed, and before backfill is put in place.
 2. Rough-in inspection shall be made after the roof, framing, fireblocking and bracing are in place and all ducting and other components to be concealed are complete, and prior to the installation of wall or ceiling membranes.
- C. Plumbing Code: P107.1 Required inspections and testing
1. Underground inspection shall be made after trenches or ditches are excavated and bedded, piping installed, and before any backfill is put in place.
 2. Rough-in inspection shall be made after the roof, framing, fireblocking, firestopping, draftstopping and bracing is in place and all sanitary, storm and water distribution piping is roughed-in and prior to the installation of wall or ceiling membranes.
- D. Electrical Code:
1. Underground inspection shall be made after trenches or ditches are excavated and bedded, conduit installed, and before backfill is placed.
 2. Rough-in inspection shall be made after the roof, framing, fireblocking and bracing are in place and other components to be concealed are complete, and prior to the installation of concealing construction.
- E. National Fire Alarm Code: Section 4.5:

1. The installing contractor shall furnish a written statement stating that the system has been installed in accordance with approved plans and tested in accordance with the manufacturer's published instructions and the appropriate NFPA requirements (Section 4.5.1.2).
2. This shall be accompanied by the record of completion form (Figure 4.5.2.1) Verification of compliance of the completed installation shall be included in the responsibilities of the Chapter 1 inspector (Section 4.5.2.4).

1.2 ITEMS REQUIRING NORTH CAROLINA STATE BUILDING CODE, CHAPTER 17 SPECIAL INSPECTIONS

- A. 2018 North Carolina State Building Code Chapter 17 requires special inspections including the following items as defined by their respective sections as noted:

IT-1 SPECIAL CASES (Refer to NCBC Section 1705.1.1)

IT-2 STEEL CONSTRUCTION (Refer to Section 1705.2 and the Exception; Table 1705.2.3)

IT-3 CONCRETE CONSTRUCTION (Refer to NCBC Section & Table 1705.3; Ch. 19)

IT-4 MASONRY (Refer to NCBC Section 1705.4)

IT-5 WOOD (Refer to NCBC Section 1705.5)

IT-6 SOILS (Refer to NCBC Table 1705.6 & Section 1705.6)

IT-7 DRIVEN DEEP FOUNDATIONS (Refer to NCBC Section 1705.7)

IT 8 CAST-IN-PLACE DEEP FOUNDATIONS (Refer to NCBC Section 1705.8)

IT 9 HELICAL PILES (Refer to NCBC Sections 1705.9)

IT 10 FABRICATED ITEMS (Refer to NCBC Sections 1705.10 & 1704.2.5)

IT 11 WIND RESISTANCE (Refer to NCBC Sections 1705.11; 1705.11.1 – 1705.11.3; & 1609.3.1)

IT-12 SEISMIC RESISTANCE (Refer to NCBC Sections 1705.12)

IT 13 TESTING FOR SEISMIC RESISTANCE (Refer to Section 1705.13)

IT-14 SPRAYED FIRE-RESISTANT MATERIALS (Refer to NCBC Sections 1705.14)

IT 15 MASTIC AND INTUMESCENT FIRE-RESISTANT COATING 1705.15

IT-16 EXTERIOR INSULATION & FINISH SYSTEM (EIFS)

IT 17 FIRE-RESISTANT PENETRATIONS AND JOINTS (Refer to NCBC Sections 1705.17; 1705.17.1; & 1705.17.2)

IT-18 SMOKE CONTROL (Refer to NCBC Section 1705.18)**1.3 REPORTING SERVICES**

- A. It is the inspectors' responsibility to verify that the contractor conforms to this section of the code. Furthermore, it is vital to understand that mechanical, electrical and plumbing seismic and vibration analysis and inspections are required and must include the seismic protection for electrical raceways, and equipment; plumbing, piping and related equipment; and, seismic protection for mechanical systems.
- B. Testing, inspections and source quality control may occur on or off project site. Perform off-site testing as required by Architect or Owner.
- C. Reports will be submitted by independent firm to Architect, Contractor, and authority having jurisdiction, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
 - 1. Submit final report indicating correction of Work previously reported as non-compliant.
- D. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
 - 1. Notify Architect and independent firm 48 hours prior to expected time for operations requiring services.
 - 2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
- E. Testing and employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- F. Re-testing or re-inspection required because of non-conformance to specified requirements shall be performed by same independent firm on instructions by Architect. Payment for re-testing or re-inspection will be charged to Contractor by deducting testing charges from Contract Sum/Price.
- G. Agency Responsibilities:
 - 1. Test samples of mixes submitted by Contractor.
 - 2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 - 3. Perform specified sampling and testing of products in accordance with specified standards.
 - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 5. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
 - 6. Perform additional tests required by Architect.
 - 7. Attend preconstruction meetings and progress meetings.
- H. Agency Reports: After each test, promptly submit two copies of report to Architect, Contractor, and authority having jurisdiction. When requested by Architect, provide interpretation of test results. Include the following:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Name of inspector.
 - 4. Date and time of sampling or inspection.
 - 5. Identification of product and specifications section.
 - 6. Location in Project.
 - 7. Type of inspection or test.

8. Date of test.
 9. Results of tests.
 10. Conformance with Contract Documents.
- I. Limits On Testing Authority:
1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency or laboratory may not approve or accept any portion of the Work.
 3. Agency or laboratory may not assume duties of Contractor.
 4. Agency or laboratory has no authority to stop the Work.

1.4 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Architect 30 days in advance of required observations.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- D. Refer to Section 01 33 00 - Submittal Procedures, MANUFACTURERS' FIELD REPORTS article.

1.5 PRODUCTS

Not Used.

1.6 EXECUTION

Not Used.

SCHEDULE OF INSPECTION AND TESTING AGENCIES

This Statement of Special Inspections / Quality Assurance Plan includes the following building systems:

- | | |
|--|---|
| <input checked="" type="checkbox"/> Soils and Foundations | <input type="checkbox"/> Spray Fire Resistant Material |
| <input checked="" type="checkbox"/> Cast-in-Place Concrete | <input checked="" type="checkbox"/> Special Inspections for Wind Resistance |
| <input type="checkbox"/> Precast Concrete | <input type="checkbox"/> Exterior Insulation and Finish System |
| <input checked="" type="checkbox"/> Masonry | <input checked="" type="checkbox"/> Mechanical & Electrical Systems |
| <input checked="" type="checkbox"/> Structural Steel | <input checked="" type="checkbox"/> Architectural Systems |
| <input type="checkbox"/> Cold-Formed Steel Framing | <input checked="" type="checkbox"/> Seismic Requirements |
| <input checked="" type="checkbox"/> Retaining Walls Taller than 5' | <input type="checkbox"/> Other |
| <input type="checkbox"/> Deep Foundations | |

| Special Inspection Agencies | Firm | Address, Telephone, e-mail |
|------------------------------------|---|---|
| 1. Special Inspections | <i>SI</i> | <i>OWNER TO PROVIDE</i> |
| 2. Structural Engineer of Record | <i>LHC Structural Engineers Robert E. Lasater</i> | <i>5430 Wade Park Blvd, Suite 400 Raleigh, NC 27607 919.832.5587 blasater@bennett-pless.com</i> |
| 3. Testing Laboratory | <i>ITL</i> | <i>OWNER TO PROVIDE</i> |
| 6. Other | | |

Note: The inspectors and testing agencies shall be engaged by the Owner or the Owner's Agent, and not by the Contractor or Subcontractor whose work is to be inspected or tested. Any conflict of interest must be disclosed to the Building Official, prior to commencing work.

QUALITY ASSURANCE PLAN**Quality Assurance for Seismic Resistance**

| | |
|-------------------------|----------|
| Seismic Design Category | <i>C</i> |
|-------------------------|----------|

Quality Assurance for Wind Requirements

| | |
|----------------------------------|----------------|
| Basic Wind Speed (3 second gust) | <i>128 mph</i> |
| Wind Exposure Category | <i>C</i> |

Statement of Responsibility

Each contractor responsible for the construction of a main wind- or seismic-force-resisting system, designated seismic system or a wind- or seismic-resisting component listed in the statement of special inspections shall submit a written statement of responsibility to the building official and the owner prior to the commencement of work on the system or component. The contractor's statement of responsibility shall contain the following:

- a. Acknowledgment of awareness of the special requirements contained in the statement of special inspections;
- b. Acknowledgment that control will be exercised to obtain conformance with the construction documents approved by the building official;
- c. Procedures for exercising control within the contractor's organization, the method and frequency of reporting and the distribution of the reports; and
- d. Identification and qualifications of the person(s) exercising such control and their position(s) in the organization.

SCHEDULE OF SPECIAL INSPECTIONS**Legend**

ITL - Inspections Testing
Laboratory

SER - Structural Engineer of
Record

SI - Special Inspections

IT-# - Inspection Type

C - Continuous Special
Inspections

P - Periodic Special
Inspections

IT-1 SPECIAL CASES (Refer to NCBC Section 1705.1.1)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|-------------------------------------|-----------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Construction materials and systems that are alternatives to materials and systems prescribed by the 2012 NCBC. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.1.1, #1 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Unusual design applications of materials described in the 2012 NCBC. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.1.1, #2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Materials and systems required to be installed in accordance with additional manufacturer's instructions that prescribe requirements not contained in this code or in standards referenced by this code. | | | NCBC 1705.1.1, #3 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Special Events (as decided / required by Code Enforcement). | <input type="checkbox"/> | <input type="checkbox"/> | Local Authority Having Jurisdiction | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Retaining Walls. | <input type="checkbox"/> | <input type="checkbox"/> | | |

IT-2 STEEL CONSTRUCTION (Refer to Section 1705.2 and the Exception; Table 1705.2.3)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|-------------------------------------|--|--------------------------|-------------------------------------|---|-----------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Structural Steel. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | AISC 360 | NCBC 1705.2.1 & Exception |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Cold-formed Steel Deck. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | SDI QA/QC | NCBC 1705.2.2 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Open-web Steel Joists and Joist Girders. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | | NCBC 1705.2.3 & Table |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1. Installation of open-web steel joists and joist girders. a. End connections - welding or bolted. | | <input checked="" type="checkbox"/> | SJI specifications listed in Section 2207.1 | |
| | | | b. Bridging - horizontal or diagonal. | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | i. Standard bridging. | | <input checked="" type="checkbox"/> | SJI specifications listed in Section 2207.1 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | ii. Bridging that differs from the SJI specifications listed in Section 2207.1 | | <input checked="" type="checkbox"/> | | Uplift Bridging |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Cold-formed steel trusses spanning 60 feet or greater | | <input type="checkbox"/> | | NCBC 1705.2.4 |

IT-3 CONCRETE CONSTRUCTION (Refer to NCBC Section & Table 1705.3; Ch. 19)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|-------------------------------------|---|--------------------------|-------------------------------------|--|-----------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1. Inspect reinforcement, including pre-stressing tendons and verify placement. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | ACI 318 Ch 20, 25.2, 25.3, 26.6.1 – 26.76.3; & NCBC 1908.4 | |

| | | | | | | | |
|--------------------------|--------------------------|-------------------------------------|---|-------------------------------------|-------------------------------------|---|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 2. Reinforcing Bar welding: a. Verify weldability of reinforcing bars other than ASTM A706. b. Inspect single-pass fillet welds, maximum 5/16". c. Inspect all other welds. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | AWS D1.4; ACI 318:26.6.4 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 3. Inspect anchors cast in concrete. | | <input checked="" type="checkbox"/> | ACI 318: 17.8.2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 4. Inspect anchors post-installed in hardened concrete members. a. Adhesive anchors installed in horizontally or upwardly inclined orientations to resist sustained tension loads. b. Mechanical anchors and adhesive anchors not defined in 4.a. | <input checked="" type="checkbox"/> | | ACI 318: 17.8.2.4 ACI 318: 17.8.2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 5. Verify use of required design mix. | | <input checked="" type="checkbox"/> | ACI 318: Ch. 19, 26.4.3, 26.4.4, NCBC 1904.1, 1904.2. 1908.2, 1908.3 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 6. Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete. | <input checked="" type="checkbox"/> | | ASTM C 172; ASTM C 31; ACI 318: 26.4, 26.12 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 7. Inspect concrete and shotcrete placement for proper application techniques. | <input type="checkbox"/> | | ACI 318: 26.5, NCBC 1908.6, 1908.7. 1908.8 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 8. Verify maintenance of specified curing temperature and techniques | | <input checked="" type="checkbox"/> | ACI 318: 26.5.3-26.5.5 NCBC 1908.9 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 9. Inspect of pre-stressed concrete for: a. Application of pre-stressing forces; and b. Grouting of bonded pre-stressing tendons. | <input type="checkbox"/> | <input type="checkbox"/> | ACI 318: 26.10 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 10. Inspect erection of precast concrete members | | <input type="checkbox"/> | ACI 318: Ch. 26.8 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 11. Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs. | | <input type="checkbox"/> | ACI 318: 26.11.2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 12. Inspect formwork for shape, location and dimensions of the concrete members being formed. | | <input checked="" type="checkbox"/> | ACI 318:26.11.1.2(b) | |

IT-4 MASONRY (Refer to NCBC Section 1705.4)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|-------------------------------------|---|-------------------------------------|-------------------------------------|---|----------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Masonry Construction. | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | TMS 402/ ACI 530/ ASCE 5 and TMS 602/ACI 530.1/ASCE 6, | See NCBC 1705.4 Exceptions |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Empirically designed masonry (per 2109), glass unit masonry (per 2110) or masonry veneer (per Ch 14) in Risk Category IV. | <input type="checkbox"/> | <input type="checkbox"/> | TMS 402/ ACI 530/ ASCE 5, Level B Quality Assurance | |

IT-5 WOOD (Refer to NCBC Section 1705.5)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|------------------------|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Prefabricated wood structural elements and assemblies to be in accordance with the requirements set forth in NCBC Section 1704.2.5. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1704.2.5 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | High Load Diaphragms. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.5.1 & 1704.2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Temp & permanent bracing on metal-plate-connected trusses spanning ≥ 60 ft. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.5.2 | |

IT-6 SOILS (Refer to NCBC Table 1705.6 & Section 1705.6)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|-------------------------------------|--------------------------|-------------------------------------|--|-------------------------------------|-------------------------------------|---|---------------------------|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1. Verify materials below shallow foundation are adequate to achieve the design bearing capacity. | | <input checked="" type="checkbox"/> | NCBC 1705.6; geotechnical report & construction documents from RDPIRC | See NCBC 1705.6 exception |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 2. Verify excavations are extended to proper depth and have reached proper material. | | <input checked="" type="checkbox"/> | NCBC 1705.6; geotechnical report & construction documents from RDPIRC | |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 3. Perform classification and testing of compacted fill materials. | | <input checked="" type="checkbox"/> | NCBC 1705.6; geotechnical report & construction documents from RDPIRC | |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill. | <input checked="" type="checkbox"/> | | NCBC 1705.6; geotechnical report & construction documents from RDPIRC | |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 5. Prior to placement of compacted fill, inspect sub-grade and verify that site has been prepared properly. | | <input checked="" type="checkbox"/> | NCBC 1705.6; geotechnical report & construction documents from RDPIRC | |

IT-7 DRIVEN DEEP FOUNDATIONS (Refer to NCBC Section 1705.7)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|--|--------------------------|---|---|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. Verify element materials sizes and lengths comply with the requirements. | <input type="checkbox"/> | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. Determine capacities of test elements and conduct additional load tests as required. | <input type="checkbox"/> | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. Inspect driving operations and maintain complete and accurate records for each element. | <input type="checkbox"/> | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |

| | | | | | | | |
|--------------------------|--------------------------|--------------------------|---|--------------------------|--|---|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4. Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and document any damage to foundation element. | <input type="checkbox"/> | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 5. For steel elements, perform additional inspections in accordance with Section 1705.2. | | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 6. For concrete elements and concrete-filled elements, perform tests and additional special inspections in accordance with Section 1705.2. | | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 7. For specialty elements, perform additional inspections as determined by the registered design professional in responsible charge. | | | NCBC 1705.7; geotechnical report & construction documents from RDPIRC | |

IT 8 CAST-IN-PLACE DEEP FOUNDATIONS (Refer to NCBC Section 1705.8)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|---|--------------------------|---|---|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. Inspect drilling operations and maintain complete and accurate records for each element. | <input type="checkbox"/> | | NCBC 1705.8; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end-bearing strata capacity. Record concrete or grout volumes. | <input type="checkbox"/> | | NCBC 1705.8; geotechnical report & construction documents from RDPIRC | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. For concrete elements, perform tests and additional special inspections in accordance with section 1705.3. | <input type="checkbox"/> | | NCBC Section 1705.8; geotechnical report & construction documents from RDPIRC | |

IT 9 HELICAL PILES (Refer to NCBC Sections 1705.9)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|---|--------------------------|---|---|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Inspect during installation. Record: 1. Installation equipment used. 2. Pile dimensions. 3. Tip elevations. 4. Final depth. 5. Final installation torque. 6. Other pertinent installation data as req'd by RDPIRC. | <input type="checkbox"/> | | NCBC Section 1705.9; geotechnical report & construction documents from RDPIRC | |

IT 10 FABRICATED ITEMS (Refer to NCBC Sections 1705.10 & 1704.2.5)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|-----|-----|----|-----------------|---|---|----------|------------------|
|-----|-----|----|-----------------|---|---|----------|------------------|

| | | | | | | | |
|--------------------------|--------------------------|-------------------------------------|---|--------------------------|-------------------------------------|-----------------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Inspect during fabrication. 1. Structural, 2. Load-bearing or 3. Lateral load-resisting members or assemblies. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | NCBC Section 1705.10 or 1704.2.5. | SI are not required if the fabricator meets 1704.2.5, #1 or #2; or if the fabricator is approved per 1704.2.5.1 |
|--------------------------|--------------------------|-------------------------------------|---|--------------------------|-------------------------------------|-----------------------------------|---|

IT 11 WIND RESISTANCE (Refer to NCBC Sections 1705.11; 1705.11.1 – 1705.11.3; & 1609.3.1)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|-------------------------------------|--|--------------------------|-------------------------------------|----------------|--|
| | | | Only required in the following instances: 1. In wind Exposure Category B, where <i>Vasd</i> is \geq 120 MPH (per 1609.3.1), or 2. In wind Exposure Category C or D, where <i>Vasd</i> is \geq 110 MPH (per 1609.3.1). | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Structural Wood. 1. Gluing elements of the main wind force-resisting system. 2. Nailing, bolting, anchoring, etc. of elements of the main wind force-resisting system. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.11.1 | Not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other elements of the MWR system, where the fastener spacing of the sheathing is > 4" o.c. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Cold-formed steel light frame construction. 1. Welding operations of elements of the MWRS 2. Screw attachment, bolting, anchoring and other fastening of elements of the MWRS including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs | | <input type="checkbox"/> | NCBC 1705.11.2 | Not required for shear walls and diaphragms, where either of the following applies: #1. Sheathing is gypsum bd or fiberboard; #2. Sheathing is wood structural panel or steel sheets on one side of the shear wall, panel or diaphragm assembly and the fastener spacing of the sheathing is > 4" o.c. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Wind-resisting components 1. Roof covering, roof deck and roof framing connections 2. Exterior wall covering and wall connections to roof and floor diaphragms and framing | | <input checked="" type="checkbox"/> | NCBC 1705.11.3 | |

IT-12 SEISMIC RESISTANCE (Refer to NCBC Sections 1705.12)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|-------------------------------|---|
| | | | SI in sections 1705.12.1 – 1705.12.9 are not required for structures designed and constructed in accordance with one of the following: 1. Structure is light-frame construction, S_{DS} is not greater than 0.5; and building height is not greater than 35'. 2. SFRS of the structure is reinforced masonry or reinforced concrete, S_{DS} is not greater than 0.5; and building height is not greater than 25'. | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Structural steel in the seismic force-resisting systems of buildings and structures assigned to SDC B, C, D, E or F. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.12.1.1; AISC 341 | Not required in the SFRS of buildings or structures in SDC B or C not specifically detailed for seismic resistance, with response modification coefficient, $R, \leq 3$ |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Structural steel elements in the seismic force-resisting systems of buildings or structures assigned to SDC B, C, D, E or F other than those covered in Section 1705.12.1.1, including struts, chords and foundation elements. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.12.1.2; AISC 341 | Not required in the SFRS of buildings and structures in SDC B or C with response modification coefficient, $R, \leq 3$ |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Structural Wood in the seismic force-resisting systems of structures assigned to SDC C, D, E or F. | <input type="checkbox"/> | | NCBC 1705.12.2 | These SI are not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other elements of the SFRS when the fastener spacing of the sheathing is > 4" o.c. Includes wood shear walls, wood diaphragms, drag struts braces, panels & hold-down's. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. Field gluing operations of elements of seismic force-resisting system 2. Nailing, bolting, anchoring and other fastening of elements of the seismic force-resisting system | | <input type="checkbox"/> | | |

| | | | | | | | |
|--------------------------|--------------------------|-------------------------------------|--|--------------------------|-------------------------------------|------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <p>Cold-formed steel light frame construction in the SFRS of structures in SDC C, D, E, or F.</p> <ol style="list-style-type: none"> 1. Welding operations of elements of the SFRS 2. Screw attachment, bolting, anchoring, and other fastening of elements of the SFRS including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.12.3 | <p>Not required for shear walls and diaphragms, including screw installation, bolting, anchoring and other fastening to components of the SFRS where either of the following applies: #1. Sheathing is gypsum bd or fiberboard; #2. Sheathing is wood structural panel or steel sheets on one side of the shear wall, panel or diaphragm assembly and the fastener spacing of the sheathing is > 4”o.c</p> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>Designated seismic systems for structures assigned to Seismic Design Category C, D, E or F. Verify the label, anchorage and mounting conform to the certificate of compliance</p> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | ASCE 7, Section 13.2.2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <p>Architectural components – erection and fastening of exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer in structures assigned to Seismic Design Category D, E or F</p> | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.12.5 | <p>Not required for: #1. Exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer ≤ 30’ in height above grade or walking surface. #2. Exterior cladding and interior and exterior veneer weighing 5 psf or less. #3. Interior nonbearing walls weighing 15 psf or less.</p> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <p>Access floors - anchorage in structures assigned to Seismic Design Category D, E or F.</p> | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.12.5.1 | |

| | | | | | | |
|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Plumbing, Mechanical and electrical components: Seismic Design Categories C, D, E or F: 1. Anchorage of electrical equipment for emergency and standby power. 2. Installation and anchorage of piping systems for Hazardous materials and associated mechanical units. 3. Installation and anchorage of ductwork for Hazardous materials. 4. Installation and anchorage of vibration isolation systems where the required clearance is $\leq 1/4''$ between the equipment support frame and restraint. | <input type="checkbox"/> | NCBC 1705.12.6, #1 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | NCBC 1705.12.6, #3 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | NCBC 1705.12.6, #4 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | NCBC 1705.12.6, #5 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Seismic Design Categories E or F: 1. Anchorage of other electrical equipment. | <input type="checkbox"/> | NCBC 1705.12.6, #2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Storage racks $\geq 8'$ in height in Seismic Design Categories D, E or F. | <input type="checkbox"/> | NCBC 1705.12.7 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Seismic isolation systems in seismically isolated structures assigned to SDC B, C, D, E, or F. | <input type="checkbox"/> | NCBC 1705.12.8 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Installation of cold-formed steel special bolted moment frames in the SFRS of structures assigned to SDC D, E, or F. | <input type="checkbox"/> | NCBC 1705.12.9 | |

IT 13 TESTING FOR SEISMIC RESISTANCE (Refer to Section 1705.13)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Structural Steel. 1. Nondestructive testing for seismic resistance for SFRS for buildings assigned to SDC B, C, D, E or F. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.13.1 NCBC 1705.13.1.1 or AISC 341 | Exception: SDC B or C buildings with a response modification coefficient ≤ 3 . |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Structural Steel Elements. 1. Nondestructive testing for seismic resistance of structural steel elements in the SFRS of buildings and structures assigned to SDC B, C, D, E or F if not covered in 1705.13.1.1. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.13.1.2 AISC 341 | Exception: SDC B or C buildings with a response modification coefficient ≤ 3 . |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Nonstructural Components for structures assigned to SDC B, C, D, E or F where the requirements of Section 13.2.1 of ASCE 7 for nonstructural components, supports or attachments are met by seismic qualification as specified in Item 2 therein, the RDPIRC shall specify on the approved construction documents the requirements for seismic qualification by analysis, testing or experience data. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.13.2 | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Designated seismic systems for structures assigned to SDC C, D, E or F that are subject to the requirements of Section 13.2.2 of ASCE 7 for certification, the RDPIRC shall specify on the approved construction documents the requirements to be met by analysis, testing or experience data. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.13.3 | |

| | | | | | | | |
|--------------------------|--------------------------|--------------------------|--|--|--|---|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Seismic Isolation Systems in Seismically isolated structures assigned to SDC B, C, D, E, or F. | | | NCBC 1705.13.4; ASCE 7, section 17.8 | |
|--------------------------|--------------------------|--------------------------|--|--|--|---|--|

IT-14 SPRAYED FIRE-RESISTANT MATERIALS (Refer to NCBC Sections 1705.14)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|---------------------------------|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sprayed fire-resistant materials. | | | NCBC 1705.14.4.2 & ASTM E605 | 4/1000sf |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. Floor, roof and wall assemblies | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.3 | 4 @12"x12" |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. Cellular Decks | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.4 | 4 @12"x12" |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. Fluted Decks | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.5 | 25% |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4. Structural members | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.6 | 9@12" |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 5. Beams and Girders | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.7 | 7@12" |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 6. Joists and Trusses | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.8 | 12@12" |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 7. Wide-flanged columns | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.14.4.9 | 4@12" |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 8. Hollow structural section and pipe columns | <input type="checkbox"/> | <input type="checkbox"/> | | |

IT 15 MASTIC AND INTUMESCENT FIRE-RESISTANT COATING 1705.15

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|----------------------------|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Mastic and Intumescent fire-resistant coating applied to structural elements and decks. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.15; AWCI 12-B | |

IT-16 EXTERIOR INSULATION & FINISH SYSTEM (EIFS)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | EIFS application. | <input type="checkbox"/> | <input type="checkbox"/> | | Not required for: 1. EIFS applications installed over a water-resistive barrier that drains to the exterior. 2. EIFS applications installed over masonry or concrete walls. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Water-resistive barrier coating when installed over a sheathing substrate. | <input type="checkbox"/> | <input type="checkbox"/> | ASTM E2570 | |

IT 17 FIRE-RESISTANT PENETRATIONS AND JOINTS (Refer to NCBC Sections 1705.17; 1705.17.1; & 1705.17.2)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|-----|-----|----|-----------------|---|---|----------|------------------|
|-----|-----|----|-----------------|---|---|----------|------------------|

| | | | | | | |
|-------------------------------------|--------------------------|--|--|--------------------------|-------------------------------------|--|
| | | Applies to all new high-rise buildings and all new buildings in Risk Category III or IV. Additions, Changes of Use, NCEBC Ch 14 evaluated buildings and Level 3 Alterations within existing high-rises and / or Risk Category III or IV buildings will also require these special inspections. | | | | |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>Inspection of tested and listed penetration firestop systems:</p> <p>1. Through penetrations:</p> <p>a. Verify materials before installation.</p> <p>b. Verify against design (Cutsheet or EJ).</p> <p>c. For each type of firestop:</p> <p>i. Witness 10% of installations, or</p> <p>ii. Destructive testing on 2% of installations.</p> <p>d. Verify all firestops are installed.</p> <p>2. Membrane penetrations:</p> <p>a. Verify materials before installation.</p> <p>b. Verify against design (Cutsheet or EJ).</p> <p>c. For each type of firestop:</p> <p>i. Witness 10% of installations or</p> <p>ii. Destructive testing on 2% of installations.</p> <p>d. Verify all firestops are installed.</p> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>NCBC 1705.17.1; ASTM E2174-10ae1</p> <p>10% of installations per floor or per area. Area = 1 sf – 10,000 sf.</p> <p>2% of installations per floor or per area. Area = 1 sf – 10,000 sf</p> <p>10% of installations per floor or per area. Area = 1 sf – 10,000 sf</p> <p>2% of installations per floor or per area. Area = 1 sf – 10,000 sf</p> |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>Installation of tested and listed fire-resistant joint systems:</p> <p>1. Verify materials before installation.</p> <p>2. Verify against design (cutsheet or EJ) .</p> <p>3. For each type of joint system:</p> <p>a. Witness installation of 5% min of total lineal feet of joint system being installed, or</p> <p>b. Destructive testing, disassembly or visual inspection at the rate of at least 1 sample for every 500 lineal feet of the joint system.</p> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>NCBC 1705.17.2; ASTM E2393-10a</p> |

IT-18 SMOKE CONTROL (Refer to NCBC Section 1705.18)

| ITL | SER | SI | Inspection Task | C | P | Standard | Notes / Comments |
|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Inspection of smoke control system. | <input type="checkbox"/> | <input type="checkbox"/> | NCBC 1705.18 | |

FINAL REPORT OF SPECIAL INSPECTIONS

Project: *Harnett Primary Addition*

Location: *Dunn, NC*

Owner: *Harnett County Schools*

Design Professional in Responsible Charge: *Thomas Hughes, AIA, LEED AP*

To the best of my information, knowledge and belief, the Special Inspections required for this project, and itemized in the State of Special Inspections submitted for permit, have been performed and all discovered discrepancies have been reported and resolved other than the following:

Comments:

(Attach continuation sheets if required to complete the description of corrections).

Interim reports submitted prior to this final report form a basis for and are to be considered an integral part of this final report.

Respectfully submitted,
Special Inspector

Licensed Professional Seal

Signature

Date

AGENTS FINAL REPORT OF SPECIAL INSPECTIONS

AGENTS FINAL REPORT

Project: *Harnett Primary Addition*Location: *Dunn, NC*Owner: *Harnett County Schools*Design Professional in Responsible Charge: *Thomas Hughes, AIA, LEED AP*

To the best of my information, knowledge and belief, the Special Inspections or testing required for this project, and designated for this Agent in the *Statement of Special Inspections* submitted for permit, have been performed and all discovered discrepancies have been reported and resolved other than the following:

Comments:

(Attach continuation sheets if required to complete the description of corrections).

Interim reports submitted prior to this final report form a basis for and are to be considered an integral part of this final report.

Respectfully submitted,

Agent of the Special Inspector

Licensed Professional Seal

Signature

Date

END OF SECTION

SECTION 01 50 00**TEMPORARY FACILITIES AND CONTROLS****PART 1 GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Temporary Utilities.
 - 2. Construction Facilities.
 - 3. Temporary Controls.
 - 4. Moisture and Mold Control.
 - 5. Operation, Termination and Removal.

1.3 GENERAL

- A. Use Charges:
 - 1. Installation, use charges, maintenance of and removal of temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities for construction operations without cost, including, but not limited to, Architect, testing agencies, separate contractors and authorities having jurisdiction.
- B. Informational Submittals:
 - 1. Erosion and Sedimentation Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
 - 2. Moisture Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
 - a. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
 - b. Indicate procedures for discarding water damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water damaged Work.
 - c. Indicate sequencing of work that requires water, such as sprayed fire resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
 - 3. Dust and HVAC Control Plan: Submit coordination drawing and narrative that indicates the dust and HVAC control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
 - a. Locations of dust control partitions at each phase of work.
 - b. HVAC system isolation schematic drawing.
 - c. Location of proposed air-filtration system discharge.
 - d. Waste handling procedures.
 - e. Provide positive means to prevent air-borne dust and debris from entering the HVAC air distribution systems, louvers, ductwork, and pathways.
 - f. Other dust control measures.

- C. Quality Assurance:
 1. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
 2. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- D. Temporary Use of Permanent Facilities: Architect and Owner must approve the use of permanent equipment for temporary uses. Approval does not designate acceptance of the system. Prior to operation of permanent equipment for temporary purposes, verify installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.
 1. In the case of permanent equipment installed by a separate contractor, and prior to requesting approval of Architect and Owner, engage separate contractor and acquire written approval for each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.
- E. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Division 01 Section "Closeout Procedures."
- F. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

1.4 TEMPORARY UTILITIES

- A. Temporary Electricity:
 1. Provide power service required from utility source as needed for construction operation.
 2. Complement existing power service capacity and characteristics as required for construction operations.
 3. Provide power outlets, with branch wiring and distribution boxes located as required for construction operations. Provide flexible power cords as required for portable construction tools and equipment.
 4. Permanent convenience receptacles may not be utilized during construction.
- B. Temporary Lighting For Construction Purposes:
 1. Provide and maintain lighting for construction operations to achieve minimum lighting level of 2 watt/sq ft.
 2. Provide and maintain minimum 1 watt/sq ft lighting to exterior staging and storage areas after dark for security purposes.
 3. Provide and maintain minimum 0.25 watt/sq ft HID lighting to interior work areas after dark for security purposes.
 4. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps for specified lighting levels.
 5. Maintain lighting and provide routine repairs.

6. Permanent building lighting may be utilized during construction.
- C. Temporary Heating:
1. Provide heating devices and heat as needed to maintain specified conditions for construction operations.
 2. Enclose building prior to activating temporary heat in accordance with Enclosures article in this section.
 3. Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress, unless indicated otherwise for specific activities and products.
- D. Temporary Cooling:
1. Provide cooling devices and cooling as needed to maintain specified conditions for construction operations.
 2. Enclose building prior to activating temporary cooling in accordance with Enclosures article in this section.
 3. Maintain maximum ambient temperature of 80 degrees F in areas where construction is in progress, unless indicated otherwise for specific activities and products.
- E. Temporary Ventilation:
1. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- F. Temporary Communication Services:
1. Internet Service and Wi-Fi Access: Provide and maintain, broadband internet service in field office as part of a functioning field office. Provide desktop computer with Microsoft operating system, Microsoft Office 365 software suite, modem, copier, and printer. Provide access and functionality for Owner, Architect, and Architect's consultants.
- G. Temporary Water Service:
1. Provide suitable quality water service as needed to maintain specified conditions for construction operations.
 2. Extend branch piping with outlets located so water is available by hoses with threaded connections.
- H. Temporary Sanitary Facilities:
1. Provide and maintain required facilities and enclosures. Use of New facility is not permitted. Provide facilities at time of project mobilization.

1.5 CONSTRUCTION FACILITIES

- A. Field Offices and Storage Buildings: Provide with the following minimum requirements.
1. Preparation: Fill and grade sites for temporary structures sloped for drainage away from buildings and project construction.
 2. Locations: Locate structures minimum distance of 30 feet from existing and new structures.
 3. Construction: Structurally sound, secure, weather tight enclosures, and maintained during project construction.
 - a. Exterior Envelope:
 - 1) Thermal properties to be appropriate to occupancy and storage requirements.
 - 2) Weather resistant materials and finishes.
 4. Removal: At completion of Work, remove buildings, foundations, utility services, and debris. Construct and finish areas in accordance with the Contract Documents.
 - a. If areas are not indicated to receive new construction, restore areas to pre-construction condition.

5. Relocating field office functions to a part of the new construction requires Owner's written agreement.
- B. Storage Buildings: Sized for project related material storage requirements, allowing for access and orderly provision for maintenance and inspection of products in accordance with Section 01 60 00 - Product Requirements.
1. Interior finishes to be as required to provide specified conditions for storage of products.
 2. Heating and ventilation to be as required to maintain products in accordance with Contract Documents.
 3. Lighting to be as required for maintenance and inspection of products.
 4. Maintain storage buildings and surrounding areas.
- C. Field Office: Weather tight, modular type buildings constructed with floors raised above ground, securely anchored to foundations, steps, landings, and ramps as required for occupant entry/egress.
1. Install and make ready for occupancy within 15 days after Notice to Proceed.
 2. Overall Size: Minimum overall dimensions.
 - a. 64 x 36 feet.
 3. Spaces separate from each other as follows:
 - a. Office(s) for Contractor staff and functions.
 - b. Meeting room for project meetings:
 - 1) Tables and chairs to accommodate 16 persons.
 - 2) Minimum 55 inch LED television/monitor mounted on wall for viewing during meetings; equipped with multiple HDMI connections and wireless connectivity.
 - c. Designated space for As-Built drawings to be maintained for the duration of the construction.
 - d. Toilet facilities; fully functioning; continuously stocked with toilet paper, paper towels and hand cleansing products.
 4. Interior Finishes: Sheet type materials for walls and ceilings, pre-finished or painted; resilient flooring and base.
 5. Electrical outlets to be distributed throughout spaces for easy access.
 6. Lighting: Interior lighting to be 50 foot candles at desk top height; exterior lighting at entry/egress doors.
 7. Heating, Cooling, and Ventilating: Automatic equipment to maintain comfort conditions of 76 degrees F in summer and 68 degrees F in winter.
 8. Furnishings to be sturdy construction; include hanging rack for drawings and drawings review table.
 9. Parking: Gravel surfaced parking and walk travel ways to office entries. Maintain walk travel ways free of debris, overgrowth, mud, water, and snow.
 10. Maintenance and Cleaning: Provide services as needed and as follows.
 - a. Weekly janitorial services for common areas, meeting room, and toilets; bi-weekly cleaning and maintenance for offices.
 11. Employee Residential Occupancy: Not allowed on Owner's property.
- D. Vehicular Access:
1. Construct temporary all-weather access roads from public thoroughfares to serve construction area, of width and load bearing capacity to accommodate unimpeded traffic for construction purposes.
 2. Construct temporary bridges and culverts to span low areas and allow unimpeded drainage.
 3. Extend and relocate vehicular access as Work progress requires, provide detours as necessary for unimpeded traffic flow.
 4. Locations as indicated on Drawings.

5. Provide unimpeded access for emergency vehicles. Maintain 20 feet wide driveways with turning space between and around combustible materials.
 6. Provide and maintain access to fire hydrants free of obstructions.
 7. Provide means of removing mud from vehicle wheels before entering streets.
 8. Do not use existing on-site paved surfaces for construction traffic.
- E. Parking:
1. Construct temporary gravel surface parking areas to accommodate construction personnel.
 2. When site space is not adequate, provide additional off-site parking.
 3. Use of existing parking facilities used by construction personnel is not permitted.
 4. Do not allow heavy vehicles or construction equipment in parking areas.
 5. Do not allow vehicle parking on existing pavement.
 6. Permanent Pavements and Parking Facilities:
 - a. Bases for permanent roads and parking areas may be used for construction traffic.
 - b. Avoid traffic loading beyond paving design capacity. Tracked vehicles not allowed.
 - c. Use of permanent parking structures is permitted.
 7. Maintenance:
 - a. Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, mud, snow, and ice.
 - b. Maintain existing and permanent paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.
 8. Removal, Repair:
 - a. Remove temporary materials and construction when permanent paving is usable.
 - b. Remove underground work and compacted materials to depth of 2 feet; fill and grade site as specified.
 - c. Repair permanent facilities damaged by use, to original condition.
 9. Mud from Site Vehicles: Provide means of removing mud from vehicle wheels before entering streets.
- F. Progress Cleaning and Waste Removal:
1. Maintain areas free of waste materials, debris, and rubbish. Maintain site in clean and orderly condition.
 2. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing spaces.
 3. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
 4. Collect and remove waste materials, debris, and rubbish from site weekly and dispose off-site.
 5. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.
- G. Project Identification:
1. Project Identification Sign:
 - a. One painted sign of construction, design, and content shown on Drawings, location as designated by Architect and Owner.
 2. Project Informational Signs:
 - a. Painted informational signs of same colors and lettering as Project Identification sign, or standard products; size lettering for legibility at 100 feet distance.
 - b. Provide sign at each field offices and storage buildings.

- c. Provide state traffic agency directional traffic signs to direct traffic into and within site. Relocated as Work progress requires.
 - d. No other signs are allowed except those required by law.
 3. Sign Painter: Experienced as professional sign painter for minimum three years.
 4. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.
 5. Sign Materials:
 - a. Structure and Framing: New, wood, structurally adequate.
 - b. Sign Surfaces: Exterior grade plywood with medium density overlay, minimum 3/4 inches thick, painted both sides, standard large sizes to minimize joints.
 - c. Paint and Primers: Exterior quality, two coats; sign background of color as selected.
 - d. Lettering: Exterior quality paint, colors as selected.
 6. Installation:
 - a. Install project identification sign within 15 days after Notice to Proceed.
 - b. Erect at designated location.
 - c. Erect supports and framing on secure foundation, rigidly braced, and framed to resist wind loadings.
 - d. Install sign surface plumb and level. Anchor securely.
 - e. Paint exposed surfaces of sign, supports, and framing.
 7. Maintenance: Maintain signs and supports clean, repair deterioration and damage.
 8. Removal: Remove signs, framing, supports, and foundations at completion of Project and restore area.
- H. Traffic Regulation:
 1. Provide temporary signs, signals, devices, flag persons, flares and lights as required by codes or local authorities.
 2. Signs, Signals and Devices:
 - a. Post Mounted and Wall Mounted Traffic Control and Informational Signs: As approved by authority having jurisdiction.
 - b. Automatic Traffic Control Signals: If required by and as approved by local jurisdictions.
 - c. Traffic Cones and Drums, Flares and Lights: As approved by authority having jurisdiction.
 - d. Flag Person Equipment: As required by authority having jurisdiction.
 3. Flag Persons: Provide trained, equipped, and State DOT certified flag persons to regulate traffic when construction operations or traffic encroaches on public roadway.
 4. Flares and Lights: Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.
 5. Haul Routes:
 - a. Consult with authority having jurisdiction and establish public thoroughfares to be used for haul routes and site access.
 - b. Confine construction traffic to designated haul routes.
 - c. Provide traffic control as required by authority having jurisdiction and at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.
 6. Traffic Signs and Signals:
 - a. Provide signs at approaches to site and on site, at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
 - b. Provide, operate, and maintain traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control, and areas affected by Contractor's operations.
 - c. Relocate as Work progresses, to maintain effective traffic control.

7. Removal:
 - a. Remove equipment and devices when no longer required.
 - b. Remove post settings and foundations entirely.
 - c. Repair damage caused by installation.

1.6 TEMPORARY CONTROLS

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 1. Comply with work restrictions specified in Division 01 Section "Summary."
- C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and dis-charge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent proper-ties and walkways, according to requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
 1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
 2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
 3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site for the duration of Project.
 4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
 1. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
 2. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- E. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- F. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.
- G. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- H. Temporary Egress: Maintain protected temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- I. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.

- J. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
1. For projects where smoking is not entirely prohibited throughout site:
 - a. Prohibit smoking within buildings under construction. Designate area on site where smoking is permitted. Provide approved ashtrays in designated smoking areas.
 - b. Prohibit smoking in construction areas.
 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.
 5. Portable Fire Extinguishers: Provide UL rated extinguishers appropriate to application needs, capacity, class and extinguishing agent as required by locations and classes of fire exposures. Comply with current requirements of NFPA, OSHA, and local authorities having jurisdiction.
 - a. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable exit.
 - b. Provide minimum one fire extinguisher in each field office and storage building and as otherwise required in construction areas.
- K. Barriers:
1. Provide barriers to prevent unauthorized entry to construction areas to allow for Owner's use of site, and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
 2. Provide protection for plants designated to remain. Replace damaged plants.
 3. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.
- L. Enclosures and Fencing:
1. Construction: Commercial grade chain link fence.
 2. Provide fence not less than 6 feet high where indicated on the Drawings between the area of Work and existing structures maintaining safe width for circulation.
- M. Security:
1. Security Program:
 - a. Protect Work from theft, vandalism, and unauthorized entry.
 - b. Initiate program at project mobilization.
 - c. Maintain program throughout construction period until Owner occupancy.
 2. Entry Control:
 - a. Restrict entrance of non-construction persons and vehicles into Project site.
 - b. Allow entrance only to authorized persons.
- N. Dust Control:
1. Execute Work by methods to minimize raising dust from construction operations.
 2. Provide positive means to prevent air-borne dust from dispersing into atmosphere.
 3. Provide positive means to prevent air-borne dust and debris from entering HVAC air distribution systems, louvers, ductwork, and pathways.
- O. Noise Control:

1. Provide methods, means, and facilities to minimize noise produced by construction operations during school (or other facility type) operating hours.

1.7 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to air-borne mold spores, protect as follows:
 1. Protect porous materials from water damage.
 2. Protect stored and installed material from flowing or standing water.
 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 4. Remove standing water from decks.
 5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
 1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 2. Keep interior spaces reasonably clean and protected from water damage.
 3. Periodically collect and remove waste containing cellulose or other organic matter.
 4. Discard or replace water-damaged material.
 5. Do not install material that is wet.
 6. Discard, replace, or clean stored or installed material that begins to grow mold.
 7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.
- D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure, but prior to the full operation of permanent HVAC systems, maintain as follows:
 1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 2. Use temporary HVAC systems to control humidity.
 3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
 - c. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.

1.8 OPERATION, TERMINATION, AND REMOVAL

- A. Maintenance: Maintain facilities in good operating condition until removal.
 1. Maintain operation of temporary facilities and controls on a daily and 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- B. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Owner acceptance of project.

- C. Termination and Removal: Remove each temporary facility when no longer required, when it has been replaced by authorized use of a permanent facility, and no later than Owner acceptance of project. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 2. Prior to inspection for Owner acceptance, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."
 3. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.
 4. Remove temporary underground installations entirely. Fill, grade and finish as required by Contract Documents.
 5. Clean and repair damage caused by installation or use of temporary work.
 6. Restore existing conditions and construction to original condition.
 7. Restore new project work construction to specified condition.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Product Delivery Requirements.
 - 2. Product Storage and Handling Requirements.
 - 3. Environmental Requirements
 - 4. Product Options.
 - 5. Product Substitution Requests.
 - 6. Equipment Electrical Characteristics and Components.
 - 7. Spare Parts And Maintenance Products.
 - 8. Substitution Request Form (attached at end of this Section).
- B. Related Requirements:
 - 1. Section 01 33 00 - Submittal Procedures.
 - 2. Section 01 40 00 - Quality Requirements: Product quality monitoring.

1.3 DEFINITIONS

- A. Basis of Design Product Specification: A specification in which a specific manufacturer or manufacturer's product is named and accompanied by the words "Basis of Design," and may include make or model number or other designation, to establish significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.
- B. Provide, Furnish, and Supply:
 - 1. Provide: To furnish and install.
 - 2. Furnish: To supply, deliver, unload, inspect for damage, and store.
 - 3. Supply: Same as Furnish.
- C. Install: To unpack, assemble, erect, apply, place, construct, finish, cure, protect, clean, start up, and make ready for use.
- D. Product: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. Product is material, machinery, components, equipment, fixtures, and systems forming the work result. Product is not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products are new and never before used.
 - 1. All products installed as part of the Work are to be new products, unless otherwise indicated. New products are products that have not been previously incorporated into another project or facility and has not been used. Products salvaged, recycled or re-used from other projects are not considered new products.
 - a. Salvaged, recycled or re-used products are permitted only when specifically indicated as such in the Contract Documents.
 - 2. Named Product: Items identified by manufacturer or manufacturer's product name, and may include make or model number or other designation shown or listed in

- manufacturer's published product literature, that is current as of date of the Contract Documents.
3. **Comparable Product:** Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- E. **Project Manual:** The book-sized volume(s) that includes information about procurement requirements (if any), contracting requirements, and specifications for the Work.

1.4 PRODUCT DELIVERY REQUIREMENTS

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.
- F. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.5 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Store and protect products in accordance with manufacturers' instructions.
- B. Store with seals and labels intact and legible.
- C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- D. For exterior storage of fabricated products, place on sloped supports above ground.
- E. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Ambient air temperature and humidity levels to be as required prior to, during and after installation of Work. Minimum requirements to be as recommended by product manufacturer unless requirements indicated in Work specification section are more stringent.

1.7 PRODUCT OPTIONS

- A. Products Specified by Reference Standards and/or by Description Only: Use product complying with the referenced standards and descriptions.
- B. Products Specified by Naming One or More Manufacturers: Use product of one of manufacturers named and complying with specifications.
 - 1. Substitutions allowed only if so stated in the list of manufacturers. Comply with Substitution Request requirements.
 - 2. If Basis of Design manufacturer is indicated, use of Basis of Design product is preferred if other manufacturers are indicated; but, required if no other manufacturer is indicated.

1.8 PRODUCT SUBSTITUTION REQUESTS

- A. Comply with the requirements indicated in the General Conditions of the Contract, the Supplementary General Conditions and as indicated in this Article.
- B. Substitution Requests during the Bidding Period: Architect will consider Requests For Substitutions from Bidder only, and only up to fourteen (14) days before receipt of Bids.
- C. Substitution Requests during the Construction Period: Substitutions may be considered from Contractor only, and only when a product becomes unavailable through no fault of Contractor.
 - 1. During Construction Period, substitutions will not be considered by Architect or Owner when they are indicated or implied on Shop Drawings, Product Data or other submittal requirements, without separate written and certified Substitution Request.
- D. Substitution Request Submittal Procedure:
 - 1. Submit two copies of each Substitution Request to Architect for consideration. Use Substitution Request Form located at end of this Section. Limit each request to one proposed Substitution. The requirements for Substitution Request are indicated on the Substitution Request Form and as otherwise indicated in the Contract documents.
 - 2. During the Bidding Period (when permitted), Architect will notify Contractor of accepted substitutions by issuance of Addendum.
 - 3. During the Construction Period, Architect will notify Contractor of accepted substitutions in written form. After which, Contractor will provide submittal requirements indicated in the related specification Section.

PART 2 PRODUCTS**2.1 GENERAL PRODUCT REQUIREMENTS**

- A. Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
- B. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
- C. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
- D. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
- E. Where products are accompanied by the term "as selected," Architect will make selection.

- F. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
- G. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
 - 1. If no product available within specified category matches and complies with other specified requirements, comply with Product Substitution Requests requirements in this Section for proposal of product.
- H. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from submitted samples" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items; unless indicate otherwise within the Submittals article of specification Section.

2.2 EXISTING PRODUCTS

- A. Do not use materials and equipment removed from existing premises unless specifically permitted or required by Contract Documents.
- B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.

2.3 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by the Contract Documents.
- B. At minimum, comply with specified requirements and reference standards.
- C. Specified products define standard of quality, type, function, dimension, appearance, and performance required.
- D. Furnish products of qualified manufacturers suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise. Confirm that manufacturer's production capacity can provide sufficient product, on time, to meet Project requirements.
- E. Where all other criteria are met, Contractor is to give preference to products that:
 - 1. If used on interior, have lower emissions.
 - 2. If wet-applied, have lower VOC content.
 - 3. Are extracted, harvested, and/or manufactured closer to the location of the project.
 - 4. Have longer documented life span under normal use.
 - 5. Result in less construction waste.
 - 6. Are made of vegetable materials that are rapidly renewable.
 - 7. Are made of recycled materials.
 - 8. If made of wood, are made of sustainably harvested wood, wood chips, or wood fiber.
 - 9. Are Cradle-to-Cradle Certified.
 - 10. Have a published Environmental Product Declaration (EPD).
 - 11. Have a published Health Product Declaration (HPD).
 - 12. Have a published GreenScreen Chemical Hazard Analysis.
- F. Furnish interchangeable components from same manufacturer for components being replaced.

2.4 EQUIPMENT ELECTRICAL CHARACTERISTICS AND COMPONENTS

- A. Wiring Terminations: Furnish terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Include lugs for terminal box.

- B. Cord and Plug: Furnish minimum 6 foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

2.5 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Coordinate with Owner to deliver and store Spare Parts and Maintenance Products.
- B. Required items are for Owner's future maintenance stock and are in addition to items required to install and complete the Work as indicated in the Drawings and Specifications.
- C. Required items are indicated in the following location(s):
 - 1. In individual Specification Sections in Divisions 01 through 49.
 - 2. In the Drawings.
- D. Items include, but are not limited to, tools, special tools, spare parts, maintenance products, extra materials, and similar items.
- E. Label, Package, and Deliver Items: Coordinate delivery times and locations with Owner for attendance and receiving.
 - 1. Package, label and deliver to Project site and place in location as directed by Owner.
 - a. Label items with legible print indicating manufacturer's name, model, series, and color identification.
 - 2. Receipts of Delivery: Prepare, prior to delivery, an itemized receipt for items required to be delivered, to be signed and dated by Contractor and Owner representatives at time of delivery. The receipt shall indicate the following information for each item delivered:
 - a. Project Identification.
 - b. Date and time of delivery.
 - c. Location of delivery.
 - d. Item Specification Section Number and Title.
 - e. Item Description.
 - f. Quantity/Size/Amount Required (as indicated in specifications).
 - g. Quantity/Size/Amount Delivered.
 - h. Signatures/dates certifying delivery by Contractor and receipt by Owner.
 - 3. Submit receipts as support documentation with the List Of Spare Parts and Maintenance Products.
- F. Closeout Submittal: Submit the List of Spare Parts and Maintenance Products as indicated in Section 01 78 39 - Project Record Documents, article Record Certifications Submittals.
 - 1. Prepare itemized list to include all items and quantities required. List to be columnized with columns indicating information indicated above for the Receipts of Delivery. Behind the list, insert the certified Receipts of Delivery, sorted by delivery dates.

PART 3 EXECUTION

Not Used.

SUBSTITUTION REQUEST FORM

Project: _____ Substitution Request Number: _____
 _____ Architect's Project Number: _____
 To: _____ From Company: _____
 _____ Date: _____
 Re: _____ Contract For: _____
 Specification Title: _____ Section #: _____
 Article/Paragraph References: _____
 Proposed Substitution: _____
 Manufacturer: _____ Phone: _____
 Manufacturer Address: _____
 Trade Name: _____ Model #: _____

I have attached complete proposed Substitution data substantiating its compliance with the Contract Documents, including:

1. Reference to Article and Paragraph numbers in Specification Section.
2. Manufacturer's name and address, product, trade name, model or catalog number, performance and test data, and reference standards.
3. Itemized point-by-point comparison of proposed substitution with specified product, listing variations in quality, properties, performance, warranties, and other pertinent characteristics.
4. Certified test data to show compliance with performance characteristics specified.
5. Samples, color and finish options, and shop drawings as applicable or requested.
6. Details indicating changes required in other Work.
7. Cost data comparing proposed substitution with specified product, to include net cost difference.
8. Availability of maintenance service and source of replacement parts as applicable.
9. Other information as necessary to assist Architect's evaluation.

I, _____, certify that:

1. I have provided the information required above.
2. I have investigated proposed substitution within context of adjacent materials and construction, I and determined that it meets or exceeds quality and performance levels of specified product.
3. I will coordinate installation of accepted substitution and make approved changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
4. I waive claims for additional costs or time extension which may subsequently become apparent.
5. I will reimburse Owner and Architect for review or redesign services associated with re-approval requirements by authorities having jurisdiction and redesign services required otherwise.

Certified By: _____ Signature: _____ Date: _____
 Contractor Company: _____ Phone: _____
 Address: _____

Notary State of: _____ County of: _____

Subscribed and sworn to before me on this _____ day of _____ in the year _____

by: _____ .

Notary Public Signature: _____ My Commission Expires: _____

Notary Public Printed Name: _____

SECTION 01 73 00**EXECUTION****PART 1 GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Examination.
 - 2. Preparation.
 - 3. Construction Layout.
 - 4. Field Engineering.
 - 5. Installation.
 - 6. Cutting and Patching.
 - 7. Coordination of Owner-Installed Products.
 - 8. Progress Cleaning.
 - 9. Starting and Adjusting.
 - 10. Protection of Installed Construction.
- B. Related Requirements:
 - 1. Division 01 Section "Summary" for limits on use of Project site.
 - 2. Division 01 Section "Submittal Procedures".
 - 3. Division 01 Section "Closeout Procedures".
 - 4. Division 01 Section "Project Record Documents" for submitting documentation.
 - 5. Division 07 Section "Firestopping" for patching penetrations in fire-rated construction.

1.3 DEFINITIONS

- A. Existing In-Place Materials and Construction: Materials and construction that existed prior to the beginning of Work for this Project and is to remain without compromise after the Work of this Project.
- B. Cutting: Removal of existing in-place materials and construction necessary to permit installation or performance of the Work of this Project.
- C. Patching: Fitting and repair work required to restore existing in-place materials and construction to original conditions after installation of other work.

PART 2 PRODUCTS**2.1 MATERIALS**

- A. General: Comply with requirements specified in other Sections.

PART 3 EXECUTION**3.1 EXAMINATION**

- A. General: Verify that existing conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Existing Site Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, and other construction affecting or affected by the Work.
 - 1. Verify the locations and invert elevations at points of connection to sanitary sewer, storm sewer, water-service piping, underground electrical and communication services, and other utilities.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving project site.
- C. Verify existing substrate is capable of structural support or attachment of new Work being applied or attached.
- D. Examine and verify specific conditions described in individual specification sections.
- E. Verify utility services are available, of correct characteristics, and in correct locations.
- F. Examine substrates, areas, and conditions for compliance with requirements for installation tolerances and other conditions affecting performance.
- G. Examine rough-in of mechanical and electrical systems to verify actual and compliant locations for connections before equipment and fixture installation.
- H. Verify compatibility between new Work to be apply and existing substrates upon which new Work is to be applied, including compatibility with existing finishes, sealers, or primers.
- I. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- J. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- K. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.
- L. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect.
- M. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

- D. Verify that the required tools, equipment, utilities, products, and materials are available to the area of Work and that all items are in condition as to produce coordinated workflow and compliant Work.
- E. Dissimilar Materials: Apply appropriate coating or material as permanent separator of dissimilar materials to prevent galvanic, chemical, and other corrosive processes that produce discoloration or damaging effects on construction materials. Application to be in a manner as to not be visible when construction is completed.
- F. Exterior Wood Without Shop Applied Finish: Where field-coated wood materials are indicated, back-prime all concealed surfaces with primer/sealer recommended by coating manufacturer for substrate materials.

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a Professional Land Surveyor, registered in the State in which the project is located, to lay out the Work using accepted surveying practices.
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish limits on use of Project site.
 - 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 4. Inform installers of lines and levels to which they must comply.
 - 5. Check the location, level and plumb, of every major element as the Work progresses.
 - 6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 - 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Owner and Architect.

3.4 FIELD ENGINEERING

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

- B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

- C. Final Property Survey:
 - 1. Contractor is to engage the services of a Professional Land Surveyor to prepare a final property survey showing significant features and real property as constructed in accordance with the Contract Documents.
 - 2. The land surveyor is to be registered in the State in which the project is located.
 - 3. Survey is to indicate final completed property conditions and features.
 - 4. Survey is to include land surveyor signed certification that the principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
 - a. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
 - 5. Contractor is to review the survey documentation to confirm that the survey indicates the Work is compliant with the requirements of the Contract Documents. Noncompliant Work is to be corrected by the Contractor and the correction(s) are to be updated in the survey and certified by surveyor in the survey documentation.
 - a. Contractor is to submit compliant final survey to Owner with Contractor's written letter certifying that the final survey indicates the Work to be compliant with the requirements of the Contract Documents.
 - b. Record the compliant final property survey with the appropriate authorities having jurisdiction as the official "Property Survey".
 - c. Record Documents: Include the following in the project closeout record documents.
 - 1) Copy of the surveyor certified, compliant final property survey.
 - 2) Copy of Contractor's compliance certification.
 - 3) Evidence of official recording of compliant final property survey with the appropriate authorities having jurisdiction.

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.

- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for in-installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 CUTTING AND PATCHING

- A. Employ skilled and experienced installer to perform cutting and patching.
- B. Execute cutting, fitting, and patching to complete Work, and to:
 - 1. Fit the several parts together, to integrate with other Work.
 - 2. Uncover Work to install or correct ill-timed Work.
 - 3. Remove and replace defective and non-conforming Work.
 - 4. Remove samples of installed Work for testing.
 - 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- C. Execute work by methods to avoid damage to other Work, and to provide proper surfaces to receive patching and finishing.
- D. Patching Existing In-Place Materials: Use materials for patching identical to the existing in-place materials. For exposed surfaces, use materials that visually match the existing in-place adjacent surfaces.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual, functional and performance requirements of the existing in-place materials.
- E. Cut masonry and concrete materials using masonry saw or core drill.
- F. Restore Work with new products in accordance with requirements of Contract Documents.
- G. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- H. Maintain integrity of wall, ceiling, and floor construction. Completely seal voids.

- I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Division 07 of the Specifications, to full thickness of penetrated element.
- J. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for assembly, refinish entire unit.
- K. Identify hazardous substances or conditions exposed during the Work to Owner and Architect for decision or remedy.

3.7 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's separate construction personnel.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner provided work and separate contractors.
 - 1. Construction Schedule: Incorporate services and work activities of Owner provided work and separate contractors into the project's Construction Schedule.

3.8 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 degrees F.
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements of local and state authorities and as indicated in the contract documents related to Construction Waste Management and Disposal.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.9 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Division 01 and other Sections related to "Commissioning".
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Testing and Balancing: Test and balance HVAC and controls system to operate at required levels of performance. Record and submit process and final testing and balancing results indicating compliance with project requirements.
- F. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section "Quality Requirements."

3.10 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide protection and maintain conditions that ensure installed Work is without damage or deterioration until Owner acceptance of project. Temporarily remove protective measures as required for required inspections, then reapply protective measures until Owner acceptance of project.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 GENERAL**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative, certification and procedural requirements for contract closeout, including, but not limited to, the following:
1. Procedures Prior to Substantial Completion.
 2. Substantial Completion Procedures.
 3. Final Completion Procedures.
 4. Final Cleaning.
 5. Repair of the Work.
- B. Related Requirements:
1. Division 01 Section "Administrative Requirements".
 2. Division 01 Section "Execution" for progress cleaning of Project site.
 3. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
 4. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 5. Division 01 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
 6. Sections indicating specific operation and maintenance manual requirements for the Work in those Sections.
 7. Sections indicating specific closeout and special cleaning requirements for the Work in those Sections.

1.3 PROCEDURES PRIOR TO SUBSTANTIAL COMPLETION

- A. Complete the following a minimum of two (2) months prior to execution of Demonstration and Training for Owner.
1. Operation and Maintenance Manuals: Refer to Section 01 78 23 - Operation and Maintenance Data for requirements.
 - a. Submit Initial O&M Manuals two (2) months prior to training for Owner.
- B. Complete the following a minimum of thirty (30) days prior to issuance of Contractor Request for Substantial Completion Inspection.
1. Project Closeout Meeting: Refer to Section 01 30 00 - Administrative Requirements for requirements. Provide notice to indicated attendees a minimum of seven (7) days prior to meeting.
- C. Complete the following a minimum of ten (10) days prior to issuance of Contractor Request for Substantial Completion Inspection.
1. Project Record Documents: Initial Submittals of the Record Documents.
 - a. Refer to Section 01 78 39 - Project Record Documents.
 - b. Complete all Section requirements and submit Initial Submittals indicated.
 2. Demonstration and Training: Initial Submittal of the Demonstration and Training Manual.

- a. Refer to Section 01 79 00 - Demonstration and Training.
- b. Complete all Section requirements and submit Initial Submittal indicated.
3. Acquire and prepare documentation required as part of the Contractor Request for Substantial Completion Inspection.
4. Submit LEED and other Sustainable Design Submittals required in Division 01 for sustainable design and reporting requirements.

1.4 SUBSTANTIAL COMPLETION PROCEDURES

- A. Substantial Completion Inspection: Submit a written request to Architect for inspection for certification of date of Substantial Completion a minimum of thirty (30) days prior to date the work will be completed and ready for final inspection. Include Contractor's List of Incomplete Items (Contractor's Punch List) as further detailed in this Section under heading CONTRACTOR'S LIST OF INCOMPLETE ITEMS.
 1. On receipt and review of request, Architect will either proceed with scheduling inspection or notify Contractor of unfulfilled requirements that preclude certification of Substantial Completion.
 - a. In such case that the Architect provides notification to Contractor of unfulfilled requirements, Contractor will complete the noted and other such incomplete requirements that preclude certification of Substantial Completion. Whereafter, Contractor will issue another written request to Architect of inspection.
 2. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list of incomplete work or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
 - a. If, during inspection, the Architect determines certification cannot be issued, the Architect will discontinue further inspection and provided notification report to Contractor of such determination.
 - b. In such case that the Architect's inspection report determines that certification cannot be issued, complete the noted and all incomplete work and provide written request for reinspections to include a copy of the Architect's previous report of the failed inspection. Copy of report to include Contractor's certification and date and Contractor initials of completion by each deficient item completed in preparation for reinspections.
 - c. Results of completed inspection will form the basis of requirements for final completion.

1.5 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
 1. Submit final Certificate For Payment according to Division 01 Section "Payment Procedures."
 2. Contractor Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection report and list of items to be completed or corrected (punch list), indicating completion as follows:
 - a. Each item dated and initialed by Contractor's Superintendent as being inspected and complete.
 - b. Certification by Contractor's Project Manager that Punch List and all Work is complete.
 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Corrected closeout and project documentation that was previously deficient.
 5. Remaining closeout and project documentation not yet submitted.

6. Submit Final Operation and Maintenance Manuals Submittal as indicated in Section 01 78 23 - Operation and Maintenance Data.
 7. Submit Final Project Record Documents Submittal as indicated in Section 01 78 39 - Project Record Documents.
 8. Submit Final Demonstration and Training Manual: Refer to Section 01 79 00 - Demonstration and Training.
- B. Final Completion Inspection: Submit a written request to Architect for final inspection to determine acceptance a minimum of ten (10) days prior to date the work will be completed and ready for final inspection and tests.
1. On receipt and review of request, Architect will either proceed with scheduling inspection or notify Contractor of unfulfilled requirements that preclude certification of final Certificate For Payment.
 - a. In such case that the Architect provides notification to Contractor of unfulfilled requirements, Contractor will complete the noted and other such incomplete requirements that preclude certification of final Certificate For Payment. Whereafter, Contractor will issue another written request to Architect of inspection.
 2. Architect will process the final Certificate For Payment after inspection or will notify Contractor of incomplete requirements that must be completed or corrected before certificate will be issued.
 - a. If, during inspection, the Architect determines certification cannot be issued, the Architect will discontinue further inspection and provided notification report to Contractor of such determination.
 - b. In such case that the Architect's inspection report determines that certification cannot be issued, complete the noted and all incomplete work and provide written request for reinspections to include a copy of the Architect's previous report of the failed inspection. Copy of report to include Contractor's certification and date and Contractor initials of completion by each deficient item completed in preparation for reinspections.
 - 1) Contractor's written request for reinspections to include an updated final Certificate For Payment and updated Contractor Certified List of Incomplete Items.

1.6 CONTRACTOR'S LIST OF INCOMPLETE ITEMS

- A. Time of Submittal: Submit along with written request to Architect for inspection to determine Substantial Completion.
- B. Prepare and submit a comprehensive list of contract requirements and work to be completed and corrected (Contractor's Punch List), indicating the value of each item on the list and reasons why the Work is incomplete.
- C. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Also, include at the beginning of the list, incomplete contract requirements (administrative and otherwise) other than construction work.
 1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.

- c. Name of Architect.
 - d. Name of Contractor.
 - e. Contractor's Certification signature and date (First page only).
 - f. Page number "of" Total pages.
4. Submit list of incomplete items in the following format:
- a. PDF electronic file. Architect will return annotated file.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 - 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.
- C. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.

- k. Remove labels that are not permanent.
 - l. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - o. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - q. Leave Project clean and ready for occupancy.
- D. Construction Waste Disposal:
- 1. Remove construction waste from site and dispose of waste in accordance with regulatory codes, laws, ordinances and requirements of Authority Having Jurisdiction.
 - 2. Comply with waste disposal requirements to include, but not limited to Section 01 73 00 - Execution as related to Progress Cleaning.

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 - 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 - 2. Remove and replace chipped, scratched or otherwise marred cast stone units and natural stone units.
 - 3. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
 - 4. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
 - 5. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION

SECTION 01 78 23
OPERATION AND MAINTENANCE DATA

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
1. Emergency, Operation and Maintenance Documentation Directory Manual.
 2. Emergency Manual - systems, subsystems and equipment.
 3. Operation Manual - systems, subsystems and equipment.
 4. Systems and Equipment Maintenance Manual - systems, subsystems and equipment.
 5. Product Maintenance Manual.
- B. Related Requirements:
1. Sections indicating Closeout Procedures.
 2. Sections indicating Submittal Procedures for submitting copies of submittals for operation and maintenance manuals.
 3. Sections indicating Commissioning Requirements for verification and compilation of data into operation and maintenance manuals.
 4. Sections indicating specific operation and maintenance manual requirements for the Work in those Sections.
 5. Sections indicating Demonstration and Training requirements.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Manuals Content: Content is to include pertinent data and data specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
1. Where applicable, clarify and update content of manuals to correspond to revisions and field conditions.
- B. Manuals Format: Format to be as follows and as further detailed in this Section and the Contract Documents:
1. Electronic Copies (PDF electronic file): Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.
 - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory. Label each digital media disk indicating content name of manual; project identification name and numbers; and names and phone numbers of Owner and Contractor (and Construction Manager, if any).
 - b. Enable inserted reviewer comments on draft submittals.

2. Paper Copies: Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves.
- C. Initial Manuals Submittal:
1. Submit at time indicated in Section 01 77 00 - Closeout Procedures.
 2. Submit two (2) Electronic Copies of Manuals as described in this Section.
 3. Submit one (1) Paper Copies of Manuals as described in this Section.
- D. Final Manuals Submittal:
1. Correct deficiencies from Initial Submittal.
 2. Submit at time indicated in Section 01 77 00 - Closeout Procedures.
 3. Submit two (2) Electronic Copies of Manuals as described in this Section.
 4. Submit three (3) Paper Copies of Manuals as described in this Section.

1.5 REQUIREMENTS FOR MANUALS

- A. Comply with these requirements for each Manual to be submitted for this Project. Requirements apply to both Paper Copy and Electronic Copy manual formats and for Initial and Final Manual submissions.
- B. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
1. Title page.
 2. Table of contents.
 3. Manual contents.
- C. Title Page: Include the following information:
1. Subject matter included in manual.
 2. Name and address of Project.
 3. Name and address of Owner.
 4. Date of submittal.
 5. Name and contact information for Contractor.
 6. Name and contact information for Construction Manager (if any).
 7. Name and contact information for Architect.
 8. Name and contact information for Commissioning Authority (if any).
 9. Names and contact information for major consultants to the Architect that designed the systems contained in the manual.
 10. Cross-reference to related systems in other manuals.
- D. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
1. Main headings in table of contents to be Specification Section Number and Title. Inset below each main heading the description of the documentation provided and table of contents reference number in sequence as follows:
 - a. Number prefix to be Section Number (without spaces), followed by two-digit sequence number.
 - b. Examples: 044200-01; 044200-02; etc. 081416-01; 081416-02; etc.
 2. Divider tab insert numbers to match table of content reference numbers.
 3. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- E. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

- F. Electronic Copies of Manuals: Prepare manuals in the form of a multiple file composite electronic PDF file for each manual type required.
1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 2. File Names and Bookmarks: Provide digitally linked bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting book-marks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
 3. Submittal Media: Electronic Digital Media Disk. Two copies of disk; labeled with identification information; inserted into sleeve at front of Paper Copies of Manuals.
- G. Paper Copies of Manuals: Prepare manuals in the form of hard copy, bound and labeled volumes.
1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2 x 11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary, to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine with printed title of manual type; project name and Owner project number(s); subject matter of contents; and name, address and telephone number of Contractor (and Construction Manager, if any). At the bottom of each binder front and spine, indicate "01 78 23 - O&M Data - Vol 1 of 4" (sequence Volume # by manual type).
 2. Dividers: Heavy-paper dividers with plastic insert tabs for insertion of table of contents reference number.
 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
 4. Supplementary Text: Prepared on 8-1/2 x 11-inch white bond paper.
 5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

PART 2 PRODUCTS

2.1 EMERGENCY, OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
1. List of documents.
 2. List of systems.

3. List of equipment.
 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to manuals that contain information about each system.
 - C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
 - D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
 - E. Identification: In the documentation directory and in each manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems".

2.2 EMERGENCY MANUAL

- A. Content: Organize manual into a separate section for each of the following:
 1. Type of emergency.
 2. Emergency instructions.
 3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 1. Fire.
 2. Flood.
 3. Gas leak.
 4. Water leak.
 5. Power failure.
 6. Water outage.
 7. System, subsystem, or equipment failure.
 8. Chemical release or spill.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
 1. Instructions on stopping.
 2. Shutdown instructions for each type of emergency.
 3. Operating instructions for conditions outside normal operating limits.
 4. Required sequences for electric or electronic systems.
 5. Special operating instructions and procedures.

2.3 OPERATION MANUAL

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 2. Performance and design criteria if Contractor has delegated design responsibility.
 3. Operating standards.
 4. Operating procedures.
 5. Operating logs.
 6. Wiring diagrams.
 7. Control diagrams.

8. Piped system diagrams.
 9. Precautions against improper use.
 10. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
1. Product name and model number. Use designations for products indicated on Contract Documents.
 2. Manufacturer's name.
 3. Equipment identification with serial number of each component.
 4. Equipment function.
 5. Operating characteristics.
 6. Limiting conditions.
 7. Performance curves.
 8. Engineering data and tests.
 9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
 2. Equipment or system break-in procedures.
 3. Routine and normal operating instructions.
 4. Regulation and control procedures.
 5. Instructions on stopping.
 6. Normal shutdown instructions.
 7. Seasonal and weekend operating instructions.
 8. Required sequences for electric or electronic systems.
 9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as in-stalled.
- E. Piped Systems: Diagram piping as installed and identify color-coding where required for identification.

2.4 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
1. Standard maintenance instructions and bulletins.
 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.

2. Troubleshooting guide.
 3. Precautions against improper maintenance.
 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 5. Aligning, adjusting, and checking instructions.
 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semi-annual, and annual frequencies.
 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and tele-phone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

2.5 PRODUCT MAINTENANCE MANUAL

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:
1. Product name and model number.
 2. Manufacturer's name.
 3. Color, pattern, and texture.
 4. Material and chemical composition.
 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
 2. Types of cleaning agents to be used and methods of cleaning.
 3. List of cleaning agents and methods of cleaning detrimental to product.
 4. Schedule for routine cleaning and maintenance.
 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 EXECUTION

3.1 MANUAL PREPARATION

- A. Emergency, Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- D. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 1. Do not use original project record documents as part of emergency, operation or maintenance manuals.
 2. Comply with requirements of newly prepared record Drawings in Division 01 Section "Project Record Documents."
- G. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION

SECTION 01 78 39
PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
1. Record Contract Drawings.
 2. Record Shop Drawings.
 3. Record Specifications.
 4. Record Product Data and Samples.
 5. Record Project Warranties.
 6. Record Certifications.
- B. Related Requirements:
1. Division 01 Section "Execution" for additional requirements including, but not limited to, Final Property Survey, and Starting and Adjusting equipment.
 2. Division 01 Section "Closeout Procedures" for general closeout procedures.
 3. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
 4. Divisions 03 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

1.3 DEFINITIONS

- A. Record Prints: Contractor maintained documents on which the Contractor records approved new information and revisions to the original information thereon. The recording process and result is often referred to as "marked-up" and "as-built" documents.

1.4 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents in the field for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents during normal working hours by the Designers and Owner.

1.5 CLOSEOUT SUBMITTALS

- A. General Requirements:
1. Reproductions of photocopy type and electronic scanned type:
 - a. Quality: Reproductions are to accurately depict the colors and information on the Contractor's Record Prints and other documents.

1. Initial Submittal: Documents to be unexecuted with all information filled in except commencement/expiration dates and certification signatures and dates.
 - a. Paper Copy Format: Submit one photocopy of Manual.
 - b. Electronic Scanned Files Format: Submit two (2) on read-only digital media disk.
 2. Final Submittal:
 - a. Paper Copy Format: Submit final Manual and one photocopied sets.
 - b. Electronic Scanned Files Format: Submit two (2) on read-only digital media disk.
- G. Record Certifications Submittal.
1. Initial Submittal:
 - a. Paper Copy Format: Submit one photocopy of Certifications.
 - b. Electronic Scanned Files Format: Submit two (2) on read-only digital media disk.
 2. Final Submittal:
 - a. Paper Copy Format: Submit final Certifications and one photocopied sets.
 - b. Electronic Scanned Files Format: Submit two (2) on read-only digital media disk.

PART 2 PRODUCTS

2.1 RECORD PRINTS - CONTRACT DRAWINGS AND SHOP DRAWINGS

- A. Contractor is to maintain Record Prints as marked-up copies of original Contract Drawings and approved Shop Drawings in two (2) format types. Both formats to be maintained current and to be available for review by Owner and Architect throughout construction progress.
1. Marked-Up Paper Copies Format.
 2. Electronic Marked-Up (annotated) PDF Format.
 - a. Annotations and associated data to be distinct and viewable by PDF software applications "Bluebeam REVU" and "Adobe Acrobat".
- B. Preparation: Promptly incorporate new and revised drawings, notes, and approved installation variations as modifications are issued. Contractor's personnel to be proficient at recording graphic and electronic information in both format types. During project closeout, both format types will be submitted as the Contractor's Record Prints for the Contract Drawings and the Shop Drawings.
1. Require individual or entity who obtained record data, whether individual or entity is installer, subcontractor, or similar entity, to provide information for Contractor to apply to corresponding marked-up Record Prints.
 2. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 3. Accurately record information in an acceptable drawing technique.
 4. Record data daily after obtaining it.
 5. Record and check the markup before enclosing concealed installations.
 6. Cross-reference Record Prints to corresponding archive photographic documentation.
- C. Content: Types of items requiring marking include, but are not limited to, the following:
1. Dimensional changes to Drawings.
 2. Revisions to details shown on Drawings.
 3. Depths of foundations below first floor.
 4. Locations and depths of underground utilities.
 5. Revisions to routing of piping and conduits.
 6. Revisions to electrical circuitry.

7. Actual equipment locations.
 8. Duct size and routing.
 9. Locations of concealed internal utilities.
 10. Changes made by Change Order, Construction Change Directive and Field Orders.
 11. Changes made following Architect's written orders.
 12. Details not on the original Contract Drawings.
 13. Field records for variable and concealed conditions.
 14. Record information on the Work that is shown only schematically.
- D. Mark the Record Prints completely and accurately.
- E. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
- F. Mark important additional information that was either shown schematically or omitted from original Drawings.
- G. Incorporate new drawings received, including but not limited to, drawings received as part of Addenda, Construction Change Directives, Change Orders or Field Orders.
- H. When entire drawing sheet is replaced by a newly issued drawing, indicate with a large red "X" through the entire deleted sheet and note in red the identification of the new drawing sheet (e.g. "This Sheet Replaced By _____; Change Order # ____; Dated ____).
1. Insert the new drawing sheet behind the deleted drawing and similarly identifying it (e.g. "This Sheet Added To Replace _____; Change Order # ____; Dated ____).
- I. Note Construction Change Directive numbers, Alternate numbers, Change Order numbers, Field Order numbers and similar identification, where applicable.

2.2 RECORD CONTRACT DRAWINGS SUBMITTALS

- A. Paper Copy Format:
1. Bind each set of final marked-up Record Prints into volume sets in like manner as the original contract drawings.
 2. Annotate in red the following in a prominent and consistent location on each sheet (including sheets with no markups).
 - a. Designation "PROJECT RECORD CONTRACT DRAWINGS".
 - b. Name of Contractor.
 - c. Signature and Date.
- B. Electronic Scanned Files Format:
1. Scan marked-up Record Prints as PDF electronic files.
 2. Each drawing sheet to be separate electronic file.
 3. Name each file with the sheet identification number and title, and add a 3-digit prefix that sequences the files in the order in which each sheet appeared in the original contract drawings (e.g. "043_A-603 Door and Frame Elevations.pdf").
 4. For added drawings, provide sequencing of file name in logical and contextual order similar to original contract drawings.
 5. Create digital hyperlinked bookmarks for each sheet that provides a single bookmarked navigation panel for accessing sheets by clicking bookmark (bookmarked table of contents).
 6. Identification Information:
 - a. Electronically annotate in red the following in a prominent and consistent location on cover sheet of each drawings set volume:
 - 1) Same information as indicated for Paper Copy Format.
 7. Electronically annotate in red the following in a prominent and consistent location on each page (including pages with no mark-ups):

- a. Designation "PROJECT RECORD CONTRACT DRAWINGS".
8. Label electronic digital media with same information as indicated for Paper Copy Format.

2.3 RECORD SHOP DRAWINGS SUBMITTALS

A. Paper Copy Format:

1. 3-Ring Binder Format: Drawing sets size 8-1/2 x 11 inches and 17 x 11 inches.
 - a. Bind in 3-ring hard binder. Binder sized to hold 8-1/2 x 11 inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers. For 17 x 11 inch sheets, fold each sheet at 8-1/2 inches and back fold at 12-3/4 inches to facilitate unfolding view of content.
 - b. Organize drawing sets in sequence by Specification Section Number.
 - c. Insert durable divider tab sheet at beginning of each set. Each extended tab to indicate Specification Number. Binder holes to be reinforced to prevent pull-out.
 - d. Insert identification information in cover sleeve and spine sleeve.
 - 1) Designation "PROJECT RECORD SHOP DRAWINGS".
 - 2) Project Name and Number.
 - 3) Name of Contractor.
 - 4) Signature and Date.
 - e. First page in each binder is to be the overall record shop drawings directory.
 - 1) Provide overall directory titled "Directory for Project Record Shop Drawings". List each set of shop drawings sequenced by Specification Section Number - Title and Subtitle.
 - 2) Include a column indicating "3-Ring Binders" or "Bound Sets" for each item. The intent is to direct the viewer to the appropriate archived format location.
2. Bound Sets Format: Drawing sets larger than indicated for 3-Ring Binder Format.
 - a. Bind each set with durable paper cover sheet and folded heavy paper spine.
 - b. Include identification information on cover sheets:
 - 1) Same information as indicated for 3-Ring Binder Format.
 - 2) Add a copy of the overall record shop drawings directory.

B. Electronic Scanned Files Format:

1. Scan marked-up Record Prints as PDF electronic files.
2. Each set of shop drawings to be separate electronic file with one or more sheets.
3. Name each file with the corresponding Specification Section Number - Title_Subtitle. (e.g. "07 32 00 - Roofing_Insulation.pdf").
4. Provide a file with overall directory titled "Directory for Project Record Shop Drawings", listing each set of shop drawings sequenced by Specification Section Number - Title_Subtitle. Name of directory file to be "00 00 00 - Directory for Project Record Shop Drawings.pdf". Title at top of directory page to be two lines. First line to indicate project name and number. Second line to be "Directory for Project Record Shop Drawings". Create digital hyperlinked bookmarks for each directory item that is linked to the corresponding shop drawing file.
5. Identification Information:
 - a. Electronically annotate in red the following in a prominent and consistent location of each drawing sheet (including sheets with no mark-ups):
 - 1) Same information as indicated for 3-Ring Binder Format.
 - b. Label electronic digital media with same information as indicated for 3-Ring Binder Format.

2.4 RECORD PRINTS - SPECIFICATIONS (Project Manual)

- A. Maintain one set of marked-up paper copies of the original Specifications, incorporating new and revised drawings and notes as modifications are issued. Contractor's personnel to be proficient at recording graphic information in production of marked-up Record Prints.
- B. Preparation: Mark Record Prints to show the actual product installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is installer, subcontractor, or similar entity, to provide information for Contractor to apply to corresponding marked-up Record Prints.
 - 1. Give particular attention to information on concealed products and installation that would be difficult to identify and record later.
 - 2. Accurately record information in an acceptable and legible manner.
 - 3. Record data daily after obtaining it.
 - 4. Mark Table of Contents to include deletions, additions and other modification.
 - 5. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options, finishes and colors selected.
 - 6. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
- C. Mark the Record Prints completely and accurately.
- D. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.

2.5 RECORD SPECIFICATIONS (Project Manual) SUBMITTALS

- A. Paper Copy Format:
 - 1. Bind each set of marked-up Record Prints into volume sets in like manner as the original specifications.
 - 2. Include identification information on cover pages.
 - a. Designation "PROJECT RECORD SPECIFICATIONS".
 - b. Name of Contractor.
 - c. Signature and Date.
- B. Electronic Scanned Files Format:
 - 1. Scan marked-up Record Prints as PDF electronic files.
 - 2. Each specification volume to be separate electronic file.
 - 3. Name each file "Record Specifications - Volume #.pdf".
 - 4. Create digital hyperlinked bookmarks for each specification section that matches marked-up Table of Contents.
 - 5. Identification Information:
 - a. Electronically annotate in red the following in a prominent and consistent location on cover page of each specifications volume:
 - 1) Same information as indicated for Paper Copy Format.
 - b. Electronically annotate in red the following in a prominent and consistent location on each page (including pages with no mark-ups):
 - 1) Designation "PROJECT RECORD SPECIFICATIONS".
 - c. Label electronic digital media with same information as indicated for Paper Copy Format.

2.6 RECORD PRINTS - PRODUCT DATA AND SAMPLES

- A. Maintain one set of marked-up paper copies of the approved Product Data and Samples, incorporating notes and modifications as approved. Contractor's personnel to be proficient at recording graphic information in production of marked-up Record Prints. Record Prints for

Samples are paper copies (including photos as needed) of approved submitted Samples for the purpose of documenting approvals and recording changes. Physical samples are to be maintained by Contractor until disposition is confirmed by Contractor with Architect and Owner during required Closeout Meeting.

- B. Preparation: Mark Record Prints to show the actual product installation where installation varies substantially from that shown in approved Product Data and Sample submittals. Require individual or entity who obtained record data, whether individual or entity is installer, subcontractor, or similar entity, to provide information for Contractor to apply to corresponding marked-up Record Prints.
 - 1. Give particular attention to information on concealed products and installation that would be difficult to identify and record later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Accurately record information in an acceptable and legible manner.
 - 4. Record data daily after obtaining it.
- C. Mark the Record Prints completely and accurately.
- D. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.

2.7 RECORD PRODUCT DATA AND SAMPLES SUBMITTALS

- A. Paper Copy Format:
 - 1. Bind in 3-ring hard binder. Binder sized to hold 8-1/2 x 11 inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers. For 17 x 11 inch sheets, fold each sheet at 8-1/2 inches and back fold at 12-3/4 inches to facilitate unfolding view of content. For oversized sheets, insert heavy-duty 3-ring type clear plastic pocket holders of inserting documents. Use multiple pocket holders in succession to avoid over-stuffing pocket holders.
 - 2. Organize product data and samples sets in sequence by Specification Section Number.
 - 3. Insert durable divider tab sheet at beginning of each product data set. Each extended tab to indicate Specification Number. Binder holes to be reinforced to prevent pull-out.
 - 4. Insert identification information in cover sleeve and spine sleeve.
 - a. Designation "PROJECT RECORD PRODUCT DATA AND SAMPLES".
 - b. Project Name and Number.
 - c. Name of Contractor.
 - d. Signature and Date.
 - 5. First page in each binder to be overall directory titled "Directory for Project Record Product Data and Samples". List each set of product data and samples sequenced by Specification Section Number - Title_Subtitle. Coordinate directory items with divider tab sheets.
- B. Electronic Scanned Files Format:
 - 1. Scan marked-up Record Prints as PDF electronic files.
 - 2. Each set of product data to be separate electronic file with one or more pages.
 - 3. Name each file with the corresponding Specification Section Number - Title_Subtitle. (e.g. "07 32 00 - Roofing - Insulation.pdf").
 - 4. Provide a file with overall directory titled "Directory for Project Record Product Data and Samples", listing each set of product data and samples sequenced by Specification Section Number - Title_Subtitle. Name of directory file to be "00 00 00 - Directory for Project Record Product Data and Samples.pdf". Title at top of directory page to be two lines. First line to indicate project name and number. Second line to be "Directory

for Project Record Product Data and Samples". Create digital hyperlinked bookmarks for each directory item that is linked to the corresponding product data file.

5. Identification Information:
 - a. Electronically annotate in red the following in a prominent and consistent location of each product data and samples page (including pages with no mark-ups):
 - 1) Same information as indicated for 3-Ring Binder Format.
 - b. Label electronic digital media with same information as indicated for 3-Ring Binder Format.

2.8 RECORD PROJECT WARRANTIES MANUAL

- A. Content: All required Warranties, Bonds, Maintenance Service Agreements, Certifications and similar documents.
- B. Paper Copy of Project Warranties Manual:
 1. Organize documents into an orderly sequence based on the table of contents of Project Manual and Specification Section Numbers.
 2. Bind content in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2 by 11 inch paper. Entire cover and spine to have integral clear plastic sleeve with open top for insertion of printed identification information.
 3. First page to be title page with identification information.
 4. Second page to be Table of Contents listing each document. Main headings in table of contents to be Specification Section Number and Title. Inset below each main heading the identification of the document and number in sequence as follows:
 - a. Number prefix to be Section Number (without spaces), followed by two-digit sequence number.
 - b. Examples: 044200-01; 044200-02; etc. 081416-01; 081416-02; etc.
 - c. Divider tab insert numbers to match table of content numbers.
 5. Provide heavy bond divider tabs with plastic-covered insert tabs for each separate document.
 6. In front of each document, insert a page with the following content:
 - a. Specification Number and Title.
 - b. Description of the product, equipment or construction element to which the document is related.
 - c. Name, address, and telephone number of Installer.
 7. Identify each binder on the front and spine with script as follows:
 - a. PROJECT WARRANTIES MANUAL
 - b. Project name and ID number(s).
 - c. Contractor name, address, and telephone number.
 8. For Final Submittal of Project Warranties Manual:
 - a. Contractor is responsible for acquiring all information and signatures to affect full execution of documents, including from Owner when required, prior to final submittal.
 - b. All commencement dates are to be the Date of Project Acceptance, unless previously agreed upon otherwise in writing by Owner and Contractor. Such written agreement must be included with documentation.
 - c. Documents to be finalized original documents with all information filled in including commencement and expiration dates and certification signatures and dates by all parties.
- C. Electronic Copy of Project Warranties Manual:
 1. PDF single file format on digital media disk; labeled with identification information.

2. Content to be the same and organized in like manner as described for Paper Copy of Project Warranties Manual.
3. Digital file to include bookmarked panel with digitally hyperlinked bookmarks duplicating the Table of Contents for digital navigation to contents.

2.9 RECORD CERTIFICATIONS SUBMITTALS

- A. Content: Documentation includes, but is not limited to, the following.
1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 2. Health Department Inspection and Acceptance: Obtain written acceptance for areas of construction receiving or required to receive such inspection.
 3. Fire Marshal Inspection and Acceptance: Obtain written acceptance for areas of construction receiving or required to receive such inspection.
 4. Certificate of Insurance: For continuing coverage. Include documentation of changeover requirements.
 5. Changeover information related to Owner's occupancy, use, operation and maintenance of HVAC and other building systems, and other utilities. Include record of startup, testing and preventative maintenance performed for systems and equipment.
 6. Stairs and Ramps Compliance Certification. Refer to PART 3 - EXECUTION in this Section, article Stairs and Ramps Compliance Certification.
 7. Spare Parts and Maintenance Products Delivery Certification.
 8. Permanent Locks, Keys and Security: Certification signed/dated by both Contractor and Owner indicating completion of final changeover of permanent locks and delivery of keys and pertinent documentation to Owner.
 9. Record of inspection and walkthrough with Owner and local emergency responders.
 - a. Schedule and conduct inspection and walkthrough with Owner and local emergency responders. Provide record of the event.
 10. Record of termination and removal of temporary facilities.
 - a. Terminate and remove temporary facilities from Project site, including mockups, construction equipment, and similar elements.
 11. Record of completion of final cleaning requirements.
 - a. Complete final cleaning requirements, including touchup painting.
 12. Damage or Settlement Surveys.
 13. Final Property Survey.
 14. Testing and Balancing HVAC and Controls.
 15. For projects with LEED or other Sustainable Design requirements, submit LEED and other Sustainable Design Submittals required in Division 01 for sustainable design and reporting requirements.
 16. Miscellaneous Records: Includes submission of required project records, certifications and documentation associated with various construction activities or indicated in Divisions 01 through 49 Sections that are not related to other named closeout submittal types.
- B. Paper Copy Format:
1. Bind in 3-ring hard binder. Binder sized to hold 8-1/2 x 11 inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers. For 17 x 11 inch sheets, fold each sheet at 8-1/2 inches and back fold at 12-3/4 inches to facilitate unfolding view of content.
 2. Provide multiple volume binders of quantity if data quantity dictates.
 3. Organize categories of documents by numbered logical sequence.

4. Insert durable divider tab sheet at beginning of each document type. Extended tabs to be type for text insertion. Binder holes to be reinforced to prevent pull-out.
 5. Insert identification information in cover sleeve and spine sleeve.
 - a. Designation "PROJECT RECORD CERTIFICATIONS". Add volume # if more than one volume is needed.
 - b. Project Name and Number.
 - c. Name of Contractor.
 - d. Signature and Date.
 6. First page in each binder to be overall directory titled "Directory for Project Record Certifications". List each document type and sub-document sequentially with title and subtitle. Coordinate directory items with divider tab sheets.
- C. Electronic Scanned Files Format:
1. Scan documents as PDF electronic files.
 2. Each document to be separate electronic file with one or more pages.
 3. Name each file with the corresponding Specification Section Number - Title_Subtitle. (e.g. "31 31 16 - Termite Control - Application Records.pdf").
 4. Provide a file with overall directory titled "Directory for Project Record Certifications", listing document type sequenced by Specification Section Number - Title_Subtitle. Name of directory file to be "00 00 00 - Directory for Project Record Certifications.pdf". Title at top of directory page to be two lines. First line to indicate project name and number. Second line to be "Directory for Project Record Certifications". Create digital hyperlinked bookmarks for each directory item that is linked to the corresponding product data file.
 5. Identification Information: Label electronic digital media with same information as indicated for 3-Ring Binder Format.

PART 3 EXECUTION

3.1 STAIRS AND RAMPS COMPLIANCE CERTIFICATION

- A. Provide survey services to survey and certify that all interior and site constructed stairs and ramps are compliant with current applicable building codes and the Americans With Disabilities Act (ADA). Engage a professional registered surveyor or engineer to conduct survey, document survey data and certify that survey data indicates compliance as indicated.
 1. Documentation data is to include drawing indicating locations of stairs and ramps surveyed with locations keyed to survey data.
 2. Surveyor or engineer to be qualified and experienced to provide the required service and is to be registered in the State in which project is located.
 3. Documentation data and compliance certification to be sealed by the professional registered surveyor or engineer.
- B. Correct construction found to be noncompliant with requirements indicated. When complete re-engage professional service provider to complete compliance certification.
- C. Closeout Submittal: Submit the sealed Stairs and Ramps Compliance Certification as indicated in this Section for Records Certifications Submittals.

END OF SECTION

SECTION 01 79 00**DEMONSTRATION AND TRAINING****PART 1 GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes Contractor administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.
 - 3. Demonstration and Training Manual - Record of demonstration and training.

1.3 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products.
 - 2. Attendance List: For each training module, provide list of Owner's intended participants.

1.4 CLOSEOUT SUBMITTALS

- A. General Requirements:
 - 1. Submit records and documentation of required demonstration and training program/modules and actual training events for Owner. Comply with the requirements indicated at end of this Section, article SUBMITTAL - DEMONSTRATION AND TRAINING MANUAL.
- B. Initial Demonstration And Training Manual Submittal:
 - 1. Paper Copy Format: Submit one photocopy of Manual.
 - 2. Electronic Copy Format: Submit two (2) on read-only digital media disk.
 - 3. Submittal time to be as indicated in Section 01 77 00 - Closeout Procedures.
- C. Final Demonstration And Training Manual Submittal:
 - 1. Paper Copy Format: Submit one final Manual and one photocopy Manual.
 - 2. Electronic Copy Format: Submit two (2) on read-only digital media disk.
 - 3. Submittal time to be as indicated in Section 01 77 00 - Closeout Procedures.

1.5 QUALITY ASSURANCE

- A. Pre-Instruction Meeting: A minimum of seven (7) days prior to commencing training sessions, conduct meeting at Project site. Review methods and procedures related to demonstration and training including, but not limited to, the following:
 - 1. Inspect and discuss work items, locations and facilities requiring instruction.
 - 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, facilities needed to avoid delays, and training attendees.

3. Review required content of instruction for training modules.
4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.
5. Review training documentation requirements.

1.6 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate with Owner to acquire list of Owner's intended participants for each training module.
- C. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- D. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals.
- E. Do not submit instruction program until operation and maintenance data has been submitted, reviewed and approved by Architect. Refer to Section 01 78 23 - Operation and Maintenance Data.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- C. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each Training Module, include instruction for the following as applicable to the system, equipment, or component:
 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor has delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Operations manuals.
 - c. Maintenance manuals.
 - d. Project record documents.

- e. Identification systems.
- f. Warranties and bonds.
- g. Maintenance service agreements and similar continuing commitments.
- 3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
- 4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.
- 5. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
- 6. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.
- 7. Maintenance: Include the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning.
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
- 8. Repairs: Include the following:
 - a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

3.2 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module information. Assemble training modules into a training manual to be provided to the training attendees.

- B. Prior to time established to begin instruction, set up instructional equipment at instruction location.

3.3 INSTRUCTION

- A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
- B. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner, through Architect, with at least seven days' advance notice.
- C. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- D. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

3.4 SUBMITTAL - DEMONSTRATION AND TRAINING MANUAL

- A. Content: Records and documentation of required demonstration and training programs/modules and actual training events for Owner.
- B. Paper Copy of Demonstration And Training Manual:
 - 1. Organize documents into an orderly sequence based on each Training Module and in order of the subject matter Specification Section Numbers.
 - 2. Bind content in 8-1/2 by 11 inch heavy-duty, three-ring, vinyl-covered, loose-leaf binders(s); thickness as necessary to accommodate contents; and clear plastic sleeved DVD ring binder storage page(s) for DVD content inclusion. Entire cover and spine to have integral clear plastic sleeve with open top for insertion of printed Manual identification information.
 - 3. Manual first page to be title page with identification information.
 - a. Manual Title: DEMONSTRATION AND TRAINING MANUAL.
 - b. Name of Project and Project Number.
 - c. Name of Architect.
 - d. Name of Construction Manager (if any).
 - e. Name of Contractor.
 - f. Name of Subcontractor.
 - 4. Manual second page to be Table of Contents listing each Training Module. Main headings in table of contents to be Specification Section Number and Title. Inset below each main heading the identification of each Training Module.
 - 5. Manual second page to be Table of Contents listing each Training Module. Main headings in table of contents to be Specification Section Number and Title. Inset below each main heading the identification of each Training Module.
 - a. INSTRUCTION PROGRAM - OVERVIEW
 - 1) (Subheading to follow, if any)
 - 2) (Subheading to follow, if any)
 - b. TRAINING MODULE - (Section Number and Title for each module)
 - 1) (Subheading to follow, if any)
 - 2) (Subheading to follow, if any)
 - 6. Provide heavy bond divider tabs with plastic-covered insert tabs for each separate Training Module set of records.
 - 7. Individual Training Module records: Order of insertion to be as indicated.

- a. In front of each Training Module, insert a page with the following content:
 - 1) Specification Section Number and Title.
 - 2) Description of the Training Module and bullet list of product, equipment or construction element to which the documentation is related.
 - 3) Name, address, and telephone number of Installer and Instructor.
 - b. Documentation of Owner attendees that attended training session.
 - c. Documentation of Training Module developed as part of the Instructional Program.
 - d. Documentation of actual training session, including additional information disseminated or generated during training session.
 - e. If training video(s) was viewed during the training session, indicate so by video title(s) and include the labeled DVD disk.
 - f. If video record of the training session is required, or produced without requirement, include the labeled DVD disk.
- C. Electronic Copy of Demonstration And Training Manual:
1. PDF single file format on digital media disk; labeled with identification information.
 2. Content to be the same and organized in like manner as described for Paper Copy of Demonstration And Training Manual.
 3. Digital file to include bookmarked panel with digitally hyperlinked bookmarks duplicating the Table of Contents for digital navigation to contents.
 4. Include video recordings as separate files on Manual media disk; hyperlinked to references in the Manual; playable by mouse click on hyperlinked references.
- D. Closeout Submittal: Manual in accordance with requirements indicated in Section 01 77 00 - Closeout Procedures.

END OF SECTION

