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Greenville Transportation Activity Center – Greenville, NC

Project Manual

Addendum No. 3, June 16, 2016

Project Number L3005900

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Date	June 16, 2016
Project Name	Greenville Transportation Activity Center
Project Location	Greenville, NC
Project No.	L3005900

1.1 Definition

A. An Addendum is a modification to a Bid Issue. An Addendum is issued during the bidding period and supersedes previous documentation in the Bid Issue.

2.1 Bidder's Responsibility

A. The Bidder’s proposal shall incorporate this Addendum to the same extent as though it was originally included in the Bid Issue.

B. The Bidder’s proposal confirms receipt of the Addendum as provided in the Form of Proposal.

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3.1 Drawings

A. The following Drawings are revised and reissued:

Site

1. Drawing No. C-5 Revision 1

   Description of Revision:

   a. Revised location of domestic water and fire service.

2. Drawing No. C-7 Revision 1

   Description of Revision:

   a. Revised to remove and replace the accessible ramp and sidewalk on the southeast corner of the Pitt Street / Pitt-Greene Connector intersection.

   b. Revised to remove the sidewalk at the intersection of the Pitt-Greene Connector and Greene Street.

3. Drawing No. LA-2 Revision 1

   Description of Revision:

   a. Revised estimated length of seat wall.

4. Drawing LA-3 Revision 1

Description of Revision:

a. Revised notes referencing soldier course brick pavers.

b. Revised nets in detail 2/LA-3.

c. Revised Streetscapes note 1.

B. The following Drawings are revised as follows:

Architectural

1. Drawing No. A-910

Description of Revision:

a. Detail 2/A-910: change “brushed stainless steel” to “colored anodized.”

b. Detail 3/A-910 clarification: custom colored graphic on ¼ inch laminate to be 24 inches by 24 inches and mounted with adhesive.

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4.1 Project Manual

A. The following Specification Sections are revised and reissued:

1. Section No. 000110 – Specifications List

Description of Revision:

a. Updated Specifications List.

2. Section No. 042000 – Unit Masonry

Description of Revision:

a. Added 4” x 8” pavers.

b. Added paver thickness.

3. Section No. 061543 – Cross Laminated Timber Panels

Description of Revision:

a. Revised contact information for Nordic Structures.

4. Section No. 061800 – Glued-Laminated Construction

Description of Revision:

a. Revised contact information for Nordic Structures.

b. Added Spruce-Pine-Fir to column species.

5. Section No. 071352 – Modified Bituminous Sheet Waterproofing

   Description of Revision:

   a. Added “Colphene 3000” as manufactured by Soprema, Inc. as an equal product.

6. Section No. 075000 – Membrane Roofing (Single-Ply)

   Description of Revision:

   a. Added Versico Roofing Systems as an acceptable manufacturer.

7. Section No. 071352 – Modified Bituminous Sheet Waterproofing

   Description of Revision:

   a. Added “Colphene 3000” as manufactured by Soprema, Inc. as an equal product.

8. Section No. 101400 – Exterior Signs

   Description of Revision:

   a. Changed basis of design manufacturer.

   b. Changed finish on cast letters.

9. Section No. 101401 – Interior Signs

   Description of Revision:

   a. Added “Series 200A Sand-carved” as manufactured by Mohawk Sign Systems as an equal product.

END OF ADDENDUM NO. 3

Greenville Transportation and Activity Center
SPECIFICATIONS LIST

O = Original Issue
REV = Revised
Blank = Future Issue
DEL = Deleted

		Issue for Construction, May 10, 2016	Addendum No. 1, 5/26/16	Addendum No. 2, 06/09/16	Addendum No. 3, 06/16/16	
Procurement and Contracting Requirements						
000101	Project Title Page	O			REV	
000107	Seals Page	O				
000110	Specifications List	O		REV		
000115	List of Drawings	O				
001113	Advertisement for Bids	O				
002113	Instructions to Bidders	O		REV		
002513	Pre-Bid Meetings	O				
003126	Existing Hazardous Material and Removal Information	O				
003132	Geotechnical Data	O				
004113	Bid Form - Stipulated Sum Single-Prime Contract	O		REV		
004313	Bid Security Forms	O				
004325	Substitution Request Form (During Procurement)	O				
005213	Owner-Contractor Agreement	O				
006000	Project Forms	O				
006113	Performance and Payment Bond Form	O				
006239	Disadvantaged Business Enterprise Program	O				
006276.13	Sales Tax Form	O				
008000	Supplementary Conditions	O				
008100	Special Conditions – FTA Terms & Conditions	O				
Division 01 - General Requirements						
010460	Chases, Openings and Inserts	O				
010490	Coordination Drawings	O				
011100	Summary of Work	O				
012200	Unit Prices	O				
012300	Alternates	O	REV			
012513	Product Substitution Procedures	O				
012600	Modification Procedures	O				
012973	Schedule of Values	O				
012976	Application for Payment	O				
013100	Project Coordination	O				
013119	Project Meetings	O				
013200	Progress Reports	O				
013216	Construction Schedules	O				
013300	Submittals	O				
013329	Sustainability Requirements	O				
013410	Submittal Register	O		REV		

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013543	Environmental Protection	O				
014100	Codes, Regulations and Standards	O				
014216	Definitions and Documentation Standards	O				
014523	Inspection and Testing Services	O				
014527	Inspection and Testing of Earthwork	O				
014533	Inspection and Testing of Cast-In-Place Concrete	O				
014535	Inspection and Testing of Masonry	O				
014537	Inspection and Testing of Asphaltic Concrete	O				
014551	Inspection and Testing of Structural Steel	O				
014570	Inspection and Testing of Exterior Enclosure	O				
014571	Inspection and Testing of Roofing and Waterproofing	O				
014900	Methods and Means Engineering	O				
015200	Construction Facilities	O				
015700	Construction Pollution Controls	O				
016000	Material and Equipment	O				
016610	Testing and Balancing of Mechanical Systems	O				
017123	Field Engineering	O				
017329	Cutting and Patching	O				
017400	Warranties and Bonds	O				
017419	Construction Waste Management	O				
017423	Final Cleaning	O				
017700	Project Closeout	O				
017823	Operation and Maintenance Data	O				
017839	Project Record Documents	O				
018120	Construction Indoor Air Quality (IAQ) Management	O				
019113	General Commissioning Requirements	O				
Division 02 - Existing Conditions						
024116.13	Building Demolition	O				
Division 03 - Concrete						
031000	Concrete Formwork	O				
032000	Concrete Reinforcement	O				
032500	Concrete Accessories	O				
033000	Cast-In-Place Concrete	O				
033543	Polished Concrete Finishing	O				
Division 04 - Masonry						
042000	Unit Masonry	O		___	REV	

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Division 05 - Metals						
050513	Fluoropolymer Coatings	O				
051200	Structural Steel Framing	O				
051213	Architecturally Exposed Structural Steel Framing	O				
055000	Metal Fabrications	O				
055213	Pipe and Tube Railings	O				
Division 06 - Wood, Plastic and Composites						
061000	Rough Carpentry	O				
061543	Cross Laminated Timber Panels	O			REV	
061600	Sheathing	O				
061800	Glue-Laminated Construction	O				
062000	Finish Carpentry	O				
064000	Architectural Woodwork	O				
Division 07 - Thermal and Moisture Protection						
070050	Exterior Enclosure, General	O				
071352	Modified Bituminous Sheet Waterproofing	O			REV	
072100	Thermal Insulation	O				
072600	Air/Vapor Barriers	O				
074233	Phenolic Wall Panels	O				
075000	Membrane Roofing (Single-Ply)	O			REV	
076000	Flashing and Sheet Metal	O				
077200	Roof Accessories	O				
077210	Fall Arrest Roof Anchors	O				
078400	Firestopping	O				
079200	Joint Sealants	O				
Division 08 - Openings						
081113	Standard Hollow Metal Doors and Frames	O				
081400	Wood Doors	O				
081500	Fiberglass-Reinforced Plastic Doors	O				
083100	Access Doors and Panels	O				
084113	Aluminum Entrances and Storefronts	O				
084413	Glazed Aluminum Curtainwall	O				
087100	Door Hardware	O				
088000	Glazing	O				
088300	Mirrors	O				
089100	Louvers	O				

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Division 09 - Finishes						
092116	Gypsum Board Assemblies	O				
093013	Ceramic Tiling	O				
095100	Acoustical Ceilings	O				
096519	Resilient Tile Flooring	O				
096543	Linoleum Flooring	O		REV		
096813	Tile Carpeting	O				
099100	Painting	O				
099600	High Performance Coatings	O				
Division 10 - Specialties						
101400	Exterior Signs	O			REV	
101401	Interior Signs	O			REV	
102113	Compact Laminate (Solid Phenolic) Toilet Compartments	O				
102813	Toilet Accessories	O				
104413	Fire Extinguishers and Cabinets	O				
Division 11 - Equipment						
113113	Residential Kitchen Appliances	O				
Division 12 - Furnishings						
122113	Horizontal Louver Blinds	O				
124813	Entrance Mats and Frames	O				
129300	Site Furnishings and Structures	O				
Division 14 - Conveying Equipment						
142400	Machine Roomless Holesss Hydraulic Elevators	O				
Division 21 - Fire Suppression						
210517	Sleeves and Sleeve Seals for Fire-Suppression Piping	O				
210518	Escutcheons for Fire-Suppression Piping	O				
210523	General-Duty Valves for Water-Based Fire-Suppression Piping	O				
211100	Facility Fire-Suppression Water-Service Piping	O				
211313	Wet-Pipe Sprinkler Systems	O				
211316	Dry-Pipe Sprinkler Systems	O				

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Division 22 - Plumbing						
220513	Common Motor Requirements for Plumbing Equipment	O				
220517	Sleeves and Sleeve Seals for Plumbing Piping	O				
220518	Escutcheons for Plumbing Piping	O				
220519	Meters and Gages for Plumbing Piping	O				
220523	General-Duty Valves for Plumbing Piping	O				
220529	Hangers and Supports for Plumbing Piping and Equipment	O				
220553	Identification for Plumbing Piping and Equipment	O				
220716	Plumbing Equipment Insulation	O				
220719	Plumbing Piping Insulation	O				
220800	Commissioning of Plumbing Systems	O				
221113	Facility Water Distribution Piping	O				
221116	Domestic Water Piping	O				
221119	Domestic Water Piping Specialties	O				
221123	Domestic Water Pumps	O				
221313	Facility Sanitary Sewers	O				
221316	Sanitary Waste and Vent Piping	O				
221319	Sanitary Waste Piping Specialties	O				
221319.13	Sanitary Drains	O				
221413	Facility Storm Drainage Piping	O				
221423	Storm Drainage Piping Specialties	O				
221429	Sump Pumps	O				
223300	Electric, Domestic-Water Heaters	O				
224213.13	Commercial Water Closets	O				
224213.16	Commercial Urinals	O				
224216.13	Commercial Lavatories	O				
224216.16	Commercial Sinks	O				
224713	Drinking Fountains	O				
224723	Remote Water Coolers	O				
Division 23 - HVAC						
230513	Common Motor Requirements for HVAC Equipment	O				
230517	Sleeves and Sleeve Seals for HVAC Piping	O				
230518	Escutcheon for HVAC Piping	O				
230523	General-Duty Valves for HVAC Piping	O				
230529	Hangers and Supports for HVAC Piping and Equipment	O				
230553	Identification for HVAC Piping and Equipment	O				
230593	Testing, Adjusting, and Balancing for HVAC	O				
230713	Duct Insulation	O				
230800	Commissioning of Mechanical Systems	O				
230900	Instrumentation and Control for HVAC	O				
230901	Commissioning of Integrated Automation Systems	O				

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230993	Sequence of Operations for HVAC Controls	O				
232300	Refrigerant Piping	O				
233113	Metal Ducts	O				
233300	Air Duct Accessories	O				
233423	HVAC Power Ventilators	O				
233713	Diffusers, Registers, and Grilles	O				
234100	Particulate Air Filtration	O				
236200	Packaged Compressor and Condenser Units	O				
236313	Air-Cooled Refrigerant Condensers	O				
237433	Dedicated Outdoor-Air Units	O				
238219	Fan Coil Units	O				
238239	Unit Heaters	O				
Division 26 - Electrical						
260519	Low-Voltage Electrical Power Conductors and Cables	O				
260526	Grounding and Bonding for Electrical Systems	O				
260529	Hangers and Supports for Electrical Systems	O				
260533	Raceways and Boxes for Electrical Systems	O				
260543	Underground Ducts and Raceways for Electrical Systems	O				
260544	Sleeves and Sleeve Seals for Electrical Raceways and Cabling	O				
260553	Identification for Electrical Systems	O				
260572	Overcurrent Protective Device Short-Circuit Study	O				
260573	Overcurrent Protective Device Coordination Study	O				
260574	Overcurrent Protective Device Arc-Flash Study	O				
260800	Commissioning of Electrical Systems	O				
260913	Electrical Power Monitoring and Control	O				
260923	Lighting Control Devices	O				
260936	Modular Dimming Controls	O				
262416	Panelboards	O				
262713	Electricity Metering	O				
262726	Wiring Devices	O				
262813	Fuses	O				
262816	Enclosed Switches And Circuit Breakers	O				
265119	LED Interior Lighting	O				
265219	Emergency and Exit Lighting	O				
265613	Lighting Poles and Standards	O				
265619	Exterior Lighting	O				
Division 27 - Communications						
270000	Communications	O				
270526	Grounding and Bonding for Communications Systems	O				
270529	Hangers and Supports for Communications Systems	O				
270533	Conduits and Backboxes for Communications Systems	O				
270536	Cable Tray for Communications Systems	O				
270553	Identification for Communications Systems	O				

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270800	Commissioning of Communications	O				
271116	Communications Cabinets, Racks, Frames and Enclosures	O				
271119	Communications Termination Blocks and Patch Panels	O				
271519	Data Communications Horizontal Cabling	O				
271543	Communications Faceplates and Connectors	O				
275116	Public Address Systems	O				
Division 28 - Electronic Safety and Security						
280513	Conductors and Cables for Electronic Safety and Security	O				
281300	Access Control	O				
282300	Video Surveillance	O				
283111	Digital, Addressable Fire-Alarm System	O				
Division 31 - Earthwork						
312000	Earth Moving	O				
313116	Termite Control			O		
Division 32 - Exterior Improvements						
321216	Asphalt Paving	O				
321313	Concrete for Exterior Improvements	O				
321416	Brick Pavers, Mortar Bed	O				
321723	Pavement Markings	O				
329000	Planting	O				
Division 33 - Utilities						
331000	Water Utilities	O				
333000	Sanitary Sewerage Utilities	O				
334000	Storm Sewer Utilites	O				

END

Part 1 General

1.1 Summary (Non-inclusive)

A. Section Includes: Manufactured unit masonry for Project, including face brick and concrete masonry units, and as follows:

1. Accessories related to unit masonry work, for example, mortar, reinforcement, anchorage and masonry lintels.

1.2 Related Work Specified Elsewhere (Non-inclusive)

A. Applicable Sections: Division 01.

B. Inspection and Testing Services: Division 01.

C. Inspection and Testing of Masonry: Division 01.

D. Concrete Reinforcement: Division 03.

E. Metal Fabrications: Division 05.

F. Exterior Enclosure, General: Division 07.

G. Thermal Insulation: Division 07.

H. Air/Vapor Barriers: Division 07.

I. Flashing and Sheet Metal: Division 07.

J. Joint Sealants: Division 07.

K. Firestopping: Division 07.

L. High-Performance Coatings: Division 09.

M. Painting: Division 09.

N. Louvers: Division 08.

O. Mechanical: Division 23.

P. Plumbing: Division 22.

Q. Electrical: Division 26.

1.3 Submittals

A. Submit per the requirements of Division 01.

B. Shop Drawings:

1. Shape and Profile Drawings for each type of unit.

2. Reinforcement Placement Drawings: For each piece of reinforcing bar.

3. Masonry Control Joint Drawings:

a. Elevations: Minimum 1/4 inch equals 1 foot scale elevation of each area of wall.
b. Details: Full size details of each assembly including heads, sills, corners and intersections with abutting construction and joints in system.
c. Assembly Details: Multiple, exploded, isometric, three-dimensional details showing the sequential assembly of typical intersections including but not limited to corners, tee intersections and cross intersections.

C. Product Data:

1. For each type of concrete masonry unit, reinforcement, anchorage, cleaning products and accessories.

2. Mortar Mix Designs: As indicated.

D. Samples:

1. Full-size Samples of concrete masonry units face brick, custom shapes for Design Professional's review and approval. Samples shall indicate full range of color and texture variation.

2. Colored Mortar.

3. Weep holes/ vent blocks.

E. Quality Control Procedures:

1. Cold and hot weather construction procedures.

2. Cleaning Procedures: As recommended in writing by manufacturer of masonry and cleaning agent. Customize to suit the Work.

3. Preconstruction Testing: As indicated.

F. Certifications:

1. Certifications from material manufacturers of compliance with Referenced Standards and Specifications, including UL Certificates for fire rated Concrete Masonry Units.

2. Certifications from each material manufacturer of Unit Masonry that cleaning products are compatible and have not deleterious effect.

1.4 Definitions

A. Control Joints:

1. In Brick: Creates an open plane in wythe to allow initial expansion.

B. Expansion Joints: A continuous break in entire structure of building and are not necessarily specified in this Section. Note that Brick Institute of America and other similar technical organizations use term "expansion joint" for control joints in brick and tile. When interpreting required reference standards it is Contractor's responsibility to coordinate meaning of each term with its appropriate usage in Specifications.

1.5 Quality Assurance

A. Work of this Section shall be subject to review, inspection and approval of Owner's Representative. Inspection and Testing, including reports and certifications are responsibility of Contractor. Perform Inspection and Testing in accordance with Division 01. Owner reserves right to verify all tests with Owner's independent Inspection and Testing Agency.

B. Manufacturer's Qualifications: Manufacturer of each unit masonry product shall have a minimum ten (10) years experience. Company shall demonstrate through written third party documentation successful completion of five (5) projects of similar scope and complexity in last three (3) years.

C. Mason's Qualifications: Installer of unit masonry shall be a company specializing in performing Work of this Section with minimum five (5) years experience. Company shall demonstrate through written third party documentation successful completion of five (5) projects of similar scope and complexity in last three (3) years.

D. Accessory Manufacturer's Qualifications: Manufacturer of each accessory product shall be a company specializing in manufacture of products specified in this Section with minimum five (5) years experience. Company shall demonstrate through written third party documentation successful completion of five (5) projects of similar scope and complexity in last three (3) years.

E. Single Source Requirements: Each of types of products and materials listed below shall be furnished by a single manufacturer for entire Project.

1. Concrete Masonry Units.

2. Ground Face Concrete Masonry Units.

3. Brick.

4. Reinforcement, Ties and Anchors.

5. Mortar and Grout Materials including Pigments and Admixtures.

6. Cleaning Agent.

F. Referenced Codes and Standards: Comply with the following per requirements of Division 01.

1. Brick Institute of America (BIA): "Technical Notes"

2. Portland Cement Association (PCA): "Concrete Masonry Handbook"

3. National Concrete Masonry Association (NCMA): "TEK Manual for Concrete Masonry Design and Construction"

G. Regulatory Requirements:

1. Comply with technical requirements of ACI530.1/ASCE6 "Specifications for Masonry Structures" except for any requirements which may conflict with responsibilities of Contractor, Owner and Design Professional as required by Conditions of Contract and other Specification Sections.

2. Fire Performance: Where indicated, provide materials and construction identical to those assemblies whose fire resistance has been determined in accordance with ASTM E 119, by an Inspection and Testing Agency, by equivalent concrete masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

H. Masonry Field Sample Panel:

1. Provide unit masonry work required for Field Sample Panel.

2. Construct Field Sample Panels of each type of unit masonry specified to verify selections made under sample submittals and to demonstrate aesthetic effects. Field Sample Panel shall incorporate full range of color and texture variation of units. For exterior masonry face Sample Panel south and build a corner return at east. Build panels 48 inches long by 48 inches high with return ends 16 inches long by 48 inches high. Include a control joint with sealant. Sample Panels for masonry concealed in finished Work are not required. Maintain and protect approved panels for duration of Work. Completed Work shall match approved Sample Panels.

a. Where masonry is to match existing, erect panels adjacent and parallel to existing surface.
b. Protect approved sample panels from the elements with weather-resistant membrane.

1) Approval of sample panels is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by the Design Professional in writing.

2) Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless such deviations are specifically approved by the Design Professional in writing.

c. List of Materials Used in sample panel: List product names together with manufacturers, manufacturers' product model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.

3. If Sample Panels are disapproved, provide new panels. Repeat procedure until Sample Panels are approved.

4. Remove Sample Panels, either approved or disapproved, only by direction from Owner's Representative. Removal shall be complete, with all materials disposed off site and Project Site restored.

5. Clean Sample Panel with methods indicated.

I. Mock-up Panel

1. Submit Drawings of masonry mock-up panel.

2. Provide unit masonry work required for mock-up panel in accordance with approved Drawings and as specified in Exterior Enclosure, General: Division 07.

J. Preinstallation Conference: Participate in preinstallation meeting specified in Exterior Enclosure, General: Division 07.

K. Masonry Inspection and Testing shall be performed in conjunction with this Work as specified in Division 01.

1. Furnish materials to Agency for testing as required.

2. Provide free access to portions of Work and cooperate with appointed firm.

3. Submit mortar mix designs and sample prisms for review prior to commencement of Work.

4. If materials do not conform, select new materials and mixes, and resubmit for retesting. Contractor shall pay for retesting.

1.6 Delivery, Handling And Storage

A. Prior to delivery, pack special units, such as ground face, in such manner as to protect faces and edges from damage.

B. Deliver masonry materials to Project Site in undamaged condition.

C. Store and handle masonry units off ground, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not place until units are in an air-dried condition.

D. Store cementitious materials off ground, under cover, and in a dry location.

E. Store aggregates on tarps, paving or other hard, clean surface where grading and other required characteristics can be maintained and contamination avoided.

F. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.7 Project Conditions

A. Cold-Weather Construction: Comply with ACI 530 unit masonry standard for cold-weather construction and the following:

1. Do not lay masonry units that are wet or frozen.

2. Remove masonry damaged by freezing conditions.

B. Hot-Weather Construction: Comply with ACI 530 referenced unit masonry standard for hot-weather construction.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.

2. Protect sills, ledges, and projections from mortar droppings.

3. Protect surfaces of window and doorframes, as well as similar products with painted and integral finishes, from mortar droppings.

4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

5. Monitor other trades as they come in contact with masonry as to perform their work without damaging masonry. Masonry Contractor shall provide additional protection materials to other trades prior to trades starting their work. Replace masonry if damaged by other trades.

Part 2 Products

2.1 Materials, General

A. Use admixtures that comply with the VOC limits specified in Sustainability Requirements: Division 01.

2.2 Mortar

A. Materials:

1. Cementitious materials, admixtures and sand and admixtures shall remain same throughout entire Work where exposed to view.

2. Comply with ASTM C 270 and as indicated. Cementitious materials shall be Portland cement and lime only. Masonry cement is not acceptable.

3. Portland Cement: ASTM C 150, Type I.

4. Sand and Aggregates: ASTM C 144:

5. Lime: ASTM C 207, Type S.

6. Water: Potable public supply and free of detrimental content.

7. Pigment: Mineral oxide pigment, sunfast and lime proof, with specific gravity approximating that of Portland cement. Pigment shall not exceed 5 percent of the weight of Portland cement. Carbon black shall not exceed 2 percent of weight of Portland cement. Acceptable Manufacturers: Solomon, Glen Gery and Essroc.

   a. Pigmented mortar shall match color as selected by Design Professional from manufacturer's full line

8. Latex Pointing Mortar Additive: "Laticrete 1776: "Grout Admix" manufactured by Laticrete International, Inc. or approved equivalent.

9. Epoxy Pointing Mortar: Prepackaged, multi-component epoxy mortar complying with ANSI A 118.3. Color selected by Design Professional from manufacturer's full line. Provide "SpectraLOCK Pro Grout" manufactured by Laticrete International, Inc. or approved equivalent.

B. Mortar Mixes:

1. Mortar mixes shall comply with ASTM C 270 as follows:

   a. Type S with a minimum 28 day compressive strength of 1800 psi. Proportion shall be one (1) part Portland cement to 1/4 to 1/2 parts hydrated lime. Aggregate ratio shall be 2 1/4 to 3 times sum of separate volumes of cement and lime.
   b. Type M with a minimum 28 day compressive strength of 2500 psi. Proportion shall be one (1) part Portland cement to 1/4 part hydrated lime. Aggregate ratio shall be 2 1/4 to 3 times sum of separate volumes of cement and lime.
   c. Type N with a minimum 28 day compressive strength of 750 psi. Proportion shall be one (1) part Portland cement to 1/2 to 1 1/4 part hydrated lime. Aggregate ratio shall be 2 1/4 to 3 times sum of separate volumes of cement and lime.
   d. Type O with a minimum 28 day compressive strength of 350 psi. Proportion shall be one (1) part Portland cement and 1 1/4 to 2 1/2 parts hydrated lime. Aggregate ratio shall be 2 1/4 to 3 times sum of separate volumes of cement and lime.

2. Trial Batches for Masonry Sample Panel and Mock-up Panels: After material sources have been established and approved, mix trial batches of types required in shades and colors. Once mortar ingredient proportions are established for strength and appearance and approved in Sample Panel, maintain same mortar mixture(s) for entire Work.

3. Add mortar color and admixtures in accordance with manufacturer's written recommendations. Ensure uniformity of mix and coloration.

4. Do not use anti-freeze compounds to lower freezing point of mortar.

5. Use mortar within two (2) hours of mixing. Do not retemper mortar after two (2) hours of mixing.

C. Tuck pointing mortar for existing masonry.

2.3 Grout Materials

A. High slump grout complying with ASTM C 476 with the following 28 day compressive strength when tested in accordance with ASTM C 1019:

1. 2000 psi : Grout for ASTM C 90 unit.

2.4 Masonry Units, General

A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to exceed tolerances and to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not uses units where such defects are present, including dimensions that vary from specified dimensions by more than stated tolerances, will be exposed in the completed Work or will impair the quality of completed masonry.

2.5 Concrete Masonry Units (Only As Optional 4" CMU Beneath Brick Veneer)

A. Concrete Block:

1. Type:

a. Load Bearing Units: ASTM C 90.

1) Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1900 psi.

b. Non-load Bearing Units: ASTM C 129, Type I moisture controlled.

2. Weight Classification:

a. Normal Weight: 125 pcf or more.

3. Integral Water Repellent: Provide units made with integral water repellent for exposed units and where indicated.

a. Integral Water Repellent: Liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested as a wall assembly made with mortar containing integral water-repellent manufacturer's mortar additive according to ASTM E 514, with test period extended to 24 hours, show no visible water or leaks on the back of test specimen.

4. Units shall be uniform in color and texture, free of water smears, surface or web cracks, spalls or broken corners within limits of reference standard. Surface effect shall be tight; texture shall be fine for exposed or painted units. Units to receive plaster or stucco shall have an open surface effect and coarse texture.

5. Unit Face Size, Nominal: as indicated Width: Manufactured to dimensions 3/8 inch less than nominal dimensions.

6. Units with narrow core in center web for ease of splitting shall not be used as full-size stretcher units.

7. Provide special shape units for control joints, exposed end units, bond beams, and lintels and as indicated.

8. Units shall have two (2) cores and nominal depth as indicated.

2.6 Face Brick

A. Brick basis of design - Sienna Ironspot Velour as manufactured by Endicott ClayProducts Company. Brick stretcher size shall be Norman size.

1. Other providers:

a. Norman size #374 Autumn Blend as manufactured by Taylor Clay Products Company.
b. Norman size Sienna Blend Velour A by The Belden Brick Company.

B. Provide special solid and molded shapes, sizes, and factory-gaged stretcher brick, matching color and texture of brick stretcher units across full range of variation in order to blend into Final Work.

C. *[1] Brick pavers shall be solid 4” x 12” or 4” x 8” paver brick to match color and texture of face brick as shown on drawings.

1. *[1] Paver thickness to be 2 1/4 inch.

2.7 Reinforcement, Ties And Anchors

A. General:

1. Acceptable manufacturers are listed below. No substitutions.

a. Blok Lok Limited.
b. A. A. Wire Products Company.
c. Heckmann Building Products, Inc.
d. Hohmann & Barnard, Inc.
e. Wire-Bond.

2. Materials shall be as listed, unless otherwise indicated:

a. Galvanized Steel: ASTM A 82 Carbon Steel Wire, ASTM A 1008/ A1008M Carbon Steel Sheet Metal, ASTM A 36 Steel Plate, Hot Dip Galvanized After Fabrication per ASTM A 153 Class B-1 or B-2 to suit material thickness.

b. Stainless Steel: ASTM A 240 stainless steel sheet, ASTM A 276 stainless steel plates, bars and shapes, ASTM A 479 stainless steel wire.

3. Embedment shall be as per ACI 530 and as follows:

a. Horizontal reinforcing and ties parallel to wythe shall be 2 3/8 for nominal 4 inch wythes and 2 inches narrower than nominal wythe thickness for all others.
b. Ties perpendicular to wythe shall extend minimum half way into wythe thickness but shall maintain minimum 5/8 inch cover from exterior face of wall.

4. Custom fabricate reinforcement, ties and anchors for Project conditions. Custom fabricate horizontal reinforcing tees and intersection for other than 90 degree conditions.

B. Horizontal Joint Reinforcing: Single Wythe:

1. Type: Truss.

2. Sidewires: No. 9 gage.

3. Crosswires: No. 9 gage.

D. Ties To Concrete: Dovetail slot, 1 inch wide by 1 inch deep formed from 22 gage sheet and dovetail wire tie. Dovetail end fabricated of 12 gage by 1 inch sheet metal and tapered wire box tie fabricated of 3/16 inch wire.

2.8 Steel Reinforcement

A. Deformed ASTM A 615/A 615M Grade 60 bars fabricated as specified in Concrete Reinforcement: Division 03; sizes as indicated on Drawings. Provide bar positioners of standard No. 9 gage wire with mill galvanized finish.

2.9 Joint Filler

A. Concrete Masonry Control Joint Keys: ASTM D 2000, 2AA-805 rubber shear keys with a minimum durometer hardness of 75 to 85. Size to fit wythe and sash block slot.

B. Compressible Filler: Closed cell neoprene sponge, ASTM D 1056 Class RE41, with 50 percent minimum compressibility in widths that permit sealant.

Premolded Joint Filler: Unimpregnated fiber board, ASTM D 994 or closed cell neoprene sponge, ASTM D 1056 Class RE41, with 50 percent minimum compressibility in widths that permit sealant.

2.14 Joint Sealants

A. As specified in Joint Sealants: Division 07.

2.15 Cell Closure Mesh

A. Galvanized wire mesh of 1/2 inch grid of 16 gage wire.

2.17 Cleaning Solution

A. Contractor's Option:

1. Job mixed detergent solution of trisodium phosphate and laundry detergent one-half (1/2) cup dry measure of each dissolved in 1 gallon of water.

2. Proprietary cleaners without strong acids shall be compatible with masonry.

Part 3 Execution

3.1 Examination

A. Examine substrate conditions including, but not limited to, foundations, concrete work and structural steel cold-formed metal framing, sheathing, vapor barrier, flashing, insulation, metal fabrications and hollow metal for compliance with requirements for installation tolerances and other conditions affecting performance of unit masonry.

1. For record, prepare written report listing conditions detrimental to performance of unit masonry.

B. Examine rough-in and built-in construction to verify actual locations of connections prior to installation.

C. Do not proceed until unsatisfactory conditions have been corrected.

3.2 Preparation

A. Furnish metal dovetail anchor slots for embedment into concrete and anchors to structural steel fabricator for welding to steel. Furnish sufficient quantity, and direct their correct placement.

B. Ensure items built-in by Work of other Sections for this Work are properly located and sized.

C. Establish lines, levels, and coursing. Protect from disturbances.

D. Lay out walls in advance for accurate spacing of bond patterns with uniform joint widths and for accurate locating of openings, movement-type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.

E. Broom clean concrete surfaces to support masonry. If surface is smooth finished roughen surface with a bush hammer to ensure masonry bond.

3.3 Installation: General

A. Comply with Referenced Standards, unless otherwise indicated.

B. Thickness: Build cavity and composite walls and other masonry construction to full thickness indicated. Build single-wythe walls to actual thickness of masonry units, using units of nominal thickness indicated.

C. Build chases and recesses as indicated or required to accommodate items specified in this and other Sections. Provide minimum 8 inches of masonry between chase or recess and jamb or openings and between adjacent chases and recesses.

D. Leave openings for equipment to be installed before completion of masonry. After installation, complete masonry to match adjacent construction.

E. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting where possible.

F. Matching Existing Masonry: Match coursing, bonding, color, and texture of new masonry and mortar with existing masonry.

G. Protection: Protect masonry work from freezing and entry of water. Cover and secure top of each day's work with nonstaining waterproof coverings.

H. Unless otherwise indicated, build masonry full height to underside of structure. Nonbearing walls shall stop 3/4 inch clear of structure. Prepare top joint for premolded joint filler and sealant.

I. Stopping and Resuming Work: In each course, rack back one-half (1/2) unit length for one-half (1/2) running bond or one-third (1/3) unit length for one-third (1/3) running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly, if required, and remove loose masonry units and mortar prior to laying fresh masonry.

J. Mortar Joints: Provide full bed and head mortar joints. Do not deeply furrow mortar beds. Head joints must be fully buttered with mortar and shoved tight against adjacent unit. Slushing head joints is not allowed. Units shall not be moved, tapped or realigned after initial placement. If a unit is displaced, all head and bed mortar must be removed and procedure started over.

K. Building In: Construct unit masonry work to accommodate built-in Work. Build masonry into frames and against dissimilar Work. Slush frames full with mortar and build in anchorage furnished with dissimilar Work. For heavy items installed into masonry, provide a grout bed of 1:3 Portland cement sand mix and use wedges to relieve weight on grout. Rake joints 3/4 inch deep between exposed masonry and dissimilar Work to accommodate sealant. Build in Work furnished under other Specification Sections.

L. Tolerances:

1. Maximum Variation from Masonry Unit to Adjacent Masonry Unit: 1/16 inch.

2. Maximum Variation from Vertical and Horizontal Building Lines: 1/4 inch in 10 feet.

3. Maximum Variation from Cross-sectional Thickness of Cavity Walls: Plus or minus 1/4 inch.

4. Maintain flush face on exposed masonry surfaces.

3.4 Laying Concrete Masonry Units

A. Bond Pattern: One-half (1/2) running bond.

B. Mortar: Use Type S.

C. Lay units with cores vertical.

D. Joints shall be 3/8 inch wide, both horizontally and vertically.

E. Tooled joints in exposed block work shall be concave. Joints in concealed block work may be struck flush.

F. Mortar Coverage:

1. Provide full mortar coverage on horizontal and vertical face shells.

2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.

3. For starting course on footings where cells are not grouted, spread out full mortar bed including areas under cells.

G. Corners and Intersections:

1. Provide interlocking masonry unit bond in each course at corners unless corner is location of a control joint, unless otherwise indicated.

2. At intersections of non-load bearing walls unless intersection is location of a control joint provide fully bonded intersection with wire mesh anchors at 16 inches on center maximum vertically.

H. Where built-in items shall be embedded in cores of hollow masonry units, place a layer of metal mesh in the joint below and rod mortar or grout into core.

I. Fill cores in hollow concrete masonry units with grout in the following locations, unless otherwise indicated:

1. For three (3) courses under bearing plates, beams, lintels, posts, and similar items.

2. Within 16 inches of rated door opening jambs.

J. Isolate top joint of non-load bearing masonry partitions from horizontal structural framing members and slabs or decks with premolded joint filler and sealant. Joint thickness shall be 3/4 inch minimum, unless otherwise indicated.

K. Isolate masonry partitions from vertical structural framing members, unless otherwise indicated. Minimum 3/4 inch.

L. Do not wet concrete masonry units before laying.

M. Clean mortar droppings from walls as Work progresses. Remove dropping or splatter when nearly dry to prevent smears. Dry rub with another concrete unit and with a stiff fiber-bristle or stainless steel brush.

3.5 Grouting Concrete Masonry Units (CMU) (Only As Optional 4" CMU Below Brick Veneer)

A. Grouted spaces shall be free of mortar droppings, debris, loose aggregates, and any material deleterious to masonry grout.

B. In spaces to receive grout, reinforcement and ties shall be in place prior to grouting.

C. Isolate spaces to be grouted with mesh or solid Concrete Masonry Units.

D. Place grout in lifts not exceeding 5 feet. Consolidate each grout lift at time of placement by mechanical vibration and reconsolidate by mechanical vibration after initial water loss and settlement has occurred.

E. If opening to be grouted is smaller than 2 inches by 3 inches clear between masonry surfaces or horizontal reinforcing reduce maximum grout lift to 1 foot.

F. Place grout within 1 1/2 hours from introducing water in mixture and prior to initial set.

G. Reject defective masonry units, do not install masonry units with chips, cracks, crazes or other imperfections in exposed CMU walls that detract from overall appearance when viewed from a distance of 5 feet.

H. Intermingle masonry units from different pallet loads as Work progresses, to evenly mix minor color variations in exposed CMU walls.

I. Clean walls as they are laid. Remove green mortar with brushes or rags. Do not use abrasives. Do not allow mortar lumps or smears to harden on surface.

3.11 Laying Brick

A. Select brick from different pallets in a random mingle of approved color range to avoid concentrations of light and dark areas and so that no repeat patterns of color or texture result.

B. All joints intended to receive mortar in exterior and interior wythes shall be completely filled. Mortar squeezed from joints and protruding into a cavity shall be plastered onto back face of masonry units and not cut off to prevent mortar falling into cavity.

C. Bond Pattern: One-half (1/2) running bond.

D. Mortar: Type N.

E. Both horizontal and vertical joints shall be of same width.

F. Joints exposed to view tool concave, and in a manner that compresses mortar and seals surface along edges of units. Joints not exposed to view may be struck flush except at cavities.

G. Wet clay and shale masonry units with absorption rates in excess of 1 gram per minute per square inch as determined by ASTM C 67 standards, to maintain permissible rate of absorption when laying. Units shall be surface dry when laid. Do not otherwise wet units.

H. Provide interlocking masonry unit bond at each corner and intersection unless location is a control joint.

3.12 Horizontal Joint Reinforcement

A. Place horizontal joint reinforcement 16 incheson center in walls above grade and 8 incheson center in walls below grade.

B. Where openings occur, place horizontal joint reinforcement 8 inches on center in first and second bed joints above and below opening. Extend reinforcement a minimum of 24 inches beyond openings. Do not bridge control joints at openings where indicated.

C. Form corners and intersection in accordance with material manufacturer's written instructions using prefabricated "ELL" and "TEE" units.

D. Lap horizontal joint reinforcing splices a minimum of 6 inches.

E. Cut and bend side rods 90 degrees where joint reinforcement is interrupted by openings and control joints.

3.13 Anchoring And Bracing Masonry

A. General: Provide ties, anchors, clips and other accessories to tie masonry together and to adjoining structure. Anchorage shall allow differential movement of connected materials while restraining applied loads.

C. Anchors to Concrete: Provide vertical dovetail slots 16 inches on center maximum cast into concrete. Install ties at each slot at 16 inches on center spacing maximum.

3.14 Movement Joints

A. Concrete masonry control joints: Install continuous control joint key between two (2) standard sash block, lateral restraint anchors 16 inches on center or in accordance with NCMA. If control joint occurs at an intersection, install compressible filler 1 1/2 inches narrower than wythe between walls.

B. Brick control joints: Install compressible filler 3/4 inch back from exposed face.

C. Build in horizontal pressure-relieving joints above non-bearing masonry where it abuts structure above. Joint shall be minimum 3/4 inch with compressible filler held back 3/4 inch from each face of masonry. Ensure continuity of joint at all structural elements above masonry.

D. Build in horizontal pressure-relieving joints below shelf angles supporting masonry veneer. Install compressible filler.

E. Provide control joints in concrete masonry as indicated and at maximum 40 feet on center and at following points of weakness.

1. At abrupt changes in wall height.
2. At changes in wall thickness, such as those at pipe or duct chases and those adjacent to columns or pilasters.
3. Above joints in foundations and floors.
4. Below joints in roofs and floors that bear on wall.
5. At a distance of not over one-half (1/2) allowable joint spacing from bonded intersections or corners.
6. At one (1) or both sides of door and window openings where indicated.

F. Where control joints are indicated above openings, lintel bearing shall be a slip joint. Grout full cells below lintel, but do not extend reinforcing bars. Provide a slip sheet of two (2) layers of building felts separating bearing surface from lintel. Extend a standard control joint from end of lintel to top of wall. Provide a sealant joint between lintel and bearing.

G. Install control joints in brick where indicated.

3.17 Cleaning New Masonry

A. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry.

B. Remove large mortar particles by hand with wooden paddles and nonmetallic scrapers, hoes or chisels.

C. Test cleaning methods on Sample Panel; Obtain Design Professional's approval of sample cleaning before proceeding with cleaning of masonry.

D. Comply with BIA "Technical Note No. 20 Revised".

E. Concrete masonry be kept clean during installation. Final cleaning is only to supplement cleaning during lay-up. If final cleaning cannot result in a finished wall of matching, unblemished appearance, remove and replace affected units to match adjacent Work.

3.18 Protection Of Finished Work

A. Protect Finished Work as per requirements of Division 01. Remove protection prior to Date of Substantial Completion.

B. Without damaging completed Work, provide protection boards at, for example, exposed external corners, lintels and soffits which may be damaged by construction activities.

END

*[1] Addendum No. 3, 06/16/16

Part 1 General

1.1 Summary (Non-inclusive)

A. Section Includes: Cross Laminated Timber (CLT) Roof, Floor Panels and Stair Panels as shown on the Drawings.

1.2 Related Work Specified Elsewhere (Non-inclusive)

A. Applicable Sections: Division 01.

B. Coordination Drawings: Division 01.

C. Glued-Laminated Construction: Division 06.

D. Rough Carpentry: Division 06.

E. High-Performance Coatings: Division 09.

1.3 Submittals

A. Submit per the requirements of Division 01.

B. Product Data: For each type of product indicated.

C. Shop Drawings: Include panel location plans, dimensions, shapes and sections, openings, support conditions, connections.

1. Indicate lifting connections.
2. Indicate locations, tolerances, and details of anchorage to supporting structure.
3. Include and locate openings larger than 10 inches.
4. Indicate location of CLT panel by same identification mark placed on panel.
5. Indicate relationship of CLT panels to adjacent materials.
6. Clearly indicate stress grade, service grade, appearance grade.
7. Provide three dimensional models of all interfaces, CLT panels, secondary timber members, plus all connections.

D. CLT supplier to provide a fully accurate three-dimensional (3D) model of the interfaces (supports, abutments, etc.), CLT panels, secondary timber members, plus all connections prior to submission of shop drawings. Model to be generated using software compatible with Revit 2015).

E. Structural Design Calculations: When required by contract drawings provide CLT structural design calculations, by a registered Professional Engineer licensed in the state of NC.

F. Samples: Submit eight (8) Sample of CLT panel; approximately 12 by 12 by 4 inches for field applied coatings by others.

G. APA Product Report and Certified ANSI PRG 320 certificate.

H. Local/Regional Materials: Indicate location of manufacturing facility including name, address and distance between manufacturing facility and the product site.

I. VOC Content: Product data and material safety data sheets (MSDS) for the CLT adhesive used on the interior of the building indicating chemical composition and VOC content.

J. Sustainability Submittals: Provide the following in accordance with Sustainability Requirements: Division 01.

1. Materials Sustainability Documentation Form.
2. Product data, certification letter, and costs for materials with recycled content.
3. Product data and costs for regional materials.
4. Product data, costs, and chain-of-custody certificates for products containing certified wood.
5. Product data for adhesives and sealants indicating VOC content.
6. Product data for paints and coatings indicating VOC content and chemical composition.
7. Product data for products containing composite wood or agrifiber products or wood glues indicating that they do not contain urea-formaldehyde resin.

1.4 Quality Assurance

A. Referenced Codes and Standards: Comply with the following in accordance with Division 01.

1. ANSI D3737-07 Structural Glued Laminated Timber.
2. AITC 405 and ASTM D2559-00 Standards for Wood Adhesives.
3. ANSI A190.1-2007 Structural Glued-laminated.
4. APA Standard for Performance Related CLT- ANSI/APA PRG 320/2011.

B. Manufacturer's Qualifications:

1. Certified by APA The Engineered Wood Association for compliance with ANSI/APA PRG 320/2011 and passed all of its testing standards.

C. Design Standards: Comply with the National Design Specification for Wood Construction NDS 2005 applicable to types of CLT panels indicated.

1.5 Delivery, Storage, And Handling

A. Support units during shipment on non-staining material in same position as during storage.

B. Store units with adequate bracing and protect units to prevent contact with soil and separated with striping (so air may circulate around all faces of members), to prevent staining, and to prevent cracking, distortion, warping or other physical damage.

1. Place stored units so identification marks are clearly visible.

C. Handle and transport units in a position consistent with their shape and design in order to avoid excessive stresses that would cause cracking or damage. Protect corners with wood blocking.

D. Lift and support units only at designated points shown on Shop Drawings.

E. Slit underside of membrane covering during storage at Site. Do not deface members.

F. Cover top and sides with opaque moisture resistant membrane.

G. Maintain protection of CLT panel at all times during construction.

Part 2 Products

2.1 Manufacturers

A. Manufacturers shall have environmental product declaration available to meet LEED requirements. Other equal manufacturers with environmental product declarations may be considered.

B. *[1] Structurlam Products Ltd, 2176 Government Street, Penticton, B.C., Canada V2A 8B5; Kris Spickler, 916-797-5588, kspickler@structurlam.com.

C. SmartLam, 335 Spokane Ave., Whitefish, MT 59937, 406-862-0098.

D. *[1] Nordic Structures, 504-1100 Canadiens-de-Montreal Avenue, Montrreal, Quebec H3B 2S2, Jean-Marc Dubois, 518-869-9116, jmdubois@nordice.com.

2.2 Materials

A. Wood Species –No.1/No.2 Spruce-Pine-Fir and where Visual grade surface is required use Douglas fir L1 lamstock for Cross Laminated Timber (CLT) panels.

B. Adhesives in compliance with ANSI A190.1, DIN 68141 and EN301 and EN302.

1. Acceptable Product: Purbond HB E452.

2.3 Accessories

A. Steel Connectors: Galvanized Steel.

B. Wrapping Material: Weatherproof, lightproof, stain free material. Cut holes on site and underside of wrapping to avoid accumulation of condensation.

2.4 Fabrication

A. Fabricate Cross Laminated Timber (CLT) members in accordance with ANSI/APA PRG 320/2011 except where specified otherwise and to following classifications. Use multiple layers of 19mm minimum to 38mm maximum thick laminations.

B. Service grade: interior or exterior as located on Drawings.

C. Appearance Classification:

1. Non-Exposed (where panels are concealed):

a. Shake and checks allowed, shall not exceed 36 inches or 1/4 of the length.
b. Heart or blue stain allowed, not limited.
c. Knots well-spaced, quantity not limited.
d. Minimal wane on face.
e. Side pressure on exposed face not required.

2. Exposed (where panels are in view in final construction):

a. Utilize DF L1 lamstock lumber at the exposed visual grade face only.
b. Knots: NLGA Select Structural limitation. Clear of knots. Refer to Spec section 061800 and appearance match between CLT and Glu-lam.
c. Pitch streaks not permitted.
d. Wane on face not permitted.
e. Side pressure on exposed faces required.

D. Cross Laminated Timber (CLT) members to be fabricated with ¼" chamfers on long sides.

E. Cross Laminated Timber (CLT) members to be joined at panel edges using a continuous spline as indicated on Drawings.

F. Mark members for identification during erection. Ensure that marks will be concealed in final assembly for appearance grade members. Clearly mark top surface.

G. Coat all cuts, holes and slots.

H. Field apply sealer to all sides of laminated members. Double coat ends of laminated members.

I. All structural steel connecting CLT panel elements to each other and shall be detailed, and if supplied, test fitted in the shop by the CLT supplier.

Part 3 Execution

3.1 Examination

A. Prior to fabrication, check all dimensions relating to this section of work. Report any discrepancies to Engineer.

B. Prior to site erection, examine all site conditions and ensure an acceptable condition.

3.2 Installation

A. Erect CLT panels in accordance with final reviewed shop drawings.

B. Make adequate provision for possible erection stresses. Set panels level and plumb to correct positions. Securely brace panels and anchor in place to maintain plumb until permanently secured by finished structure.

C. Fit CLT panels closely and accurately, without trimming, cutting or other modifications, unless approved in writing by Engineer.

D. Site cutting or boring of CLT panels, other than shown on shop drawings not permitted without written consent of Engineer.

3.3 Cleaning

A. Clean exposed surfaces of CLT panels after erection and completion of field touch up.

1. Perform cleaning procedures, if necessary, according to CLT manufacturer's written recommendations, Protect other work from staining or damage due to cleaning operations.

2. Do not use cleaning materials or processes that could change the appearance of exposed CLT panels or damage adjacent materials.

END

Part 1 General

1.1 Summary (Non-inclusive)

A. Section Includes: Roofing replacement system consisting of complete tear-off, evaluation of existing insulation and preparation of existing roof surface for, fully-adhered membrane plus new insulation, insulation cover board, base flashing, and accessories.

1.2 Related Work Specified Elsewhere (Non-inclusive)

A. Applicable Sections: Division 01.

B. Inspection and Testing Services: Division 01.

C. Inspection and Testing of Roofing and Waterproofing: Division 01.

D. Rough Carpentry: Division 06.

E. Flashing and Sheet Metal: Division 07.

F. Exterior Enclosure, General: Division 07.

G. Roof Accessories: Division 07.

H. Mechanical: Division 23, refer to for equipment mounted on or penetrating roof.

I. Electrical: Division 26, refer to for equipment mounted on or penetrating roof.

1.3 Submittals

A. Submit per requirements of Division 01.

1. Exterior Enclosure submittals will not be reviewed without receipt of Preliminary Certification letters indicated in Inspection and Testing of Roofing and Waterproofing: Division 01.

2. Coordinate and submit concurrently, submittals required in other Sections that affect Work of this Section.

3. Coordinate with Coordination Drawings specified in Project Coordination Section of Division 01.

B. Shop Drawings: Indicate joint, penetration and termination conditions and conditions of interface with adjacent walls, parapets, and other materials and as follows: Show all layers of the roof system starting from the substrate. Show continuity with other weather-resistive materials and air/vapor retarder materials. Include sufficient detail to indicate compliance with conditions unique for this Project.

1. Submit plan at minimum 1/8 inch equals 1 foot.
2. Submit details at minimum 3 inches equals 1 foot.
3. Relative elevations and slopes of substrates and finished roof surface.
4. Drain locations and size of sumps.
5. Parapet and edge details.
6. Location of tapered edge strips.
7. Curbs, rails, hatches, and vents in accordance with Roof Accessories: Division 07.
8. Expansion joints and area dividers.
9. All flashing details.
10. Walkway pad layout, coordinated with lightning protection system.
11. Layout of components including all layers of roof assembly.
12. Tapered insulation:
    a. Layout of insulation showing slopes, crickets, valleys and drain locations.
    b. Longitudinal and transverse sections showing insulation layers.
13. Roof top equipment and penetrations required for Work of other specification Divisions.

C. Product Data: For each component or material used in system including accessories, primers, and other miscellaneous products.

D. Samples:

1. Paper sample of “Roofing Identification Sign”, with information completed for this Project.
2. Manufacturer’s color coating color chart.

E. Qualifications: Manufacturers and installers qualifications.

F. Quality Control Procedures: Submit Manufacturer’s Field Reports within one (1) week after inspection.

G. Certifications: Written certification letters where specified.

H. Closeout Submittals:

1. Special Warranty:

a. Intent to Warrant letter. Do not commence Work without approval of Intent to Warrant.
b. Executed Warranty after completion of Work.

2. Maintenance Plan: Manufacturer's Roof Maintenance Plan.

I. Sustainability Submittals: Provide the following in accordance with Sustainability Requirements: Division 01.

1. Materials Sustainability Documentation Form.

2. Product data, certification letter, and costs for materials with recycled content.

3. Product data and costs for regional materials.

4. Product data for adhesives and sealants indicating VOC content.

5. Product data for paints and coatings indicating VOC content and chemical composition.

6. Product test reports indicating that roof materials comply with Solar Reflectance Index requirement.

1.4 Definitions

A. Roofing Systems: Components required to maintain building watertight from substrate up to top of base flashing including, but not limited to, substrate primers, insulation, insulation cover board, attachments, membrane, coatings, and base flashing.

1.5 Performance Requirements

A. Roofing manufacturer shall select products and installation techniques to conform to indicated requirements. Thicknesses and material descriptions indicated are minimums. Provide thicker materials or materials with higher performance values if required by roof manufacturer to comply with the indicated performance requirements or if required to issue indicated warranty.

1. Best Practice: Provide materials and detailing which provides most proven durability, generally as recommended by manufacturer for twenty (20) year warranty, whether a twenty (20) year warranty is specified or not.

B. UL Listing: Provide single-ply roofing system and component materials that have been tested for application and slopes indicated and are listed by Underwriters Laboratories, Inc. (UL) for Class A external fire exposure.

1. Provide single-ply roofing system that can be installed to comply with UL requirements for Fire Classified and Class 90 wind-uplift requirements.

1.6 Quality Assurance

A. Manufacturer's Qualification: Manufacturers shall have ten (10) years documented experience producing roofing membranes of the same Type as those required for this Project.

B. Installer's Qualification: Installer shall have satisfactorily completed minimum three (3) projects of similar system, scope and complexity within last one (1) year. Installer shall currently be licensed and approved by manufacturer and shall have been so for previous three (3) years. Submit list of projects with Owner and Design Professional contact with telephone numbers and manufacturer's certification.

C. Single Source Requirements: Primary products and materials required to complete system shall be produced directly by listed manufacturer. Secondary products including insulation, primers, anchors, and may be produced by a secondary manufacturer approved in writing by primary manufacturer.

D. Regulatory Requirements: Comply with applicable Volatile Organic Compounds (VOCs) regulations.

E. Referenced Codes and Standards: Comply with the following in accordance with Division 01.

1. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual

2. Single-Ply Roofing Institute (SPRI): Flexible Membrane Roofing: A Professional's Guide to Specifications

F. Certifications:

1. Manufacturer's certification that installer is approved for this Project and has been an approved installer as required above.

2. System Certification Letter: Manufacturer's certification as follows:

   a. List information specific to this project, including Owner, Contractor, Building, and location.
   b. List each material required for roofing system.
   c. Certification of single source responsibility.
   d. Certification of acceptance of secondary products manufactured by Others.
   e. Certification of acceptance of products specified elsewhere which are installed within or in contact with roofing system.
   f. Certification that products and materials comprising roofing system are compatible with each other and with adjacent materials they may contact.
   g. Certification that roof systems comply with specified UL and FMG requirements.
   h. Certification that roof system is eligible for indicated warranty.

G. Insurance Certification: Assist Owner's Representative in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

H. Preliminary Roofing Conference: As soon as possible after award of roofing work and before initial submittals, meet with Installer (Roofer), installers of substrate construction (roof decks) and other work adjoining roof system including penetrating work and roof accessories, Design Professional, Owner's Representative, Inspecting Agent, and representatives of other entities directly concerned with performance of roofing system including (as applicable) Owner's insurers.

1. Review requirements (Contract Documents), submittals, status of coordinating work, availability of materials, substrate requirement and installation facilities, and establish preliminary installation schedule. Review requirements for inspections, testing, certifications, forecasted weather conditions, governing regulations, insurance requirements, and proposed installation procedures.

2. Discuss roofing system protection requirements for construction period extending beyond roofing installation. Discuss possible need for temporary roofing.

3. Confirm that all parties involved are aware of Warranty requirements and Intent to Warrant letter has been submitted and approved.

4. Record discussion, including agreement or disagreement on matters of significance; furnish copy of recorded discussions to each participant. If substantial disagreements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.

I. Preapplication Roofing Conference: Approximately two (2) weeks before scheduled commencement of roofing installation and associated work, meet at Project Site with Installer, installer of each component of associated work, installers of deck or substrate construction to receive roofing work, installers of rooftop units and other work in and around roofing that must precede or follow roofing work, including mechanical work, if any, Design Professional, Owner's Representative, Inspection Agent, roofing system manufacturer's representative, and other representatives directly concerned with performance of Work, including, where applicable, Owner's insurers, and governing authorities.

1. Review foreseeable methods and procedures related to roofing work, including, but not limited to, the following:

    a. Tour representative areas of roofing substrates (decks), inspect and discuss condition of substrate, roof drains, curbs, penetrations, and other preparatory work performed by other trades.
    b. Review structural loading limitations of steel deck and inspect deck for loss of flatness and for required mechanical fastening.
    c. Review roofing system requirements included on Drawings, Specifications, and other Contract Documents.
    d. Review required submittals, completed and yet to be completed.
    e. Review Intent to Warrant and unexecuted Warranties.
    f. Review and finalize construction schedule related to roofing work and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

g. Review required inspection, testing, certifying and material usage accounting procedures.
h. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing, if not a mandatory requirement.

2. Record Contractor discussions of conference, including decisions and agreements or disagreements reached, and furnish copy of record to each party attending. If substantial disagreements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.

J. Inspection and Testing: Services of an independent Inspection and Testing Agency will be required in relation to Work of this Section. Refer to Division 01.

K. Coordination: Contractor shall coordinate Work specified in other Sections and in other Contracts affecting roof in any way.

1.7 Delivery, Handling And Storage

A. Deliver materials in original unopened containers or packaging clearly labeled with manufacturer's name, brand name, instructions for storage, handling and use, all identifying numbers and labels.

B. Store materials on pallets or other similar raised platform and protected from weather.

C. Do not overload structure by storing large amounts of material in one (1) area.

D. Store adhesives and other temperature sensitive materials between 60 degrees F and 80 degrees F.

1.8 Project Conditions

A. Application of roofing shall not commence or proceed during inclement weather or if precipitation is more than 50 percent likely during next 8 hour period per National Weather Service or if temperatures are outside of manufacturer’s written instructions.

1.9 Sequencing

A. Coordinate Work to minimize construction traffic required over complete roofing system.

1.10 Special Warranty

A. Intent to Warrant: Submit an Intent to Warrant executed by authorized representative of roof membrane system manufacturer, indicating that manufacturer has reviewed Drawings and Specifications, conditions affecting work and relationship of roof membrane system with related work, and that manufacturer proposes to provide warranty as referenced without further stipulation.

B. Manufacturer's Warranty:

1. Provide a twenty (20) year warranty from manufacturer, signed by an authorized representative of manufacturer which shall warrant that manufacturer shall repair any defective workmanship and replace any defective material within roofing system as indicated.

2. The following exclusions are permitted in Warranty:

   a. Natural disasters such as lightning, hail, floods, and earthquakes.
   b. Damage from traffic or storage of material on roof.
   c. Structural failure of roof deck, parapet or coping.
   d. Infiltration of moisture in, through or around walls, coping or building structure.
   e. Movement or deterioration of metal counterflashing or other metal components adjacent to roof.
   f. Damage to building (other than roofing system components) or its contents.

3. Warranty shall include coverage for failure due to wind velocities up to 90 miles per hour.

4. Warranty shall provide that if upon proper notification Warrantor fails to promptly repair roof, Owner may make temporary repairs to avoid damage to facility. Such action shall not be considered a breach of provisions of Warranty.

5. Owner shall be permitted to make alterations, additions and repairs to roof within written approved guidelines of Warrantor without jeopardizing unexpired portion of Warranty's original term.

6. There shall be no deviations from these Specifications or from requirements of roofing material manufacturer that would prevent issuing of Warranty.

1.11 Owner's Instructions

A. Care and Maintenance: Provide manufacturer's written Roof Maintenance Plan customized for Project, for maintenance of roof including, for example, inspection schedules, trouble shooting, early signs of a potential problem and temporary emergency repairs.

Part 2 Products

2.1 Manufacturer

1. Subject to compliance with specified criteria, provide primary system components manufactured by one (1) of the following:

2. TPO:

   a. Firestone Building Products Co.
   b. Carlisle Syntec Systems.
   c. Johns Manville Co.
   d. ∗[1] Versico Roofing Systems.

2.2 Materials, General

A. Use paints and coatings that comply with the VOC limits and chemical restrictions specified in Sustainability Requirements: Division 01.

2.3 Roofing Membrane

A. TPO: A fabric-Reinforced Thermoplastic Polyolefin Sheet complying with ASTM D 6878.

1. Thickness: Minimum 60 mils nominal thickness.

2. Reinforcement: Fiberglass or polyester as required to meet performance criteria.

3. Exposed Face Color: White.

2.4 Insulation

A. Polyisocyanurate: Rigid closed-cell foam boards permanently bonded to non-asphaltic glass fiber facing sheet complying with ASTM C 1289, UL Class A, FMG Class 1 and the following:

1. Compressive Strength per ASTM D 1621: Minimum 20 psi.

2. Maximum Face Size: 4 feet by 4 feet.

3. R-value for a 1 inch board tested per ASTM C 518 and conditioned per RIC/TIMA 281-1: Minimum 5.6.

4. Minimum Thickness: in order to achieve R-25.

5. Crickets: Same material as insulation, tapered so finished surface slopes minimum 1/4 inches per foot.

6. Tapered Insulation:

a. Slope of finished surface: Minimum 1/4 inch per foot including crickets.
b. Minimum thickness measured at perimeter of drain sumps: 2 inches.

B. Insulation Cover Board: Silicone impregnated gypsum board core panels with integral glass fiber facers, 5/8 inch thick, pre-primed, complying with ASTM C 1177, Dens Deck by Georgia-Pacific Corp.

2.5 Bonding Materials

A. Membrane Adhesives: Supplied by same manufacturer as membrane and formulated for use with roof membrane and insulation, inert to weathering by withstanding oxidation, ozonization, hydrolysis, and chemical attach from ponded water. Adhesive shall withstand specified uplift force. Adhesive shall be compliant with all Volatile Organic Compounds (VOCs) regulations.

B. Flashing Cement Mastics, and Sealants: Supplied or approved by membrane manufacturer. Comply with all Volatile Organic Compounds (VOCs) regulations.

2.6 Accessory Materials

A. Accessory materials shall be as recommended in writing by membrane manufacturer, as required to comply with specified criteria, and appropriate for a 20-year warranted system whether or not such a warranty is being offered.

B. Traffic Pads: approximately 24 inches by 24 inches by 1/4 inch as recommended in writing by membrane manufacturer. Layers of additional membrane are not acceptable as traffic pads.

C. TPO Base Flashing: Use TPO membrane.

1. Furnish factory pre-molded inside and outside corner units recommended in writing by manufacturer.

D. Pre-molded Flashing Boots: Manufacturer's standard conical elastomeric boots, molded to fit pipe penetrations.

E. Mechanical Fasteners: Corrosion-resistant per FMG 4470 criteria as recommended by membrane manufacturer and insulation manufacturer for deck type, and complying with fire and insurance uplift rating requirements. Provide system tested and approved for specified wind uplift rating.

F. Tapered Edge Strips: 1 1/2 inches high by 18 inches wide, same material as insulation.

G. Termination Bar: 3/32 inch thick extruded aluminum and punched with elongated holes approximately 1 inch on center.

H. Concrete adjustable roof paver pedestal system where indicated. Basis of design: Wassau Terra Stand System with 36" square concrete pavers. Paver to be selected by Architect from manufacturer's full line.

2.7 Laminated Metal Flashing Fabrication

A. Shop fabricate laminated metal flashing to form base flashing, edge flashing, scuppers and overflows as indicated in accordance with requirements of Flashing and Sheet Metal: Division 07.

B. Shop fabricate inside and outside corners, transitions and terminations in accordance with requirements of Flashing and Sheet Metal: Division 07. Form inside corners with a 1 inch cant.

Part 3 Execution

3.1 Examination

A. Examine substrate surfaces to receive single-ply roofing system and associated work and conditions under which roofing will be installed.

1. Verify roof openings, pipes, conduit, sleeves, ducts, and vents through roof are solidly set, and wood nailers, counterflashing receivers and reglets are in place.

2. Verify that curbs, rails, pipe curb assemblies, roof top mechanical equipment and other roof-mounted elements specified elsewhere are in place and properly anchored.

3. Verify that surrounding parapets, roof edges and walls are properly prepared for application of roofing system.

4. Verify deck is supported and secured.

5. Verify deck is clean and smooth, free of depressions, waves, or projections, properly sloped to drains and valleys.

6. Verify deck surfaces are dry and free of snow or ice. Verify flutes of metal deck are clean and dry.

7. Verify concrete substrates have a moisture content below manufacturer's published maximum recommended value.

8. Verify that penetrating elements have indicated air seal or firestopping.

B. Reporting: Report defects or deficiencies in writing to Contractor, Design Professional and Owner's Representatives.

C. Do not proceed with roofing work until defects or deficiencies have been corrected.

D. Acceptance: Commencement of roofing work constitutes acceptance of substrate. Provide removal and replacement of roofing required for, or caused by, defects or deficiencies in substrate, including damp materials at no additional cost.

3.2 Preparation

A. Protect adjacent surface from staining or soiling caused by roofing application. Prevent liquid materials from entering or clogging drains, pipes, conduits or conductors. Prevent foreign materials from entering or clogging roof drains, scuppers or downspouts.

B. Coordinate installing roofing system components so that, insulation, and insulation cover board are not exposed to precipitation or left exposed overnight. Provide watertight cut offs at end of each day's work to cover exposed sheets and insulation. Remove cut offs immediately before resuming Work.

3.3 Application

A. General: Comply with approved submittals, Specifications, and manufacturer's written instructions for a 20-year warrantable system whether or not such a warranty is required.

B. Insulation Application:

1. General:

a. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

b. Lay tapered boards, tapered edge strips, or cut boards to slope to form a minimum 3 feet square by 1 1/2 inch deep sump at roof drains.
c. Apply no more insulation than can be covered with membrane in same day.
d. Install tapered edge strips wherever roofing intersects a vertical surface or a curb, at all penetrations, at perimeter of roof edge and as indicated.
e. Use tapered insulation or tapered edge strips to form crickets to direct water to roof drains. Install crickets behind all roof penetrations or irregularities, for example, roof-mounted equipment, curbs, rails and hatches which cross the down slope flow of water.
f. Place tapered thickness insulation to required slope pattern in accordance with manufacturer's written instructions and approved submittals.
g. Insulation cover board shall be top layer of insulation assembly. Cut insulation cover board to follow slope of roof insulation at tapered edge strips, crickets, valleys, ridges and other breaks in slope.

2. Insulation, Mechanically-Fastened:

a. Mechanically-fasten insulation to substrate in accordance with insulation manufacturer's written instructions and as required to comply with specified uplift criteria.
b. Mechanically-fasten subsequent layers of insulation and insulation cover board with joints staggered minimum 6 inches from joints of first layer.

C. TPO Membrane Application, Fully Adhered:

1. Adhere membrane roofing over area to receive roofing and install according to membrane roofing system manufacturer's written instructions.

2. Retain first paragraph below if applicable.

3. Start installation of membrane roofing in presence of membrane roofing system manufacturer's technical personnel.

4. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

5. Retain first paragraph below for adhesive bonding membrane to substrate.

6. Bonding Adhesive: Apply to substrate and underside of membrane roofing at rate required by manufacturer and allow to partially dry before installing membrane roofing. Do not apply to splice area of membrane roofing.

7. In addition to adhering, mechanically fasten membrane roofing securely at terminations, penetrations, and perimeter of roofing.

8. Apply membrane roofing with side laps shingled with slope of roof deck where possible.

9. Seams: Clean seam areas, overlap membrane roofing, and hot-air weld side and end laps of membrane roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.

a. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet membrane.

b. Revise number of seam tests in first subparagraph below to suit Project.
c. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
d. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.

10. Spread sealant bed over deck drain flange at roof drains and securely seal membrane roofing in place with clamping ring.

D. TPO Flashings and Accessories:

1. Apply base flashings to seal membrane to vertical elements and penetrations. Install prefabricated corners. Form corners and special shapes with uncured sheets only when prefabricated shapes are not available.

2. Secure top of base flashing with roofing nails maximum 12 inches on center or with termination bar secured maximum 18 inches on center.

3. Coordinate overlap of base flashing under copings and other flashings with air/vapor barrier as indicated. Overlap shall occur on vertical surface and shall be shingled in the direction of flow.

4. Flash each penetrating pipe, conduit, tube or other similar elements using prefabricated flashing boots or pipe curb assembly specified in Roof Accessories: Division 07.

5. Coordinate installation of roof drains, sumps and related flashings.

6. Pitch pockets are not allowed.

E. Scuppers and Overflows: Verify that rough opening for has been lined with air/vapor barrier membrane flashing. Install shop fabricated scuppers and overflows under roofing membrane. Mechanically anchor at maximum 6 inches on center around perimeter of both faces and not less than two (2) anchors per leg. Seal roof membrane to scupper with adhesive at EPDM and TPO and by hot air welding at PVC.

F. Protective Coating: Apply coating to EPDM membrane materials exposed to view in accordance with manufacturer's written instructions.

G. Traffic Pads: Install pads using cold adhesive at EPDM and hot air welding at PVC and TPO as recommended in writing by manufacturer in locations indicated. Space pads to allow for drainage. Install traffic pads under each lightning protection air terminal mounted on roof and continuous under lightning protection cables.

3.4 Field Quality Control

A. Inspection: Services of an independent Inspection and Testing Agency shall be used in relation to this Work.

B. Moisture Test: Prior to Date of Substantial Completion, independent Inspection and Testing Agency specified in Division 01 will survey roof to search for leaks demonstrated by wet insulation.

1. If there has not been rainfall of at least 1 inch in 24 hours during two (2) week period prior to test, use hoses and sprinklers to thoroughly soak roof surface for 12 hours. Submit request for change order for cost of soaking if required. Do not include cost of soaking in Base Price.

2. If leaks or wet underlying materials are found, remove membrane and wet materials, let system dry and repair system. Contractor shall pay for retesting by original independent Inspection and Testing Agency until no leaks or wet underlying materials are discovered.

C. Manufacturer's Representative: Manufacturer's technical field representative shall inspect construction activities, at start of work, minimum two (2) hours per week during work and at completion of each area of work. Representative shall attend meetings concerning roofing when indicated or as scheduled to coordinate Work. Representative shall submit a written report after each inspection noting as a minimum weather conditions, condition of stored materials, work in progress, condition of substrates, number of workers and which workers have completed manufacturers' training programs, and all other pertinent data. Services of manufacturer's field representative are not intended to supersede manufacturer's written requirements for inspection to issue Warranty.

3.5 Cleaning

A. Clean roof areas of roofing tools, unused materials and debris.

B. Clean spilled adhesive or other materials from exposed surfaces that were not to receive roofing.

C. Clean roof areas in order to meet LEED reflectance criteria.

3.6 Protection

A. Protect roof system from construction traffic. Apply temporary protection if roof system is extensive roof traffic is required.

3.7 Roofing Schedule

A. Roof System Type SMNA:

1. Substrate: Cross Laminated Timber Deck.

2. Insulation: Tapered Polyisocyanurate, Mechanically Fastened.

3. Insulation Cover Board: Siliconized Gypsum sheathing, Mechanically Fastened.

4. Roof Membrane: TPO sheet, Fully Adhered.

END

Part 1 General

1.1 Summary (Non-inclusive)

A. Section Includes: Exterior signs and their installation complete as specified herein and as indicated on Drawings and shall include the following.

1. Cast and Fabricated Letters.

2. Accessories, Supports and Anchors.

1.2 Related Work Specified Elsewhere (Non-inclusive)

A. Applicable Sections: Division 01.

1.3 Submittals

A. Submit per the requirements of Division 01.

B. Shop Drawings: Show fabrication and installation details, post setting and wiring diagrams as required.

C. Samples: Two (2) sets of finish Samples for approval.

D. Closeout Submittals: Special Warranty: As indicated.

1.4 Special Warranty

A. Furnish five (5) year Warranty on metal finishes, against peeling, cracking, fading, crazing or blistering.

Part 2 Products

2.1 Approved Manufacturers

A. *[1] Products of Gemini Sign Products are specified to establish desired quality and performance of the Work. Equivalent products of other manufacturers will be evaluated as substitutions in accordance with requirements of Division 01.

2.2 Cast Letters

A. Cast Letters:

1. Material: Aluminum 0.90 inch thick.

2. Letter Height: As shown on Drawings.

*[1] Addendum No. 3, 06/16/16

3. Letter Style: As shown on Drawings.

4. Mounting Method: Projected from surface on pin mounts.

5. Final Finish (Color): Anodized Aluminum.

2.3 Finish

A. *[1] Etch and degrease all exposed aluminum. Provide manufacturer's standard colored anodized finish. Color shall be as selected by Design Professional.

2.4 Workmanship

A. Execute aluminum letter forms with square edges or as indicated on Drawings. Chipped, nicked, cut or ragged edges will not be accepted.

B. Edges of signs or letters shall be smoothly finished.

C. All finishes shall be free from lines, ridges, variations in color, orange peel, bubbles, pin holes, mottling, crazing, coarse particles and grit.

Part 3 Execution

3.1 Installation

A. Install Work in accordance with approved submittals.

3.2 Cleaning

A. After installation, clean exposed surfaces in accordance with sign manufacturer's written instructions.

END

*[1] Addendum No. 3, 06/16/16

Part 1 General

1.1 Summary (Non-inclusive)

A. Section Includes: Provide signs, as indicated in drawings.

1.2 Related Work Specified Elsewhere (Non-inclusive)

A. Applicable Sections: Division 01.

B. Finishes: Division 09.

C. Exterior Signs: Division 10.

D. Sections of Work to which interior signage is attached or fastened to its surface.

1.3 Submittals

A. Submit per the requirements of Division 01.

B. Shop Drawings: Show fabrication and installation details.

C. Samples: Provide Sample inter-letter and inter-word spacing on Sample sign inserts and panels for Design Professional's approval before fabrication is initiated.

D. Sustainability Submittals: Provide the following in accordance with Sustainability Requirements: Division 01.

1. Materials Sustainability Documentation Form.
2. Product data, certification letter, and costs for materials with recycled content.
3. Product data and costs for regional materials.
4. Product data for adhesives and sealants indicating VOC content.

E. Closeout Submittals: Special Warranty: As indicated.

1.4 Special Warranty

A. Furnish five (5) year warranty on metal finishes, against peeling, cracking, fading, crazing or blistering.

Part 2 Products

2.1 Approved Manufacturers

A. *[1] Products of ASI Sign Systems Inc., System Emboss and Mohawk Sign Systems, Series 200A Sand-carved are specified to establish desired quality and performance of Work. Equivalent products of other manufacturers will be evaluated as substitutions in accordance with requirements of Division 01.

2.2 Signs

A. Provide sign types indicated on Drawings.

B. Provide sign for each interior door.

C. All signage shall be ADA compliant.

2.3 Workmanship

A. Execute reverse screening of letters true and level, letter forms with rounded corners, chipped, nicked, cut or ragged edges are not acceptable. Screening to be executed in such a manner that edges and corners of finished letter forms are true and clean. Laminations shall be free of trapped air or other imperfections and edges shall be trimmed flush, so that front face appears monolithic.

B. Fabricate joints, miters, and other features with Work accurately machined, filed and fitted rigidly framed together at joints and contact points. Carefully match work to produce a perfect continuity of lines and designs, with finish materials in contact having hairline joints. Edges of sign plaques shall be smoothly finished.

C. Finishes shall be free from lines, ridges, variations in color, orange peel, bubbles, pin holes, mottling, crazing, coarse particles and grit.

Part 3 Execution

3.1 Installation

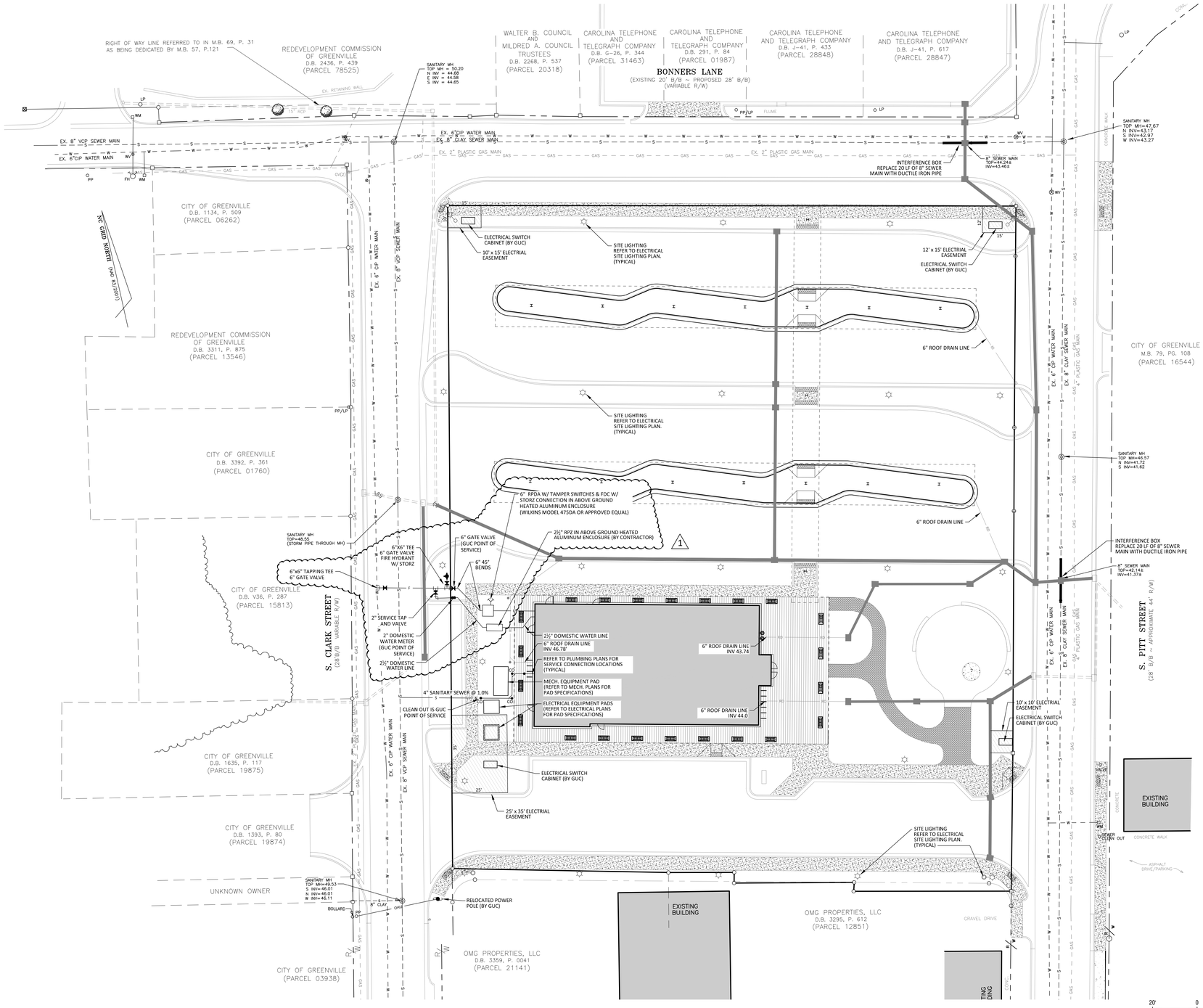
A. Erect Work plumb, level and true, with proper alignment and relationship to Work of other Sections, free of sway and deflection, structurally sound and rigidly secured.

3.2 Cleaning

A. After installation, clean exposed surfaces in accordance with sign manufacturer's written instructions.

END

*[1] Addendum No. 3, 06/16/16



Legend

- "X" IN CONCRETE
- CORNER AT INTERSECTION
- IRON PIPE SET
- P.K. NAIL SET
- NO POINT SET
- EXISTING IRON PIPE
- EXISTING IRON BAR
- CONCRETE MONUMENT
- SIGN
- WATER METER
- WATER VALVE
- GAS METER
- GAS VALVE
- EXISTING TREE
- MANHOLE
- 48.37 EXISTING SPOT ELEVATION
- 48 EXISTING CONTOURS
- PP POWER POLE
- PP/LP POWER POLE WITH LIGHT
- FIRE HYDRANT
- PROPERTY LINE
- STORM DRAIN
- FENCE LINE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- OVERHEAD UTILITY LINE
- ROOF DRAIN
- UNDERGROUND ELECTRIC
- FIRE MAIN
- CONDUIT
- UTILITY DUCT BANK
- DEMO / TO BE REMOVED
- TREE LINE / VEGETATION
- LIMITS OF DISTURBANCE
- TEMPORARY DIVERSION DITCH
- BACK OF CURB
- TOP OF CONCRETE
- TOP OF ISLAND
- TOP OF PAVEMENT
- SPILL GUTTER
- TRUNCATED DOMES
- CATCH BASIN
- DEMO / TO BE REMOVED
- ROCK INLET SEDIMENT TRAP
- TREE/SHRUB DEMO/REMOVAL
- CONCRETE
- BACTERIOLOGICAL SAMPLE POINT

Utility Notes:

1. LOCATION OF ALL EXISTING AND PROPOSED SERVICES ARE APPROXIMATE AND MUST BE CONFIRMED INDEPENDENTLY WITH LOCAL UTILITY COMPANIES PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION OR EXCAVATION. SANITARY SEWER AND ALL OTHER UTILITY SERVICE CONNECTION POINTS SHALL BE CONFIRMED INDEPENDENTLY BY THE CONTRACTOR IN THE FIELD PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. DISCREPANCIES SHALL BE REPORTED IMMEDIATELY IN WRITING TO ENGINEER. CONSTRUCTION SHALL COMMENCE BEGINNING AT THE LOWEST INVERT (POINT OF CONNECTION) AND PROGRESS UPSTREAM. PROPOSED INTERFACE POINTS (CROSSINGS) WITH EXISTING UNDERGROUND UTILITIES SHALL BE FIELD VERIFIED BY TEST PIT PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. ALL UTILITIES AND SERVICES INCLUDING BUT NOT LIMITED TO GAS, WATER, ELECTRIC, SANITARY AND STORM SEWER, TELEPHONE, CABLE, FIBER OPTIC CABLE WITHIN THE LIMITS OF DISTURBANCE SHALL BE VERTICALLY AND HORIZONTALLY LOCATED. THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE UTILITY NOTIFICATION SYSTEM TO LOCATE ALL THE UNDERGROUND UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRS OF DAMAGE TO ANY EXISTING UTILITIES DURING CONSTRUCTION AT NO COST TO THE OWNER.
3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW ALL OF THE DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THE PROJECT WORK SCOPE PRIOR TO THE INITIATION OF CONSTRUCTION. SHOULD THE CONTRACTOR FIND A CONFLICT WITH THE DOCUMENTS RELATIVE TO THE SPECIFICATIONS OR THE RELATIVE CODES, IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE PROJECT ENGINEER OF RECORD IN WRITING PRIOR TO COMMENCING CONSTRUCTION. FAILURE BY THE CONTRACTOR TO NOTIFY THE PROJECT ENGINEER SHALL CONSTITUTE ACCEPTANCE OF FULL RESPONSIBILITY BY THE CONTRACTOR TO COMPLETE THE SCOPE OF WORK AS DEFINED BY THE DRAWINGS AND IN FULL COMPLIANCE WITH LOCAL AND STATE REGULATIONS AND CODES.
4. THE SITE UTILITY CONTRACTOR SHALL DEFINE AND LOCATE VERTICALLY AND HORIZONTALLY ALL ACTIVE UTILITY SERVICE SYSTEMS THAT ARE TO BE REMOVED. THE SITE UTILITY CONTRACTOR IS RESPONSIBLE TO PROTECT AND MAINTAIN ALL ACTIVE SYSTEMS THAT ARE NOT BEING REMOVED OR RELOCATED DURING SITE ACTIVITIES.
5. THE SITE UTILITY CONTRACTOR SHALL FAMILIARIZE THEMSELVES WITH THE APPLICABLE UTILITY SERVICE PROVIDER REQUIREMENTS AND IS RESPONSIBLE FOR ALL COORDINATION REGARDING UTILITY DEMOLITION AS IDENTIFIED OR REQUIRED FOR THE PROJECT. THE CONTRACTOR SHALL PROVIDE THE OWNER WRITTEN NOTIFICATION THAT THE EXISTING UTILITIES AND SERVICES HAVE BEEN TERMINATED AND ABANDONED IN ACCORDANCE WITH JURISDICTION AND UTILITY COMPANY REQUIREMENTS.
6. INSTALL ALL STORM AND SANITARY SEWER COMPONENTS WHICH FUNCTION BY GRAVITY PRIOR TO THE INSTALLATION OF ALL OTHER UTILITIES.
7. SITE UTILITY CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF SITE PLAN DOCUMENTS AND ARCHITECTURAL PLANS FOR EXACT BUILDING UTILITY CONNECTION LOCATIONS, DOOR ACCESS AND EXTERIOR GRADING. THE UTILITY SERVICE SIZES ARE TO BE DETERMINED BY THE ARCHITECT. THE SITE UTILITY CONTRACTOR SHALL COORDINATE INSTALLATION OF UTILITIES / SERVICES WITH THE INDIVIDUAL COMPANIES, TO AVOID CONFLICTS, AND TO ENSURE PROPER DEPTHS ARE ACHIEVED. THE SITE UTILITY CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT INSTALLATION OF ALL IMPROVEMENTS COMPLIES WITH UTILITY REQUIREMENTS HAVING JURISDICTION, AND SHALL BE RESPONSIBLE FOR COORDINATING THE UTILITY TIE-INS / CONNECTIONS PRIOR TO CONNECTING TO THE EXISTING UTILITY / SERVICE. WHERE CONFLICTS EXIST WITH THESE PLANS, OR WHERE ARCHITECTURAL PLAN UTILITY CONNECTION POINTS DIFFER, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER PRIOR TO CONSTRUCTION COMMENCEMENT TO RESOLVE.
8. REFER TO M.E.P. PLANS FOR COORDINATION OF BUILDING UTILITY SERVICES.
9. ALL NEW UTILITIES, INCLUDING ELECTRIC, TELEPHONE, CABLE TV SHALL BE INSTALLED UNDERGROUND.
10. SITE UTILITY CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH UTILITY PROVIDERS FOR THE RELOCATION / ABANDONMENT OF EXISTING UTILITIES AND INSTALLATION OF NEW UTILITY SERVICES AS WELL AS FEES ASSOCIATED WITH SUCH WORK.
11. SITE UTILITY CONTRACTOR SHALL NOTIFY GREENVILLE UTILITIES COMMISSION AT (252) 551-1586 PRIOR TO BEGINNING WORK ON ANY GUC OWNED FACILITIES OR ON ANY FACILITIES TO BE ACCEPTED FOR PERMANENT OPERATION AND MAINTENANCE BY GUC.
12. EXISTING UNUSED SEWER SERVICES TO BE ABANDONED AT THE BACK OF CURB. CONTRACTOR SHALL COORDINATE WITH GUC FOR INSPECTION OF ABANDONMENT.

Utility Providers:

STORM DRAINAGE:
City of Greenville
Contact: Scott Godefroy, PE
Phone: (252) 329-4525

WATER & SANITARY SEWER:
Greenville Utilities Commission
Contact: Cliff Cahoon, PE
Phone: (252) 551-3386

GAS:
Greenville Utilities Commission
Contact: Cheryl Barrett
Phone: (252) 551-1596

PUBLIC STREETS:
City of Greenville
Contact: Scott Godefroy, PE
Phone: (252) 329-4525

ELECTRIC UTILITIES:
Greenville Utilities Commission
Contact: Chris Corey
Phone: (252) 551-1586

TELEPHONE:
CenturyLink
Contact: Pam Isles
Phone: (252) 355-4544

CABLE TV:
SuddenLink
Contact: Nathan Barnhill
Phone: (252) 792-9182

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(252) 558-0888
NC License: P-1199

Seals:

NORTH CAROLINA PROFESSIONAL SEAL 28425 ENGINEER SCOTT T. ANDERSON

REV. 6/16/2016

SCOTT T. ANDERSON, P.E., LICENSE NO. 28425

General Notes:

Project Client:
CITY OF GREENVILLE

GREENVILLE TRANSPORTATION ACTIVITY CENTER
600 S. Pitt Street, Greenville, NC

Number	Description	Date
0	IFC	05-10-2016
1	ADDENDUM NO. 2	06-16-2016

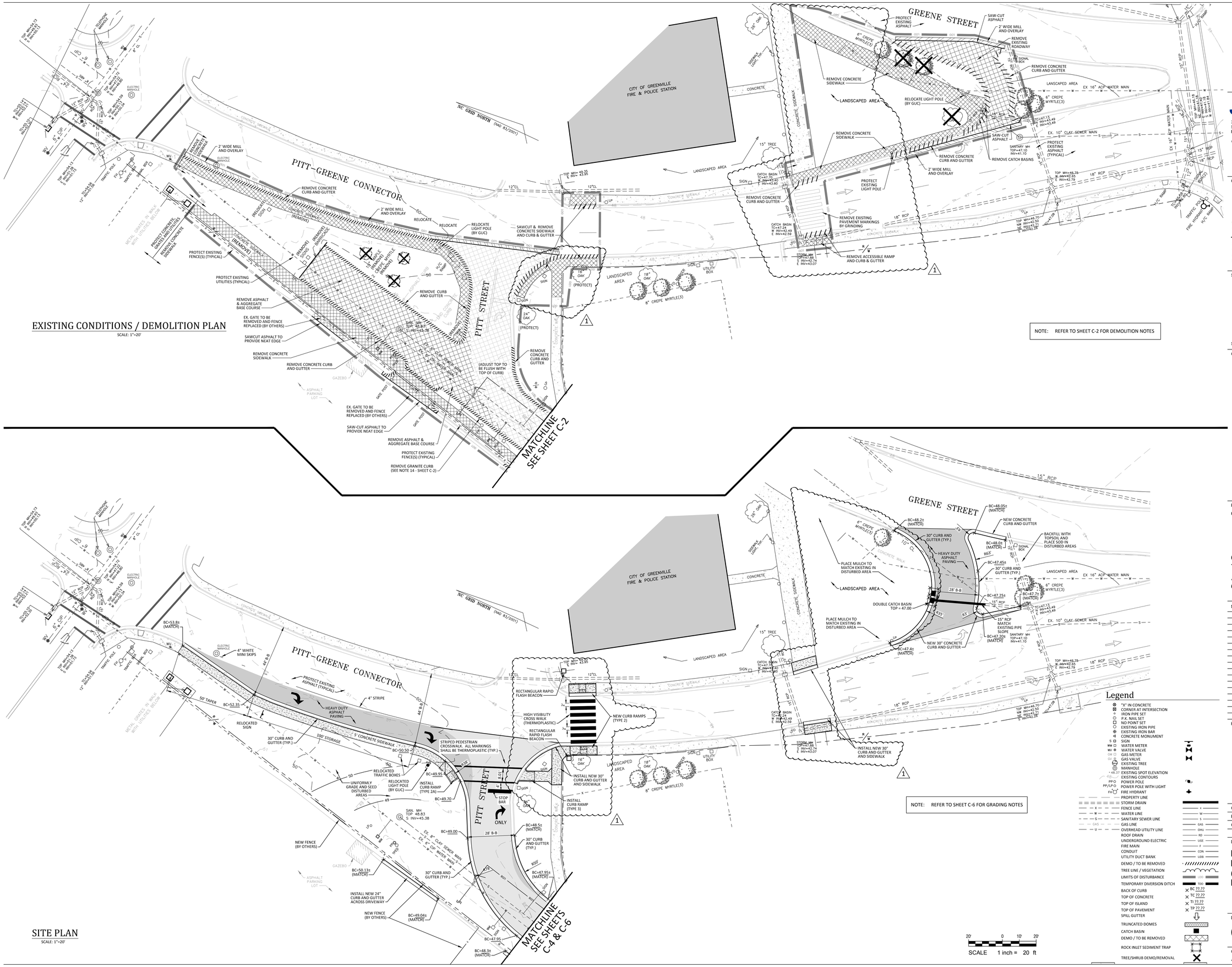
Key Plan: Project North

CAD File:
Project No.: L3005900
Copyright: 2015 Jacobs Engineering Group

Drawing Sheet Title:
SITE UTILITY PLAN

Drawing Sheet Number:
C-5

Owner's Drawing Sheet No.:
Ark Drawing No. E-1004



Legend

- "X" IN CONCRETE
- CORNER AT INTERSECTION
- IRON PIPE SET
- P.K. NAIL SET
- NO POINT SET
- EXISTING IRON PIPE
- EXISTING IRON BAR
- CONCRETE MONUMENT
- SIGN
- WATER METER
- WATER VALVE
- GAS METER
- GAS VALVE
- EXISTING TREE
- MANHOLE
- EXISTING SPOT ELEVATION
- EXISTING CONTOURS
- POWER POLE
- POWER POLE WITH LIGHT
- FIRE HYDRANT
- PROPERTY LINE
- STORM DRAIN
- FENCE LINE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- OVERHEAD UTILITY LINE
- ROOF DRAIN
- UNDERGROUND ELECTRIC
- FIRE MAIN
- CONDUIT
- UTILITY DUCT BANK
- DEMO / TO BE REMOVED
- TREE LINE / VEGETATION
- LIMITS OF DISTURBANCE
- TEMPORARY DIVERSION DITCH
- BACK OF CURB
- TOP OF CONCRETE
- TOP OF ISLAND
- TOP OF PAVEMENT
- SPILL GUTTER
- TRUNCATED DOMES
- CATCH BASIN
- DEMO / TO BE REMOVED
- ROCK INLET SEDIMENT TRAP
- TREE/SHRUB DEMO/REMOVAL

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Seals:

NORTH CAROLINA PROFESSIONAL SEAL 28425 ENGINEER SCOTT T. ANDERSON

REV. 6/16/2016

SCOTT T. ANDERSON, P.E., LICENSE NO. 28425

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Key Plan:

Project North

CAD File:

Project No.: L3005900

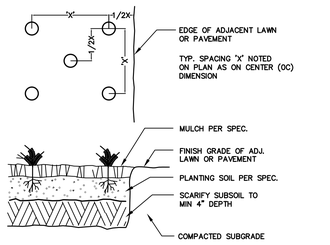
Copyright: 2015 Jacobs Engineering Group

Drawing Sheet Title:
ROADWAY IMPROVEMENTS PLAN (Pitt Street and Pitt-Greene Connector)

Drawing Sheet Number:
C-7

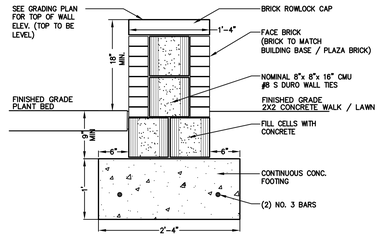
Owner's Drawing Sheet No.:

Ark Drawing No. E-1004



1 LA-2 GROUNDCOVER PLANTING

NTS

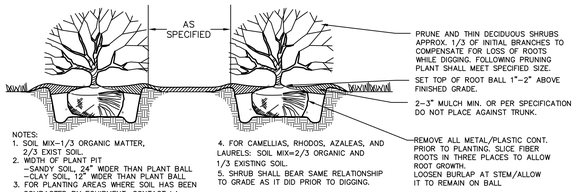


4 LA-2 BRICK SEAT WALL

+/- 51 lf of seat wall total

1

NTS



NOTES:
1. SOIL MIX-1/3 ORGANIC MATTER, 2/3 EXIST SOIL.
2. WIDTH OF PLANT PIT
   -SANDY SOIL, 24" WIDER THAN PLANT BALL
   -CLAY SOIL, 12" WIDER THAN PLANT BALL
3. FOR PLANTING AREAS WHERE SOIL HAS BEEN COMPACTED BY EQUIPMENT, CONTACT LA PRIOR TO PLANTING.
4. FOR CAMELLIAS, RHODOS, AZALEAS, AND LAURELS: SOIL MIX=2/3 ORGANIC AND 1/3 EXISTING SOIL.
5. SHRUB SHALL BEAR SAME RELATIONSHIP TO GRADE AS IT DID PRIOR TO DIGGING.

2 LA-2 SHRUB PLANTING

NTS

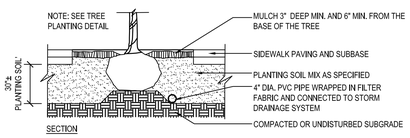
NOTES:
- Expansion joints every 30' or as shown on plans
- Control joints every 5' or as shown on plans
- score pattern as shown – 4' x width of path, alternating with 2' x width of path
- concrete pattern on sidewalk to be scored symmetrically between soldier course

STANDARD DUTY

HEAVY DUTY - SCULPTURE BASE

5 LA-2 CONCRETE SECTION

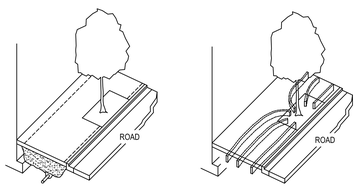
NTS



SECTION

NOTES:

1. EACH TREE TO BE PLANTED IN A LANDSCAPE ISLAND OR MEDIAN ISLAND TO BE PROVIDED A MIN. ROOT-ACCESSIBLE SOIL VOLUME OF 600 CUBIC FEET OR A MINIMUM OF 6 ROOT PATHS.
2. THE TREE ROOT AREA BENEATH / ADJACENT TO THE SIDEWALK IS EXPANDED TO MAXIMIZE ROOT ACCESSIBLE SOIL SPACE UNDER THE PAVEMENT.
3. CONNECT SOIL SPACE FOR ROOT EXPANSION WHERE POSSIBLE TO ALLOW ROOT SYSTEMS OF TREES TO OVERLAP AND COLONIZE A SHARED SOIL SPACE.
4. ANY COMBINATION OF STRUCTURAL SOILS OR ROOT CHANNELING (e.g., SOIL STRIP DRAIN/AERATION SYSTEM) THAT PERFORMS AS SPECIFIED IS ACCEPTABLE.
5. 40' X 6' WIDTH MINIMUM APPLIES TO BOTH STRUCTURAL SOILS AND SUBSURFACE SOIL CONTAINMENT SYSTEMS.
6. SUBSURFACE APPLICATION SHALL BE REVIEWED AND APPROVED BY CITY OF GREENVILLE AND THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.



STRUCTURAL SOIL SYSTEM

ROOT CHANNELING/PATHWAYS

TREE PLANTING IN SIDEWALK WITHIN R.O.W.

3 LA-2 TREE PLANTING

NTS

MATERIAL AND PLANTING DETAILS

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Seals:

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT 5751 KIMBERLY J. WICKER
5-24-16

General Notes:

Project Client:
CITY OF GREENVILLE

GREENVILLE TRANSPORTATION ACTIVITY CENTER
600 S. Pitt Street, Greenville, NC

Number	Description	Date
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1	Addendum No 2	06-16-2016

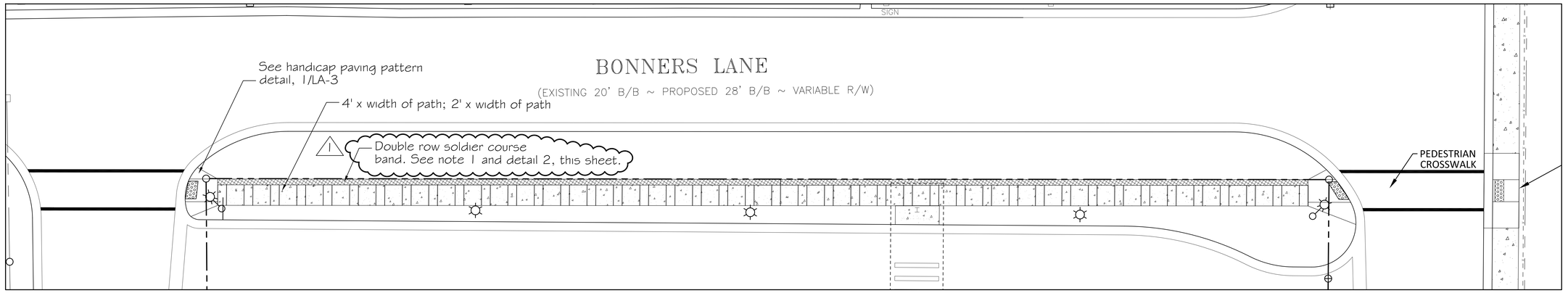
Key Plan: Project North

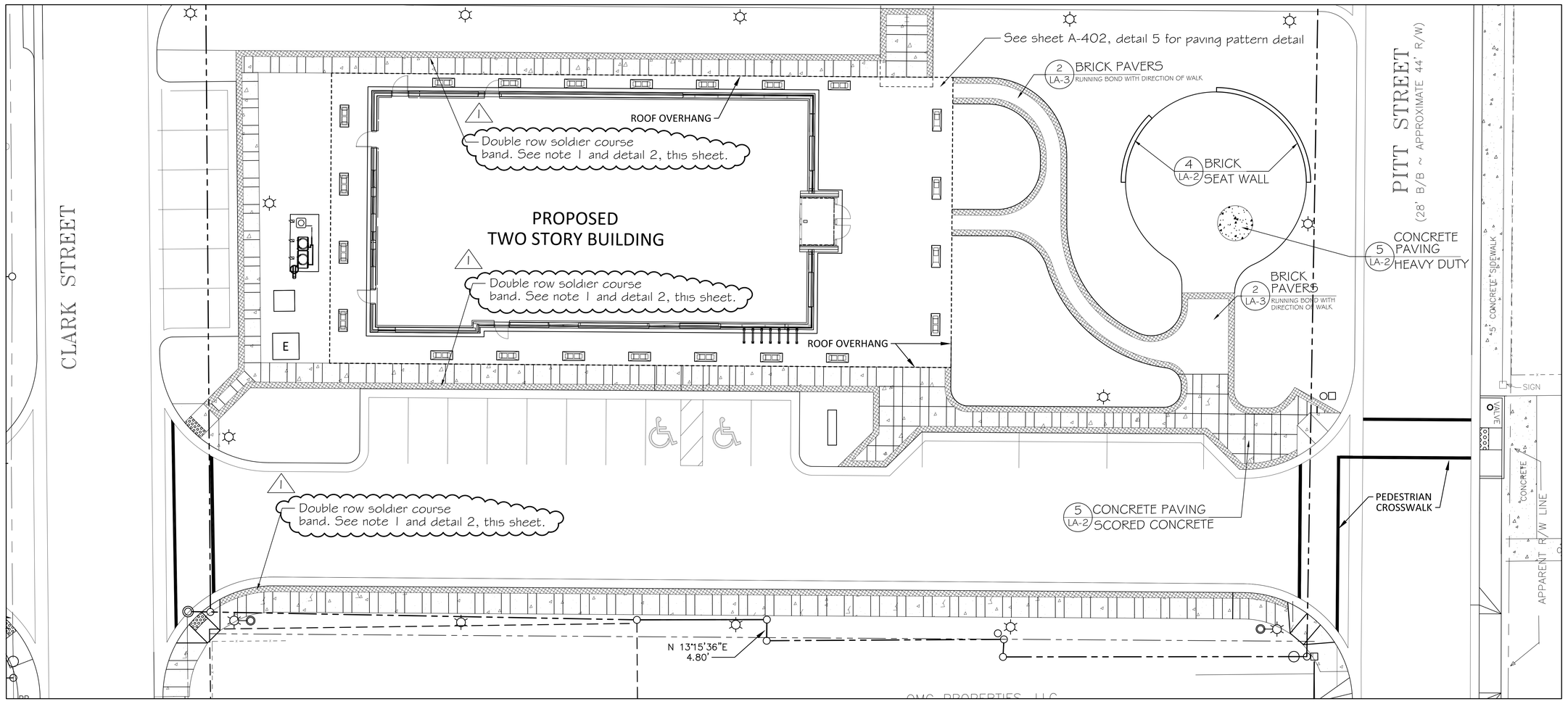
CAD File:
Project No.: L3005900

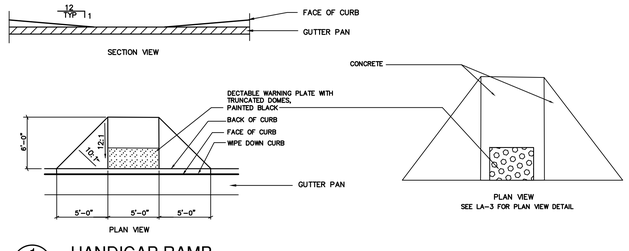
Drawing Sheet Title:
DETAILS PLAN

Drawing Sheet Number:
LA-2

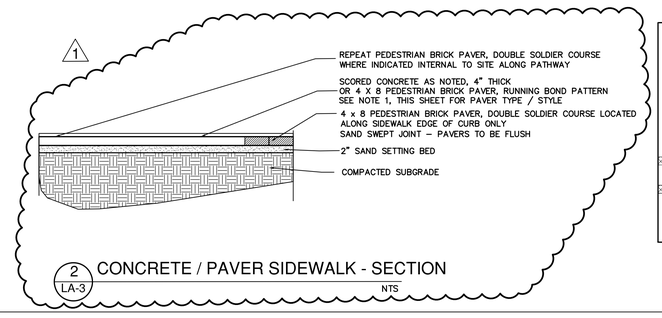
Owner's Drawing Sheet No.:



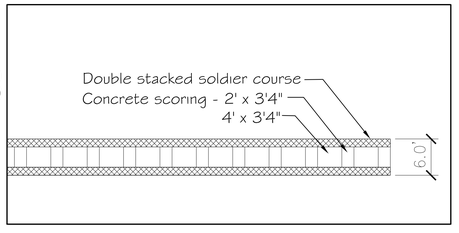




1 LA-3 HANDICAP RAMP NTS



2 LA-3 CONCRETE / PAVER SIDEWALK - SECTION NTS



CONCRETE / PAVER SIDEWALK LAYOUT - PLAN

1 STREETSCAPE NOTES:

1. Pedestrian streetscape paver to be 4"x8" modular; running bond pattern where indicated and double soldier course where indicated. Paver to be Sienna Iconsept Velour by Pine Hall Brick Co. or approved equal. Paver to be subject to approval by the City of Greenville.
2. Refer to architectural sheets for paving pattern and type detail under building overhang. Sheet A-402, detail 5.
3. See civil engineering plans for lighting fixture specifications.
4. Bike racks in rear of building to be "Trio" by Forms and Surfaces. www.forms-surfaces.com
Bike racks in the front of the building to be provided by the City of Greenville. Contractor to install all bike racks.
5. Benches to be specified by architect.

STREETSCAPE PLAN

10 5 0 10 20 30

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Seals:

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT KIMBERLY J. WICKER SEAL 5216 05-10-16

General Notes:

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Key Plan: Project North

CAD File:
Project No.: L3005900
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Drawing Sheet Title:
STREETSCAPE PLAN

Drawing Sheet Number:
LA-3

Owner's Drawing Sheet No.: