

Project Manual

ASI No. 01 for Package 03 Foundation



COLLEGE OF
Osteopathic Medicine
AT THE CHEROKEE NATION

Tahlequah, Oklahoma

April 22, 2019



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NOTE FOR REVISED SPECIFICATION SECTIONS

1. DELETED INFORMATION IS INDICATED BY A STRIKETHROUGH (IE, ~~THIS IS DELETED~~).
2. NEW INFORMATION IS INDICATED BY A DOUBLE UNDERLINE (IE, THIS IS ADDED).
3. ALL REVISED INFORMATION IS FURTHER IDENTIFIED BY A HEAVY VERTICAL LINE TO THE RIGHT OF ALL REVISIONS IN EACH INDIVIDUAL SPECIFICATION SECTION (REFER TO HEAVY BOLD LINE TO THE RIGHT FOR AN EXAMPLE).

VOLUME 1

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

	<input type="checkbox"/>	00 1115	Invitation to Bid
	<input type="checkbox"/>	00 2113	Instructions to Bidders
2019-02-08	<input type="checkbox"/>	00 3100	Available Project Information
	<input type="checkbox"/>	00 4100	Bid Form
	<input type="checkbox"/>	00 5200	Agreement Form
	<input type="checkbox"/>	00 6100	Bonds
2019-02-08	<input type="checkbox"/>	00 7200	General Conditions
	<input type="checkbox"/>	00 7300	Supplementary Conditions

DIVISION 01 - GENERAL REQUIREMENTS

	<input type="checkbox"/>	01 0500	Design Selections
	<input type="checkbox"/>	01 0510	Exterior Design Selections
	<input type="checkbox"/>	01 0520	Interior Design Selections
	<input type="checkbox"/>	01 1000	Summary
	<input type="checkbox"/>	01 2100	Allowances
2019-02-08	<input type="checkbox"/>	01 2200	Unit Prices
2019-02-08	<input type="checkbox"/>	01 2300	Alternates
2019-02-08	<input type="checkbox"/>	01 2500	Substitution Procedures
2019-02-08	<input type="checkbox"/>	01 2600	Contract Modification Procedures
2019-02-08	<input type="checkbox"/>	01 2900	Payment Procedures
2019-02-08	<input type="checkbox"/>	01 3100	Project Management and Coordination
2019-02-08	<input type="checkbox"/>	01 3200	Construction Progress Documentation
	<input type="checkbox"/>	01 3233	Photographic Documentation
	<input type="checkbox"/>	01 3300	Submittal Procedures
	<input type="checkbox"/>	01 4000	Quality Requirements
	<input type="checkbox"/>	01 4200	References
2019-02-08	<input type="checkbox"/>	01 4323	Special Inspection
2019-02-08	<input type="checkbox"/>	01 4339	Visual Mock-Up Requirements
2019-02-08	<input type="checkbox"/>	01 4516	Field Test for Water Leakage
	<input type="checkbox"/>	01 4540	Testing Mock-Up for Building Enclosure Systems
2019-02-08	<input type="checkbox"/>	01 5000	Temporary Facilities and Controls
2019-02-08	<input type="checkbox"/>	01 6000	Product Requirements
2019-02-08	<input type="checkbox"/>	01 7300	Execution
2019-02-08	<input type="checkbox"/>	01 7419	Construction Waste Management and Disposal
	<input type="checkbox"/>	01 7420	LEED Construction Waste Management and Disposal
2019-02-08	<input type="checkbox"/>	01 7700	Closeout Procedures
2019-02-08	<input type="checkbox"/>	01 7823	Operations and Maintenance Data
2019-02-08	<input type="checkbox"/>	01 7839	Project Record Documents
2019-02-08	<input type="checkbox"/>	01 7900	Demonstration and Training
	<input type="checkbox"/>	01 7910	Demonstration and Training
2019-02-08	<input type="checkbox"/>	01 8111	Sustainable Construction Requirements
	<input type="checkbox"/>	01 8112	LEED Construction Requirements
	<input type="checkbox"/>	01 8113	LEED Construction Requirements for New Construction and Major Renovations
	<input type="checkbox"/>	01 8123	LEED Construction Requirements for Commercial Interiors
	<input type="checkbox"/>	01 8133	LEED Construction Requirements for Core and Shell Development
	<input type="checkbox"/>	01 8143	LEED Construction Requirements for Schools
2019-02-08	<input type="checkbox"/>	01 9113	General Commissioning Requirements

DIVISION 02 - EXISTING CONDITIONS

2019-01-18	<input type="checkbox"/>	02 1113	Selective Site Demolition
		02 1116	Building Demolition
	<input type="checkbox"/>	02 4119	Selective Demolition

DIVISION 03 - CONCRETE

	<input type="checkbox"/>	03 0150	Concrete Patching
2019-03-20	<input type="checkbox"/>	03 1000	Concrete Forming and Accessories
	<input type="checkbox"/>	03 1100	Concrete Forming
	<input type="checkbox"/>	03 1500	Concrete Accessories
2019-03-20	<input type="checkbox"/>	03 2000	Concrete Reinforcing
2019-03-20	<input type="checkbox"/>	03 3000	Cast-In-Place Concrete
2019-04-19	<input type="checkbox"/>	03 3500	Concrete Finishing
2019-04-19	<input type="checkbox"/>	03 3543	Polished Concrete
	<input type="checkbox"/>	03 3600	Special Concrete Finishes
	<input type="checkbox"/>	03 3800	Post-Tensioned Concrete
	<input type="checkbox"/>	03 4100	Plant-Precast Structural Concrete
	<input type="checkbox"/>	03 4500	Architectural Precast Concrete
	<input type="checkbox"/>	03 4713	Tilt-Up Concrete
	<input type="checkbox"/>	03 4900	Glass-Fiber Reinforced Precast Concrete (GFRC)
	<input type="checkbox"/>	03 5216	Lightweight Insulating Concrete
	<input type="checkbox"/>	03 5300	Concrete Toppings
	<input type="checkbox"/>	03 5416	Hydraulic Cement Underlayment

DIVISION 04 - MASONRY

	<input type="checkbox"/>	04 2100	Masonry Veneer
2019-03-20	<input type="checkbox"/>	04 2200	Concrete Unit Masonry
	<input type="checkbox"/>	04 2300	Glass Unit Masonry
2019-04-19	<input type="checkbox"/>	04 4200	Exterior Stone Cladding
	<input type="checkbox"/>	04 4216	Steel Supported Stone Cladding
	<input type="checkbox"/>	04 7200	Cast Stone Masonry
	<input type="checkbox"/>	04 7500	Adhered Masonry Veneer

DIVISION 05 – METALS

2019-04-19	<input type="checkbox"/>	05 1000	Structural Steel
	<input type="checkbox"/>	05 1200	Structural Steel Framing
2019-04-14	<input type="checkbox"/>	05 1213	Architecturally Exposed Structural Steel (AESS) Framing
	<input type="checkbox"/>	05 1636	Barrier Cables
	<input type="checkbox"/>	05 2100	Steel Joists Framing
2019-04-19	<input type="checkbox"/>	053000	Metal Decking
	<input type="checkbox"/>	05 3100	Steel Decking
	<input type="checkbox"/>	05 3123	Steel Roof Deck System
	<input type="checkbox"/>	05 3133	Permanent Metal Forming
2019-04-19	<input type="checkbox"/>	05 4000	Cold-Formed Steel Framing
2019-04-19	<input type="checkbox"/>	05 4300	Slotted Channel Framing
2019-04-19	<input type="checkbox"/>	05 5000	Metal Fabrications
2019-04-19	<input type="checkbox"/>	05 5100	Metal Stairs
2019-04-19	<input type="checkbox"/>	05 5213	Pipe and Tube Railings
2019-04-19	<input type="checkbox"/>	05 5300	Metal Gratings
	<input type="checkbox"/>	05 5813	Ornamental Metal Column Covers
2019-04-19	<input type="checkbox"/>	05 6000	Metal Equipment Support System

2019-04-19	<input type="checkbox"/>	05 7000	Ornamental Metal
2019-04-19	<input type="checkbox"/>	05 7300	Ornamental Handrails and Railings

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

2019-04-19	<input type="checkbox"/>	06 1053	Miscellaneous Rough Carpentry
2019-04-19	<input type="checkbox"/>	06 1643	Exterior Gypsum Sheathing
2019-04-19	<input type="checkbox"/>	06 4023	Interior Architectural Woodwork
	<input type="checkbox"/>	06 4223	Slatwall Paneling
	<input type="checkbox"/>	06 6100	Simulated Stone Fabrications
2019-04-19	<input type="checkbox"/>	06 6400	Plastic (FRP) Paneling
	<input type="checkbox"/>	06 6413	Translucent Resin Panel Fabrications
	<input type="checkbox"/>	06 6419	Simulated Stone Paneling
	<input type="checkbox"/>	06 6713	Louvered Light Diffusers
	<input type="checkbox"/>	06 6813	Plastic Gratings

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

	<input type="checkbox"/>	07 0151	Preparation for Re-Roofing
	<input type="checkbox"/>	07 0152	Patching of Existing Roofing
	<input type="checkbox"/>	07 1114	Asphalt Mastic Dampproofing
	<input type="checkbox"/>	07 1328	Pre-Applied Sheet Waterproofing
2019-04-22	<input checked="" type="checkbox"/>	07 1352	Modified Bituminous Sheet Waterproofing
	<input type="checkbox"/>	07 1413	Hot Fluid-Applied Rubberized Asphalt Waterproofing
2019-04-19	<input type="checkbox"/>	07 1416	Cold Fluid Applied Waterproofing
2019-04-19	<input type="checkbox"/>	07 1616	Crystalline Waterproofing
	<input type="checkbox"/>	07 1700	Bentonite Waterproofing
	<input type="checkbox"/>	07 1800	Traffic Coatings
	<input type="checkbox"/>	07 1900	Water Repellents
2019-04-22	<input checked="" type="checkbox"/>	07 2100	Thermal Insulation
2019-04-19	<input type="checkbox"/>	07 2119	Spray-Applied Foam Insulation
2019-04-19	<input type="checkbox"/>	07 2400	EIFS
	<input type="checkbox"/>	07 2423	DEFS for Soffits
	<input type="checkbox"/>	07 2500	Mechanically Fastened Air and Water Barriers
2019-03-20	<input type="checkbox"/>	07 2600	Under-Slab Vapor Retarder
	<input type="checkbox"/>	07 2613	Rubberized Asphalt Vapor Retarders
	<input type="checkbox"/>	07 2617	Below Slab Vapor Retarders
	<input type="checkbox"/>	07 2713	Self-Adhering Air and Water Barriers
	<input type="checkbox"/>	07 3113	Asphalt Shingles
	<input type="checkbox"/>	07 3127	Simulated Slate Roofing
	<input type="checkbox"/>	07 3200	Roof Tiles
2019-04-19	<input type="checkbox"/>	07 4114	Metal Roof Panels
2019-04-19	<input type="checkbox"/>	07 4213	Formed Metal Wall Panels
	<input type="checkbox"/>	07 4216	Modular Metal Wall Panels
	<input type="checkbox"/>	07 4229	Terra Cotta Wall Panels
	<input type="checkbox"/>	07 4243	Composite Metal Wall Panels
	<input type="checkbox"/>	07 4263	Insulated-Core Metal Wall Panels
	<input type="checkbox"/>	07 5013	Single-Ply Membrane Roofing

2019-04-19	<input type="checkbox"/>	07 5216	Modified Bituminous Membrane Roofing
	<input type="checkbox"/>	07 5556	Fluid-Applied Protected Membrane Roofing
	<input type="checkbox"/>	07 5563	Vegetated Protected Membrane Roofing
2019-04-19	<input type="checkbox"/>	07 6200	Flashing and Sheet Metal
2019-04-19	<input type="checkbox"/>	07 7200	Roof Accessories
	<input type="checkbox"/>	07 7600	Roof Pavers and Pedestal Assemblies
	<input type="checkbox"/>	07 8116	Cementitious Fireproofing
	<input type="checkbox"/>	07 8123	Intumescent Mastic Fireproofing
2019-04-19	<input type="checkbox"/>	07 8413	Penetration Firestopping
2019-04-19	<input type="checkbox"/>	07 8446	Fire-Resistive Joint Firestopping
	<input type="checkbox"/>	07 9100	Preformed Joint Seals
2019-04-19	<input type="checkbox"/>	07 9200	Joint Sealants
	<input type="checkbox"/>	07 9500	Expansion Control

DIVISION 08 - OPENINGS

	<input type="checkbox"/>	08 0610	Door Schedule
2019-04-19	<input type="checkbox"/>	08 1113	Hollow Metal Doors and Frames
	<input type="checkbox"/>	08 1114	Interior Hollow Metal Frames
	<input type="checkbox"/>	08 1170	Steel Fire Door and Frame Assembly
2019-04-19	<input type="checkbox"/>	08 1216	Interior Aluminum Frames
2019-04-19	<input type="checkbox"/>	08 1416	Prefinished Flush Wood Doors
	<input type="checkbox"/>	08 1433	Stile and Rail Wood Doors
2019-04-19	<input type="checkbox"/>	08 3113	Access Doors and Frames
2019-04-19	<input type="checkbox"/>	08 3213	Sliding Aluminum-Framed Glass Doors
	<input type="checkbox"/>	08 3313	Coiling Counter Doors
	<input type="checkbox"/>	08 3323	Overhead Coiling Doors
	<input type="checkbox"/>	08 3326	Overhead Coiling Grilles
	<input type="checkbox"/>	08 3338	Interior Side Coiling Grilles
2019-04-19	<input type="checkbox"/>	08 3400	Special – Function Doors
	<input type="checkbox"/>	08 3470	Acoustical Metal Door, Window, and Frame Assemblies
	<input type="checkbox"/>	08 3513	Folding Doors
	<input type="checkbox"/>	08 3515	Accordion Folding Fire Doors
	<input type="checkbox"/>	08 3613	Sectional Overhead Doors
2019-04-19	<input type="checkbox"/>	08 4110	Interior Storefront
	<input type="checkbox"/>	08 4127	Exterior All-Glass Entrances and Storefronts
	<input type="checkbox"/>	08 4128	Interior All-Glass Entrances and Storefronts
	<input type="checkbox"/>	08 4213	Exterior Aluminum Entrance Doors
2019-04-19	<input type="checkbox"/>	08 4216	Interior Aluminum Entrance Doors
2019-04-19	<input type="checkbox"/>	08 4229	Automatic Entrances
	<input type="checkbox"/>	08 4233	Revolving Entrance Doors
2019-04-19	<input type="checkbox"/>	08 4243	Medical Specialty Sliding Entrances
2019-04-19	<input type="checkbox"/>	08 4400	Glazed Aluminum Framing Systems
	<input type="checkbox"/>	08 4426	Structural Glass Curtainwall
	<input type="checkbox"/>	08 4500	Translucent Insulating Panel Assemblies
	<input type="checkbox"/>	08 5113	Aluminum Windows
2019-04-19	<input type="checkbox"/>	08 5619	Sliding Pass Windows
	<input type="checkbox"/>	08 5656	Bullet-Resistive Windows
	<input type="checkbox"/>	08 6200	Unit Skylights
	<input type="checkbox"/>	08 6300	Metal-Framed Skylights

2019-04-19	<input type="checkbox"/>	08 7100	Door Hardware
	<input type="checkbox"/>	08 7121	Interior Automatic Door Operators for Staff Use
2019-04-19	<input type="checkbox"/>	08 7122	Automatic Door Operators for the Disabled
2019-04-19	<input type="checkbox"/>	08 8000	Glazing
	<input type="checkbox"/>	08 8300	Unframed Mirrored Glazing
2019-04-19	<input type="checkbox"/>	08 8816	Between Glass Blinds Units
	<input type="checkbox"/>	08 8840	Switchable Privacy Glass Units
	<input type="checkbox"/>	08 9100	Wall Louvers

DIVISION 09 - FINISHES

	<input type="checkbox"/>	09 0565	Floor Preparation for Renovation Work
	<input type="checkbox"/>	09 0600	Room Finish Schedule
	<input type="checkbox"/>	09 2300	Gypsum Plastering
	<input type="checkbox"/>	09 2400	Portland Cement Plastering
	<input type="checkbox"/>	09 2600	Veneer Plastering
	<input type="checkbox"/>	09 2613	Gypsum Veneer Plastering
	<input type="checkbox"/>	09 2713	GFRG Fabrications
2019-04-19	<input type="checkbox"/>	09 2900	Gypsum Board Assemblies
2019-04-19	<input type="checkbox"/>	09 3000	Tiling
2019-04-19	<input type="checkbox"/>	09 5113	Acoustical Panel Ceilings
	<input type="checkbox"/>	09 5133	Acoustical Metal Pan Ceilings
	<input type="checkbox"/>	09 5135	Snap-in Metal Pan Ceilings
2019-04-19	<input type="checkbox"/>	09 5423	Linear Metal Ceilings
	<input type="checkbox"/>	09 5436	Suspended Decorative Grids
2019-04-19	<input type="checkbox"/>	09 6115	Concrete Floor Sealer
	<input type="checkbox"/>	09 6116	Liquid Floor Hardener
	<input type="checkbox"/>	09 6119	Moisture Floor Treatment
	<input type="checkbox"/>	09 6340	Stone Flooring
	<input type="checkbox"/>	09 6400	Wood Flooring
2019-04-19	<input type="checkbox"/>	09 6500	Resilient Flooring
2019-04-19	<input type="checkbox"/>	09 6513	Resilient Base and Accessories
	<input type="checkbox"/>	09 6520	Interlocking Rubber Tile Flooring
2019-04-19	<input type="checkbox"/>	09 6603	Precast Terrazzo Flooring for Stairs
	<input type="checkbox"/>	09 6613	Thick-Set Terrazzo Flooring
2019-04-19	<input type="checkbox"/>	09 6623	Thin-Set Terrazzo Flooring
	<input type="checkbox"/>	09 6723	Resinous Flooring
2019-04-19	<input type="checkbox"/>	09 6800	Carpeting
	<input type="checkbox"/>	09 6900	Access Flooring
2019-04-19	<input type="checkbox"/>	09 7200	Wall Covering
	<input type="checkbox"/>	09 7213	Tackboard Wall Coverings
	<input type="checkbox"/>	09 7500	Interior Stone Facing
	<input type="checkbox"/>	09 7723	Fabric Wrapped Panels
2019-04-19	<input type="checkbox"/>	09 8433	Acoustical Wall Panels
2019-04-19	<input type="checkbox"/>	09 9100	Painting
	<input type="checkbox"/>	09 9413	Textured Interior Coatings
	<input type="checkbox"/>	09 9600	High-Performance Coatings
	<input type="checkbox"/>	09 9613	Multicolored Interior Coatings
2019-04-19	<input type="checkbox"/>	09 9653	Elastomeric Coatings
2019-04-19	<input type="checkbox"/>	09 9663	Textured Acrylic Coating

DIVISION 10 - SPECIALTIES

2019-04-19	<input type="checkbox"/>	10 1100	Visual Display Boards
	<input type="checkbox"/>	10 1146	Visual Display Fabrics
2019-04-19	<input type="checkbox"/>	10 1400	Interior Signage
	<input type="checkbox"/>	10 1443	Photoluminescent Exit Path Marking System
	<input type="checkbox"/>	10 1700	Telephone Specialties
2019-04-19	<input type="checkbox"/>	10 2113	Toilet Compartments
2019-04-19	<input type="checkbox"/>	10 2115	Cubicle Specialties
	<input type="checkbox"/>	10 2213	Wire Mesh Partitions
	<input type="checkbox"/>	10 2223	Accordion Folding Partitions
2019-04-19	<input type="checkbox"/>	10 2238	Operable Panel Partition
	<input type="checkbox"/>	10 2239	Vertically Folding Panel Partitions
2019-04-19	<input type="checkbox"/>	10 2613	Wall and Corner Guards
2019-04-19	<input type="checkbox"/>	10 2813	Toilet Accessories
	<input type="checkbox"/>	10 2819	Shower Doors and Enclosures
2019-04-19	<input type="checkbox"/>	10 4116	Emergency Key Cabinets
2019-04-19	<input type="checkbox"/>	10 4400	Fire Protection Specialties
	<input type="checkbox"/>	10 4450	Automated External Defibrillators (AED)
2019-04-19	<input type="checkbox"/>	10 5113	Metal Lockers
2019-04-19	<input type="checkbox"/>	10 5116	Wood Lockers
	<input type="checkbox"/>	10 5503	USPS-Delivery Postal Specialties
	<input type="checkbox"/>	10 5506	Private-Delivery Postal Specialties
2019-04-19	<input type="checkbox"/>	10 5713	Wall Mounted Coat Rack and Shelf
	<input type="checkbox"/>	10 7113	Exterior Sun Control Devices
2019-04-19	<input type="checkbox"/>	10 7500	Flagpoles

DIVISION 11 - EQUIPMENT

	<input type="checkbox"/>	11 1300	Loading Dock Equipment
2019-04-19	<input type="checkbox"/>	11 2400	Building Maintenance Equipment
2019-04-19	<input type="checkbox"/>	11 5213	Projection Screens
2019-04-19	<input type="checkbox"/>	11 7000	Medical Equipment
	<input type="checkbox"/>	11 7313	Wall-Mounted Fold-Up Writing Surface
	<input type="checkbox"/>	11 7316	Wall-Mounted Chart Rack

DIVISION 12 - FURNISHINGS

	<input type="checkbox"/>	12 2113	Horizontal Louver Blinds
	<input type="checkbox"/>	12 2116	Vertical Louver Blinds
2019-04-19	<input type="checkbox"/>	12 2413	Roller Window Shades
	<input type="checkbox"/>	12 2500	Between Glass Blinds
	<input type="checkbox"/>	12 3553	Laboratory Casework
2019-04-19	<input type="checkbox"/>	12 3571	Stainless Steel Casework
	<input type="checkbox"/>	12 3640	Stone Countertops
2019-04-19	<input type="checkbox"/>	12 3661	Simulated Stone Countertops
	<input type="checkbox"/>	12 4816	Entrance Floor Grilles
2019-04-19	<input type="checkbox"/>	12 4843	Entrance Floor Mats
	<input type="checkbox"/>	12 6300	Stadium Seating
2019-04-19	<input type="checkbox"/>	12 9313	Bicycle Racks

DIVISION 13 - SPECIAL CONSTRUCTION

	<input type="checkbox"/>	13 2817	Ballpark Netting and Supports
	<input type="checkbox"/>	13 3448	Pre-Fabricated Rooftop Helipad
	<input type="checkbox"/>	13 4900	Radiation Protection
	<input type="checkbox"/>	13 4923	RF/MRI Modular Shielding Enclosure
2019-04-19	<input type="checkbox"/>	13 8500	Seismic Protection

DIVISION 14 - CONVEYING EQUIPMENT

	<input type="checkbox"/>	14 1000	Dumbwaiters
2019-04-19	<input type="checkbox"/>	14 2100	Electric Traction Elevators
	<input type="checkbox"/>	14 2400	Hydraulic Elevators
	<input type="checkbox"/>	14 3100	Escalators
	<input type="checkbox"/>	14 9100	Chutes
	<input type="checkbox"/>	14 9200	Pneumatic Tube Systems

DIVISION 31 - EARTHWORK

2019-01-18	<input type="checkbox"/>	31 1000	Site Clearing
	<input type="checkbox"/>	31 2000	Earth Moving
2019-02-08	<input type="checkbox"/>	31 2200	Grading
2019-02-08	<input type="checkbox"/>	31 2300	Excavation and Fill
2019-04-22	<input checked="" type="checkbox"/>	31 2311	Earthwork for Building Construction
	<input type="checkbox"/>	31 2400	Earthwork for Structures
2019-01-18	<input type="checkbox"/>	31 2500	Erosion and Sedimentation Controls
2019-04-22	<input checked="" type="checkbox"/>	31 3116	Termite Control
	<input type="checkbox"/>	31 6213	Prestressed Concrete Piles
	<input type="checkbox"/>	31 6216	Steel H Piles
	<input type="checkbox"/>	31 6218	Mini-Piles
	<input type="checkbox"/>	31 6329	Drilled Concrete Piers

DIVISION 32 - EXTERIOR IMPROVEMENTS

2019-02-08	<input type="checkbox"/>	32 1100	Base Courses
2019-04-19	<input type="checkbox"/>	32 1200	Flexible Paving
2019-02-08	<input type="checkbox"/>	32 1300	Rigid Paving
	<input type="checkbox"/>	32 1313	Concrete Paving
2019-02-08	<input type="checkbox"/>	32 1373	Concrete Paving Joint Sealants
		32 1413	Interlocking Precast Concrete Paving
	<input type="checkbox"/>	32 1416	Brick unit Paving
	<input type="checkbox"/>	32 1440	Stone Paving
2019-02-08	<input type="checkbox"/>	321613	Curbs and Gutters
	<input type="checkbox"/>	32 1715	Parking Accessories
	<input type="checkbox"/>	32 3113	Chain Link Fencing
	<input type="checkbox"/>	32 3115	Tubular Steel Fencing
	<input type="checkbox"/>	32 3117	Gate Operators

32 3121 Cable Guardrail System

DIVISION 33 - UTILITIES

	<input type="checkbox"/>	33 1000	Water Utilities
2019-04-19	<input type="checkbox"/>	33 3000	Sanitary Sewerage Utilities
2019-04-19	<input type="checkbox"/>	33 3200	Wastewater Utility Pumping stations
2019-04-19	<input type="checkbox"/>	33 3400	Sanitary Utility Sewerage Force Mains
2019-04-19	<input type="checkbox"/>	33 4000	Storm Drainage Utilities
2019-04-19	<input type="checkbox"/>	33 4600	Sub drainage Pipe
2019-04-22	<input checked="" type="checkbox"/>	33 4613	Foundation Drainage System

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SECTION 07 1352

MODIFIED BITUMINOUS SHEET WATERPROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Modified bituminous sheet waterproofing system and supplementary items necessary for installation at the following applications:
 - 1. Vertical positive side applications at foundation walls.
 - 2. Horizontal positive side applications at above grade split slabs.
 - 3. Horizontal positive side applications at earth covered horizontal decks.

1.2 ACTION SUBMITTALS

- A. Product Data: Manufacturer's technical literature for each product or system indicated.
 - 1. Include manufacturer's specifications for materials and installation instructions.
 - 2. Include manufacturer's written instructions for evaluating, preparing, and treating substrate.
- B. Shop Drawings: Show details of fabrication and installation, including plans, elevations, sections, details of components and attachments to other work. Distinguish between shop and field-assembled work. Include in shop drawings substrate joint and crack treatments, waterproofing applications, flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

1.3 INFORMATIONAL SUBMITTALS

- A. Manufacturer's Project Acceptance Document: Certification by the manufacturer that its product(s) are approved, acceptable, suitable for use in specific locations, for specific details, and for applications indicated, specified, or required, and that a warranty will be issued.
- B. Product Test Reports: Written reports based on evaluation of comprehensive tests performed by qualified testing agency indicating that each product complies with requirements.
- C. Field Quality Control Reports: Written report of testing and inspection required by "Field Quality Control".
- D. Pre-Construction Test Report: Written reports of manufacturer's testing required by "Quality Assurance" Article.
- E. Qualification Data:
 - 1. For firms and persons specified in "Quality Assurance" to demonstrate their capabilities and experience. Include list of completed projects.
- F. Warranty: Sample of warranty.

1. Provide manufacturer's written warranty covering materials and installation (labor) stating obligations, remedies, limitations and exclusions.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer with not less than 5 years of experience in the successful production and in-service performance of products and systems similar to scope of this Project.
- B. Installer Qualifications:
 1. Experience: Installer's personnel with not less than 5 years of experience in the successful performance of Work similar to scope of this Project.
 2. Supervision: Installer shall maintain a competent supervisor at Project while the Work is in progress, and who has not less than 5 years of experience installing products and systems similar to scope of this Project.
 3. Manufacturer Acceptance: Installer shall be certified, approved, licensed, or acceptable to manufacturer to install products.
- C. Mock-Ups: Before beginning Work of this Section, install minimum 100 sf (9.3 sm) of waterproofing system using materials indicated for the completed Work; incorporating substrate construction, sealing at penetrations, and seaming to demonstrate installation of system. Acceptance of mock-ups does not constitute acceptance of deviations from the Contract Documents contained in mock-ups unless such deviations are specifically accepted by Architect in writing. Apply mock-ups to set quality standards for materials and execution.
 1. Demonstrate surface preparation, crack, joint, and corner treatments.
 2. If Architect determines mock-up does not comply with requirements, reconstruct mock-ups until accepted.
 3. Accepted mock-ups may become part of completed Work if undisturbed at time of Substantial Completion.
- D. Pre-Construction Subsoil Water Testing:
 1. General Requirements: Test subsoil water for compatibility with waterproofing materials.
 2. Test Method: Use manufacturer's standard test method to test for acids, alkalis, brine, or other contaminants that may inhibit performance of waterproofing materials.
 3. Specimen Quantity: Obtain and submit as many subsoil water samples required from Project at approximate locations where waterproofing will be installed.
 4. Reports: Interpret test results and certify reports indicating requirements for use of waterproofing materials and for corrective measures necessary.

1.5 PRE-INSTALLATION CONFERENCE

- A. Pre-Installation Conference: Before Work begins, conduct conference at Project site.
 1. Participants:
 - a. Architect.
 - b. Contractor, including superintendent.
 - c. Installer, including project manager and supervisor.
 - d. If requested, Manufacturer's qualified technical representative.
 - e. Installers of other construction interfaced with Work.

2. Minimum Agenda: Installer shall demonstrate understanding of the Work required by describing detailed procedures for preparing, installing, and cleaning the Work. Demonstration shall include, but not be limited to, following topics:
 - a. Tour representative areas of Work, inspect and discuss condition of substrate, and other preparatory work performed by other trades.
 - b. Review Contract Document requirements.
 - c. Review approved submittals.
 - d. Review inspection and testing requirements.
 - e. Review environmental conditions and procedures for coping with unfavorable conditions.
 - f. Resolve deviations or differences between Contract Documents and the manufacturer's specifications.
3. Record discussions, including decisions and agreements, and prepare report.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver liquid materials to Project site in original packages with seals unbroken, labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by waterproofing manufacturer.
- C. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- D. Store rolls according to manufacturer's written instructions.
- E. Protect stored materials from direct sunlight.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by manufacturer. Do not apply waterproofing to a damp or wet substrate or during high humidity conditions including snow, rain, fog, or mist.

1.8 COORDINATION

- A. Coordinate installation of products and systems with interfacing and adjoining construction to provide a successful installation without failure.

1.9 WARRANTY

- A. Manufacturer's Warranty: Furnish manufacturer's written material and labor warranty signed by an authorized representative using manufacturer's standard form agreeing to furnish materials and labor required to repair or replace work which exhibits material defects caused by manufacture or design and installation of product. "Defects" is defined to include but not limited to deterioration or failure to perform as required.
 1. Warranty Period: Manufacturer shall warrant the products to be free from material and labor Defects for a period of 10 years form date of Substantial Completion.
 2. Include Work provided under Division 07 Section "Pre-Applied Sheet Waterproofing" in

warranty.

- B. Installer's Warranty: Furnish installer's written workmanship warranty signed by an authorized representative using installer's standard form agreeing to provide labor required to repair or replace work which exhibits workmanship defects. "Defects" is defined to include but not limited to deterioration or failure to perform as required.
 - 1. Warranty Period: Installer shall warrant the installation to be free from workmanship Defects for a period of 2 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS AND PRODUCTS

- A. Acceptable Manufacturers and Products: Subject to compliance with requirements of Contract Documents as judged by the Architect, provide product by one of manufacturers listed. If not listed, submit as substitution according to the Conditions of the Contract and Division 01 Section "Substitution Procedures".

2.2 MATERIALS, GENERAL

- A. Single Source Responsibility: Furnish each type of product from single manufacturer. Provide secondary materials only as recommended by manufacturer of primary materials.

2.3 PERFORMANCE REQUIREMENTS

- A. General: Provide modified bituminous sheet waterproofing that prevents the passage of liquid water and complies with the following minimum physical requirements as demonstrated by testing performed by an independent testing agency of manufacturer's current waterproofing membrane formulations.
 - 1. Tensile Strength: 250 psi (1.7 MPa) according to ASTM D 412, Die C, modified.
 - 2. Ultimate Elongation: 300 percent minimum according to ASTM D 412, Die C, modified.
 - 3. Low-Temperature Flexibility: Pass at minus 20 deg F (minus 29 deg C) according to ASTM D 1970.
 - 4. Crack Cycling: Unaffected after 100 cycles of 1/8 in (3 mm) movement according to ASTM C 836.
 - 5. Puncture Resistance: 40 lbf (180 N) minimum according to ASTM E 154.
 - 6. Hydrostatic-Head Resistance: 150 ft (45 m) minimum according to ASTM D 5385.
 - 7. Water Absorption: 0.15 percent weight-gain maximum after 48-hour immersion at 70 deg F (21 deg C) according to ASTM D 570.
 - 8. Vapor Permeance: 0.05 perms (2.9 ng/Pa x s x sq. m) according to ASTM E 96, Water Method.
- B. Material Compatibility: Provide waterproofing materials that are compatible with one another under conditions of service and application required, as demonstrated by manufacturer based on testing and field experience.

2.4 MODIFIED BITUMINOUS SHEET WATERPROOFING MATERIALS

- A. Modified Bituminous Sheet Waterproofing: 60 mils (1.5 mm) thick, self-adhering sheet consisting of 56 mils (1.4 mm) of rubberized asphalt laminated to a 4 mils (0.10 mm) thick, polyethylene film with release liner on adhesive side.
1. Manufacturers and Products:
 - a. American Hydrotech, Inc.; VM60.
 - b. Carlisle Coatings & Waterproofing Inc.; CCW MiraDRI 860/861.
 - c. CETCO Building Materials Group; Envirosheet.
 - d. Grace Construction Products; Bituthene 3000.
 - e. Henry Company; Blueskin WP 200.
 - f. Meadows, W. R., Inc.; Mel-Rol.
 - g. Polyguard Products, Inc.; Polyguard 650.
 - h. Sika Corporation; SikaBit S-60.
 - i. Tamko Roofing Products, Inc.; TW-60.
 2. Manufacturers and Products:
 - a. CETCO Building Materials Group; Envirosheet.
 - b. Grace Construction Products; Bituthene 3000.
 - c. Sika Corporation; SikaBit S-60.

2.5 ACCESSORY MATERIALS

- A. General: Furnish accessory materials recommended by waterproofing system manufacturer for intended use and compatible with waterproofing.
- B. Primer: Liquid primer suitable for substrate provided by waterproofing manufacturer.
- C. Surface Conditioner: Liquid surface conditioner suitable for substrate provided by waterproofing manufacturer.
- D. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, trowel grade or low viscosity provided by waterproofing manufacturer.
- E. Substrate Patching Membrane: Low-viscosity, two-component, asphalt-modified coating provided by waterproofing manufacturer.
- F. Sheet Strips: Self-adhering, rubberized-asphalt sheet strips of same material and thickness as sheet waterproofing provided by waterproofing manufacturer.
- G. Mastic and Adhesives: Liquid mastic and adhesives provided by waterproofing manufacturer.
- H. Termination Bars: ASTM A 666, Type 304 formed stainless steel bars; 2 types, one flat and one flat with upper flange shaped to receive sealant, locations as indicated; 1 in by 1/8 in (25 mm by 3 mm) thick; predrilled at 8 in (200 mm) centers; with stainless steel fasteners. No aluminum or plastic bars allowed.

2.6 BOARD INSULATION

- A. Extruded Polystyrene Board Insulation: As specified in Division 07 Section "Thermal

Insulation".

2.7 MOLDED-SHEET DRAINAGE PANELS

A. Molded-Sheet Drainage Panels; Vertical Applications:

1. Description: Pre-fabricated composite with drainage core faced with geotextile filter fabric on dimpled side (facing earth) and protective covering on flat side (facing waterproofing).
2. Protective Covering: Smooth polymeric film.
3. Drainage Core: Three-dimensional, non-biodegradable, molded polypropylene or polystyrene.
 - a. Minimum Compressive Strength: 15,000 lbf/sf (718 kPa) according to ASTM D 1621.
 - b. Minimum In-Plane Flow Rate: 15 gpm/ft (188 L/min per m) of unit width at hydraulic gradient of 1.0 and compressive stress of 25 psig (172 kPa) according to ASTM D 4716.
4. Geotextile Filter Fabric: Non-woven needle-punched geotextile, manufactured for subsurface drainage, made from polypropylene, polyolefin, or polyester; complying with following properties according to AASHTO M 288:
 - a. Survivability: Class 2.
 - b. Permittivity: 0.1 per second, minimum.
5. Manufacturers and Products:
 - a. American Hydrotech; Hydrodrain 420.
 - b. American Wick Drain Corporation; AmeriDrain 520.
 - c. Carlisle Coatings & Waterproofings; CCW MiraDRAIN 6200.
 - d. Grace Construction Products; Hydroduct 220.
 - e. Henry Company; DB 520.
 - f. JDR Enterprises, Inc.; J-Drain 420.
 - g. Polyguard Products, Inc.; Flow 15P.
 - h. Sika Corporation; SikaDrainage Mat 420.
 - i. Tremco Commercial Sealants & Waterproofing; TREMDrain 1000.

B. Molded-Sheet Drainage Panels; Horizontal Applications (as indicated below):

1. Location:
 - a. Horizontal positive side applications at above grade split slabs.
 - b. Horizontal positive side applications at earth covered horizontal decks.
2. Description: Pre-fabricated composite with drainage core faced with geotextile filter fabric on dimpled side (facing earth) and protective covering on flat side (facing waterproofing).
3. Protective Covering: Smooth polymeric film.
4. Drainage Core: Three-dimensional, non-biodegradable, molded polypropylene or polystyrene.

- a. Minimum Compressive Strength: 18,000 lbf/sf (862 kPa) according to ASTM D 1621.
 - b. Minimum In-Plane Flow Rate: 18 gpm/ft (225 L/min per m) of unit width at hydraulic gradient of 1.0 and compressive stress of 25 psig (172 kPa) according to ASTM D 4716.
5. Filter Fabric: Non-woven needle-punched geotextile, manufactured for subsurface drainage, made from polypropylene, polyolefin, or polyester; complying with following properties according to AASHTO M 288:
- a. Survivability: Class 2.
 - b. Permittivity: 0.1 per second, minimum.
6. Available Manufacturers and Products:
- a. American Hydrotech, Inc.; Hydrodrain 700.
 - b. American Wick Drain Corporation; AmeriDrain 654.
 - c. Carlisle Coatings & Waterproofings; CCW MiraDRAIN 9800.
 - d. Grace Construction Products; Hydroduct 660.
 - e. Henry Company; DB 650n with G100s/s base/protection sheet.
 - f. Polyguard Products, Inc.; Flow 18-H.
 - g. Sika Corporation; SikaDrainage Mat 700.
 - h. Tremco Commercial Sealants & Waterproofing; TREMDrain 2000.
- A. Adhesive for Bonding Drainage Panels: Product compatible with drainage panels being bonded and with demonstrated capability to bond securely to substrates indicated without damaging substrates.
- B. Miscellaneous Accessories: As required by manufacturer for complete installation assembly, including flanges around piping penetrations and expanded base and tie-in fittings as necessary to coordination with foundation drainage system.
- C. Foundation Drainage System: As specified in Division 33 Section "Foundation Drainage System".

PART 2 - EXECUTION

2.1 EXAMINATION

- A. Acceptance of Surfaces and Conditions: Examine substrates to receive products and systems and associated work for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting work within a particular area will be construed as acceptance of surface conditions.

2.2 INSTALLATION, GENERAL

- A. Installation Quality Standards: In addition to standards listed elsewhere, perform Work according to following, unless otherwise specified:
- 1. ASTM D 6135.
 - 2. Respective manufacturer's written installation instructions.

3. Accepted submittals.
4. Contract Documents.

2.3 PREPARATION

- A. General: Comply with manufacturer's instructions, recommendations and specifications for cleaning and surface preparation. Surfaces shall have no defects, contaminants, or errors which would result in poor or potentially defective installation or would cause latent defects in Work.
- B. Excavation Dewatering: Verify that the waterproofing application area is dry and free of standing and uncontrolled water. Should the dewatering system fail at any time during application of waterproofing system, the materials shall be completely removed and work shall start over with new materials once the area is dry and free of water again.
- C. Concrete Surfaces:
 1. Verify concrete has cured and aged for minimum time period recommended by waterproofing manufacturer.
 2. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
 3. Remove fins, ridges, mortar, and other projections.
 4. Verify honeycomb voids, rock pockets, form tie holes, and other defects are filled by other Division 03 Sections.
 5. Remove dust and dirt from joints and cracks according to ASTM D 4258.
 6. Remove debris, oily substances, mud, grease, oil, bitumen, form-release agents, paints, curing compounds, penetrating contaminants or film-forming coatings from concrete, and similar substances.

2.4 MODIFIED BITUMINOUS SHEET WATERPROOFING INSTALLATION

- A. General Installation Performance Requirements: Install waterproofing system to prevent passage of liquid water under hydrostatic pressure.
- B. Joint and Crack Treatment: Prepare, treat, rout, and fill joints and cracks in substrate.
- C. Primer: Apply to substrates at required rate and allow to dry. Limit priming to areas that will be covered by waterproofing in same day. Reprime areas exposed for more than 24 hours.
- D. Waterproofing Tie-Ins: Install waterproofing and accessories to tie into adjacent waterproofing to ensure watertight installation.
- E. Termination and Penetration Treatment: Prepare vertical and horizontal surfaces at terminations and penetrations through waterproofing and at expansion joints, drains, and sleeves.
- F. Waterproofing Application: Apply and firmly adhere sheets over area to receive waterproofing.
 1. Accurately align sheets and maintain uniform 2-1/2 in (63 mm) minimum lap widths and end laps. Overlap and seal seams and stagger end laps to ensure watertight installation.

2. Treat inside and outside corners. Install sheet strips centered over vertical inside corners. Install 3/4 in (19 mm) fillets of liquid membrane on horizontal inside corners and as follows:
 - a. At footing-to-wall intersections, extend liquid membrane each direction from corner or install sheet strip centered over corner.
 - b. At deck-to-wall intersections, extend liquid membrane or sheet strips onto deck waterproofing and to finished height of sheet flashing.
 3. Apply sheets firmly without wrinkles, buckles or kinks.
 4. Apply sheets so that direction of flow of water is over and not against laps.
 5. Apply sheet strips under waterproofing membrane at, but not limited to, following locations:
 - a. Expansion joints.
 - b. Discontinuous deck-to-wall and deck-to-deck joints.
 - c. Under clamping ring at drains.
 - d. Wall angles and corners.
 - e. Substrate cracks.
 - f. Penetrations.
 - g. Isolation, construction and contraction joints.
 - h. Where waterproofing membrane may be subject to unusual strain.
 6. Apply liquid membrane fillet at interior corners under sheet strips.
 7. If not indicated otherwise, terminate top edges of sheets under metal counterflashings or with metal termination bars and sealants.
 8. Apply mastic or liquid membrane to vertical and horizontal terminations.
 9. Seal exposed edges of sheets at terminations not concealed by metal counterflashings or metal termination bars and sealants.
- G. Damaged Waterproofing: Repair waterproofing not complying with requirements and patch with sheet waterproofing patch extending 6 in (150 mm) beyond repaired areas in each direction, pressed or rolled in place, with edges sealed with mastic.
1. Patch tears, voids, misaligned or inadequately lapped seams.
 2. Slit fishmouths and blisters, overlap flaps, and patch.

2.5 BOARD INSULATION INSTALLATION

- A. Extruded Polystyrene Board Insulation: As specified in Division 07 Section "Thermal Insulation".

2.6 MOLDED-SHEET DRAINAGE PANEL INSTALLATION

- A. Installation: Place and secure molded-sheet drainage panels with adhesive, with geotextile filter fabric facing away from waterproofed surface. Lap edges and ends of geotextile filter fabric to maintain continuity. Protect installed drainage panels during subsequent construction.

2.7 FIELD QUALITY CONTROL

- A. **Manufacturer's Field Service:** Manufacturer's qualified technical representative shall periodically inspect Work to ensure installation is proceeding in accordance with manufacturer's designs, recommendations, instructions, and warranty requirements. Representative shall submit written reports of each visit indicating observations, findings, and conclusions of inspection.
1. **Manufacturer's Technical Representative Qualifications:** Direct employee of technical services department of manufacturer with experience in providing recommendations, observations, evaluations, and problem diagnostics.
- B. **Testing Agency:** The Owner may employ and pay a qualified independent testing agency to perform field quality control. Materials and installation failing to meet specified requirements shall be replaced at Contractor's expense. Retesting of materials and installations failing to meet specified requirements shall be done at Contractor's expense.
- C. **Testing:** Provide one of the following testing methods:
1. **Flood Testing:** Flood test each deck area for leaks, according to recommendations in ASTM D 5957, after completing waterproofing and flashing, but before overlaying construction is placed. Install temporary containment assemblies, plug or dam drains, and flood with potable water.
 - a. Flood to an average depth of 2-1/2 in (65 mm) with a minimum depth of 1 in (25 mm) and not exceeding a depth of 4 in (100 mm). Maintain minimum of 2 in (50 mm) of clearance from top of base flashing.
 - b. Flood each area for 24 hours.
 - c. After flood testing, repair leaks, repeat flood tests, and make further repairs until waterproofing and flashing installation is watertight.
 2. **Electronic Water Testing, Electronic Field Vector Mapping (EFVM):** Perform leak testing by an electronic detection process to verify entire waterproofing membrane is free of holes, open seams, and capillary defects that allow water to pass. Administer EFVM by a qualified testing agency as follows:
 - a. Leak detection of horizontal waterproofing membrane shall be done prior to placement of protection board and remaining system components.
 - 1) Place conductor wire on bare membrane. Secure wire with small strips of waterproofing or other compatible membrane or tape.
 - 2) Thoroughly wet waterproofing membrane with potable water in area of test. Wetting can be accomplished by hand or mechanical spray devices. Membrane shall be wet during testing procedures.
 - 3) Technician shall mark on waterproofing membrane or surface exact location of defect and assign an identification number to each location.
 - 4) Visually inspect entire waterproofing membrane area and repair breaches found. An EFVM retest shall be performed to confirm integrity of repair(s).
 - b. Technician shall prepare a report of each day's test results containing a written description and photograph of defect(s) located and a schematic CAD drawing indicating location of conductor wire and of defect(s) located in testing field to within 1 in (25 mm) of accuracy. This report shall be made available in hard copy.

- c. Report results of tests, both successful and unsuccessful. In addition to results, report shall include date of test, project name, list of products being applied and tested, name of applicator, name of Contractor, and conditions causing failure of waterproofing membrane in event of an unsuccessful test.
 - d. Materials and installations failing to meet specified requirements shall be replaced at Contractor's expense. Retesting of materials and installations failing to meet specified requirements shall be done at Contractor's expense.
- D. Correction of Deficiencies: Correct deficiencies in or remove waterproofing that does not comply with requirements, repair substrates, reapply waterproofing, and repair flashing.
 - 1. After tests, repair leaks and make further repairs until waterproofing installation is watertight.
- E. Final Inspection: Arrange for waterproofing system manufacturer's qualified technical representative to inspect waterproofing installation on completion of waterproofing membrane and flashing. Notify Architect and Owner 48 hours in advance of date and time of final inspection.

2.8 CLEANING AND PROTECTION

- A. Protect waterproofing from damage and wear during remainder of construction period.
- B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

**17-13 OSU, College of Osteopathic Medicine at
Cherokee Nation
Childers Architect
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**MODIFIED BITUMINOUS
SHEET WATERPROOFING**

07 1352 - 12

THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Thermal insulation products and systems and supplementary items necessary for installation.

1.2 DEFINITIONS

- A. Mineral Fiber: Insulation composed principally of fibers manufactured from rock, slag or glass, with or without binders.
- B. Mineral Wool: A synthetic vitreous fiber insulation made by melting predominantly igneous rock, and or furnace slag, and other inorganic material, and then physically forming the melt into fibers

1.3 ACTION SUBMITTALS

- A. Product Data: Manufacturer's technical literature for each product and system indicated.
 - 1. Include manufacturer's specifications for materials, finishes, construction details, installation instructions, and recommendations for maintenance.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data:
 - 1. For firms and persons specified in "Quality Assurance" to demonstrate their capabilities and experience. Include list of completed projects
- B. Manufacturer's Project Acceptance Document: Certification by the manufacturer that its product(s) are approved, acceptable, suitable for use in specific locations, for specific details, and for applications indicated, specified, or required.

1.5 PRE-INSTALLATION CONFERENCE

- A. Pre-Installation Conference: Before Work begins, conduct conference at Project site.
 - 1. Participants:
 - a. Architect.
 - b. Contractor, including superintendent.
 - c. Installer, including project manager and supervisor.
 - d. If requested, Manufacturer's qualified technical representative.
 - e. Installers of other construction interfaced with Work.

2. Minimum Agenda: Installer shall demonstrate understanding of the Work required by describing detailed procedures for preparing, installing, and cleaning the Work. Demonstration shall include, but not be limited to, following topics:
 - a. Tour representative areas of Work, inspect and discuss condition of substrate, and other preparatory work performed by other trades.
 - b. Review Contract Document requirements.
 - c. Review approved submittals.
 - d. Review inspection and testing requirements.
 - e. Review environmental conditions and procedures for coping with unfavorable conditions.
 - f. Resolve deviations or differences between Contract Documents and the manufacturer's specifications.
3. Record discussions, including decisions and agreements, and prepare report.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect plastic insulation as follows:
 1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
 2. Protect against ignition at all times. Do not deliver plastic insulating materials to Project site before installation time.
 3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

1.7 COORDINATION

- A. Coordinate installation of products and systems with interfacing and adjoining construction to provide a successful installation without failure.

PART 2 - PRODUCTS

2.1 MANUFACTURERS AND PRODUCTS

- A. Acceptable Manufacturers and Products: Subject to compliance with requirements of Contract Documents as judged by the Architect, provide product by one of manufacturers listed. If not listed, submit as substitution according to Conditions of the Contract and Division 01 Section "Substitution Procedures".
- B. Basis of Design (Product Standard): Contract Documents are based on products and systems specified to establish a standard of quality. Other manufacturers offering products having equivalent characteristics may be considered, provided deviations are minor and comply with requirements of Contract Documents as judged by the Architect.

2.2 MATERIALS, GENERAL

- A. Single Source Responsibility: Furnish each type of product from single manufacturer. Provide secondary materials only as recommended by manufacturer of primary materials.
- B. General: Provide insulating materials that comply with requirements and referenced standards in sizes to fit applications indicated, selected from manufacturer's standard thicknesses, widths, and lengths.

2.3 PERFORMANCE REQUIREMENTS

- A. Plenum Rating: Provide glass mineral fiber (fiberglass) insulation to be installed within ceiling plenums rated as follows for use in plenums as determined by testing identical products per "Erosion Test" and "Mold Growth and Humidity Test" described in UL 181, or by comparable tests from another standard acceptable to authorities having jurisdiction.
 - 1. Erosion Test Results: No visible evidence of cracking, flaking, peeling, or delamination of interior surface of duct assembly, after testing for 4 hours at 2500 fpm (13 m/s) air velocity.
 - 2. Mold Growth and Humidity Test Results: No evidence of mold growth, delamination, or other deterioration due to the effects of high humidity, after inoculation with Chaetomium globosum on all surfaces and storing for 60 days at 100 percent relative humidity in the dark.
- B. Fire-Test-Response Characteristics:
 - 1. Fire Resistance Ratings: Materials and construction identical to assemblies tested for fire resistance according to ASTM E 119/NFPA 251/UL 263 and included under Categories listed below that are published in Underwriters Laboratories, Inc. (UL) "Fire Resistance Directory"; or listing of another testing and inspecting agency acceptable to authorities having jurisdiction.
 - a. Polystyrene Insulation: Category CCVW.
 - b. Mineral Fiber Insulation: Category BZJZ
 - 2. Surface Burning Characteristics: Materials and construction identical to assemblies tested for fire resistance according to ASTM E 84/NFPA 255/UL 723 by an independent testing and inspecting agency acceptable to authorities having jurisdiction listed below. Identify products with appropriate markings of applicable testing agency.
 - 3. Fire Rated Assembly Design: Selected from Product Category BXUV published in UL's "Fire Resistance Directory", or design of other testing agency acceptable to authorities having jurisdiction.
 - 4. Combustion Characteristics: Materials and construction identical to assemblies tested for fire resistance according to ASTM E 136 by an independent testing and inspecting agency acceptable to authorities having jurisdiction

2.4 GLASS MINERAL FIBER (FIBERGLASS) BATT INSULATION

- A. Unfaced Insulation:
 - 1. Description: ASTM C 665, Type I, ASTM C553, Type II. Unfaced blankets produced by bonding inorganic glass mineral fibers with a thermosetting binder; free of formaldehyde.
 - 2. Manufacturers and Products:

- a. CertainTeed Corporation; CertaPro Sustainable Insulation.
 - b. Johns Manville; Unfaced Batts for Metal Framing.
 - c. Knauf Insulation; EcoBatt with ECOSE Technology.
 - d. Owens-Corning; EcoTouch Thermal Batts for Metal Frame Construction.
3. Surface Burning Characteristics per ASTM E 84:
- a. Flame spread: 25 or less.
 - b. Smoke developed: 50 or less.
4. Thickness: Full depth of metal stud cavity.

2.5 GLASS MINERAL FIBER (FIBERGLASS) SEMI-RIGID INSULATION

- A. Description: ASTM C 612, Type IA or Types IA and IB. Unfaced, semi-rigid boards produced by bonding inorganic glass mineral fibers with a thermosetting binder.
- B. Manufacturers and Products:
- 1. CertainTeed Corporation; CB-300.
 - 2. Johns Manville; Insul-SHIELD 300.
 - 3. Knauf Insulation; Insulation Board with Ecosse Technology; 3.00 PCF.
 - 4. Owens-Corning; 703.
- C. deg F (29.8 K x m/W at 24 deg C).
- D. Surface-Burning Characteristics per ASTM E 84:
- 1. Flame spread: 25 or less.
 - 2. Smoke developed:
 - a. Exposed-to-View or Concealed Spaces other than Return Air Plenums: 450 or less.
 - b. Return Air Plenums: 50 or less.
- E. Thickness: As indicated but not less than 2 in (50 mm).
- F. Other-than-Cavity Wall Locations:
- 1. Unfaced: ASTM C 612, Types IA and IB. Unfaced rock mineral wool board insulation.
 - a. Location: Typical unless noted to be foil-faced.
 - 2. Foil-Faced: ASTM C 612, Types IA and IB. Rock mineral wool board insulation faced with foil-scrim-kraft vapor-retarder membrane.
 - a. Location: Where indicated on drawings for non-fire-rated perimeter conditions and/or for spandrel insulation.
 - 3. Density: Nominal density of 4 lb/cu. ft. (64 kg/cu. m), thermal resistivity of 4 deg F x h x sq. ft./Btu x in. at 75 deg F (27.7 K x m/W at 24 deg C).
 - 4. Surface Burning Characteristics per ASTM E 84:
 - a. Flame spread: 25 or less.

- b. Smoke developed: 50 or less.
- 5. Thickness: As indicated on drawings but not less than required for an R-value of 19.
- 6. Fiber Color: Regular color, unless otherwise indicated.
- 7. Manufacturers:
 - a. Rock Wool Manufacturing Company.
 - b. Roxul, Inc.
 - c. Themafiber, Inc.

2.6 EXTRUDED POLYSTYRENE RIGID INSULATION

- A. Description: Unfaced, rigid, cellular polystyrene thermal insulation formed from polystyrene base resin by an extrusion process, and with other requirements indicated in this Article.
 - 1. Surface Burning Characteristics per ASTM E 84:
 - a. Flame Spread: 25 or less.
 - b. Smoke Developed: 450 or less.
 - 2. Adhesive for Bonding Insulation: Product compatible with insulation being bonded and with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation or substrates.
- B. Cavity Wall Locations:
 - 1. Product Quality Standard: ASTM C 578, Type IV, 25 psi minimum compressive strength.
 - 2. Size: 2 in (50 mm) thick by 16 in (400 mm) high by 96 in (2400 mm) long, square edges.
 - 3. R-Value: 10
 - 4. U-Value: 0.1
 - 5. Manufacturers and Products:
 - a. Dow Chemical Company; Styrofoam CavityMate Plus
 - b. Owens Corning; FOAMULAR CW25
 - c. Pactiv Building Products Division; GreenGuard Type IV 25.
- C. Other-than-Cavity Wall Locations:
 - 1. Product Quality Standard: ASTM C 578 of following type and minimum compressive strength for the following locations:
 - a. Slabs-on-Grade: Type VI, 40 psi (276 kPa).
 - b. Backfilled Walls: Type IV, 25 psi (173 kPa).
 - 2. Manufacturers and Products:
 - a. Type IV:
 - 1) DiversiFoam Products; CertiFoam 25.
 - 2) Dow Chemical Company; STYROFOAM Square Edge.
 - 3) Owens Corning; FOAMULAR 250.
 - 4) Pactiv Building Products Division; GreenGuard Type IV 25.

- b. Type VI:
 - 1) DiversiFoam Products; CertiFoam 40.
 - 2) Dow Chemical Company; STYROFOAM Roofmate or Highload 40.
 - 3) Owens Corning; FOAMULAR 400 or 404.

3. Thickness: As indicated but not less than 2 in (50 mm).

2.7 POLYISOCYANURATE RIGID INSULATION

- A. Refer to Division 07 roofing section(s) for polyisocyanurate rigid insulation used as roofing insulation.

2.8 SPRAYED FOAM INSULATING GAP FILLER

- A. As specified in Division 07 Section "Joint Sealants".

2.9 SPRAY-APPLIED THERMAL INSULATION

- A. Spray-Applied Thermal Insulation:

1. Description: Glass mineral fiber insulation spray applied for thermal or acoustic applications.

- a. Thermal Resistance: ASTM C 518; R-Factor = 4 per 1 in (25 mm).
- b. Noise Reduction Coefficient: ISO 354; NRC 0.75 at 1 in (25 mm), 0.95 at 2 in (50 mm)

2. Surface Burning Characteristics:

- a. Flame spread: Class A; 25 or less.
- b. Smoke developed:

- 1) Exposed-to-View or Concealed Spaces other than Return Air Plenums: 450 or less.
- 2) Return Air Plenums: 50 or less.

3. Thickness: As indicated on drawings but not less than required for an R-value of 19.

4. Density: As required for application.

5. Manufacturer and Product: Monoglass Incorporated; Monoglass Spray-On Insulation, white color.

- B. Spray-Applied Protective Coating: Manufacturers' standard protective coating for sealing a tamped insulation surface.

1. Locations: Installations exposed to view in finished construction and for installations in crawl spaces; and not indicated to have a vapor retarder.

2. Manufacturer and Product: Monoglass Incorporated; Insulseal, medium coating; color to be selected.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Acceptance of Surfaces and Conditions: Examine substrates to which thermal insulation will be applied for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting Work within a particular area will be construed as acceptance of surface conditions.

3.2 INSTALLATION, GENERAL

- A. Installation Quality Standards: In addition to standards listed elsewhere, perform Work according to following, unless otherwise specified:
 - 1. Respective manufacturer's written installation instructions.
 - 2. Accepted submittals.
 - 3. Contract Documents.
- B. General Requirements:
 - 1. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice, rain, or snow.
 - 2. Comply with insulation manufacturer's written instructions applicable to products and application indicated.
 - 3. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
 - 4. Apply a single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.

3.3 PREPARATION

- A. General: Comply with manufacturer's instructions, recommendations, and specifications for cleaning and surface preparation. Surfaces shall have no defects, contaminants, or errors which would result in poor or potentially defective installation or would cause latent defects in Work.

3.4 INSTALLATION OF INSULATION SYSTEMS

- A. Unfaced Glass Mineral Fiber (Fiberglass) Semi-Rigid and Batt Insulation: Install insulation in cavities formed by framing members according to following:
 - 1. Use insulation widths and lengths that fill the cavities formed by framing members. Where more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. Where partition will be covered by gypsum board on only one side, apply adhesive to backside of gypsum board that is installed and press insulation in place to form bond to prevent insulation from sagging within cavity.

- B. Mineral Wool Semi-Rigid Insulation: Install in cavities formed by framing members according to the following requirements:
1. Cavity Wall Installations:
 - a. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
 - b. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 2. Glazed Aluminum Framing System (Curtainwall) Installations:
 - a. Hold insulation in place by securing metal clips and straps or integral pockets within window frames, spaced at intervals recommended in writing by insulation manufacturer to hold insulation securely in place without touching spandrel glass. Maintain cavity width of dimension indicated on Drawings between insulation and glass.
 - b. Install insulation to fit snugly without bowing.
 - c. Install mullion covers, minimum 8 in (200 mm) width of insulation, centered over horizontal and vertical aluminum frames within spandrel area using the same impaling pins as used to attach the curtainwall insulation material. Secure covers with clinch shields over impaling pins.
- C. Sprayed Foam Insulating Gap Filler: As specified in Division 07 Section "Joint Sealants".
- D. Sprayed-Applied Thermal Insulation: Comply with manufacturer's written instructions for application procedures, and types of equipment used to mix, convey, and spray on insulation material.
1. Cover adjacent work subject to damage from fallout or overspray of insulation materials during application. Provide temporary enclosure as required to confine spraying operations and ensure adequate ambient conditions for temperature and ventilation.
 2. Coat substrates with adhesive before applying insulation material where recommended in writing by manufacturer for material and application indicated.
 3. Extend insulation material in full thickness over entire area of each substrate to be protected.
 4. Spray-apply insulation materials to maximum extent possible. Following the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by manufacturer.
 5. Apply insulation material in thicknesses and densities not less than those required to achieve minimum R-value indicated.
 6. Maintain profile of substrates except fill voids between members, including voids formed by fluted decks above beams and similar voids.
 7. Cure sprayed insulation materials according to manufacturer's recommendations to prevent premature drying.
 8. Protective Coating: Board-tamp sprayed insulation and over-spray with protective coating at installations that will be exposed to view in finished construction and for installations in crawl spaces.
 - a. Vapor Retarder Coating: Where indicated to have a vapor retarder, install this in lieu of protective coating. Board-tamp sprayed insulation and over-spray with vapor retarder coating.

3.5 PROTECTION

- A. Protection: Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation

END OF SECTION

**17-13 OSU, College of Osteopathic Medicine at
Cherokee Nation
Childers Architect
2019-04-22**

THERMAL INSULATION

07 2100 - 10

SECTION 31 2311

EARTHWORK FOR BUILDING CONSTRUCTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. The work covered by this Section consists of furnishing all plant, labor, equipment, appurtenances and material in performing all operations, hauling, placing, spreading, watering, processing, compacting and shaping earth sections, within the building limits, complete in place in accordance with the Project Manual and Drawings.

1.2 RELATED WORK ELSEWHERE

- A. Site Clearing - Section 31 1000
- B. Under-Slab Vapor Retarder – Section 07 2600
- C. General Foundation Notes on Drawings.
- D. Project Soils Report – shall be completely reviewed and understood by the contractor. In case of conflict or omission, the Project Soils Report shall govern.

1.3 SUBSURFACE SOIL DATA

- A. Subsurface soil investigations have been made and the results are available for examination by the Contractor. This is not a warranty of conditions; the Contractor is expected to examine the site and determine for himself the character of materials to be encountered.
- B. No additional allowance will be made for rock removal, site clearing and grading, filling, compaction, disposal, or removal of any unclassified materials.

1.4 REFERENCES

- A. ASTM International, latest versions.
 - 1. ASTM D 1556 Standard Test Method for Density of Soil in Place by the Sand-Cone Method
 - 2. ASTM D 698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard effort (12,400 ft-lbf/ft³)(600kN-m/m³)]
 - 3. ASTM D 4318 Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
 - 4. ASTM D 6938 Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

1.5 SUBMITTALS

- A. Submit copies of materials certificates and test results for materials in accordance with type of tests, frequencies and remarks as outlined in the sampling and testing schedule.

1.6 TESTING AND INSPECTION

- A. General: The Owner shall employ the services of a registered, licensed Geotechnical Engineer to observe all controlled earthwork soil testing. The testing laboratory shall provide continuous on-site observation by experienced personnel during construction of fill material. The Contractor shall notify the testing laboratory at least two working days in advance of any field operations of controlled earthwork, or of any resumption of operations after stoppages.
- B. Report of Field Density Tests
 - 1. The Geotechnical Engineer shall submit, daily, the results of field density tests required by these specifications.
- C. Costs of Tests and Inspection
 - 1. The cost of testing, inspecting and engineering, as specified in this section of the specifications, shall be borne by the Owner.
- D. Lines and Grades: Alignment and grade of all elements shall be made on true tangents and curves. Grades shall conform to the elevations indicated on Drawings, with minor adjustments, to provide a smooth approach at building lines, at connections to existing paving and to provide proper drainage. Correct irregularities at no cost to the Owner.

1.7 WEATHER LIMITATIONS

- A. Controlled fill shall not be constructed when the atmospheric temperature is below 35 degrees F. When the temperature falls below 35 degrees, it shall be the responsibility of the Contractor to protect all areas of completed work against any detrimental effects of ground freezing by methods approved by the testing laboratory. Any areas that are damaged by freezing shall be reconditioned, reshaped, and compacted by the Contractor in conformance with the requirements of this specification without additional cost to the Owner.

PART 2 - PRODUCTS

2.1 STRUCTURAL FILL MATERIAL

- A. On-Site Soils / Imported Fill: GC, SC, SW or GW.
- B. Low volume Change (LVC) Engineered Fill: CL, GC or SC (LL<50).
 - a. CL materials shall not be placed below slabs or foundations.
- C. On-Site Soils: CH - **SHALL NOT BE PLACED WITHIN UPPER 2 FEET BENEATH FOUNDATIONS, FLOOR SLABS AND PAVEMENTS.**
- D. On-Site Soils: ML soils are only considered suitable as controlled fill if containing at least 35% gravel sized particles.
- E. Material shall consist of soils that conform to the following physical characteristics:

Sieve Size Sq. Openings	Percent Passing By Weight
12 inch*	100
No. 200	85 or less

* or lift thickness whichever is less

- F. The liquid limit of the material to be used for fill within 2 feet of bottom of foundations or slabs or backfill, as determined in accordance with ASTM D 4318 shall not exceed 50.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clearing and Grubbing: Prior to placing structural fill all borrow areas and areas to receive structural fill shall be stripped of vegetation and deleterious materials. Strippings shall be hauled offsite or stockpiled for subsequent use in landscaped areas or non-structural fill areas as designated by the Owner or his representative and approved by the Geotechnical Engineer.

3.2 CONSTRUCTION AREA TREATMENT

- A. Site Preparation - Fill Areas: Prior to placing structural fill the areas to be filled shall be scarified to a depth of eight inches and moisture conditioned as described below. The area to be filled shall then be compacted to a minimum of 95 percent of standard proctor density as determined in accordance with ASTM D 698. Any soft or "spongy" areas shall be removed as directed by the Geotechnical Engineer and replaced with structural fill as described herein.
- B. Site Preparation - Cut Areas: Following excavation to rough grade all building and pavement areas shall be scarified to a depth of eight inches and moisture conditioned as described below. All building and paved areas shall be compacted to a minimum of 95 percent of standard proctor density as determined by ASTM D 698.

3.3 EQUIPMENT AND METHODS

- A. In areas not accessible to heavy equipment, distribute by and compact with hand operated vibratory compactors.

3.4 BORROW

- A. The Contractor shall provide sufficient material for fill to the lines, elevations and cross sections as shown on the contract drawings from borrow areas.
- B. The Contractor shall obtain from the Owners of said borrow areas the right to excavate material, shall pay all royalties and other charges involved, and shall pay all expenses in developing the source including the cost of right-of-way required for hauling the material.

3.5 COMPACTION

- A. Fill shall be spread in layers not exceeding 12 inches (loose), watered as necessary, and compacted. Moisture content at time of compaction shall plus/minus 2 percent of optimum moisture for CL, SC, GC, GW and SW soil types and 0-4% above optimum for CH soil types. A density of not less than 95 percent of maximum dry density shall be obtained within the building pads.

- B. Optimum moisture content and maximum dry density for each soil type used shall be determined in accordance with ASTM D 698.
- C. Compaction of the fill shall be by mechanical means only. Where vibratory compaction equipment is used, it shall be the Contractor's responsibility to ensure that the vibrations do not damage nearby buildings or other adjacent property. Where vibratory compaction is not possible, pneumatic rolling equipment shall be used.

MATERIAL	MINIMUM PERCENT COMPACTION
Structural & granular fill in construction area	95
Subgrade below structural fill	95
Structural fill under exterior walls	95
Miscellaneous backfill	90

3.6 MOISTURE CONTROL

- A. The material moisture content, while being compacted, shall be plus/minus 2 percent of optimum moisture for CL, SC, GC, GW and SW soil types and 0-4% above optimum for CH soil types.

3.7 DENSITY REQUIREMENTS

- A. Density of undisturbed soils, in-place fill and backfill shall be determined in accordance with the procedures of ASTM D 1556 or ASTM D 6938. If tests indicate that the density of in-place soil is less than required, the material shall be scarified, moistened or dried as necessary to obtain proper moisture content and recompacted as necessary to achieve the proper densities. Sufficient density tests shall be made and reports submitted by the Testing Laboratory indicating all cut and fill areas were compacted and graded in accordance with the requirements.

3.8 SLOPE PROTECTION & DRAINAGE

- A. Berming and grading shall be done as may be necessary to prevent surface water from flowing into and out of the construction area. Any water accumulating therein shall be removed by pumping or by other methods.

3.9 SOIL EROSION PROTECTION

- A. The Contractor shall ensure that no soil erodes or blows from the site into public right-of-way or onto private property.
- B. The Contractor shall promptly clean up any material which erodes or blows into the public right-of-way or onto private property.

3.10 PRESERVATION OF PROPERTY

- A. Provide temporary fences, barricades, coverings, or other protections to preserve existing items indicated to remain and to prevent injury or damage to persons or property. Apply protections to adjacent properties as required.
- B. Restore damaged work to condition existing prior to start of work, unless otherwise directed.

3.11 EXISTING UTILITIES

- A. The Contractor shall verify the location of any utility lines, pipelines, or underground utility lines in or near the area of the work in advance of and during Earthwork. The Contractor is fully responsible for any and all damage caused by failure to locate, identify and preserve any and all existing utilities, pipelines and underground utility lines. Repair damaged utilities to the satisfaction of the utility owner at no expense to the Owner.
- B. Should uncharted or incorrectly charted piping or other utilities be encountered during grading, consult the Architect immediately for directions as to procedures.
- C. Cooperate with the Owner and public or private utility companies in keeping service and facilities in operation.

3.12 WASTE

- A. Dispose of all waste off Owner's property.
- B. Burning of waste will not be permitted.

3.13 AIR POLLUTION

- A. Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt air pollution. Comply with governing regulations pertaining to environmental protection.

SAMPLING AND TESTING SCHEDULE FOR EARTHWORK			
FIELD QUALITY CONTROL			
MATERIAL	TEST FOR	FREQUENCY	REMARKS
NATURAL GROUND	Compaction in accordance with ASTM D 1556 or ASTM D 6938	1 per 2500 square feet of surface	Conduct a minimum of 3 tests on each section.
EMBANKMENT AND/OR SUBGRADE	Soil Conditions Moisture-Density in accordance with ASTM D 698	Test 1 per soil classification	
	Compaction control in accordance with ASTM D 1556 or ASTM D 6938	1 per each lift every 2500 square feet of surface	Immediately after placing, Conduct a minimum of 3 tests per section
		1 per each lift for each 2500 square feet of fill	

END OF SECTION

SECTION 313116
TERMITE CONTROL

PART 1 - GENERAL

1.1 SUMMARY

- A. Work required for this Section includes soil treatment for termite control including supplementary Work necessary for its installation.

1.2 DEFINITIONS

- A. EPA: Environmental Protection Agency.
- B. PCO: Pest control operator.

1.3 ACTION SUBMITTALS

- A. Product Data: Treatments and application instructions, including EPA-Registered Label.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: Signed by manufacturers of termite control products certifying that treatments furnished comply with requirements.
- B. Soil Treatment Application Report: After application of termiticide is completed, submit report for Owner's record information, including the following as applicable:
 - 1. Date and time of application.
 - 2. Moisture content of soil before application.
 - 3. Brand name and manufacturer of termiticide.
 - 4. Quantity of undiluted termiticide used.
 - 5. Dilutions, methods, volumes, and rates of application used.
 - 6. Areas of application.
 - 7. Water source for application.
- C. Qualification Data:
 - 1. For firms and persons specified in "Quality Assurance" to demonstrate their capabilities and experience. Include list of completed projects.
- D. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: A PCO who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment in jurisdiction where Project is located and who is experienced and has completed termite control treatment similar to that indicated for this Project and whose work has a record of successful in-service performance.

- B. Regulatory Requirements: Formulate and apply termiticides, and label with a Federal registration number, to comply with EPA regulations and authorities having jurisdiction.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: To ensure penetration, do not treat soil that is water saturated or frozen. Do not treat soil while precipitation is occurring. Comply with EPA-Registered Label requirements and requirements of authorities having jurisdiction.

1.7 COORDINATION

- A. Coordinate soil treatment application with excavating, filling, and grading and concreting operations. Treat soil under footings, grade beams, and ground-supported slabs, before construction.

1.8 WARRANTY

- A. Special Warranty: Written warranty, signed by applicator and Contractor certifying that termite control work, consisting of applied soil termiticide treatment, will prevent infestation of subterranean termites. If subterranean termite activity or damage is discovered during warranty period, re-treat soil and repair or replace damage caused by termite infestation.
- B. Warranty Period: Five years from date of Substantial Completion.

1.9 MAINTENANCE SERVICE

- A. Continuing Service: Provide a proposal for continuing service, including monitoring, inspection, and retreatment for occurrences of termite activity, from applicator to Owner, in the form of a standard yearly (or other period) continuing service agreement, starting on the date of Substantial Completion. State services, obligations, conditions, and terms for agreement period and for future renewal options.

PART 2 - PRODUCTS

2.1 SOIL TREATMENT

- A. Termiticide: Provide an EPA-registered termiticide complying with requirements of authorities having jurisdiction, in a soluble or emulsible, concentrated formulation that dilutes with water or foaming agent, and formulated to prevent termite infestation. Use only soil treatment solutions that are not harmful to plants. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to the product's EPA-Registered Label.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of the soil, interfaces with earth moving, slab and foundation work, landscaping, and other conditions affecting performance of termite control.

- B. Proceed with application only after unsatisfactory conditions have been corrected. Starting of Work will be construed as installers acceptance of installation conditions.

3.2 PREPARATION

- A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's written instructions for preparing substrate. Remove all extraneous sources of wood cellulose and other edible materials such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil and around foundations.
- B. Soil Treatment Preparation: Remove foreign matter and impermeable soil materials that could decrease treatment effectiveness on areas to be treated. Loosen, rake, and level soil to be treated, except previously compacted areas under slabs and footings. Termiticides may be applied before placing compacted fill under slabs if recommended by termiticide manufacturer.
- C. Fit filling hose connected to water source at the site with a backflow preventer, complying with requirements of authorities having jurisdiction.

3.3 APPLYING SOIL TREATMENT

- A. General: Apply soil treatment under all enclosed structures. Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's EPA-Registered Label for products.
- B. Application: Mix soil treatment termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of termiticide, according to manufacturer's EPA-Registered Label, to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction. Distribute the treatment evenly.
- C. Slabs-on-Grade and Basement Slabs: Under ground-supported slab construction, including footings, building slabs, and attached slabs as an overall treatment. Treat soil materials before concrete footings and slabs are placed.
- D. Foundations: Adjacent soil including soil along entire inside perimeter of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab, and around interior column footers, piers, and chimney bases; and along entire outside perimeter, from grade to bottom of footing. Avoid soil washout around footings.
- E. Crawlspace: Soil under and adjacent to foundations as previously indicated.
- F. Adjacent Areas: Around entrance platform, porches, and equipment bases. Apply overall treatment only where attached concrete platform and porches are on fill or ground.
- G. Penetrations: At expansion joints, control joints, and area where slabs will be penetrated.
- H. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.
- I. Protect termiticide solution, dispersed in treated soils and fills, from being diluted until ground-supported slabs are installed. Use waterproof barrier according to EPA-Registered Label instructions.
- J. Post warning signs in areas of application.

- K. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

END OF SECTION

SECTION 33 4613

FOUNDATION DRAINAGE SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

- A. Work required for this section includes foundation drainage system including supplementary items necessary to complete their installation.

1.2 ACTION SUBMITTALS

- A. Product Data: Manufacturer's technical literature for each product and system indicated.
 - 1. Include manufacturer's specifications for materials, finishes, construction details, installation instructions, and recommendations for maintenance.
- B. Shop Drawings: Show details of fabrication and installation, including plans, elevations, sections, details of components and attachments to other work. Distinguish between shop and field-assembled work.
 - 1. Show details and installation drawings for interface with drainage pipe system.
- C. Samples:
 - 1. Geotextile Filter Fabric: Two 12 inch squares.
 - 2. Perforated drain pipe:
 - a. Pipe: 12" inch long piece.
 - b. Fittings: One of each.

1.3 COORDINATION

- A. Coordinate and schedule sequencing with materials trades for concrete walls, foundations, concrete finishing, waterproofing, excavation, and backfilling.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Molded-Sheet Drainage Panels: Refer to Division 07 waterproofing section.
- B. Filter Fabric: Woven or nonwoven geotextile filter fabric of polypropylene or polyester fibers, or combination of both. Flow rates range from 110 to 330 gpm per sq. ft. when tested according to ASTM D 4491.
- C. Perforated Drainage Pipe: ASTM D 2729 Polyvinyl Chloride nominal 4 inch, bell-and-spigot pipe including fittings, cleanouts, etc.

- D. Impervious Fill: Clay, gravel and sand mixture.
- E. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, ASTM D 448, coarse aggregate, Size 57, with 100 percent passing 1-1/2 inch sieve and not more than 5 percent passing No. 8 sieve.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Acceptance of Surfaces and Conditions: Examine substrates to receive products and systems and associated work for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting work within a particular area will be construed as acceptance of surface conditions.

3.2 INSTALLATION, GENERAL

- A. Installation Quality Standards: In addition to standards listed elsewhere, perform Work according to following, unless otherwise specified:
 - 1. Respective manufacturer/fabricator's written installation instructions.
 - 2. Accepted submittals.
 - 3. Contract Documents.

3.3 PREPARATION

- A. General: Comply with manufacturer's instructions, recommendations, and specifications for cleaning and surface preparation. Surfaces shall have no defects, contaminants, or errors which would result in poor or potentially defective installation or would cause latent defects in Work.

3.4 INSTALLATION, FOUNDATION DRAINAGE SYSTEM

- A. Molded-Sheet Drainage Panels: Refer to Division 07 waterproofing section.
- B. Bottom Impervious Fill:
 - 1. Place impervious fill material on subgrade adjacent to bottom of footing after concrete footings have been cured and forms removed.
 - 2. Place and compact impervious fill not less than 6 inches deep and 12 inches wide.
- C. Filter Fabric:
 - 1. Cut fabric roll to proper width prior to installation.
 - 2. Include sufficient width to conform to trench perimeter and for minimum six inch top overlap.
 - 3. Lap upstream roll over downstream roll minimum of two feet, to form shingled effect.
 - 4. Ensure fabric continuity as fabric conforms to excavation surface during drainage fill placement and compaction.
 - 5. Following drainage fill placement, fold fabric over aggregate to form longitudinal lap.

6. Place backfill soil over lap at sufficient intervals to maintain lap during subsequent backfilling.
7. Exercise care during fabric installation to prevent natural or fill soils from intermixing with drainage aggregate.

D. Drainage Fill:

1. Place supporting layer of drainage fill over compacted subgrade to compacted depth of not less than 4 inches.
2. After installing drainage piping, add drainage fill to width of at least 6 inches on side away from wall and to top of pipe to perform tests.
3. After satisfactory testing, cover piping to width of at least 6 inches on side away from footing and above top of pipe at least 12 inches.
4. Place drainage fill in layers not exceeding 3 inches in loose depth; compact each layer placed.

E. Drain Pipe: Comply with ASTM D 2321 and as follows:

1. Excavate to proper depths, profiles and lines required for proper drainage.
2. Provide minimum slope of 1 percent (1:100) unless otherwise indicated. Slope to drain.
3. Lay drain pipe solidly bedded in filtering material with bells facing upslope and spigot end inserted fully into adjacent bell.
4. Provide full bearing for each pipe section throughout its length to true grades and alignment, and continuous slope in direction of flow.
5. Lay perforated pipe with perforations down and joints tightly closed in accordance with pipe manufacturer's recommendations.
6. Provide fittings and couplings as required.
7. Joint PVC pipe and fittings according to ASTM D 3034 with elastomeric seal gaskets according to ASTM D 2321.
8. Joint perforated, PVC pipe and fittings according to ASTM D 2729, with loose, bell-and-spigot joints.
9. Provide riser extensions and clean-outs at grade at approximately 100 feet on center. Locate at beginning of pipe run and changes in direction.
10. Set top of clean-outs 1 inch above grade and secure in 12 inch square by 4 inch deep concrete anchor.
11. Extend piping and connect to building storm drainage system or building sump pumps.

3.5 FIELD QUALITY CONTROL

- A. Testing: After installing drainage fill to top of pipe, test drain piping with water to ensure free flow before backfilling. Remove obstructions, replace damaged components, and repeat test until results are satisfactory.

3.6 CLEANING

- A. Clear interior of installed piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of each day or when work stops.

END OF SECTION